

**Powys Local Development Plan,
Deposit June 2015**

Habitat Regulations Assessment

Appendix 1 – Site Characteristics

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<p>Site Name: Brecon Beacons Location Grid Ref: SO024211 JNCC Site Code: UK0030096 Size: 269.67 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Brecon Beacons SAC is located to the south of the town of Brecon and the Old Red Sandstone cliffs and escarpment is typical of the upland scenery within the National Park. The site is comprised of 4 different units contained within Brecon Beacons SSSI. Pen y Fan is the highest peak in south Wales. The site is of particular interest for the arctic-alpine plants and plant communities growing on the sandstone rocks and ledges on its precipitous mostly north and east facing cliffs. The escarpments also support stands of dry heath vegetation.</p> <p>Within the SAC boundary the only significant areas of dry heath are found on the steep slopes of the NNR. The heath is largely dominated by single species stands of heather <i>Calluna vulgaris</i> and bilberry <i>Vaccinium myrtillus</i>, although some stands have crowberry <i>Empetrum nigrum</i>. Heather and bilberry also grow on the cliff ledges and are sometimes joined by cowberry (<i>Vaccinium vitis-idaea</i>). Here, there is some gradation into the other Annex I habitat types for which this SAC is designated. On the lower slopes, where grazing levels are higher, heath species become less dominant and are replaced by acid grassland. Bracken is locally abundant both on the steeper slopes, where it grows where the soil is slightly deeper, and on the lower slopes where it is sometimes mixed with scrub. Trees, including endemic whitebeams (<i>Sorbus</i>), and shrubs are an important element of the crag vegetation.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation ▪ Siliceous rocky slopes with chasmophytic vegetation <p>Annex I habitats present as qualifying features, but not primary reasons for site selection:</p> <ul style="list-style-type: none"> ▪ European dry heaths ▪ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
<p>Conservation Objectives</p>	<p>Vision for the Site: The Old Red Sandstone cliffs and screes are composed of acidic and more base-rich sandstone. These rocks provide ideal habitat for a wide range of plants, including lichens, mosses, liverworts and flowering plants. The cliffs, ledges and rocky slopes also provide a grazing free refuge that allows plants like serrated wintergreen, purple saxifrage and</p>

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	<p>endemic hawkweeds to thrive. On ledges evidence of tall, un-grazed vegetation with species like great wood-rush and lady's-mantle is easily visible and flowering during the summer months.</p> <p>Craig Cerrig-gleisiad and Fan Frynach and Y Gyrn support the main areas of dry heath. Mixtures of heather and bilberry are dominant here, along with crowberry, cowberry, mosses and lichens. The heathland has a varied age structure created by grazing, such that there is a mosaic young, mature and degenerate heath. Dense patches of bracken are generally absent from these areas and the dominance of purple moor-grass is under control.</p> <p>The area of other habitats of particular interest, such as blanket bog and flushes are stable in the long term, their quality and range of typical species are maintained and the factors that may affect them are under control.</p> <p>For each species of particular interest, the population is stable or increasing and is sustainable in the long term and the factors that affect the species or its habitat are under control. The special geological features and landforms are available for continuing study.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation. <p><u>Vision for this feature:</u></p> <ul style="list-style-type: none"> ▪ The base-rich sandstone cliffs, including crevices, scree and associated patches of thin soil remain free from disturbance and support typical plants, including mosses and liverworts. ▪ A variety of rare and scarce plants thrive in these areas, including purple saxifrage, green spleenwort, Oeders apple-moss, lesser rough earwort and several rare hawkweeds. ▪ Populations of these species are sufficiently large and widespread to be sustained into the future (currently some populations may be critically low). ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Siliceous rocky slopes with chasmophytic vegetation. <p><u>Vision for this feature:</u></p> <ul style="list-style-type: none"> ▪ The acidic sandstone rocks, including crevices and scree,

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	<p>remain free from disturbance to and support typical plants, including mosses, ferns and lichens.</p> <ul style="list-style-type: none"> ▪ A variety of rare and scarce plants thrive in these areas, including fir clubmoss, dwarf willow, and greater streak-moss. ▪ Populations of these species are sufficiently large and widespread to be sustained into the future. ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats present as qualifying features, but not primary reasons for site Selection:</p> <ul style="list-style-type: none"> ▪ European dry heaths <p><u>Vision for this feature:</u></p> <ul style="list-style-type: none"> ▪ The extent, quality and diversity of heath vegetation are maintained and, where possible, degraded heath is restored to good condition. ▪ The main heathland areas within the SAC and SSSI have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as qualifying features, but not primary reasons for site Selection:</p> <ul style="list-style-type: none"> ▪ Hydrophilous tall herb fringe communities of plains and montane to alpine levels <p><u>Vision for this feature:</u></p> <ul style="list-style-type: none"> ▪ The cliff ledges with less acidic soil remain largely free from grazing, such that the typical flowering plants can flourish and flower freely. ▪ Several uncommon plants thrive in these areas, including serrated wintergreen and rare hawkweeds. ▪ The populations of these plants are sufficiently large and widespread to be sustained into the future. ▪ All factors affecting the achievement of the above conditions are under control.
<p>Component SSSIs</p>	<p>Brecon Beacons SSSI is composed of 10 management units of which numbers 1, 4, 8, and 9 comprise to form the Brecon Beacons SAC.</p> <ul style="list-style-type: none"> ▪ Unit 1 - Craig Cwm Du and Craig Cerrig ▪ Unit 4 - SAC area within Great Forest Common ▪ Unit 8 - SAC cliffs within Brecon Beacons Common ▪ Unit 9 - SAC cliffs within Buckland Manor Common

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<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Grazing - Some areas under-grazed while others are over-grazed.</p> <ul style="list-style-type: none"> ▪ Upper limit: 0.2 livestock units/ha/year (One livestock unit is equivalent to 1 cow or horse. A sheep (with lamb) is equivalent to 0.15 livestock units). ▪ Lower limit: Sufficient to prevent the development of scrub within heathland/grassland of conservation interest and/or spread of bracken and ivy. <p>Air Quality - Ensure that no critical loads for acidic and nitrogen deposition are exceeded. No critical loads for acidic and nitrogen deposition are exceeded at relevant Environment Agency monitoring station in more than one year out of five: Sulphur dioxide – 20µg/m³ Nitrous Oxides – 30µg/m³ Ozone – 3000 ppb Ammonia – 1µg/m³ N – 10-20 kg/ha/yr acid – 0.35 keq/ha/yr</p> <p>Erosion - No noticeable impacts from human or livestock induced erosion in units 1, (2), 4, (7), 8, 9, (10). Calcareous chasmophytic vegetation may be damaged by erosion caused by trampling by people and livestock, both directly and by smothering with material washed down from above. Natural rockfalls occur and allow some of the less competitive species to thrive.</p> <p>Rock Climbing - No rock climbing in units 1, (2), (3), 4, (7), 8, 9, (10) without agreement. Although most of the rocks at this site are too soft or unstable for climbing, intensive use can dislodge plants and disturb breeding birds. These impacts may be avoided if climbing is subject to specific agreements, which include a code of conduct.</p> <p><u>Synthesised Conditions to maintain integrity (applies to all qualifying features)</u></p> <ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ Maximum – 0.2 livestock units/ha/year ○ Minimum – sufficient to prevent bracken / ivy encroachment • Air Quality (must not exceed the following maximums in more than 1 in 5 years) <ul style="list-style-type: none"> ○ Sulphur dioxide – 20µg/m³

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	<ul style="list-style-type: none"> ○ Nitrous Oxides – 30µg/m³ ○ Ozone – 3000 ppb ○ Ammonia – 1µg/m³ ○ Nitrogen – 10-20 kg/ha/yr ○ acid – 0.35 keq/ha/yr • Erosion – no noticeable impacts in the following units <ul style="list-style-type: none"> ○ 1, (2), 4, (7), 8, 9, (10). <p>Refer to Core Management Plan (including conservation objectives) for Brecon Beacons Site of Special Scientific Interest (SSSI) incorporating Brecon Beacons Special Area of Conservation (2008) for further information at http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=501946fe-f02d-4dae-bf58-1b40f6a40778&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation. Un-favourable ▪ Siliceous rocky slopes with chasmophytic vegetation. Un-favourable ▪ European dry heaths Un-favourable ▪ Hydrophilous tall herb fringe communities of plains and montane to alpine levels. Un-favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>Craig Cerrig-gleisiad and Craig Cwm-du: These areas are a National Nature Reserve (NNR); the management regime is light grazing. Almost all of the heathland is contained in these sections, and is in good condition. Public pressure from ramblers and climbers is not a significant problem.</p> <p>Pen y Fan, Blaen Taf crags and Craig y Fro: These areas are on common land where grazing has been at high levels for the past 30-40 years. The SAC interests here are largely confined to cliffs and crags inaccessible to sheep. The potential for loss of habitat to grazing is therefore small. If grazing were reduced, there would probably be a small extension in the extent of the chasmophytic vegetation of both calcareous and silicious rocky slopes, due to reduction in sheep dunging, grazing and rubbing of the smaller accessible outcrops. Due to the high palatability of the hydrophilous tall herb fringe communities, a very large reduction, or exclusion, of grazing would be required to obtain extensions in habitat area. The European dry heath is very limited in extent on this part of the site and unlikely to extend in area with reduced grazing.</p>

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	<p><u>Erosion</u> Grazing pressure, combined with human trampling, along the Pen y Fan ridge has caused localised soil erosion. In places, soil and rock debris are washing down the steeper faces and burying some colonies of arctic-alpine plants. Some progress has been made in recent years in laying a hard surface on the summit ridge path on Pen y Fan.</p> <p><u>Air pollution</u> Acidification of rain and soils, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. Mosses, liverworts and lichens are particularly vulnerable to pollution from atmospheric sources. Much of this atmospheric pollution comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial processes. The Environment Agency has reported that critical loads for air pollutants are still being exceeded, which is likely to be having an adverse impact on the vegetation.</p> <p><u>Grazing pressure</u> Many of the interesting plants on the cliffs are intolerant of grazing and are confined to areas less accessible to stock. Reduced grazing levels on the main escarpment would allow these plants to spread out from their craggy refuges. Sheep tend to graze any lime-rich grassland preferentially at certain times of year and can cause localised damage in these areas, but there are some areas they will never be able to access on vertical or unstable slopes. However, some light grazing of slopes may help to prevent encroachment by coarse vegetation, trees and scrub. Those areas currently ungrazed are not likely to be accessible to stock types currently grazing the land, therefore core areas of the feature are currently safe. Potential changes in the type of grazing animals, such as goats, which would be better suited to climbing, will be monitored and appropriate action taken to remove them.</p> <p><u>Recreational pressure from walkers and rock climbers</u> This along with livestock can cause erosion of paths along the cliffs resulting in rock and soil being washed down from eroded areas on the cliffs above.</p>

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<p>Landowner/ Management Responsibility</p>	<ul style="list-style-type: none"> ▪ Unit 1 - SAC area within the NRW-owned land ▪ Unit 4 - SAC area within Great Forest common land (CL50 Brecknock) ▪ Unit 8 - SAC area within National Trust common land (Brecon Beacons CL56 Brecknock) ▪ Unit 9 - SAC area within Buckland Manor common (CL62 Brecknock)
<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Pre-deposit and Deposit Stage Documents including relevant HRA Studies for the Brecon Beacons Local Development Plan for further information at: http://www.beacons-mpa.gov.uk/the-authority/planning/strategy-and-policy/ldp-examination/sa/sustainability-appraisal-pre-deposit http://www.beacons-mpa.gov.uk/the-authority/planning/strategy-and-policy/ldp-examination/sa/sustainability-appraisal-deposit</p>

<p>Site Name: Coedydd Llawr-y-Glyn Location Grid Ref: SN927904 JNCC Site Code: UK0030119 Size: 100.68 Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site consists of five separate blocks of woodland situated on hill slopes around the headwaters of the River Trannon. The individual blocks are complementary in their botanical interest and display the range of ecological variation within such acid oakwood types. All are dominated by mostly even-aged sessile oak, but there are variable amounts of downy birch, hazel, holly and rowan, and in some areas pedunculate oak is also present. The ground flora in some areas is dominated by heather and bilberry, whilst in others it is grassier and herbs such as bluebell, wood sorrel and violets are more prominent, although the diversity of such species is never great in woods of this type. Elsewhere, ferns and mosses are abundant and form the major botanical interest.</p>
<p>Qualifying Features</p>	<p>Annex I habitats primary reason for selection</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.
<p>Conservation Objectives</p>	<p>Vision for the site: Around 95% of the site is broadleaved woodland, the majority of which is dominated by native oaks, although birch, rowan and ash may also be locally prominent in the canopy. The woodland has trees of all age classes and contains a significant amount of both standing and fallen dead timber. Natural regeneration of native trees is sufficient to maintain the woodland cover in the long term. The shrub layer (where present) consists of locally native plants that are typical of oak woodland, such as hazel, rowan, holly, and hawthorn. The ground flora is variable in structure and composition. Some areas are dominated by bilberry and heather or wavy hair-grass but there are also extensive areas carpeted by mosses and liverworts, particularly in stream valleys and on the steep slopes. Other typical oak wood plants, such as wood sorrel, common dogviolet, common cow-wheat, bluebell and opposite-leaved golden saxifrage may be locally prominent. Some of the stream gullies support well-developed fern communities, including broad buckler-fern, scaly male-fern, oak fern and beech fern. Lichens, growing on the larger trees, that are indicators of old woodland, are gradually spreading throughout the site.</p> <p>The woodland remains closed over much of the site, especially around the steeper gorges, which support extensive moss and liverwort</p>

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	<p>carpets that are reliant on deep shade and humid conditions. The site also supports a good variety of breeding birds that are typical of upland oak woods, including pied flycatcher, redstart, wood warbler, woodpeckers and birds of prey. There are a variety of different structural elements that provide habitat for these species, including open woodland, dense scrub and ground cover and tree holes for nesting.</p> <p>Annex I habitats primary reason for selection:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p>There is only one feature for the site, and so the vision for this feature is the same as that for the site. It is required that the feature be in a favourable conservation status, where all of the conditions set out in the Performance Indicators table (below) are satisfied, and all factors affecting the achievement of these conditions are under control.</p>
<p>Component SSSIs</p>	<p>The plan area has been divided into 14 management units of which all comprise to form the Coedydd Llawr y Glyn SAC. This enables practical communication about features, objectives, and management and will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land ownership.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>This is a difficult site to manage. The number of comparatively small units makes a piecemeal approach inevitable, and a balance has to be struck between lightly grazed areas to benefit bryophytes, and ungrazed areas to encourage regeneration and a more diverse ecological structure. In the past it has proved difficult to alter unsuitable grazing practices. However, good progress has been made in recent years. As a result the situation overall is much better than it was in the past. In order to continue and improve on this it will be essential to maintain good relationships and retain existing Management Agreements, either through NRW or Tir Gofal, and to negotiate new agreements in other areas, where appropriate.</p> <p>In the longer term, it is essential to closely monitor site condition on a regular basis, both formally and informally, to assess progress towards Favourable Conservation Status, a goal that nonetheless cannot be achieved for several decades. It will also become necessary to consider more subtle management rather than the simple dichotomy of grazed or ungrazed units. Very low-level ongoing grazing would be</p>

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	<p>ideal, but this is usually impractical for the owners. Restoration of adjoining fields to semiimproved status and a lowering of stock numbers would result in a more natural interface between pasture and woodland. Failing that, then most of the site would benefit from stock exclusion in most years, but incorporating short pulses of quite heavy grazing in some years to reduce the dominance of dense vegetation, which is often to the detriment of bryophytes and other less robust constituents of the field layer.</p> <p><u>Synthesised Conditions to maintain integrity (applies to all qualifying features)</u></p> <ul style="list-style-type: none"> • Extent of Oak woodland. <ul style="list-style-type: none"> ○ Upper limit – No limit (100%). ○ Lower limit – 97ha (95%) overall. Within an individual unit 90% may be acceptable. • Distribution. <ul style="list-style-type: none"> ○ Upper Limit – as follows. ○ Lower limit – 13 out of 14 units. • Canopy cover. <ul style="list-style-type: none"> ○ Upper Limit – 100%. ○ Lower Limit – 90%. ○ There should be a varying pattern of canopy breaks over time within the whole site area. • Regeneration. <ul style="list-style-type: none"> ○ Upper Limit – none. ○ Lower limit – Presence of viable saplings of native species at least 1.5m high within 10 – 15 years of a gap appearing. • Woodland Structure. <ul style="list-style-type: none"> ○ Upper Limit – none. ○ Lower Limit – Presence of understorey and field layer, consisting of locally native species. • Deadwood. <ul style="list-style-type: none"> ○ Upper Limit – none. ○ Lower Limit – Presence of standing and/or fallen deadwood with a minimum diameter of 20cm and minimum length of 2m. • Bryophytes. <ul style="list-style-type: none"> ○ Upper Limit – none. ○ Lower limit – 50% cover. • Grazing pressure. <ul style="list-style-type: none"> ○ Upper Limit – 0.1 LSU/ha/year. ○ Lower Limit – None.

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	<ul style="list-style-type: none"> • Non-native species. <ul style="list-style-type: none"> ○ Upper Limit – 5% cover of non-native trees in the canopy AND no beech, rhododendron (or other invasive non-native shrubs) in the understorey or shrub layer. ○ Lower limit – none. • Woodland Management. <ul style="list-style-type: none"> ○ There is no evidence of tree felling or coppicing within the past five years. (Tree surgery for safety reasons excluded). <p>Refer to Core Management Plan (including conservation objectives) for Coedydd Llawr-Y-Glyn Special Area of Conservation (2008) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=bb45eb69-b4ee-4f67-9058-47b31336ca29&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles: Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Livestock Grazing</u> Much of the woodland is fenced against livestock but certain blocks are subject to sheep grazing. In these areas current stocking levels are not damaging to the trees or ground flora but are sufficient to prevent regeneration of oak and other woody species. It would be desirable to exclude livestock from most of these areas to encourage natural regeneration. This could be achieved by a combination of SSSI management agreements and agri-environment measures.</p> <p><u>Management of qualifying feature</u> Where epiphytic lichens and moisture/shade-reliant mosses and liverworts are prominent it is important that a closed canopy is maintained. Elsewhere some thinning or group felling would be desirable in order to facilitate tree and shrub regeneration and promote development of the ground flora. Airborne acid and nutrient deposition require monitoring particularly for epiphytic lichens on the oak trees.</p> <p><u>Nutrient run-off</u> Nutrient run-off from farmland above the woods is causing localised damage to the ground flora and it would be desirable to create buffer strips in these areas.</p>

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<p>Landowner/ Management Responsibility</p>	<p>Since notification, the efforts of statutory agency staff, and latterly the advent of agrienvironment schemes, have resulted in significant areas of the site being closed to stock and so freed from grazing pressure. This is now the case in the majority of the Cwm Carreg-ddu block and part of the Coed Pen-y-banc block. Coed Gwernafon has not been grazed since the early 1990s, having been acquired by the Woodland Trust. Part of Coed Ty-newydd is also ungrazed. Coed Glan-yr-afon is now the only large part of the site that is heavily sheepgrazed, although this is still true in smaller parts of all the blocks. It is now unusual for consent to be given for felling within the woodlands except for safety reasons or to remove alien species, and coppicing is no longer practiced by the landowners.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Coetiroedd Cwm Elan / Elan Valley Woodlands Location Grid Ref: SN923638 JNCC Site Code: UK0030145 Size 439.53 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Elenydd – Mallaen area occupies the southern section of the Cambrian Mountains in central Wales, stretching from the upper Cothi and Tywi valleys north-west of Llandovery to the Ystwyth, Elan and Wye valleys in the north. These hills are built of rocks of Silurian and Ordovician age and the landforms are typical of the 'slate uplands' of south-central Wales, with plateaux separated by steep-sided valleys.</p> <p>Elenydd is located in the centre of this area. It is one of the most important areas of hill land in Wales for nature conservation and is of outstanding interest for its range of breeding birds. Much of the hill vegetation is also of special interest. Elenydd is important in Mid Wales for its nutrient-poor upland lakes. The area supports a wide variety of uncommon plants and animals.</p> <p>Cwm Doethie – Mynydd Mallaen, consisting largely of steep-sided valleys and upland tracts, is located in the southern part of the Cambrian Mountains. It is of outstanding interest for its heath and woodland habitats and wildlife and, in particular, its birdlife.</p> <p>Marcheini Uplands, Gilfach Farm and Gamallt are located to the north of the River Wye above Rhayader. This is an area of outstanding ornithological interest. The site also supports important areas of blanket bog, dry heath, woodland, grassland and lichen-rich rock outcrops.</p> <p>Carn Gafallt is located at the junction of the rivers Elan and Wye just below Rhayader. It is an excellent example of a predominantly upland site supporting a diverse range of habitat types. These include nationally important examples of semi-natural broadleaved woodland, above which is situated one of the largest expanses of heather moorland in Brecknock. The area is not only important for its plant communities, but also supports notable populations of birds, invertebrates and lower plants.</p> <p>Llynoedd Ieuan, located in the hills between the Wye and Ystwyth valleys, is an extensive area of submontane heathland and blanket mire containing three upland lakes with associated areas of actively growing basin mire.</p> <p>Cwm Gwynllyn occupies a glaciated valley to the north west of Rhayader. It has a number of features of biological interest. It includes</p>

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	<p>important areas of freely drained, sessile oak woodland developed on acidic Silurian rocks, which grade into heath, ffridd and rocky habitats. Gwynllyn, a good example of a nutrient-poor lake, is surrounded by a well-developed transition into bog, scrub and grassland habitats.</p> <p>Coedydd Glannau a Cwm Coel are located in the Elan Valley on the west side of Garreg-ddu Reservoir. They comprise a particularly diverse example of sessile oak woodland, with welldeveloped epiphytic lichen, moss and liverwort communities.</p> <p>Coed yr Allt-goch is located on the north-east shore of Penygarreg Reservoir in the Elan Valley. It is a good example of sessile oak woodland, developed on free draining Silurian rocks.</p> <p>Cerrig Gwalch is a fine example of mixed deciduous woodland developed on an east-facing steep cliff in the Wye valley to the north of Rhayader.</p> <p>Caban Lakeside Woodlands are located on the east-facing slopes above Caban Coch Reservoir in the Claerwen valley. They support one of the most interesting lower plant floras in Radnor.</p> <p>Mwyngloddfa Cwmystwyth comprises old mine workings located in the upper Ystwyth valley. It is of special interest for its minerals and for the plant communities that have developed on the metal-rich spoil tips, associated rock outcrops and ruined buildings. These habitats support a great variety of lichens, including a number of rare species, which are typically only found associated with heavy-metal-rich sites. The mine workings are also important for hibernating bats.</p> <p>Caeau Cnwch a Ty'n-y-graig comprises four traditionally managed fields lying in a small valley below Craig Cnwch, near Elan Village. They provide an outstanding example of a type of herb-rich grassland that is characteristic of the upland fringe of central Wales. Caeau Troed-rhiw-drain occupies sloping ground on the south west side of Peny-y-garreg Reservoir in the Elan Valley. It supports outstanding examples of herb-rich hay meadows in which a number of rare plant species are well represented. The meadows are variants of a characteristic mid Wales type</p> <p>Gweunydd Ty'n-y-llidiart comprises a series of rough pasture fields situated on gently sloping ground to the west of Garreg-ddu Reservoir in the Elan Valley. The site is notable in displaying an excellent</p>

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	<p>example of the range of dry and damp unimproved pasture types once typical of the upland fringe in this part of Wales. More than one hundred species of higher plants are known to occur here.</p> <p>Rhos yr Hafod is located on the hillside to the north of Penygarreg Dam in the Elan Valley. It is an outstanding example of herb-rich hay meadow and pasture land in which a number of uncommon plant species are very well represented.</p> <p>Rhosydd Llanwrthwl comprises a series of unimproved wet pastures on level or gently sloping ground in the valley of the Afon Dulas, to the west of Llanwrthwl village. The size and quality of the stands of wet grassland, wet heath and flush vegetation present at Rhosydd Llanwrthwl are exceptional, and represent a significant proportion of the higher quality remnants of this habitat resource left in Brecknock. Several locally scarce plants are present, and nationally scarce invertebrates have been recorded from the site.</p> <p>Vicarage Meadows are located at Abergwesyn in the upper Irfon valley. They are an important example of an unusual type of unimproved, herb-rich acid grassland. The rich flora includes a number of uncommon plants.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heaths. ▪ Tilio-Acerion forests of slopes, screes and ravines.
<p>Conservation Objectives</p>	<p>Vision for the site: For each habitat, or species group of special interest, its natural range and areas it covers within that range are stable or increasing, and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and, the conservation status of its typical species is favourable.</p>

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	<p>For each species of particular interest, the population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.”</p> <p>The following information is generic from the management plan of the Elenydd (& its constituent designations):</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Old sessile oak woodlands remain a significant and conspicuous feature of the upland valley sides within the plan area. Those in the Elan and Claerwen valleys and Rhayader area, the Dinas and Gwenffrwd area of the upper Tywi valley and the Cothi valley to the north of Mynydd Mallaen are particularly well developed and extensive. • The boundary between the woodland and adjacent upland habitat is often a flexible one where trees regenerate on to open ground. At many locations oak woodland forms patches in ‘ffridd’ areas where there is less grazing pressure on the upland fringe. • The oak woodland has of a variety of different structures and its character varies from place to place, ranging from long standing closed canopy areas to largely open wood pasture. • The dominant trees are sessile oaks, but in places birch is more conspicuous. Rowans and other trees occur as a minor component while at the foot of slopes where the oak woodland grades into wet woodland, there are some alders and willows. Non-native trees such as beech and sycamore will be present only in small numbers are generally scarce. • Under-storey shrubs are generally quite sparse, but scattered groups of hazel or holly will be found in some woods. • Ground cover varies widely. Parts will be bracken covered, others grassy, others again have a wider range of flowering plants and ferns and are often carpeted with bluebells in

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	<p>spring. On thin soils in shaded moist situations there are luxuriant carpets of mosses and liverworts, with or without under-shrubs like heather and bilberry.</p> <ul style="list-style-type: none"> • The larger trees support a variety of lichens on their trunks and branches. • In each woodland block, trees in most age classes are present and veteran trees are prominent in some areas, particularly where there is wood pasture. • In all areas except wood pasture, there is evidence of actual regeneration in the form of seedlings and saplings or potential for regeneration, while in some wood pasture areas the planting and protecting of young trees, especially oak, may be appropriate. • Dead wood is well distributed and sometimes abundant, both lying on the woodland floor and occurring as standing dead trees or branches of trees. • The majority of the oak woodland has a closed canopy, but there are some clearings and much larger areas that are effectively wood pasture. These conditions should be sympathetic to the important populations of mosses and liverworts on the one hand and lichens on the other. • The oak woods support a characteristic assemblage of birds, such as wood warbler, pied flycatcher and redstart. • The pattern and distribution of grazed and un-grazed woods may change over time as different conservation needs arise. • All factors affecting the achievement of these conditions are under control. <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent, quality and diversity of heath vegetation within the constituent sites is maintained and, where possible, degraded heath is restored to good condition. • The main heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. • Sunny slopes in certain areas support vegetation that includes bell heather and western gorse and steep north and east facing slopes have a rich variety of mosses and liverworts beneath the dwarf shrub canopy, including bog mosses in

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	<p>some areas.</p> <ul style="list-style-type: none"> • Populations of uncommon plants, such as lesser twayblade, are stable or increasing. • The larger heathland areas provide suitable habitat for breeding birds, including red grouse and merlin. • All factors affecting the achievement of these conditions are under control. <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Ash is prominent on some of the less acidic rock outcrops within the oak woodlands in the Elan and Claerwen valleys and Rhayader areas. Particularly well-developed stands of ash woodland can be found within the Coetiroedd Cwm Elan SAC at Cerrig Gwalch and at several locations within the Carn Gaffallt SSSI. ▪ At Cerrig Gwalch, the rocks, ledges and damper soils in areas supporting ash woodland have plants that are typical of more fertile conditions, including dog's mercury, great woodrush, common dog-violet, meadowsweet, water avens, devil's-bit scabious, raspberry, lily-of-the-valley, stone bramble, slender St John's-wort, primrose, common valerian, ferns, wood sage, wild angelica, orpine, rock stonecrop, the locally rare lichen <i>Peltigera leucoplebia</i>, and a thriving population of mountain melick. ▪ Some dead wood is present and this provides an important habitat for the woodland flora and fauna. ▪ Generally, plants indicating disturbance and nutrient enrichment, such as large patches of nettles and cleavers, are not common and there are no extensive areas of bare ground within the woodland. ▪ Non-native trees and shrubs, such as sycamore and conifers, are absent. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different</p>

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	<p>designations where necessary. In this plan the management units have been based on land ownership encompassing seventeen SSSI designations:</p> <ul style="list-style-type: none"> ▪ Elenydd ▪ Cwm Doethie – Mynydd Mallaen ▪ Marcheini Uplands, Gilfach Farm & Gamallt ▪ Carn Gafallt ▪ Llynoedd Ieuan ▪ Cwm Gwynllyn ▪ Coedydd Glannau a Cwm Coel ▪ Coed Yr Allt-Goch ▪ Cerrig Gwalch ▪ Caban Lakeside Woodlands ▪ Mwyngloddfa Cwmystwyth ▪ Caeau Cnwch a Ty'n-Y-Graig ▪ Caeau Troed-Rhiw-Drain ▪ Gweunydd Ty'n-Y-Llidiart ▪ Rhos Yr Hafod ▪ Rhosydd Llanwrthwl ▪ Vicarage Meadows
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p><u>Grazing</u> Low levels of sheep grazing can be beneficial to the mosses, liverworts and lichens in the oak woodland. Different grazing regimes are required in different types of oak woodland. The more open 'park-like' areas require regular grazing during the growing season. The main oak woodland blocks may need periodic grazing to maintain a fairly open ground layer but would benefit from stock exclusion in the short-term to allow the woodland to regenerate, develop an understorey where possible and build up the levels of dead wood. In the longer term a continuous, very low stocking density may be more appropriate in some areas.</p> <p><u>Woodland management</u> The woodland should be encouraged to develop a diverse structure, with mature and over-mature trees and sufficient natural regeneration</p>

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	<p>of native trees and shrubs. As far as possible natural processes will be allowed to operate, with any active management limited to that required for the control of non-native species (see below) and for safety reasons along the footpaths. The regeneration of oak and ash in particular requires plenty of light to encourage the growth of any seedlings into viable saplings. Natural instability on the steeper slopes, cliffs and scree may create large canopy gaps on a fairly regular basis but, elsewhere, gaps arising from tree death will be rare in the short to medium term and they may be too small to permit the establishment of young trees. In this case, the enlargement of natural gaps and the creation of new gaps by selective felling might be considered in the longer term.</p> <p>Very old trees are in short supply. The majority of trees in many of the plan units are of middle years and have yet to develop the characteristic holes, crevices and dead wood of veteran trees. Every effort should be made to extend the life of existing veteran trees for as long as possible. Judicious tree surgery can lighten large limbs without harming the lower plant interest and reduce the risk of collapse of the trunk or wind throw of the entire tree. Competing woody species and climbers can be removed by cutting. Dead and decaying wood should normally be retained in the woods, though some of this is likely to fall to the bottom of the steeper slopes. Wherever possible, standing dead trees should be allowed to fall naturally. Dead wood is important for its associated fauna and flora and is also essential to nutrient recycling and restoring soil nutrients. Dead wood continues to support lower plants and once the bark falls off, standing dead trees can support specialised lichen species. Movement and cutting/tidying of dead wood should be avoided unless essential for public and livestock safety. Any woodland management work should be undertaken between August and January so as not to disturb breeding birds and all trees providing important nesting sites should be retained.</p> <p>Many woodland mosses, liverworts and lichens need high humidity levels. Humidity may be reduced by excessive opening of the canopy, or loss of adjacent woodland cover. Any proposal to fell and replant within, or adjacent to, areas that are important for lower plants, should be assessed for its potential impact on the mosses, liverworts and lichens. Where felling and replanting is proposed, a “continuous-cover” system should be used to avoid excessive opening of the tree canopy. This could take the form of phased removal of non-native trees and restocking by natural regeneration.</p>

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	<p><u>Control of invasive non-native trees and shrubs</u> Removal of beech and conifers may be agreed following assessment of their wildlife interest. There may be areas where it would be desirable to retain these trees in the canopy in the short term in order to maintain humidity for the lower plants (see above).</p> <p>In the vicinity of the former Cwm Elan House and the Hafod Estate area, the large beech trees are a feature of the historic landscape and they also represent a large potential dead wood habitat of the future, so management should aim to control their spread into other areas. All sycamores should be removed from the ash woodland but mature trees supporting good lichen communities should be retained elsewhere, provided that all saplings and young trees are removed. All rhododendron should be cleared from the woodland and any re-growth spot-treated with herbicide. Work should be carried out outside the bird breeding season.</p> <p><u>Disturbance</u> Some woodland breeding birds are particularly sensitive to disturbance during the nesting season. Public access to areas used by these species should be restricted between February and July.</p> <p><u>Grazing</u> Heavy grazing, particularly in autumn and winter, is damaging to the dwarf shrubs and should be avoided. A suitable mixed grazing regime should be established/maintained across the un-fenced parts of the sites.</p> <p><u>Burning and Cutting</u> Burning can be a useful management tool for maintaining varied structure within the mature dry heathland areas on relatively level ground and for providing habitat for breeding grouse, provided that it forms part of an approved cycle of management. It is important to ensure that such management does not damage areas or encourage the spread of bracken. Burning in combination with intense grazing can also result in the loss of those shrub species that give this habitat its characteristic appearance.</p> <p>Wet heath and other wetland areas, steep slopes and rocky areas should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses, clubmosses and ground nesting birds.</p>

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	<p>Cutting is a possible alternative to burning for heathland management in the drier areas, where vehicle access is possible, and can also be usefully employed to create firebreaks. If cutting is carried out, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Care must be taken to ensure that machinery does not cause damage to fragile peat soils. In damper areas, where heather is layering, burning and cutting are not needed.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low and heathland areas are particularly sensitive to nutrient inputs. Consequently, no fertilisers should be applied in the open hill areas. Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding, where necessary, should be confined to less sensitive upland vegetation or agriculturally improved areas. Care should be taken to avoid run-off into more sensitive areas.</p> <p><u>Atmospheric Pollution/Acidification</u> Several widespread ongoing human-induced processes are changing the environmental and ecological conditions and are causing concern in upland areas in Britain. These include acidification, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. Dwarf shrubs, mosses, liverworts and lichens are particularly vulnerable to pollution from atmospheric sources. Much of this atmospheric pollution comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial processes. If particularly damaging, current point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. However, it will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution.</p> <p><u>Access & Recreational Use</u> Unauthorised vehicle use is a threat to the moorland areas, which are easily accessible from designated by-ways. Bog and heath vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p>

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	<p>Some by-ways, such as sections of the Monks Trod, have become impassable to vehicles encouraging motorcycles to deviate onto sensitive bog areas. This causes considerable damage and disturbance. If a durable surface cannot be installed and maintained on these routes, then motor vehicles should be restricted or diverted away from sensitive areas. Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage use by off-road vehicles away from legally designated routes.</p> <p>Although the hill land within the site is subject to rights of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to bird life. However, the impacts of this use need to be monitored and any significant damage or disturbance addressed by appropriate access restrictions if necessary.</p> <p>Some moorland areas within Elenydd SSSI are also used for military training and occasionally for other organized events and activities, such as orienteering and paragliding. Such use is entirely at the discretion of the landowners and occupiers, who should ensure there is no damage or disturbance to the features of interest. Generally, off-road vehicle use should be avoided, as should sensitive bird areas during the breeding season.</p> <p><u>Grazing</u> Grazing limits the woodland's ability to regenerate naturally and is particularly damaging to the ash woodland ground flora. The majority of the ash woodland should be protected from grazing stock. However, light grazing may be needed in some areas to control the spread of the more competitive elements of the ground flora, like bramble. The long-term aim is to establish and maintain a grazing regime that most closely mimics the level that would be expected in a natural, unmanaged woodland.</p> <p><u>Woodland Management</u> The woodland should be encouraged to develop a diverse structure, with mature and over-mature trees and sufficient natural regeneration of native trees and shrubs. As far as possible natural processes will be allowed to operate, with any active management limited to that required for the control of non-native species (see below) and for safety reasons along the footpaths. The regeneration of oak and ash</p>

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	<p>in particular requires plenty of light to encourage the growth of any seedlings into viable saplings. Natural instability on the steeper slopes, cliffs and scree may create large canopy gaps on a fairly regular basis but, elsewhere, gaps arising from tree death will be rare in the short to medium term and they may be too small to permit the establishment of young trees. In this case, the enlargement of natural gaps and the creation of new gaps by selective felling might be considered in the longer term.</p> <p>Very old trees are in short supply. The majority of trees in many of the plan units are of middle years and have yet to develop the characteristic holes, crevices and dead wood of veteran trees. Every effort should be made to extend the life of existing veteran trees for as long as possible. Judicious tree surgery can lighten large limbs without harming the lower plant interest and reduce the risk of collapse of the trunk or wind throw of the entire tree. Competing woody species and climbers can be removed by cutting. Dead and decaying wood should normally be retained in the woods, though some of this is likely to fall to the bottom of the steeper slopes. Wherever possible, standing dead trees should be allowed to fall naturally. Dead wood is important for its associated fauna and flora and is also essential to nutrient recycling and restoring soil nutrients. Dead wood continues to support lower plants and once the bark falls off, standing dead trees can support specialised lichen species. Movement and cutting/tidying of dead wood should be avoided unless essential for public and livestock safety. Any woodland management work should be undertaken between August and January so as not to disturb breeding birds and all trees providing important nesting sites should be retained.</p> <p>Many woodland mosses, liverworts and lichens need high humidity levels. Humidity may be reduced by excessive opening of the canopy, or loss of adjacent woodland cover. Any proposal to fell and replant within, or adjacent to, areas that are important for lower plants, should be assessed for its potential impact on the mosses, liverworts and lichens. Where felling and replanting is proposed, a “continuous-cover” system should be used to avoid excessive opening of the tree canopy. This could take the form of phased removal of non-native trees and restocking by natural regeneration.</p> <p><u>Control of invasive non-native trees and shrubs</u> Removal of beech and conifers may be agreed following assessment of their wildlife interest. There may be areas where it would be</p>

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	<p>desirable to retain these trees in the canopy in the short term in order to maintain humidity for the lower plants (see above).</p> <p>In the vicinity of the former Cwm Elan House and the Hafod Estate area, the large beech trees are a feature of the historic landscape and they also represent a large potential dead wood habitat of the future, so management should aim to control their spread into other areas. All sycamores should be removed from the ash woodland but mature trees supporting good lichen communities should be retained elsewhere, provided that all saplings and young trees are removed. All rhododendron should be cleared from the woodland and any re-growth spot-treated with herbicide. Work should be carried out outside the bird breeding season.</p> <p><u>Disturbance</u> Some woodland breeding birds are particularly sensitive to disturbance during the nesting season. Public access to areas used by these species should be restricted between February and July.</p> <p><u>Synthesised Conditions to maintain integrity (applies to all qualifying features)</u></p> <p>Old sessile oak woods with Ilex and Blechnum in the British Isles</p> <ul style="list-style-type: none"> • Grazing pressure. <ul style="list-style-type: none"> ○ Upper limit – 0.4 livestock units(LSU)/ha/year in key wood pasture area. ○ 0.05 LSU/ha/year in other key oak woodland areas. ○ Lower limit – 0.2 LSU/ha/year in key wood pasture areas. Sufficient to suppress the growth of bramble and ivy in key woodland areas with well-developed moss and liverwort carpets and/or shade demanding lichens. • Woodland Management. <ul style="list-style-type: none"> ○ Upper Limit – 10% of canopy gaps created artificially. 20% of areas of regeneration achieved by planting. <p>European dry heaths</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – No evidence of significant burning (patches larger than 0.5ha) in any parts of any units where a burning programme has not been agreed. In areas subject to a burning plan, no more than 33% of the total heathland area is burnt in 5 years. No evidence of burning in sensitive areas.

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	<ul style="list-style-type: none"> ○ Lower limit – N/A. ● Erosion/Bare Ground. <ul style="list-style-type: none"> ○ Upper Limit – 10% bare ground in heathland areas in units where heathland is a key habitat. ○ Lower limit – N/A. ● Air Quality. <ul style="list-style-type: none"> ○ Upper Limit – No critical loads for acidic and nitrogen deposition are exceeded. ○ Lower Limit – None. <p>Tilio-Acerion forests of slopes, screes and ravines</p> <ul style="list-style-type: none"> ● Grazing pressure. <ul style="list-style-type: none"> ○ Upper limit – 0.05 LSU/ha/year. ○ Lower limit – None. Applies to all key ash woodland units. ● Non-native species. <ul style="list-style-type: none"> ○ Upper Limit – 5% cover of nonnative trees in the canopy. No beech, sycamore (or other invasive non-native trees or shrubs) in the understorey. ○ Lower limit – None. Applies to key ash woodland units. <p>Refer to Core Management Plan (including conservation objectives) for Coedydd Llawr-Y-Glyn Special Area of Conservation (2008) for further information at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=452b5711-ee14-470e-af92-0dd3e322a6c4&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● Old sessile oak woods with Ilex and Blechnum in the British Isles: Status within the Coetiroedd Cwm Elan SAC: Unfavourable. ● European Dry Heaths: Status within the Coetiroedd Cwm Elan SAC: Favourable ● Tilio-Acerion forests of slopes, screes and ravines: Status within the Coetiroedd Cwm Elan SAC & Cerrig Gwalch SSSI: Favourable <p>SPA Features:</p> <ul style="list-style-type: none"> ● Breeding Red Kite <i>Milvus milvus</i>: Favourable <p>Based information received from the Kite Conservation Trust (2007). The extent of potential feeding habitat within the sites and carrion</p>

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	<p>availability are believed to be sufficient to support the breeding population in the long term.</p> <ul style="list-style-type: none"> • Breeding Merlin <i>Falco columbarius</i>: Favourable <p>A survey of the Elenydd - Mallaen area in 2003 located 11 probable breeding pairs, indicating that feature condition was favourable, maintained. The extent of potential feeding habitat within the sites is believed to be sufficient to support the breeding population in the long term.</p> <ul style="list-style-type: none"> • Breeding Peregrine <i>Falco peregrinus</i>: Favourable <p>The results of the national survey in 2002 indicated that the condition of the feature in the SPA area was favourable, maintained. The extent of potential feeding habitat within the sites is believed to be sufficient to support the breeding population in the long term.</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> Grazing in autumn and winter, particularly by sheep, is damaging to the dwarf shrubs and should be avoided. Areas used by breeding waders and other ground nesting birds should not be grazed too heavily during the breeding season so as to prevent trampling damage to nests and young. However, continuous grazing is likely to prevent tree regeneration in the long term and may damage the field and shrub layers, where these elements are present. Heavy stocking could also damage moss and liverwort carpets and cause soil erosion on the steeper slopes.</p> <p><u>Drainage</u> The bogs, wet heathland, springs, flushes and marshy grassland are all vulnerable to drying out as a result of drainage. The natural drainage pattern must not be altered and any old drainage ditches should not be maintained.</p> <p><u>Burning</u> Bogs, wet heath and other wetland areas should not be burnt, as burning is likely to damage important plant and animal species, especially bog mosses ground nesting birds.</p> <p><u>Access & Recreational Use</u> Recreational pressure, particularly motorbike scrambling, is a problem</p>

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	<p>in localised areas. The habitat is easily damaged by such activities. A measure of control is being sought by modification of local authority highway regulations.</p> <p>Minimise damage and disturbance to bog and heath vegetation where unauthorised vehicles verge off the road.</p> <p><u>Agricultural Pollution</u> The application of any agricultural fertilisers, including lime, slurry and manure, will have a detrimental effect on the vegetation. Bogs, dry heathland and ffridd areas are particularly sensitive to nutrient inputs.</p> <p><u>Atmospheric Pollution/Acidification</u> Other man-induced threats include acidification via rainfall, and possible nitrate deposition, which may encourage the spread of <i>Molinia caerulea</i> to the detriment of other blanket bog species.</p> <p>The threat of atmospheric pollutants to floating water-plantain in the naturally nutrient-poor lakes cannot at present be quantified. Leaf surfaces are frequently entirely overgrown by epiphyllous algae that might be further stimulated by nitrogen oxide pollution.</p> <p><u>Invasive, non-native trees and shrubs</u> Beech is a particular concern as it can regenerate vigorously under an oak canopy, and when mature can suppress and alter the ground flora. In mid Wales beech supports few lichens of any interest. Mature conifers can cast dense shade but are less able to regenerate from seed within the oak woodland. Sycamore has potential to invade areas where the soil is deeper and less acidic but large trees can support uncommon lichens. Rhododendron is highly invasive and represents a serious threat to the woodland in the absence of grazing.</p> <p><u>Disturbance</u> The metal mine sites in the vicinity to roads and tracks have suffered disturbance due to fly-tipping and the removal of metal-rich spoil for hardcore and track surfacing. Some rare breeding birds are sensitive to disturbance during the nesting season. Public access to some areas used by these sensitive birds may need to be restricted between February and July.</p> <p>Disturbance by off-road 4x4 vehicles and motorcyclists and cyclists has been a concern for some years, and erection of a joint NRW/Police notice on the road gate in 2005 has not been effective.</p>

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	<p>Further signs are planned on the site, and work is underway to ascertain whether permission is necessary under Section 194 of the Law of Property Act 1925, as the land is common land. The landowners and neighbours are agreeable to the actions.</p> <p><u>Engineering Works and Development</u> The site contains several major dams, water pipelines, roads, bridges and disused mines and quarries. Operational structures require periodic repair and maintenance and this work should be carefully planned and undertaken in a sensitive manner, so that there is minimal impact on the habitats and species of interest. Major new projects, such as dams, pipelines, and hydro schemes and power lines, could have a significant impact and should be carefully assessed in accordance with environmental regulations. The impact of re-opening of old quarries will also need to be considered in a similar way, although this may offer new opportunities for nesting peregrines.</p> <p>Wind turbines may present a collision risk to birds of prey and may cause disturbance to breeding birds, such as ground nesting waders. Consideration of these effects on birds must be given when developments are proposed on or near to the site.</p>
<p>Landowner/ Management Responsibility</p>	<p>The main land uses in the Elenydd – Mallaen area, are agriculture and commercial forestry. Much of the land forms the catchment area for Llyn Brienne, Teifi Pools and the Elan Valley Reservoirs. The area is also used for military training and is important for tourism and outdoor recreation. Large areas of upland habitats remain in poor condition and require specific restoration management.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Drostre Bank Location Grid Ref: SO096312 JNCC Site Code: UK0012878 Size: 12.66 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site includes a large area of species-rich fen meadow, in association with some rush pasture. There is also an important area of alluvial ash and alder woodland, with transitions to drier woodland dominated by ash and oak.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) with associated mineral-rich flush vegetation. <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i>, <i>Alnion incarnate</i>, <i>salicion albae</i>).
<p>Conservation Objectives</p>	<p>Vision for the site: Around a third of the site supports marshy grassland, dominated by purple moorgrass and rushes, with a range of typical associated plants. The majority of this habitat is species-rich fen meadow, with plants including meadow thistle, quaking grass, tawny sedge, flea sedge, devil's-bit scabious and marsh valerian. Uncommon plants, such as early marsh orchid and pepper saxifrage, are also present. Purple moor-grass and rushes are not overwhelmingly dominant in the sward. Species indicating disturbance and nutrient enrichment, such as creeping buttercup and white clover, are uncommon, trees and shrubs are absent and bare ground does not exceed 10% within the fen meadow areas.</p> <p>The field west of the road supports a small patch of marsh dominated by small sedges, common cotton-grass and brown mosses that is fed by a nutrient-rich spring and there is a swampy area dominated by floating sweet-grass nearby. Around 60 % of the site is wooded, of which a quarter is wet woodland dominated by alder. Associated trees and shrubs in these areas include ash, downy birch, rusty willow and hazel. The ground flora includes a range of typical plants, such as meadowsweet, yellow pimpernel and remote sedge. Plants indicating nutrient enrichment and disturbance, such as stinging nettle and cleavers, are uncommon. The woodland contains glades and the extent of canopy cover fluctuates but there is sufficient regeneration from seed, or suckers, to maintain the canopy cover in the long term.</p>

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	<p>Woodland on the drier ground is dominated by oak or ash with a shrub layer and ground flora typical of these types of woodland.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) with associated mineral-rich flush vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ <i>Eu-Molinia</i> grassland occupies approximately 25% of the total site area. The remainder of the site supports other semi-natural habitats including woodland and rush pasture. ▪ The following plants will be common in the <i>eu-Molinia</i> marshy grassland: purple moor-grass (<i>Molinia caerulea</i>), meadow thistle (<i>Cirsium dissectum</i>), devil's bit scabious (<i>Succisa pratensis</i>), tawny sedge (<i>Carex hostiana</i>), Flea sedge (<i>Carex pulicaris</i>), Quaking grass (<i>Briza media</i>), Marsh Valerian (<i>Valeriana dioica</i>) and Marsh orchids (<i>Dactylorhiza</i> sp.). ▪ Purple moor-grass and rushes are not completely dominant and there is no significant accumulation of dead vegetation from year to year. ▪ Species indicative of agricultural modification, such as perennial rye grass (<i>Lolium perenne</i>) and white clover (<i>Trifolium repens</i>) will be largely absent from the <i>eu-Molinia</i> marshy grassland. Scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will also be largely absent from the <i>eu-Molinia</i> marshy grassland. ▪ Some bare ground is present but cattle poached areas are not extensive. ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i>, <i>Alnion incarnate</i>, <i>salicion albae</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Approximately 15% of the site supports alluvial forest (this is 25% of the woodland).

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	<ul style="list-style-type: none"> ▪ The remainder of the site supports other semi-natural habitats including dry woodland and marshy grassland. ▪ The tree canopy consists of alder, ash, birch and willow. ▪ Young trees/saplings and/or vegetative regrowth of the above species are present. ▪ The ground flora consists of a variety of wetland plants, including meadowsweet, yellow pimpernel, and remote sedge. ▪ Plants indicative of nutrient enrichment or disturbance such as nettle, cleavers, and rosebay willowherb are nowhere extensively dominant. ▪ Some bare ground is present but it is not extensive. ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The site has been divided into two management units which collectively make up this SAC.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) with associated mineral-rich flush vegetation. <p><u>Grazing</u> In the open wetland areas, grazing in spring, summer and autumn prevents domination by rushes and purple moor-grass, maintains the diversity of plant species and prevents the spread of scrub. Heavier grazing is likely to eliminate sensitive species and could cause localized physical damage to the sward leading to invasion by “weedy” species.</p> <p>Past usage as cattle pasture has been important in maintaining the habitat and the current regime of cattle grazing should be continued. Cattle are heavy enough to break down leaf litter and young scrub, and their feeding action results in wet grassland being grazed more evenly than with other livestock. Sheep concentrate their grazing on more palatable vegetation, avoiding tussocky purple moor-grass and rushes, and creating a very short sward elsewhere. Therefore, grazing with sheep alone is not ideal. Stocking densities should be aimed towards achieving a short sward, less than 4 inches (10 cm) high over most of the pasture for at least part of each year.</p>

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	<p><u>Drainage</u> The <i>Eu Molinion</i> grasslands occur in areas of impeded drainage or around natural springs. Existing old ditches in these areas require careful maintenance to prevent the fen meadow becoming too wet, but they should not be deepened, and no new drainage should be installed.</p> <p><u>Soil Fertility</u> The open wetland habitat is influenced by ground water that is moderately nutrient-rich but not excessively so. Surface water entering the site from the surrounding fields or road drains will have much higher concentrations of nitrates and phosphates, arising from agricultural fertiliser application. Such water should be diverted away from the site. A restriction in arable operations on the sloping fields above the site reduces the potential for nutrient-rich water and soil washing down.</p> <p>Stock feeding on the grassland would lead to damage from localised nutrient enrichment and should be avoided.</p> <p>Annex 1 habitat present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i>, <i>Alnion incarnate</i>, <i>salicion albae</i>). <p><u>Grazing</u> In the wet woodland areas, light grazing prevents domination by rushes and purple moor-grass, maintains the diversity of plant species and preserves the open glades. Increased grazing would eliminate the more sensitive woodland species and prevent tree and shrub regeneration. The grazing practice and woodland regeneration will be kept under continued review. If appropriate grazing levels are maintained, natural regeneration of trees and shrubs should be sufficient to preserve the woodland cover whilst retaining some open glades.</p> <p><u>Woodland management</u> With the current grazing in place, woodland management is not desirable, other than to remove saplings of non-native species, such as beech, which may have a detrimental effect on the native flora. Standing and fallen dead timber provides important habitat for beetles and fungi and should be retained.</p> <p><u>Drainage</u> The wet woodland occupies an area of impeded drainage in the</p>

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	<p>eastern part of the site. The water comes from old ditches originating in the fen meadow. These ditches, and the outfall stream within the woodland, may be maintained, but they should not be deepened or new drainage installed.</p> <p><u>Nutrient enrichment</u> The woodland soil is richer than that of the fen meadow because nutrients accumulate here as a result of down-slope water movement and leaf-fall. However, further enrichment from agricultural run-off or stock feeding would promote dominance by weed species, such as nettles. Surface water from the surrounding fields or road drains should be diverted away from the site whilst a restriction on the arable operations in the sloping fields above the site reduces the potential for nutrient-rich water and soil washing down.</p> <p><u>Synthesised Conditions to maintain integrity</u></p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) with associated mineral-rich flush vegetation.</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Light summer grazing is defined as - cattle and/or ponies at a rate of 0.4 LSU/ha/year for the period April to October. Heavy grazing is defined as greater than 1 LSU/ha/year (1 LSU is equivalent to a cow/horse, plus calf/foal). ○ Upper limit – No significant grazing outside the growing season or heavy grazing at any time during the summer. ○ Lower limit – The <i>Eu Molinion</i> grassland will be subject to light summer grazing by cattle and/or ponies at least 4 in every 5 years. • Extent of litter layer. <ul style="list-style-type: none"> ○ Upper Limit – No continuous litter layer. ○ Lower limit - Some dead plant material present. • Extent of bare ground. <ul style="list-style-type: none"> ○ Upper Limit – No more that 10% bare ground within 100cm radius of a sample point. ○ Lower limit - None. • Drainage. <ul style="list-style-type: none"> ○ Upper Limit – No new drainage ditches to be installed within the open meadow areas of the site. ○ Lower limit – No water ‘backingup’ into <i>Eu Molion</i> grassland as a result of blocked ditches.

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	<p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i>, <i>Alnion incarnate</i>, <i>salicion albae</i>)</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Light summer grazing is defined as - cattle and/or ponies at a rate of 0.4 LSU/ha/year for the period April to October. Heavy grazing is defined as greater than 1 LSU/ha/year (1 LSU is equivalent to a cow/horse, plus calf/foal). ○ Upper limit – No significant grazing outside the growing season or heavy grazing at any time during the summer. ○ Lower limit – The <i>Eu Molinion</i> grassland will be subject to light summer grazing by cattle and/or ponies at least 4 in every 5 years. • Drainage. <ul style="list-style-type: none"> ○ Upper Limit – No new drainage ditches to be installed within the the woodland in unit 1. • Bare ground. <ul style="list-style-type: none"> ○ Upper Limit – No more that 30% bare ground within 20m radius of a sample point. ○ Lower Limit – N/A. <p>Refer to <i>Core Management Plan (including conservation objectives) for Drostre Bank - Special Area of Conservation (2008)</i> for further information at: http://www.ccqc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/dee-to-fenns-sac-list/idoc.ashx?docid=bb7c34d7-845e-4e2b-9e14-2c2153688ee0&version=-1)</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) with associated mineral-rich flush vegetation. Unfavourable: recovering • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-padion</i>, <i>Alnion incarnate</i>, <i>salicion albae</i>) Favourable: maintained.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Agricultural processes</u> The fen-meadow community is particularly vulnerable to agricultural improvement in the form of drainage, cultivation, application of herbicides and fertilisers and increased stocking and possibly associated feeding of livestock. Conversely, abandonment of traditional treatment may, through natural succession, result in</p>

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	<p>reversion to rank secondary fen and scrubby woodland. However a management agreement is in force to ensure continuation of the traditional management of light grazing with cattle in late summer through to the early winter. The application of agricultural fertilisers or manure on site will upset the natural nutrient balance and have a detrimental effect on the vegetation.</p> <p><u>Grazing</u> Increased grazing would eliminate the more sensitive woodland species and prevent tree and shrub regeneration. Sheep concentrate their grazing on more palatable vegetation, avoiding tussocky purple moor-grass and rushes, and creating a very short sward elsewhere. Therefore, grazing with sheep alone is not ideal.</p> <p><u>Water run-off</u> There is a possibility of eutrophication of the site from the inward drainage of water enriched by nitrogenous and phosphatic fertilisers, and also as a result of fertiliser spray drift which will promote dominance by weed species, such as nettles. Monitoring projects will be initiated to ensure that the fen-meadow community is maintained in a favourable condition.</p> <p><u>Non-native species</u> With the current grazing in place, woodland management is not desirable, other than to remove saplings of non-native species, such as beech, which may have a detrimental effect on the native flora.</p>
<p>Landowner/ Management Responsibility</p>	<p>Generally the site has tended to be lightly grazed, as stock preferentially grazes the adjacent improved pasture when they are able to do so. 2007 stocking rates and other aspects of site management are subject to management agreements. These agreements specify the use of light cattle grazing during the summer months to maintain the vegetation types present. Other management covered by these agreements includes scrub control, maintenance of ditches, and a restriction on the cultivation of the previously arable fields that slope down to the site on the east side.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Granllyn Location Grid Ref: SJ224117 JNCC Site Code: UK0030158 Size: 20.99 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site is made up of two water bodies Granllyn Pool and The Moat that act as breeding sites for the great crested newts. The Granllyn Pool is a kettle formation with a peat soil and pond bottom. Surrounding these water bodies the rest of the site is composed of generally improved and well-grazed pasture. The exception to this being the grassland surrounding the Granllyn Pool (the main breeding site) which was planted up in 2004 to form a community woodland site. There is a wet juncus area in the northern most pasture of the Moat & Field (unit 2). Small blocks of woodland, hedgerows, minor roads, a cemetery and orchard are also included within the site boundary. The breeding population of Great Crested Newts (<i>Triturus cristatus</i>) for which this was, at the time of notification, the largest population in mid-Wales and one of the most important areas in Europe for this species. The site is situated in the village of Guilsfield just outside of Welshpool on the Mid Wales border.</p>
<p>Qualifying Features</p>	<p>Annex 2 species that are a primary reason for selection of the site</p> <ul style="list-style-type: none"> ▪ Great Crested Newt (<i>Triturus Cristatus</i>).
<p>Conservation Objectives</p>	<p>Vision for the site: The site supports a breeding population of over 100 adult great crested newts. This population of newts is stable or increasing and all of the factors that might affect the newts are under control.</p> <p>At least 5% of the site is aquatic habitat that is suitable for breeding great crested newts. There are two main water bodies but new temporary wet areas may be created. The pool and moat contain plenty of weed cover but at least 40% is open water at all times. These water bodies are not polluted or subject to excessive nutrient inputs from surrounding land. Predatory fish are absent, the pool margins are shallow and there is sufficient tall marginal vegetation and woodland to provide cover for newts entering and leaving the water.</p> <p>Scrub, grasslands, hedgerows and other habitats provide conditions suitable for dispersing, foraging, sheltering and hibernating amphibians. At least 5% of the site is broadleaved woodland. The pasture and amenity grassland have a sward that is suitable for foraging newts and there are plenty of suitable sites, such as fallen logs, large stones, hedge bottoms or manmade structures, where they can hide during the day or hibernate. Roads and other boundaries</p>

<p>Site Name: Granllyn Location Grid Ref: SJ224117 JNCC Site Code: UK0030158 Size: 20.99 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>within the site do not present a major obstacle to the movement of newts.</p> <p>Annex 2 species that are a primary reason for selection of the site</p> <ul style="list-style-type: none"> ▪ Great Crested Newt (<i>Triturus Cristatus</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ No less than 100 great crested newts are present on the site. ▪ At least 2 display/breeding ponds are to be found throughout the entire site. ▪ Great crested newt larvae are found in Granllyn Pool breeding ponds in at least one out of every two years. ▪ The newt display/breeding ponds have a water depth of 10cm or more during the summer months. ▪ Native macrophytes cover no more than 75% of pond/water body surfaces. Aquatic marginal vegetation is present around the pond edges. ▪ Breeding/display ponds are not be heavily shaded by surrounding bank-side vegetation. ▪ Algal blooms and surface sheens are absent from display/breeding ponds. ▪ Fish are not present in breeding/display ponds supporting great crested newts. ▪ Only small numbers of water and wildfowl can be seen on the ponds. ▪ The terrestrial habitat surrounding breeding ponds comprise of refuge areas, foraging areas, hibernacula and corridors that aid the dispersal of great crested newts. If these features are not present the conservation management aim will be to provide them. ▪ Off site habitats that function as stepping stone or corridors located between SAC compartments are maintained for migration, dispersal; foraging and genetic exchange purposes. ▪ All factors affecting the achievement of the above conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been divided into 10 different units based mainly on tenure, but also with reference to features and field names.</p>

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<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Pond Management</u> Excessive growth of aquatic and emergent plants, accumulation of decaying vegetation and silt and scrub encroachment can lead to the gradual loss of open water areas that are important to breeding newts. This is likely to be an ongoing problem at Granllyn Pool (Unit 1) but less so at the Moat (Unit 2), which is deeper and has less silt input. Periodic weed and silt removal will be needed to maintain sufficient open water in both these water bodies but this must be undertaken very carefully and with appropriate licences at the correct time of the year to avoid disturbance to breeding newts. Vegetation and silt should be left on the sides of the pool prior to disposal to allow amphibians and other aquatic creatures to return to the water.</p> <p><u>Water Quality</u> There is some concern about excessive amounts of nutrients, silt or other pollutants entering the water bodies. This may be a particular problem in Granllyn Pool where drainage water entering the site from surrounding housing could contain a lot of silt and nutrients. Planted trees may act as a buffer but sources of pollution should be closely monitored. Possible mitigation of any impacts might be achieved by a number of measures including, creating a bund along the edge of the pool abutting the housing using coppiced willow and dredged silt, channelling polluted water away from the pool or creating additional “interceptor pools” where the silt can settle out and plants such as reeds can be planted remove some of the nutrients from the incoming water.</p> <p><u>Woodland, Scrub and Hedgerow Management</u> As far as possible, natural ecological processes should be allowed to operate within the wooded areas. These will, in time, create natural clearings, promote tree and shrub regeneration, and ideally allow the steady accumulation of both standing and fallen deadwood, which are essential elements in a natural woodland system. Any active management should aim to complement natural processes, to enhance the various vegetation communities now present, and to promote a greater diversity of woodland structures by encouraging a mixed-age distribution of trees and the wider development of a shrub and ground layer. Care should be taken during such work to avoid disturbance to the newts or their places of shelter.</p> <p>Because this is a community woodland and amenity space it is expected that a high degree of public usage will prevail within this area. As a result dangerous trees, hanging branches and standing dead timber that could be a safety hazard may need to be cut down but large logs should be left on the ground and timber stacks created</p>

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	<p>to provide shelter and hibernation sites for the newts. Hedgerows should be managed by trimming and laying periodically to prolong their lives but. They should be protected from grazing stock and their bases left undisturbed to protect the newts.</p> <p><u>Grassland Management</u> The great crested newts are dependent on a mosaic of terrestrial and aquatic habitats for breeding, shelter and hibernation. Open habitats such as grassland are important feeding areas but the sward should be long enough to provide cover for the newts and their prey, grazing is not strictly necessary as the newts can thrive in rank grassland and scrub. However, it is recognised that the greater parts of units 2, 4, 6, 7 & 8 will continue to be managed as pasture land. Ideally, grazing should maintain a sward that is at least ankle high across the majority of the pasture and close mowing should be avoided when newts are likely to be present.</p> <p><u>Habitat enhancement</u> Terrestrial habitat enhancements to all units will be beneficial to the newt population and should be a conservation management aim. This might include:</p> <ul style="list-style-type: none"> ▪ Grassland: Leaving areas of grass uncut over the summer months creates a rank grassland community this provides cover and foraging habitat for newts dispersing from breeding and natal ponds. ▪ Scrub/woodland: Planting additional hedgerows, allowing scrub to develop, and allowing fallen dead wood to accumulate provides shelter and foraging habitat for newts. ▪ Sheltering habitats: The provision of log and rubble piles provides suitable areas for shelter and hibernation. <p><u>Predators</u> Amphibian breeding ponds should ideally contain no fish, as fish will predate newt larvae and frog tadpoles or eat plants that provide egg laying substrate. Consequently, no fish should be introduced to Granllyn Pool or the Moat. Any unsuitable fish that are found in these water bodies should be removed.</p> <p><u>Obstructions to Movement</u> Hedgerows and other linear landscape features must be present to enable the migration and dispersal of individuals, and facilitate genetic exchange between neighbouring newt populations. These features should not be removed or altered so as to restrict newt access. Newts</p>

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	<p>can become trapped in roadside gully pots during migration to and from breeding ponds. Once trapped, it is unlikely that animals will be able to escape. Where gully pots are present (unit 10), measures should be undertaken to reduce the likelihood of newts becoming trapped and to rescue those that do. In the medium to long term, alternative surface water drainage schemes may need to be considered.</p> <p><u>Development</u> The site lies next to a residential area and some owners may wish to develop their land in future. There is insufficient information on the potential impact on newts to set limits on development. However, maintenance works to existing structures (particularly in Units 5 & 10), alterations to structures and proposed new structures should be carefully assessed and any work implemented in a way that will cause minimal disturbance to newts.</p> <p><u>Recreational Use</u> Part of unit 1 is a 'woodlands on your doorstep site' owned and managed by the Woodland Trust. Dog walkers and teenagers regularly use the site but there is no evidence of any impact on newts. The cemetery (Unit 5) is also used by the public and there are well-used public footpaths crossing (Units 2, 4 and 6). Any burning, littering, dumping of waste or other unauthorised activities likely to adversely affect the newts will need to be addressed through preventative and remedial measures.</p> <p><u>Synthesised Conditions to maintain integrity</u></p> <p>Great Crested Newt (<i>Triturus cristatus</i>)</p> <ul style="list-style-type: none"> • Extent of breeding/display ponds. <ul style="list-style-type: none"> ○ Upper limit – Additional ponds could be created, especially in Units 2, 4, 6, 7 & 8). ○ Lower limit – Granllyn Pool (Unit 1) = 1.15 ha. The Moat (Unit 2) = 0.5 ha. • Water plant cover. <ul style="list-style-type: none"> ○ For each water main body (Units 1 & 3): ○ Upper limit – 70% water plant cover. ○ Lower limit – 50% water plant cover. • Water depth. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – Water depth > 10 cm between July and September in both main water bodies (Units 1 & 2). • Extent of shading. <ul style="list-style-type: none"> ○ For each water main body: ○ Upper limits – 20 % shading on the southern margins

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	<ul style="list-style-type: none"> ○ or 30 % of the total pond/water body margins shaded. ○ Lower limit – Some shading, on northern margins at least. • Extent and quality of terrestrial habitat. <ul style="list-style-type: none"> ○ Upper limits – No cultivated land or temporary grass leys within the site. ○ Lower limits – 18% ‘Semi-natural habitat’*1 within the site as a whole. <ul style="list-style-type: none"> Unit 1 <ul style="list-style-type: none"> ▪ Wetland – see extent of breeding/display ponds. ▪ Woodland/scrub – 0.8 ha. Unit 2 <ul style="list-style-type: none"> ▪ Wetland – see extent of breeding/display ponds. ▪ Rushy pasture – 0.4 ha. ▪ Rough grass/scrub 0.05 ha. Unit 3 <ul style="list-style-type: none"> ▪ Orchard (rough grass) – 0.4 ha. Unit 4 <ul style="list-style-type: none"> ▪ Trees/scrub – 0.1 ha. Unit 5 <ul style="list-style-type: none"> ▪ Amenity grassland/graves – 0.4 ha. Unit 6 <ul style="list-style-type: none"> ▪ Scrub – 0.05 ha. Unit 9 <ul style="list-style-type: none"> ▪ Amenity/garden – 0.1 ha. AND ○ Habitat within a 250m radius from Granllyn Pool (Unit 1) and the Moat (Unit 2) should have all of the following characteristics: <ul style="list-style-type: none"> ▪ Refuge areas, e.g. shady areas, tall vegetation, scrub, fallen deadwood, underground crevices, tree root systems and mammal burrows. ▪ Foraging areas, e.g. grasslands and woodlands. Potential hibernacula, e.g. log piles rubble piles and/or old walls. • Dispersal routes. <ul style="list-style-type: none"> ○ Upper limits – No increase (or change in position) of barriers, such as roads and hedges. ○ Lower limit – There should be no significant loss, or fragmentation, of hedgerows and other dispersal corridors. • Presence of wildfowl. <ul style="list-style-type: none"> ○ Upper limit – 4 pairs of breeding ‘wildfowl’*2 per hectare of open water between April and September. ○ Lower limit – Not required.

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	<p>*1 'Semi-natural habitat' includes woodland, scrub, parkland, un-improved/rough grassland, bracken/tall herbs, wetland and ponds, plus gardens and amenity grasslands, that can also provide valuable habitat for newts. *2 'Wildfowl' are defined as stocked ducks, swans or geese and naturalised Canada geese but not natural populations of native water birds.</p> <p>Refer to Core Management Plan (including conservation objectives) for Granllyn - Special Area of Conservation (2008) for further information at: http://www.ccqc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/glannau-to-gweunydd-sac-list/idoc.ashx?docid=4c196e7e-a0a2-486c-9627-8e1bf356a0eb&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Great Crested Newt (<i>Triturus Cristatus</i>) unfavourable, recovering
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Vegetation Cover</u> Granllyn Pool itself is vulnerable to increasing dominance by trees/vigorous emergent species. The owners of the pool (the Woodland Trust) have instigated a beneficial management regime, ensuring that directly sunlit areas of open water are maintained and expanded, and colonisation by willow is kept in check. Appropriate future management in the field immediately surrounding Granllyn Pool will involve glade creation and thinning as the planted trees become more mature, to be agreed with the Woodland Trust. Pasture further away from the Pool and the Moat is still grazed and requires monitoring to ensure compatibility for foraging and hibernating newts.</p> <p><u>Fish Introduction</u> The introduction of fish is a distinct threat, particularly to Granllyn Pool. Newt egg and larval stages are susceptible to predation by fish, and the absence of fish in the pool is likely to be a key factor in its attractiveness to the newts.</p> <p><u>Pollution</u> Water enters Granllyn Pool from a number of sources, including storm-drains from the adjacent road and from local gardens. The Moat also receives some water from adjacent pasture. There is a risk that waterborne pollution could enter both waterbodies. Key hibernating locations are presently unknown and so they may be inadvertently destroyed.</p>

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	<p><u>Introduction of invasive plants</u> Non-natives water plants, such as Canadian pondweed and New Zealand pygmyweed, can reproduce very rapidly and lead to a reduction in the open water habitat available for newts. At present (2007), they are not considered to be a significant factor, as none are present (with the possible exception of least duckweed). However, they should not be introduced to the site.</p> <p><u>Migration Barriers</u> Newts can become trapped in roadside gully pots during migration to and from breeding ponds. Once trapped, it is unlikely that animals will be able to escape. Other potential barriers to newts, such as new roads, paths, walls and high kerbs should not be installed without providing adequate crossing points.</p> <p><u>Development</u> The site lies next to a residential area and some owners may wish to develop their land in future. There is insufficient information on the potential impact on newts to set limits on development.</p> <p><u>Recreational Use</u> Some of the units are accessible for recreation and leisure purposes with designated public footpaths. Human activity such as littering could have an effect on the habitat and the qualifying feature.</p>
<p>Landowner/ Management Responsibility</p>	<p>The great crested newt is both the SAC/SSSI feature for this site and the Key Species. The habitats are managed for the conservation of the species.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Llangorse Lake / Llyn Syfaddan Location Grid Ref: SO131262 JNCC Site Code: UK0012985 Size: 215.64 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Llangorse Lake is a large shallow lake with a mean depth 2-3 metres lying in a natural depression of the Old Red Sandstone drift formed during the last glacial period. It is the largest natural lowland water in south Wales. It is one of the few natural eutrophic lakes in Britain and is of European importance in this context.</p> <p>The combination of the mineral-rich geology and size and shape of the lake encourages the growth of a wide range of aquatic and marginal plants, including several that are rare in this part of Wales. The site also demonstrates a gradation from open water, with submerged and floating plant beds, through marginal swamp and fen vegetation, marshy grassland to drier unimproved grassland, with patches of willow scrub and wet woodland. The lake also has a diverse plankton community and supports a wide variety of invertebrates, including rare and scarce species.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation.
<p>Conservation Objectives</p>	<p>Vision for the site: Llangorse Lake is an outstanding natural feature situated towards the head of the Afon Llynfi between the hills of Mynydd Llangorse and Allt yr Esgair. On average, the lake itself covers around 70% of the site and the water levels are allowed to change naturally with changes in rainfall patterns and season. During wetter periods, surrounding land is flooded, which maintains the rich array of habitats transitional between open water and drier ground. These habitats, which include reed beds, sedge fen, wet woodland and wet and dry grasslands, sit sympathetically at the edge of the lake, adding both shelter and diversity. In times of heavy rain the lake also acts as a temporary store for floodwater, slowly releasing it as rain subsides. Water quality is high, inputs of nitrates and other nutrients and sediments from agricultural and domestic sources are under control and the quality and clarity of the water is generally good. The fish population consists of native species such as pike, perch and eels, with populations of bottom-feeding species such as bream at levels that do not affect the aquatic flora. Non-native plant species or fish, such as grass-carp, are absent. The growth of pondweeds is dependent on a variety of factors</p>

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	<p>such as water temperature and turbidity and may vary each year, but in most years there is good growth, with pondweeds with both thin and wide leaves mixing with the delicate leaves of water-milfoils, hornworts and water-crowfoots. Closer still to the lake's edge the water surface is covered in the floating leaves and flowers of water lilies.</p> <p>Large parts of the lake margin are fringed by dense beds of common reed and tall sedges and here and there are patches of lesser reed-mace, bur-reeds and club-rush. Scattered amongst these beds are uncommon plants such as flowering rush, tubular water dropwort and meadow rue. In mid summer the striking flowers of purple loosestrife, bog bean and the sweet aroma of water mint add extra interest to the marginal vegetation. Wet woodland dominated by alder and willow and coloured by marsh marigold in the spring extends into the reed beds in many places and forms a bridge between the lake and the land. In a few areas there is damp oak and ash woodland with magnificent veteran trees on the drier fringes of the lake. In other places, marshy grasslands display an array of colourful flowers such as ragged-robin, marsh bedstraw, meadowsweet, greater birds-foot trefoil and orchids. Further up the slopes the land slowly dries and drier neutral grassland becomes the dominant habitat, with common knapweed, bird's-foot trefoil and red clover adding a further dash of colour to the landscape.</p> <p>In the summer, reed and sedge warbler and sometimes Cetti's warbler can be heard singing from the tall marginal vegetation, while hobbies hunt dragonflies and damselflies above. Several pairs of great crested grebes nest amongst the reed beds and on the quieter margins of the lake, waders such as lapwing and curlew display and breed. Towards mid-summer large numbers of mute swans arrive to moult. Insects and other invertebrates abound, and the quiet observer may catch a glimpse of the rare two-tone reed beetle before it drops from the vegetation in an attempt to escape predation. In winter, large rafts of wildfowl such as pochard, tufted duck, goldeneye and coot can be seen drifting on the lake, with more rarely the occasional smew, and the pig-like squeals of the secretive water rail may sometimes be heard in the reed beds. During spring, late summer and autumn, migrating birds including terns and waders, and rarities such as the aquatic warbler, stop over to rest and feed. Large numbers of swallows roost in the reed beds.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p>

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	<ul style="list-style-type: none"> ▪ Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ There is no loss of lake area, as defined in 2006 aerial photographs for summer levels. ▪ The aquatic plant community is typical of this lake type in terms of composition and structure, including species such as water-starworts, stoneworts, duckweeds, broad-leaved and fineleaved pondweeds, water lilies, amphibious bistort, water-crowfoots, rigid hornwort, spiked water-milfoil, mare's-tail and horned pondweed. ▪ Plants indicating very high nutrient levels and excessive silt loads are not dominant and invasive non-native water plants do not threaten to out-compete the native flora. ▪ The nutrient, pH and dissolved oxygen levels are typical for a lake of this type and there is no excessive growth of cyanobacteria or green algae. ▪ There is a natural hydrological regime. ▪ The natural shoreline is maintained. ▪ The natural and characteristic substrate is maintained. ▪ The natural sediment load maintained. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been divided into 13 units based on tenure, but also with reference to features and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>The full restoration of the lake to favourable condition may be difficult to achieve in the short term because of residual nutrients stored within the lake's sediments. However, every effort should be made to restore the structure and functioning of the lake to a favourable, sustainable status, with particular attention being paid to the management of environmental factors which could cause the lake to switch from the plant-dominated to phytoplankton-dominated stable state. The following environmental conditions will be key to achieve this:</p>

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	<p><u>Water Quality and Sedimentation</u> The quality of the water at Llangorse Lake is very important to the maintenance of its very special plants and animals. The lake sits within a small, predominantly lowland catchment and so receives its water from a very limited area.</p> <p>Water quality is of primary importance to the aquatic macrophyte flora. This naturally eutrophic lake entered an algal-dominated hyper-eutrophic state in the late 1970s, following high nutrient loadings from sewage effluent. These inputs were diverted and the aquatic macrophyte recovery monitored. Recovery has been substantial but there is still the potential for a return to an algal-dominated state. Surveillance of the ecosystem continues.</p> <p>The lake has been slowly recovering from a polluted state and it is vital that this recovery continues. The lake is surrounded by land that is agriculturally productive, with much used as arable or grass ley. It is important that any application of fertilizer (including manure) within the SSSI or lake catchment should be compliant with good agricultural practice, and it is of equal importance to control other inputs from agricultural and domestic sources, so as to avoid excessive levels of nutrients entering watercourses and eventually the lake.</p> <p>It is essential that land in the catchment be carefully managed to avoid sediment run-off, which could cause rapid siltation of the lake. It is therefore important that any land management practices such as ploughing and stock feeding within the SSSI or lake catchment should be compliant with good agricultural practice. Avoiding any exposed soil or mud where it can wash into watercourses entering the lake and keeping a buffer zone of permanent grassland in the lake's flood zone and next to water courses. Any ditches feeding into the lake need to be carefully managed to enable sediments to be trapped rather than enter the lake.</p> <p>NRW will continue to work with partners including the local authority, landowners in the catchment of the lake and the Welsh Assembly Government to further the recovery of the lake's water quality.</p> <p><u>Habitat Management</u> The many other habitats around the lake, such as the fen, woodlands and grassland are very important in their own right and often require management. The grasslands should be managed sympathetically, being either cut for hay in early summer and the aftermath grazed by sheep or cattle or lightly grazed throughout the growing season from spring into the early autumn. However, this would need to be carefully</p>

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	<p>managed, so that the marginal vegetation is not damaged and marginal sediments not disturbed by excessive trampling. It may be desirable in places to fence out margins to allow recovery.</p> <p>Much of the woodland surrounding the fringes of the lake adds greatly to the lake's diversity and provides further sheltering opportunities for its wildlife and requires little management. However, should the wet woodlands continue their expansion into the reed beds, non-chemical measures to control it should be employed to prevent losses of the other important habitats. The winter cutting of some reed beds could also be employed to aid the continuation of this fragile habitat and NRW will continue to monitor the situation and instigate management should it be needed.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation.</p> <ul style="list-style-type: none"> • Water quality <ul style="list-style-type: none"> ○ Upper limit – Annual mean total phosphorus (TP) of 35 µg/l or less. ○ Lower limit – At least 5 mg/l dissolved oxygen throughout the water column. • Hydrology <ul style="list-style-type: none"> ○ Upper limit – No new structures that will reduce inflow or deepening or enlargement of outflow points. ○ Lower limit – N/A. • Sediment loads and lake substrate <ul style="list-style-type: none"> ○ Upper limit – No extensive poaching of the lake margins by stock. ○ Lower limit – N/A. ○ NB. Additional limits could be set for silt load in the water column and/or sediment accumulation rates on the lakebed and nutrient content. • Recreational disturbance <ul style="list-style-type: none"> ○ Upper limit – No use outside agreed zones and periods of year as described in printed guidance. ○ Lower limit – N/A. • Development <ul style="list-style-type: none"> ○ Upper limit – No new permanent jetties, slipways or hard bank structures. ○ Lower limit: N/A. • Fishery <ul style="list-style-type: none"> ○ Upper limit – Introduced species should be removed or

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	<p>populations controlled as necessary. This will be guided by regular EA fish sampling.</p> <ul style="list-style-type: none"> ○ Lower limit – Fish are an essential component of the lake ecology. Populations need to be maintained by a sensible fisheries policy/rules and by ensuring other factors such as water quality are under control. <p>Refer to Core Management Plan (including conservation objectives) for Langorse Lake - Site of Special Scientific Interest and Special Area of Conservation (2008) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/idoc.ashx?docid=806d3a04-ed33-4b15-b41e-a39c47b93b12&version=-1</p>
<p>SAC Condition Assessment</p>	<p>Natural Eutrophic Lakes with Magnopotamion or Hydrochariton – type vegetation - Unfavourable</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Leisure and Recreation</u> Recreational activities on the lake, fisheries operations and agricultural practice within the catchment are potentially influential. The need for further measures to aid the recovery is being kept under review.</p> <p><u>Eutrophication</u> As the small Afon Llynfi is the main outlet for water from the lake, the water flows through the lake very slowly and any pollutants entering the lake will potentially remain there for long periods. Much of the current pollution is in the form of nutrients from the air and the many small watercourses entering the lake. Extra nutrients in a naturally nutrient rich lake dramatically change the types of plants growing in the lake and the number and type of insects that are able to live among the plants. This has a knock-on effect on the fish, birds and mammals of the lake.</p> <p><u>Increase in Sediments</u> Llangorse Lake sits in a shallow natural basin, the average depth of the lake is only 2-3 metres. The natural processes of erosion from the surrounding hills will naturally reduce the depth of the lake, albeit at a very slow rate, over time, but because of the shallowness of the lake it is exceptionally vulnerable to any extra sediments that may enter the lake from sources other than the natural inputs.</p>

<p>Site Name: Llangorse Lake / Llyn Syfaddan Location Grid Ref: SO131262 JNCC Site Code: UK0012985 Size: 215.64 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p><u>Impact of Wildlife</u> Possible effects from increasing numbers of Canada geese at the site, which may move nutrients from surrounding land to the waterbody needs further investigation.</p>
<p>Landowner/ Management Responsibility</p>	<p>Some units contain quite large areas of semi-improved grassland. These areas have been included to provide a buffer against sediment run-off and nutrient enrichment.</p> <p>Unit 1 is owned or leased by the BBNPA.</p> <p>Unit 9 is the crannog - a man-made island and a Scheduled Ancient Monument (SAM). The island supports a few trees and there is a little marginal aquatic vegetation, but the main interest is archaeological. The boundary of the SAM extends beyond the island to include part of the water body and aquatic vegetation.</p> <p>Unit 11 is common land, which has been developed in connection with recreational use. This is where the main jetties for launching boats are situated. There are also buildings, car parks, tracks and amenity grassland.</p> <p>Unit 13 is the main body of water, which is a common in its own right. The size of the water body fluctuates and the lake is generally more extensive in the wetter winter months. The lake margin as illustrated on the accompanying map shows the boundary of Unit 13, and represents mean summer level.</p> <p>In Units 1-8 & 10-12, which are mainly small fields, the SAC habitat is largely confined to the inundation zones (consisting of marginal fen and related habitats) which are flooded during the winter months and during high rainfall periods in summer months. Most of these units also contain habitats including marshy grassland, neutral grassland and woodland, which are not submerged by winter water levels.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>The Brecon Beacons National Park Deposit Local Development Plan Sustainability Appraisal Report (incorporating Strategic Environmental Assessment) (2010) is available at: http://www.beacons-mpa.gov.uk/the-authority/planning/strategy-and-policy/deposit-local-development-plan/sustainability-appraisal-report</p>

<p>Site Name: Montgomery Canal Location Grid Ref: SJ245100 JNCC Site Code: UK0030213 Size: 55.89 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Montgomery Canal is a partially restored but largely unused waterway. It runs for approximately 36 kilometres from near Aberbechan (three kilometres north-east of Newtown) to the English border at Llanymynech. It also has a small number of linked off-line reserves (kept as small individual management units); these were created to protect examples of the habitats and species found in the canal when restoration of the canal was started in the 1970s.</p> <p>It supports the largest, most extensive population of floating water-plantain <i>Luronium natans</i> in lowland Britain. This is a semi-natural population, having colonised from drift material or seed but needing periodic human disturbance for continued growth; in this respect the canal is a substitute for the species' former slow-moving, mesotrophic river niche, which has been largely destroyed in lowland Britain.</p> <p>The floating water-plantain is just one of a number of species of submerged, floating and marginal plant species that make up the canal habitat SSSI feature. This habitat is distributed along the entire length of the canal within the SSSI; the interest and quality varies from species-poor to species rich, depending on a number of factors, including water depth and management frequency.</p>
<p>Qualifying Features</p>	<p>Annex II Species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Floating Water-Plantain (<i>Luronium Natans</i>)
<p>Conservation Objectives</p>	<p>Vision for the site: At least 75% of the canal lengths have open water supporting a rich assemblage of floating-leaved, emergent and submerged plants at a cover of 30% or greater. Plant species include broad-leaved pondweed, autumnal water-starwort, rigid hornwort, alternate water milfoil, white water lily, greater duckweed, long-stalked pondweed, flat-stalked pondweed and perfoliate pondweed. Some sections of canal are tree-lined and here, the diversity of aquatic plants is lower, but may include important species such as floating water-plantain. Water plants, such as the invasive, non-native Canadian pondweeds, and filamentous algae, which indicate nutrient enrichment, are scarce.</p> <p>Aquatic invertebrates, especially those indicative of good water quality,</p>

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	<p>such as dragonflies and damselflies and water beetles, are abundant along the canal. More than ten species of dragonflies and damselflies breed here. On average there is a 1m wide strip of diverse marginal vegetation, which includes species such as meadowsweet, common skullcap, flowering rush, angelica, common valerian, greater tussock sedge and water dock. Reed sweet grass is confined to this 1m shelf and is not present in the central channel.</p> <p>The populations of floating-water plantain and other regionally rare water plants are stable or increasing across the site as a whole. The population of grass-wrack pondweed is increasing to best historic levels. Populations of all of these plants are sustainable in the long term, their distribution along the canal is not contracting, sufficient habitat exists to support each one and the factors that may affect these plants or their habitats are all under control.</p> <p>Alien aquatic and land-based species, such as Japanese knotweed, water fern, least duckweed and floating pennywort are absent from the canal.</p> <p>Annex II Species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Floating Water-Plantain (<i>Luronium Natans</i>). <p>The vision for this feature is to maintain the extent and distribution of <i>L. natans</i> within the Montgomery Canal at favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The <i>L. natans</i> population in favourable condition will reflect the natural carrying capacity of the canal habitat and will be limited principally by species ability to spread or be relocated (vegetative or otherwise), the suitability of the rooting medium and competition between species as part of habitat succession. ▪ Recreation pressure, principally through boat movements and fisheries management, will not significantly affect the maintenance of the species, or its ability to disperse throughout the canal network and any associated off-line reserves. ▪ The ecological status of the water environment, including elements of water quality and physical habitat quality, will be sufficient to support the population of <i>L. natans</i> in favourable condition. ▪ All factors affecting the achievement of the above conditions are under control.

<p>Site Name: Montgomery Canal Location Grid Ref: SJ245100 JNCC Site Code: UK0030213 Size: 55.89 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Component SSSIs</p>	<p>The plan area has been divided into 16 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on distribution of the SAC feature and current management of the canal, which is all owned by British Waterways. The units are usually focussed on separating out those lengths where floating water-plantain is abundant, whilst other lengths currently have a low cover or frequency of this species.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex II Species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Floating Water-Plantain (<i>Luronium Natans</i>). <p><u>Dredging</u> Silting up means that shallow water and competing marginal species restrict the availability of open water and early successional conditions that this species requires to thrive. British Waterways are mindful of their responsibilities on this site and work in partnership with NRW to ensure that existing populations are safeguarded during any works that are necessary to maintain water flows and physical structure of the canal. New funding sources for proper dredging are continually being sought, and it is hoped that a focussed and sustainable restoration to a controlled but navigated waterway would provide the means to safeguard the future of the site and this feature.</p> <p><u>Water Quality</u> There concerns about the quality of the water that feeds into the canal. This is currently being investigated by the Environment Agency as part of their review of consents process. It is possible that once proper dredging can occur that this may improve water flow and help to improve quality by removing a nutrient source.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Floating Water-Plantain (<i>Luronium Natans</i>)</p> <ul style="list-style-type: none"> • Water Quality <ul style="list-style-type: none"> ○ Upper limit – As an interim guide the total phosphorus target for the whole canal is <40µg L-1 TP. None required for other elements. ○ Lower limit – The current target is to seek to attain

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	<p>General Quality Assessment Grade A or B for biological water quality, and General Quality Assessment Grade B for water chemical quality.</p> <ul style="list-style-type: none"> • Water Clarity <ul style="list-style-type: none"> ○ Upper limit – not required. ○ Lower limit – Secchi disk should be visible at depth of 1m in 90% of observations. <p>Refer to Core Management Plan (including conservation objectives) for Montgomery Canal Special Area of Conservation (and Site of Special Scientific Interest) (2008) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/idoc.ashx?docid=7d792fcc-ec02-4cea-8283-9966bfc9614e&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Floating Water-Plantain (Luronium Natans) Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Pollution</u> Enrichment through agricultural or domestic nutrient inputs is a likely threat as this could affect the populations of floating water-plantain.</p> <p><u>Lack of Management</u> Several sections of canal currently suffer from lack of management. NRW will liaise with owners and occupiers to achieve an appropriately scaled and timed management. To ensure that bank protection and other engineering works are undertaken in a sensitive manner, NRW will liaise with competent and relevant authorities to agree on appropriate methods and practices. For example, the mowing of terrestrial and marginal vegetation would not harm aquatic plants but herbicide run-off from the towpath could be a problem.</p> <p><u>Recreation</u> The effects of boat traffic on populations of floating water-plantain are uncertain and are being investigated by British Waterways. It is certain that the species will be detrimentally affected above a certain point as the actions of propeller/wash will detach floating leaves and create turbidity which will reduce light transfer to submerged leaves.</p>

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	<p><u>Introduction of Invasive Species</u> The population of floating water-plantain is vulnerable to colonisation by aggressive species which can have an impact on the canal's ecology, through blanket coverage of the canal channel and increased nutrient input because of a large leaf biomass. The introduction of certain fish species could also damage aquatic plant populations.</p>
<p>Landowner/ Management Responsibility</p>	<p>N/A</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Mynydd Epynt Location Grid Ref: SN883400 JNCC Site Code: UK0030221 Size: 40.12 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Mynydd Epynt SAC comprises 6 separate blocks of land situated within the Sennybridge MOD Ranges between Halfway Forest and Cwm Owen in the Brecknock District of Powys. All of the blocks include spring-fed flushes supporting the SAC Feature of Interest, with Disgwylfa also supporting the additional SSSI Feature, namely the assemblage of grassland fungi in particular, waxcap species.</p>
<p>Qualifying Features</p>	<p>Annex II species present as a qualifying feature and a primary reason for site selection:</p> <ul style="list-style-type: none"> ▪ Varnished hook-moss (<i>Hamatocaulis vernicosus</i>).
<p>Conservation Objectives</p>	<p>Vision for the Site: Sufficient wetland habitat to support a viable population of varnished hook-moss, <i>Hamatocaulis vernicosus</i> is being maintained at this site. Suitable habitat for the moss of mildly base-rich spring-fed flushes where the water table is at or close to the surface for most of the year, occurs at all six locations at Mynydd Epynt. The flushes can be recognised within the six locations by the short sward of small sedges such as carnation sedge, star sedge and common sedge growing amongst the 'brown moss' carpets where rushes or bog mosses <i>Sphagnum</i> spp. are not dominant. The flushes are well grazed by sheep so that they retain their open nature and there are no woody shrubs present as these would shade out the moss. Factors, which could affect the hydrology and water chemistry of the flushes, are under control.</p> <p>In addition, at least 2.5 ha of suitable dry acid grassland habitat dominated by sheep's fescue and common bent grasses with heath bedstraw scattered through is maintained at Disgwylfa, which supports a rich variety of grassland fungi, including fairy clubs, earth-tongues and at least twenty types of waxcap. The sward is kept short throughout the year by sheep grazing and the grassland is managed without the addition of fertilisers.</p> <p>Annex II species present as a qualifying feature and a primary reason for site selection:</p> <ul style="list-style-type: none"> ▪ Varnished hook-moss (<i>Hamatocaulis vernicosus</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ There is a thriving population of varnished hook-moss in the mildly base-rich flushes, at six different locations spread

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	<p>throughout the site.</p> <ul style="list-style-type: none"> ▪ Around 1.5 ha of suitable flush vegetation will continue to occur at Mynydd Epynt at the six different locations and the moss will continue to be present and maintain its distribution throughout the suitable areas of flush in at least ten separate locations overall. ▪ The water table is maintained at or near to the surface for most of the year within the flushes. ▪ The flushes are open in character with no woody shrubs present. ▪ The flushes are not dominated by rushes, purple moor-grass or bog-mosses (<i>Sphagnum</i> spp.). ▪ The following plants are typically found in the flushes scattered amongst the moss carpet but not dominant: carnation sedge (<i>Carex panacea</i>), star sedge (<i>C. echinata</i>), common sedge (<i>C. nigra</i>), purple moor-grass (<i>Molinia caerulea</i>) and rushes (<i>Juncus acutifolius</i>) and (<i>J. articulatus</i>). ▪ Species indicative of agricultural modification, such as perennial rye grass (<i>Lolium perenne</i>) and white clover (<i>Trifolium repens</i>) are absent from the flushes and the surrounding areas of SSSI/SAC in the six locations. ▪ All six locations continue to be grazed by sheep at a level which maintains the short open sward of the flushes without poaching. ▪ All six locations are free from physical damage such as trampling/poaching caused by livestock, troop activity, vehicle passage, or impact damage from weapons practice. ▪ The population of varnished hook-moss is stable and is sustainable in the long term with its range not contracting and all factors that may affect the species are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 6 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on the separate land areas (as they are so far apart) but also taking account of the separate tenancies, which cover each separate parcel. It is assumed that there is a measure of hefting with different tenants' sheep mostly grazing the area around where they are released onto the open hill. Thus, all parcels have been allocated a separate Management Unit number except for Llyn Login/Blaen Offeriad, which has been placed in the same Management Unit because they are closer geographically to each other than the others and share a common tenancy holder.</p>

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<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Grazing</u> Maintain the current levels of extensive grazing by sheep throughout the year for Units 1, 2, 4 & 5. Review grazing levels for Unit 6, to ensure sufficient grazing of the purple moor-grass and rushes around the flush areas. Grazing levels should maintain the open nature of the flushes but not cause poaching.</p> <p><u>Water levels</u> Protect all natural springs and the associated flushes at each location to maintain the high water table throughout the year.</p> <p><u>Water Quality</u> Continue to manage the catchment areas for the flushes extensively with no nutrient run-off causing pollution e.g. from agricultural practices such as fertiliser application, run-off from feeding stations etc.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Varnished hook-moss (<i>Hamatocaulis vernicosus</i>)</p> <ul style="list-style-type: none"> • Sheep grazing levels. <ul style="list-style-type: none"> ○ Upper limit – 40,000 sheep over the whole Range. ○ Lower limit – 36,000 sheep over whole Range. A stocking rate of around 0.4 livestock units/ha/year may be the most appropriate. • Water flow through flushes throughout year. <ul style="list-style-type: none"> ○ Upper limit – To be determined. ○ Lower limit – Flowing water present throughout the year. • Water level in flushes. <ul style="list-style-type: none"> ○ Upper limit – unknown. ○ Lower limit – No alteration of watercourses or springs located within the catchment area of the flushes within the site. • Water quality. <ul style="list-style-type: none"> ○ Upper limit – unknown. ○ Lower limit – unknown. • Woody species/shrubs. <ul style="list-style-type: none"> ○ Upper limits – No woody shrubs or trees present within the flushes supporting the moss. No trees close enough to cause significant shading of the flushes or reductions in the water table.

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	<ul style="list-style-type: none"> • Surface disturbance – bare ground/open water. <ul style="list-style-type: none"> ○ Upper limit – No army activity & 5% poaching from sheep in & around flushes ○ Lower limit – 5% trampling by sheep to help maintain open sward. <p>Refer to Core Management Plan (including conservation objectives) for Mynedd Epynt Site of Special Scientific Interest including Mynydd Epynt Special Area of Conservation (2008) for further information at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/doc.ashx?docid=cff4e642-2153-4d20-82df-88e2cceb5485&version=-1</p>
<p>SAC Condition Assessment</p>	<p>Overall Conservation Status within the site: Un-favourable, based on the following information:</p> <ul style="list-style-type: none"> ▪ Llyn Login & Blaen Offeriad Feature: Favourable, maintained ▪ Southern area of Disgwylfa: Favourable, maintained ▪ Blaen-talar: Favourable, unclassified ▪ Journey's End: Favourable, unclassified ▪ Gam Rhiw: Un-favourable, unclassified <p>Conservation status of varnished hook-moss at this location is very uncertain – recorded during NRW Phase 2 Survey (M. Yeo, 1991) as Domin 2, in a 2 x 2m quadrat in 'flushed rush-pasture' and has never been noted to be abundant (pers. Comm. R G Woods January 2008). The flushes at Gam Rhiw are small and amongst abundant purple moor-grass and tall rushes and there is a tendency for these species to overwhelm the flushes since the area is being grazed solely by sheep.</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Military Training</u> All areas of the site supporting <i>Drepanocladus vernicosus</i> form part of the Ministry of Defence (MoD) army training area. These were formerly mostly used by artillery. The ranges now offer important infantry training. No areas with <i>D. vernicosus</i> lie in areas affected by the impact of large munitions but may suffer sporadic damage from trampling and the use of small explosive charges.</p> <p><u>Drainage</u> In the recent past, the MoD undertook some drainage of flushes by the use of open ditches, but none of these areas were affected. Plans</p>

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	<p>to change the grazing/letting arrangements from an annual licence held in common over the whole range to short-term tenancies over specific areas could allow farmers to drain or fertilise more of the range. Conditions will need to be included in the tenancies to preclude this activity.</p>
<p>Landowner/ Management Responsibility</p>	<p>In the early 1940's 34,000 acres were taken over by the MoD as Sennybridge Training Area and since then the grazing rights of tenants have been retained although the people who owned farms in the area before the 1940's were evicted from many of the farmsteads. This along with the needs of the Army to provide a robust accessible substrate on which to train, to provide an income and to support local communities has resulted in most of the area now being unfenced and grazed extensively by sheep.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Rhos Goch Location Grid Ref: SO197483 JNCC Site Code: UK0014792 Size: 67.65 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The central core of the site comprises Rhos Goch National Nature Reserve (NNR), a peat bog that has developed in a small glacial lake basin to the north of Hay-on-Wye in Powys. The site also includes surrounding wet meadows and patches of woodland forming part of the “lagg zone” of the bog. The site is the source of two streams, the Cwm-illa Brook (which flows north-east towards the River Arrow) and the Bach Howey (which flows south-west towards the River Wye).</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs ▪ Transition mires and quaking bogs <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) ▪ Bog woodland ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnus incanae</i>, <i>Salicetum albae</i>)
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p>Around 95% of the site is wetland, comprising a mosaic of different habitats. The central core of Rhos Goch common, comprising around 20% of the site, consists of fairly open raised bog with a series of pools and hummocks. The drier hummocks support heather, hare’s-tail cottongrass, cross-leaved heath and purple moor-grass, while the pools are dominated by common cottongrass and bog-mosses. Purple moorgrass is not overwhelmingly dominant on the raised bog. The scattered birch trees and willow scrub do not form a closed canopy. Most of the core bog area is surrounded by a band of wet woodland. This occupies around 30% of the site in total. About a third of this is “bog woodland” that receives acidic water draining from the raised bog. The canopy here consists of downy birch and rusty willow over a ground layer that is generally dominated by mixtures of purple moor-grass and common reed over carpets of bog-mosses. Other plants found here include marsh cinquefoil, water horsetail, lady fern, bilberry and velvet bent grass. Royal fern is locally abundant in these areas.</p> <p>Most of the remaining woodland is “fen-carr”, occupying the “lagg zone” of the raised mire, which receives drainage water from the surrounding fields and some from the raised bog. This woodland is still largely dominated by downy birch and rusty willow but they are joined by</p>

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	<p>frequent alder, with occasional oak, ash and aspen on the slightly drier ground. There are also a few shrubs such as hawthorn and guelder-rose. The ground flora here consists of a variety of wetland plants, including common reed, greater tussock-sedge, purple moor-grass, meadowsweet, hemp-agrimony, bittersweet, soft rush, opposite-leaved golden-saxifrage and marsh marigold. The canopy in the woodland areas is fairly even but there are occasional gaps where trees have died. Standing and fallen dead wood is plentiful. Plants indicating high nutrient levels, such as common nettle, bramble, cleavers and creeping buttercup, are generally absent from the bog woodland. They may be prominent in places within the fen carr but they are never overwhelmingly dominant.</p> <p>On the south-west side, the raised bog grades into a broad zone of basin bog and swamp vegetation that contains patches of rusty willow scrub. There are other small patches of this vegetation in the wettest parts of the surrounding pasture areas. Together they cover around 10% of the site. The open areas closest to the raised bog have vegetation that is characteristic of more acidic conditions, with plants such as sedges, common cottongrass, marsh cinquefoil, soft rush, water horsetail and marsh pennywort over carpets of bog-mosses. As the ground water becomes less acidic the bog-mosses are gradually replaced by others, such as bog groove-moss and pearmosses, with a greater range of other plants that are typical of “transition mires”, including bogbean, water mint, bog pondweed, marsh marigold, lesser spearwort, common marsh-bedstraw and forget-me-nots. The areas furthest from the raised bog support additional plants that are found in more nutrient-rich swamps, including common spike-rush, bulrush, lesser pond-sedge, greater tussock-sedge, gipsywort and the locally rare greater spearwort. The taller swamp plants form a dense canopy during the summer months but the water beneath supports floating plants such as floating club-rush, ivy-leaved duckweed and a thriving population of the bladderwort, which obtains nutrients from tiny insects trapped within its submerged bladders.</p> <p>The edge of the swamp-zone is seasonally waterlogged, supporting tall rushes or a sward of smaller grasses, such as creeping bent and Yorkshire-fog with a scattering of swamp plants including lesser spearwort, water mint, marsh marigold and bladder sedge. Disturbed areas here support floating sweet-grass, bulbous foxtail, the uncommon whorl-grass and a population of the nationally scarce pillwort. Temporary pools and water seepages running out from the swamp zone are the favoured habitat of the scarce blue-tailed damselflies, which can be seen on the wing during the summer months.</p> <p>There are large patches of rusty willow scrub in the swamp zone but</p>

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	<p>they occupy less than 5% of the site in total and the willow and birch trees are not encroaching into the open bog and swamp areas. Plants indicating high nutrient levels and disturbance, such as floating sweet-grass and creeping buttercup, may be prominent at the edges of the common but these plants are uncommon in the central wetland areas. There are poached areas with sparse vegetation, where grazing animals roam, but these cover less than 5% of the swamp zone in total.</p> <p>Marshy grassland borders the swamp zone at the southern end of the common and there are more extensive areas of this habitat in the fields that lie below the spring line in the meadows around the edges of the site. This habitat covers around a quarter of the site in total. It is largely dominated by mixtures of rushes and purple moor-grass, with a good range of typical plants, such as common marsh-bedstraw, greater bird's-foot-trefoil, tormentil, sneezewort, wild angelica, meadowsweet, lesser spearwort, carnation sedge, heath spotted-orchid, water mint, common sorrel, cuckooflower, marsh willowherb, marsh pennywort, common sedge and marsh ragwort. Around 30% of this marshy grassland also has plants that are typical of species-rich fen-meadow, including devil's-bit scabious, meadow thistle, fen bedstraw, marsh valerian, flea sedge, quaking grass, cross-leaved heath, tawny sedge and marsh orchids.</p> <p>There several springs within the meadows, which supply mineral-rich water to a series of boggy flushes. Here there are small sedges and "brown" mosses, with plants such as common butterwort, common cottongrass, flowered spike-rush, bulbous rush, marsh arrowgrass, quaking grass, marsh lousewort and bog pimpernel. In places the spring water is more acidic and there are flushes dominated by sharpflowered rush, over bog-mosses. The drier ground within the meadows at the northeastern end of the site supports some grassland dominated by common bent, crested dog's-tail, sweet vernal-grass and fescue with a good variety of flowering plants including common bird's-foot-trefoil, common knapweed, red clover, glaucous sedge, tormentil, devil's-bit scabious and betony. There are also some patches of damper grassland dominated by creeping bent at the northern end of the site.</p> <p>Purple moor-grass and rushes are not completely dominant anywhere within the marshy grassland and there is no significant accumulation of dead vegetation from year to year. Plants indicating disturbance and nutrient enrichment, such as Yorkshire fog, floating sweet-grass, rough-meadow grass, marsh thistle, creeping buttercup and cleavers are not prominent in these areas. The marshy grassland is generally free from invading scrub.</p>

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	<p>The site supports a wide range of specialised wetland insects, including rare and scarce flies, beetles and bugs. Generally, for each wetland plant or insect of particular interest, the population is stable or increasing and is sustainable in the long term, the range is not contracting, sufficient habitat exists to support the species and the factors that may affect the species or its habitat are under control.</p> <p>Rhos Goch also supports a good range of wetland breeding birds including snipe, sedge warbler, grasshopper warbler, reed bunting, lapwing and water rail.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs. <p>The vision for this feature is for it to be in a favourable conservation status within the site, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Raised bog habitat with only a few scattered trees covers at around 20 % of the site. ▪ The bog surface consists of a series of pools and hummocks. ▪ The drier hummocks support heather, hare’s-tail cottongrass, cross-leaved heath and purple moor-grass, while the pools are dominated by common cottongrass and bog-mosses. ▪ Purple moor-grass is not overwhelmingly dominant on the raised bog. ▪ Scattered birch trees and willow scrub, where present, do not form a closed canopy. ▪ There is no significant bracken encroachment around the bog edges or on the bog dome. ▪ Water levels on the bog remain high throughout the year. ▪ The vegetation is not affected by atmospheric pollution. ▪ All other factors affecting the achievement of the foregoing conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Transition mires and quaking bogs. <p>The vision for this feature is for it to be in a favourable conservation status within the site, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ “Transition mire”, comprising basin bog and swamp vegetation, with some scattered trees and scrub, covers at around 10% of the site. ▪ There is a broad zone of “transition mire” extending to at least 6 ha on the southwest side of the raised bog dome (Unit 1), with smaller patches of similar vegetation close to the main ditches

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	<p>in Portway meadows (Unit 2).</p> <ul style="list-style-type: none"> ▪ Areas closest to the raised bog have vegetation that is characteristic of more acidic conditions, with plants such as sedges, common cottongrass, marsh cinquefoil, soft rush, water horsetail and marsh pennywort over carpets of bog-mosses. ▪ In the central zone of this transition mire, bog-mosses are gradually replaced by others, such as bog groove-moss and spear-mosses, with a greater range of other typical “poor-fen” plants, including bogbean, water mint, bog pondweed, marsh marigold, lesser spearwort, common marsh-bedstraw and forget-me-nots. ▪ The areas furthest from the raised bog support additional plants that are found in more nutrientrich swamps, including common spike-rush, bulrush, lesser pond-sedge, greater tussock-sedge, gipsywort and the locally rare greater spearwort. Here the taller swamp plants form a dense canopy during the summer months but the water beneath supports floating plants such as floating club-rush, ivy-leaved duckweed and bladderwort. ▪ There are large patches of rusty willow scrub but they occupy less than 10% of the south western bog transition zone in total and the willow and birch trees are not encroaching into the open bog and swamp areas. ▪ Plants indicating high nutrient levels and disturbance, such as floating sweet-grass and creeping buttercup, may be prominent at the edges of the common but these plants are uncommon in the central wetland areas. ▪ There are poached areas with sparse vegetation, where grazing animals roam, but these cover less than 5% of the swamp zone in total. ▪ Water levels are maintained so that surface water is present throughout the year. ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All other factors affecting the achievement of the foregoing conditions are under control. ▪ There are good populations of wetland breeding birds, including water rail, snipe, sedge warbler and reed bunting. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>). <p>The vision for this feature is for it to be in a favourable conservation status within the site, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Species-rich “fen-meadow” vegetation occupies between 6 and

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	<p>10% of the site in total.</p> <ul style="list-style-type: none"> ▪ A large part of Portway meadows (Unit 2) support this vegetation and there are other patches on the drier ground at the south-west end of the common (Unit 1), Llanshiver (Unit 4) and Cefn-yblaen (Unit 5). ▪ The vegetation consists of mixtures of purple moor-grass and sharp-flowered rush, with a wide variety of other plants, including devil’s-bit scabious, meadow thistle, fen bedstraw, marsh valerian, flea sedge, quaking grass, cross-leaved heath, tawny sedge and marsh orchids. ▪ Purple moor-grass and rushes are not completely dominant and there is no significant accumulation of dead vegetation from year to year. ▪ Plants indicating disturbance and nutrient enrichment, such as Yorkshire fog, floating sweetgrass, rough-meadow grass, marsh thistle, creeping buttercup and cleavers are not prominent in these areas. ▪ The fen meadow areas may have scattered trees or bushes but are generally free from dense or invading scrub. ▪ Some bare ground is present but cattle poached areas are not extensive. ▪ Water levels are maintained so that the water table is close to the surface throughout the year but these areas are not subject to regular flooding. ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All other factors affecting the achievement of the foregoing conditions are under control. ▪ There are good populations of wetland breeding birds, such as snipe and lapwing. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Bog woodland. <p>The vision for this feature is for it to be in a favourable conservation status within the site, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Around 10 - 15 % of the site supports bog woodland. ▪ All of this woodland occurs in patches around the edges of the raised bog or in the adjacent “lagg zone” around the north-eastern edge of the common. ▪ The tree canopy consists of mainly downy birch on the bog surface and mixtures of downy birch, rusty willow and alder in the lagg zone. ▪ The ground flora generally consists of purple moor-grass and

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	<p>common reed over carpets of bogmosses.</p> <ul style="list-style-type: none"> ▪ Other typical plants found here include marsh cinquefoil, water horsetail, lady fern, bilberry and velvet bent grass. Royal fern is abundant in some areas. ▪ The woodland is maintained as far as possible by natural processes. ▪ The canopy may be fairly open, particularly on the raised bog dome, with large glades. ▪ The location of open glades may vary over time. ▪ Standing and fallen dead wood are common in places. ▪ Non native trees and shrubs, such as Scots pine, are rare. ▪ Plants indicating high nutrient levels, such as common nettle, bramble, cleavers and creeping buttercup are absent. ▪ Plants indicating surface drying, such as bracken, do not dominate the ground flora. ▪ Grazing is light enough to allow some regeneration of trees and shrubs. ▪ Water levels are maintained so that water table is at or close to the surface throughout the year. ▪ All other factors affecting the achievement of the foregoing conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>). <p>The vision for this feature is for it to be in a favourable conservation status within the site, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Around 20% of the site supports alluvial forest. ▪ The majority of this woodland is found in the “lagg zone” of the raised bog around the northeastern edge of the common (Unit 1). With small patches within the meadows at Portway (Unit 2), Dol-y-cannau (Unit 3) and Cefn-y-blean (Unit 5). ▪ The tree canopy consists of mixtures of downy birch, alder and rusty willow, with some ash and aspen in places. ▪ The ground flora consists of a variety of wetland plants, including common reed, greater tussock sedge, purple moor-grass, meadowsweet, hemp-agrimony, bittersweet, soft rush, opposite-leaved golden-saxifrage and marsh marigold. ▪ The woodland is maintained as far as possible by natural processes. ▪ The canopy is fairly even but there occasional gaps where trees have died. ▪ The location of open glades varies over time.

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	<ul style="list-style-type: none"> ▪ Standing and fallen dead wood is plentiful. ▪ Non native trees and shrubs, such as Scots pine and sycamore, are rare. ▪ Plants indicating high nutrient levels, such as common nettle, bramble, cleavers and creeping buttercup, occur locally but are nowhere overwhelmingly dominant. ▪ Plants indicating surface drying, such as purple moor-grass, bracken and bramble, do not dominate the woodland ground flora. ▪ Grazing is light enough to allow regeneration of trees and shrubs. ▪ Water levels are maintained so that surface water is present throughout the year. ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All other factors affecting the achievement of the foregoing conditions are under control. ▪ The woodland supports populations of typical breeding birds.
<p>Component SSSIs</p>	<p>The plan area has been divided into 5 Management Units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to features and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs. <p><u>Grazing</u> Maintain a suitable grazing regime on the common (Unit 1) using cattle (and possibly ponies) during the summer months, so that, ideally, there is sufficient grazing pressure on the raised bog area to prevent tree and shrub re-generation. In practice this may be difficult to achieve as stock access is difficult except in very dry periods. Grazing pressure should not be high enough to suppress the growth of heather or cause significant poaching.</p> <p><u>Water Levels</u> Maintain a high water table beneath the raised bog by removing birch, carefully managing water levels. Water tables on-site are maintained by sluices, and a large amount of adjacent unimproved pasture provides a buffer against eutrophication.</p>

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	<p><u>Scrub Encroachment</u> Continue to manage birch and willow on the raised bog by cutting and removal and/or chemical treatment with approved herbicide, as necessary. The few scattered Scot's Pine may also need to be removed to ensure they do not seed onto the raised bog. Clearance should leave an uneven boundary with the adjacent woodland to provide sheltered areas for wetland invertebrates.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Transition mires and quaking bogs. <p><u>Grazing</u> Maintain a suitable grazing regime on the common (Unit 1) using cattle (and possibly ponies) during the drier months, so that, ideally, there is sufficient grazing pressure on the transition mire and swamp areas to prevent tree and shrub re-generation, prevent a build-up of dead vegetation and in practice this may be difficult to achieve sufficient grazing during wet summers when stock access is more difficult. Grazing pressure should not be high enough to suppress the growth of tall swamp plants in the wetter areas or cause widespread poaching.</p> <p><u>Water Levels</u> Maintain a high water table with significant amounts of surface water throughout the year by maintaining inflows and carefully managing water levels in the main boundary ditches around the common. Control the level of outflows using dams and sluices if necessary. Ditch cleaning should not over-deepen the channel and dredgings should not be dumped in areas with sensitive vegetation.</p> <p><u>Scrub Encroachment</u> Continue to manage willow and birch in the transition mire and swamp areas, as necessary, by cutting and removal or chemical treatment through injection. Sufficient scrub should be retained to provide shelter and breeding habitat for wetland invertebrates and birds.</p> <p><u>Pollution</u> Prevent pollution from nutrient run-off.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>). <p><u>Grazing</u></p>

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	<p>The previous history of light to moderate cattle grazing has been an important factor in determining the present character of the meadow vegetation. Therefore, a suitable grazing regime should be maintained in Units 2, 4 & 5 using cattle and some sheep. Grazing fen meadow areas in spring and late summer/autumn prevents overwhelming domination by rushes and purple moor-grass, maintains the diversity of plant species and prevents the spread of scrub. Grazing pressure should be sufficient to maintain a varied habitat structure in the fen meadow areas (with some areas less than 10 cm high for at least part of each year) but not be too heavy, as this could lead to the loss of sensitive plants, and could cause poaching damage in places, leading to invasion by weeds.</p> <p><u>Water levels</u> Maintain a fairly high water table throughout most of the year whilst avoiding regular flooding, by protecting natural springs and inflow ditches and carefully maintaining ditches within the meadow areas of Units 2, 4 & 5, as necessary. Ditch cleaning may have to be done by hand. It should not overdeepen the channel and dredgings should not be dumped in areas with sensitive vegetation.</p> <p><u>Mowing</u> In the absence of sufficient grazing by the correct type of stock, mowing in late summer might be a useful method of preventing overwhelming domination of the fen meadow areas by coarse vegetation such as rushes and purple moor-grass. Ideally cuttings should be removed. Patches of tall vegetation should be retained for the benefit of wetland invertebrates.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Bog woodland. <p><u>Grazing</u> Keep grazing pressure in these areas to a minimum.</p> <p><u>Water Levels</u> Maintain a high water table throughout the year by maintaining inflow and carefully managing water levels.</p> <p><u>Woodland Management</u> Keep management to a minimum.</p> <p><u>Atmospheric Pollution</u> Reduce atmospheric pollution to protect sensitive vegetation.</p>

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	<p><u>Grazing</u> Anything other than occasional light grazing could damage the wet woodland areas. However, the main woodland areas are located on the parts of the common (Unit 1) that are fairly inaccessible to stock and it is neither practical nor desirable to erect fencing to achieve total exclusion.</p> <p><u>Water Levels</u> Maintain a high water table with significant amounts of surface water in the wooded lagg zone throughout the year by maintaining inflow and carefully managing water levels.</p> <p><u>Woodland Management</u> It is unlikely that any management of the wet woodland will be necessary. Due to the instability of the ground, the trees reach a limited height before collapsing and regenerating naturally. This natural process is expected to continue. Dead wood is also accumulating naturally. Holders of common rights may wish to remove brushwood but are unlikely to do so in the wettest areas where access is so difficult. Some small-scale cutting for firewood around the margins would probably be acceptable, so long as re-growth is protected from grazing stock.</p> <p><u>Pollution</u> Prevent pollution from nutrient run-off.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Active Raised Bogs</p> <ul style="list-style-type: none"> • Presence of Birch and Willow (living trees greater than 2m high). <ul style="list-style-type: none"> ○ Upper limit – at least 25 m between individuals within the core sampling area. ○ Lower limit – n/a. • Presence of Scots Pine (and other non-native trees and shrubs). <ul style="list-style-type: none"> ○ Upper limit – no seed bearing trees. ○ Lower limit – n/a. • Bracken Cover. <ul style="list-style-type: none"> ○ Upper limit – patches of 25 m² with a closed canopy, or a single cluster of 1000 fronds within the core sampling area shown on map 2, whichever is the lesser. ○ Lower limit – n/a. • Water Levels (measured at dipwell 9). <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – level higher than 257.5m above sea level

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	<p>for at least 40% of the year for three in every five consecutive years.</p> <ul style="list-style-type: none"> • Air Quality. <ul style="list-style-type: none"> ○ Upper limits – Unknown. ○ Lower limits – N/A. <p>Transition mires and quaking bogs</p> <ul style="list-style-type: none"> • Woody Scrub (bushes greater than 2m high measured within the transition mire zone). <ul style="list-style-type: none"> ○ Upper limit – 10% canopy cover, no clumps greater than 25m in their major dimension and gaps of at least 25m between clumps. ○ Lower limit – 5% canopy cover, all points within 50m of a bush or clump. • Water levels (measured at dipwells 1 and 2). <ul style="list-style-type: none"> ○ Upper limit – at summer minimum, levels should not exceed 256.3m above sea level for at least 2 out of 5 consecutive years. ○ Lower limit – at winter maximum, levels should be at least 256.5m above sea level each year. • Water Quality. <ul style="list-style-type: none"> ○ Upper limit – Conductivity of 450 micro-Siemens. ○ Lower limit – n/a (measured at major inflows). <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i>, <i>Salicion albae</i>)</p> <ul style="list-style-type: none"> • Presence of non-native trees and shrubs. <ul style="list-style-type: none"> ○ Upper limit – no seed bearing trees. ○ Lower limit – n/a. <p>Bog Woodland</p> <ul style="list-style-type: none"> • Presence of Scots Pine. <ul style="list-style-type: none"> ○ Upper limit – no seed bearing trees. ○ Lower limit – n/a. <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</p> <ul style="list-style-type: none"> • Woody Shrubs (greater than 1.5m high). <ul style="list-style-type: none"> ○ Upper limit – 3 bushes per ha in fen-meadow areas of Units 2, 4 & 5. ○ Lower limit – none present. • Bare Ground. <ul style="list-style-type: none"> ○ Upper limit – 10% bare ground. ○ Lower limit – bare ground present in some samples (measured in 1x1m quadrats). • Water levels.

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	<ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. ● Water Quality. <ul style="list-style-type: none"> ○ Upper limit – Conductivity of 450 micro-Siemens. ○ Lower limit – n/a (measured at major inflows). <p>Other Marshy Grassland (and associated habitats).</p> <ul style="list-style-type: none"> ● Woody Shrubs (greater than 1.5m high). <ul style="list-style-type: none"> ○ Upper limit – 3 bushes per ha in marshy grassland areas of Units 2, 4 & 5. ○ Lower limit – none present. ● Bare Ground. <ul style="list-style-type: none"> ○ Upper limit – 5% bare ground (across entire sample area). ○ Lower limit – Unknown. ● Water levels. ● Water Quality. <ul style="list-style-type: none"> ○ Upper limit – Conductivity of 450 micro-Siemens. ○ Lower limit – n/a (measured at major inflows). <p>Refer to <i>Core Management Plan (including conservation objectives) for Rhos Goch - Special Area of Conservation (2008)</i> for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/north-to-rhos-sac-list/idoc.ashx?docid=de2e8791-cfd5-489a-a95d-b6488e362bf0&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Active raised bogs: Favourable ▪ Transition mires and quaking bogs: Favourable ▪ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae): Favourable ▪ Bog woodland: Favourable ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>): Favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Level of Grazing</u> The open mire areas are currently threatened by natural succession to willow and birch carr. This is partly a result of a reduction in the numbers of livestock being grazed on the common in summer. The spread of woody species is being monitored and a programme of birch and willow clearance has been initiated. The effects of reduced grazing on the vegetation structure and composition are also being monitored with a view to increasing livestock numbers where appropriate.</p>

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	<p>Anything other than occasional light grazing could damage the wet woodland areas.</p> <p><u>Atmospheric Pollution</u> Pollution from distant sources may be having a detrimental effect on the sensitive bog vegetation. Background levels, arising from emissions by traffic, agriculture and major point sources, should be reduced below target thresholds.</p> <p><u>Agricultural Pollution</u> Nutrient run-off from agriculturally improved land and via drains from farmyards and roads could be damaging. Ideally fertiliser should not be spread in fields immediately adjacent to site boundary or next to watercourses in the site catchment area. Road and farmyard drains should not discharge into watercourses that feed directly into the site. It may be desirable to divert contaminated drainage water around the site or create ponds where nutrients can be intercepted.</p> <p><u>Nutrient Run-off</u> Pollution from nutrient run-off can have a detrimental effect on the water quality and the welfare of the qualifying features.</p>
<p>Landowner/ Management Responsibility</p>	<p>The fields surrounding the common are subject to traditional agricultural management, consisting of summer grazing by cattle and sheep.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Berwyn a Mynyddoedd de Clwyd / Berwyn and South Clwyd Mountains Location Grid Ref: SH917280 JNCC Site Code: UK0012926 Size: 27221.21 ha Designation: SPA / SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Berwyn and South Clwyd Mountains SAC is a large upland site (27,132 ha), the largest area of blanket bog and European dry heath in Wales. It comprises three discrete sites, Berwyn SSSI, Llandegla Moor SSSI and Ruabon and Llantysilio Mountains and Minera SSSI. All of these sites are predominantly a mixture of dry heath and blanket bog vegetation with patches of transition mires and quaking bogs vegetation found as an intricate mosaic, usually on acidic rock types, and can together be described as upland moorland.</p> <p>Berwyn supports the most extensive tract of near-natural blanket bog in Wales. Much of the blanket bog vegetation is dominated by NVC type M19 <i>Calluna vulgaris</i>–<i>Eriophorum vaginatum</i> blanket mire, with crowberry <i>Empetrum nigrum</i> and an often extensive hypnoid moss cover; within this community cloudberry <i>Rubus chamaemorus</i> is found close to the southernmost limit of its British range. On deeper peats, there are smaller stands of M18 <i>Erica tetralix</i>–<i>Sphagnum papillosum</i> mire, some of which exhibit distinctive surface patterning. The mire vegetation shows transitions to heather-dominated dwarf-shrub heath.</p> <p>Berwyn contains the largest stands of upland European dry heath in Wales. The dry heath is characteristic of Berwyn’s more easterly location and less oceanic climate than the other major Welsh uplands, and consists principally of NVC type H12 <i>Calluna vulgaris</i>–<i>Vaccinium myrtillus</i> heath, with frequent crowberry <i>Empetrum nigrum</i> and occasional cowberry <i>Vaccinium vitis-idaea</i>. Other heath vegetation present includes areas of H18 <i>Vaccinium myrtillus</i>–<i>Deschampsia flexuosa</i> heath and in some areas stands of damp H21 <i>Calluna vulgaris</i>–<i>Vaccinium myrtillus</i>–<i>Sphagnum capillifolium</i> heath. These latter heaths occur in an intermediate position between the drier heaths and blanket mire and support occasional plants of lesser twayblade <i>Listera cordata</i>.</p> <p>Berwyn is the most important upland in Wales for breeding birds. It supports a wide range of species including internationally significant numbers of hen harrier <i>Circus cyaneus</i>, merlin <i>Falco columbarius</i>, peregrine <i>Falco peregrinus</i> and red kite <i>Milvus milvus</i>, as well as significant proportions of the Welsh populations of other species including short eared owl <i>Asio flammeus</i>, golden plover <i>Pluvialis apricaria</i>, red grouse <i>Lagopus lagopus</i> and black grouse <i>Tetrao tetrix</i>.</p>

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	<p>The calcareous vegetation communities for which the site is also notified are found on the section of the Ruabon and Llantysilio and Minera SSSI. This area contains carboniferous limestone outcrops on the scarp known as the Eglwyseg Rocks, with its prominent cliffs, screes and grasslands. The calcareous screes in this area support many rare species such as the limestone fern <i>Gymnocarpium robertianum</i>, with the rocky slopes or cliffs supporting rigid buckler fern <i>Dryopteris submontana</i>, a nationally scarce fern of limestone pavement and scree at the southern edge of its distribution on Ruabon. Eglwyseg Rocks also holds populations of the endemic whitebeam (<i>Sorbus anglica</i>) and Welsh Hawkweed (<i>Heiracium cambricum</i>).</p> <p>Calcareous grasslands are also found at the north-eastern end of the Ruabon and Llantysilio mountains and Minera SSSI. This area contains several types of neutral, upland acid and calcareous grassland over areas of acidic and calcareous rock, along with areas of bracken and scrub. This area holds the only Welsh locality for the critically endangered Sedge <i>Carex muricata</i> ssp. <i>muricata</i>.</p> <p>Colonies of Welsh clearwing moth <i>Synanthedon scoliaeformis</i> are found in several localities, this being the strongest of only three populations on Wales.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Blanket bogs. • European dry heaths. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies: on calcareous substrates (<i>Festuco-Brometalia</i>). • Transition mires and quaking bogs. • Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>). • Calcareous rocky slopes with chasmophytic vegetation. <p>SPA Features:</p> <ul style="list-style-type: none"> • Hen Harrier <i>Circus cyaneus</i>. • Merlin <i>Falco columbarius</i>. • Peregrine <i>Falco peregrinus</i>.

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	<ul style="list-style-type: none"> • Red kite <i>Milvus milvus</i>.
<p>Conservation Objectives</p>	<p>Vision for the site: The hillsides, sheepwalks and ridges of the Berwyn & South Clwyd mountains are a mosaic of blanket bog and dry heath, grasslands and escarpments. The deep peat accumulated over thousands of years along the ridge tops and plateaux support active blanket bog represented by high, stable water tables and actively growing layers of sphagnum moss. Dominated by cotton grasses, cross-leaved heath and heather the blanket bog remains largely unmanaged except for some light grazing during the summer months. In some areas pools of shallow water with sphagnum carpets indicate transition mire habitats. Populations of notable rare plants including bog rosemary and tall bog sedge also thrive here.</p> <p>The areas of dry heathland comprise a mosaic of different aged dry heath, with a broad age structure. This includes areas of long heather providing nesting habitat for ground nesting birds such as grouse, merlins and hen harriers; and areas of lower young heather, and wet flushes where birds can feed on heather shoots and invertebrates. These latter areas having more diverse plant communities that include lichens, liverworts and mosses as well as other herbaceous species.</p> <p>Cliffs and screes with their own more sparse vegetation are found in steeper areas, and the limestone screes at Eglwyseg continue to be among the best developed examples in Britain. These fragile landforms are maintained in as natural a condition as possible and scree forming processes are allowed to continue naturally.</p> <p>Many of the cracks and ledges of the limestone rocks and cliffs provide an ungrazed haven for lime tolerant plants. Some of these, particularly the cracks and fissures provide shelter for species like the ferns maidenhair spleenwort and green spleenwort, which specialise by living in small crevices in the rock face. On the ledges luxuriant vegetation with small scabious, golden rod and harebell add summer colour. In the larger cracks and ledges on the cliff face the powdery grey-green foliage of whitebeam trees stands out from the neighbouring hawthorns and yews. Introduced species of plant such as cotoneaster and clematis are very few in number.</p> <p>Except for the rare tree species growing on and among the rocks of the</p>

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	<p>Eglwyseg, scrub and trees are found only at the fringes of the site and in some of the lower regions where deeper soils encourage areas of native broadleaved woodland with birch, hawthorn, rowan, oak and ash.</p> <p>At the moorland edge, native broadleaved woodland with a diverse species and age structure provides sufficient suitable habitat to maintain thriving populations of the Welsh clearwing moth and other characteristic species. However, trees are largely absent from the open heath, with limited numbers of saplings permitted to establish themselves along the moor margins where they provide habitat for moorland-edge birds such as black grouse.</p> <p>The neutral and limestone grassland areas support a variety of plant communities. Though described as grasslands, more than half of the ground cover will consist of herbaceous species. Grazing is practised at levels that allow plants to flower and set seed, while preventing the spread of trees and scrub. Bracken is found only in isolated patches at the perimeters of the site. There are very few non-native species.</p> <p>Acid grassland often with rushes is found around the lower edges of the open mountain where this is often enclosed as ffridd grazings. Some bracken may extend beyond the scrub and trees but is not found growing widely in the open moorland or grassland.</p> <p>This range of habitats supports a characteristic and varied breeding bird community which includes merlin, hen harrier, peregrine falcon, curlew, red and black grouse and short-eared owl. These species rely on the heathland, acid grassland, and rushy pasture of the ffridd supporting an adequate supply of prey species to maintain successful breeding.</p> <p>The agricultural, forestry, and game management critical to both the economic well-being of the Berwyn & South Clwyd Mountains and the maintenance of its wildlife interest is undertaken on a sustainable basis whereby these activities are compatible with the maintenance of the native habitats and species it supports.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Blanket Bogs.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no measurable decline in blanket bog; the area of the habitat must be stable or increasing. • Dry blanket bog on moisture shedding ridges and slopes will be defined as ericoid (typically <i>Calluna</i>) dominated, with clearly subordinate <i>Erica tetralix</i>. <i>Empetrum nigrum</i>, <i>Vaccinium vitis-idaea</i> and/or <i>V. myrtillus</i> will be present at high frequency. <i>Eriophorum vaginatum</i> typically constant but sometimes only at low cover – other graminoids are typically scarce. <i>Vaccinium oxycoccus</i> may sprawl over the thick bryophyte mat but other elements of “wet” bog such as <i>Narthecium</i> and <i>Drosera</i> are characteristically sparse. Hypnoid mosses (typically <i>Hypnum jutlandicum</i> and <i>Pleurozium schreberi</i>) often the dominant bryophyte component, and <i>Sphagna</i> where present most often represented by <i>Sphagnum capillifolium</i>. • Wet blanket bog on plateaux and col areas is characterised by a more even balance between ericoids and graminoids. <i>Eriophorum vaginatum</i> generally achieves a higher cover than in drier situations and <i>E. angustifolium</i> is constant. Representation of <i>Molinia caerulea</i> and <i>Trichophorum cespitosum</i> is variable according to past management and hydrology. Smaller elements such as <i>Vaccinium oxycoccus</i>, <i>Narthecium</i> and <i>Drosera</i> are typically present. Hypnoids and <i>Sphagnum capillifolium</i> may still comprise the main bryophyte element, but often joined by species of <i>Sphagnum</i> sect. <i>Sphagnum</i>. • All areas of blanket bog should exhibit a high water table just below the surface of the ground for the majority of the year and this consistent with continued peat formation. • In areas of wet bog in particular, the vegetation should develop or retain an irregular pattern with drier hummocks and wetter hollows. • The quality of blanket bog (including in terms of ecological structure and function) must be maintained. • Areas with habitats classed as degraded or modified blanket bog and bare peat should be restored to a more sustainable state by encouraging the growth of typical blanket bog vegetation and the blocking of drainage ditches. • Burning blanket bog will be discouraged as it retards the development of hummock & hollows as well as the development of more sensitive <i>Sphagna</i>.

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	<ul style="list-style-type: none"> • There should be no moor drains or grips draining the peat body. • There should be no evidence of damage caused, for example, by active drainage or burning. • Any typical species must also be at FCS, as defined below. • Non-native plant species should be absent. • There should be no decline in the range or abundance of characteristic plant species and vegetation communities. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no measurable decline of dry heath area; the area of the habitat must be stable or increasing. • The European dry heath consists principally of NVC type H12 Calluna vulgaris–Vaccinium myrtillus heath, with frequent Empetrum nigrum and occasional Vaccinium vitis-idaea. Other heath vegetation present includes areas of H18 Vaccinium myrtillus–Deschampsia flexuosa heath and in some areas stands of damp H21 Calluna vulgaris–Vaccinium myrtillus–Sphagnum capillifolium heath. These latter heaths occur in an intermediate position between the drier heaths and blanket mire and support occasional plants of Listera cordata. • Its quality (including in terms of ecological structure and function) must be being maintained. • The areas of heath vegetation should be retained and where possible permitted to re-establish on areas modified or degraded as a result of agricultural improvement, or through inappropriate management. • The dry heathland should have a diverse age structure in the heather and other shrubby plants. • Management will ensure the development of a mosaic of age structures through pioneer, building, mature to degenerate heather with at least 10% identified for no-management and allowed to develop through to maturity. • Management will not be undertaken within sensitive habitat areas. • Some native scrub development will be acceptable up to 10%

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	<p>cover with higher densities, up to 20% within e.g. identified black grouse management zones.</p> <ul style="list-style-type: none"> • Heather and other plants should not exhibit signs of suppressed growth forms due to grazing. • There should be areas of long heather providing nesting habitat for ground nesting birds such as grouse, merlin and hen harriers; and areas of lower young heather, and wet flushes where birds can feed on heather shoots and invertebrates. • Non-native plant species should be absent. • Any typical species must also be at FCS. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent of the calcareous and neutral grasslands should be maintained or increase in size at the expense of bracken, scrub and other more improved grasslands. No loss in extent is acceptable. • The calcareous grassland varies floristically. At low altitudes the sward of the calcareous grassland should be rich in calcicolous species such as <i>Carlina vulgare</i>, <i>Briza media</i> and <i>Sanguisorba minor</i>. Locally scarce species such as <i>Gymnadenia conopsea</i> and <i>Blackstonia perfoliata</i> should also be present. At higher elevations the calcareous sward has more acid species present. Along with the typical indicator species of calcareous grassland, acid loving species such as <i>Agrostis tenuis</i> and <i>Potentilla erecta</i> are regular. Within the sward, fine leaved grasses and herb species like <i>Briza media</i>, <i>Carlina vulgaris</i> and <i>Thymus polytrichus</i> will be regular, although due to the upland nature of the site other more typically acid-loving herbs like heath <i>Galium saxatile</i> and <i>Campanula rotundifolia</i> may commonly occur. Though described as grasslands, more than half of the ground cover will consist of herbaceous species. • The limestone grassland areas will have a wide variety of plant communities with the limestone grasslands having those typical of thin, lime rich soils.

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	<ul style="list-style-type: none"> • Grazing will be at levels that allow plants to flower and set seed whilst preventing the spread of trees and scrub. • Bracken will only be found in a few isolated patches at the perimeters. • Within the sward tree and scrub seedlings, and robust or tussock forming grasses such as <i>Dactylis glomerata</i>, and <i>Deschampsia cespitosa</i> are uncommon or at low cover. While weeds and other agriculturally favoured species such as <i>Lolium perenne</i>, <i>Urtica dioica</i>, <i>Cirsium arvensis</i> and <i>C. vulgare</i> are rare or absent. • Introduced species should be absent and control measures should be taken if any such species becomes established. • High levels of grazing results in localised soil erosion on steeper parts of the escarpment, which degrades some areas. However, grazing pressure should be sufficient to open small transient patches of bare ground within the sward providing a seed bed for the vascular plant species and suitable habitat for the diminutive bryophytes, macro-lichens and short-lived vascular plant species which are particularly characteristic of limestone grassland on the steeper, more exposed slopes. • On deeper soils south of the quarry acid grassland develops and in places forms a mosaic of habitats with the calcareous grassland. On these soils the spread of gorse and bracken should be controlled. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Transition mires and quaking bogs. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no measurable decline in Transition mires and quaking bogs; the area of the habitat must be stable or increasing. • Typically characterised by a range of low-growing sedges over an extensive carpet of Sphagnum bog mosses, accompanied by other mosses, rushes and some scattered herbs. • The water table is above the surface of the substrate, giving rise to characteristic floating mats of vegetation. • The vegetation normally has intimate mixtures of species

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	<p>considered to be acid-lovers and others thought of as lime-lovers.</p> <ul style="list-style-type: none"> • There should be no moor drains or grips draining the mire. • There will be no threats to the transition mire habitat from burning or grazing. • There is no significant input of nutrient-rich water from ditches and surrounding land. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no measurable decline of habitat, the area of the habitat must be stable but due to its nature an increase in extent is unlikely. • The feature is typically characterised by sensitive pioneer species including maidenhair spleenwort, and bryophytes that are able to colonise the scree, as the crags and ledges provide shelter from grazing and frost action. • The flora representative of this feature reflects the base rich nature of the rocks including limestone, calcareous-schists and the more basic igneous rocks such as serpentine and basalt. • The scree community is important for the rich fern flora and acts as refugia for a number of rare species. • Light grazing will prevent the succession to scrub and minimise colonisation by species such as ash and hazel whilst not damaging the feature through overgrazing. • The scree will remain largely undisturbed by human activity and the depositional slopes will continue to accumulate small amounts of scree. The vegetation is only likely to be truly representative of this feature where it occurs on stable scree on less steep slopes where the vegetation can accumulate. • The existing diversity of species in each of the above communities should be maintained. • There will be no reduction in extent as a result of undesirable human activity such as afforestation, quarrying, climbing or civil engineering works.

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	<ul style="list-style-type: none"> • The use of herbicides, such as Asulox to control the spread of bracken, should be restricted to areas where they will not adversely impact the feature. • Only native species should be present. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Calcareous rocky slopes with chasmophytic vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no measurable loss of habitat, the area of the habitat must be stable but due to its nature an increase in extent is unlikely. • The chasmophytic vegetation will consist of plant communities colonising cracks and fissures of rock faces. The type of plant communities developing will be largely determined by the base-status of the rock face. • The chasmophytic vegetation is usually dominated by ferns such as <i>Asplenium ruta-muraria</i> and small herbs such as <i>Thymus praecox</i> and <i>Hieracium</i> spp. The inaccessibility of rock habitats to grazing animals, especially rock ledges provides a refuge for many vascular plants that are sensitive to grazing, including numerous local and rare species. • Bryophytes and crustose lichens should form a dominant component in crevices but are also found on open rock surfaces where there is a lack of competition from vascular plants. Ledge communities are recognised as part of the feature on the site due to the spectacular stepped topography. • Grass benches should be floristically diverse supporting species characteristic of the feature such as <i>Campanula rotundifolia</i>, <i>Centaurea nigra</i> and <i>Dryopteris</i> spp. • The existing diversity of species in each of the above communities should be maintained. • Only native species should be present. • Chasmophytic vegetation and grass benches vegetation will not exhibit signs of overgrazing. • There will be no reduction in extent as a result of undesirable activities such as quarrying. • Small scale excavations may enhance the interest of the site by

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	<p>providing additional exposures but would be deleterious to the highly vulnerable scree and clitter slopes.</p> <ul style="list-style-type: none"> • The use of herbicides, such as Asulox, to control the spread of bracken should be restricted to areas where they will not adversely impact the feature. <p>SPA Features:</p> <p><u>Hen Harrier <i>Circus cyaneus</i>.</u> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population must be being maintained at eleven breeding pairs or increased beyond this. • There will be sufficient appropriate habitat to support the population in the long-term including patches of tall heather available for nesting and roosting, areas grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. • Distribution of species within site is maintained. • Distribution and extent of habitats supporting the species is maintained. • Developments should not be permitted where they can be shown to have likely adverse impacts upon hen harrier. • Populations of legally controllable predator species, such as foxes and carrion crows, will not pose a threat to ground nesting birds. • Hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines. • There will be no disturbance of any nest location. • Illegal human persecution of protected bird species should not occur. • All factors affecting the achievement of these conditions are under control. <p><u>Merlin <i>Falco columbarius</i>.</u> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population must be being maintained at 13 breeding pairs or increased beyond this.

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	<ul style="list-style-type: none"> • There will be sufficient appropriate habitat to support the population in the long-term including patches of tall heather available for nesting and roosting, areas grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. • Distribution of species within site is maintained. • Distribution and extent of habitats supporting the species is maintained. • Developments should not be permitted where they can be shown to have likely adverse impacts upon merlin. • Populations of legally controllable predator species, such as foxes and carrion crows, should not pose a threat to ground nesting birds. • Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines. • There will be no disturbance of any nest location. • Illegal human persecution of protected bird species should not occur. • All factors affecting the achievement of these conditions are under control. <p><u>Peregrine <i>Falco peregrinus</i>.</u> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population must be being maintained at 13 breeding pairs or increased beyond this. • Mountainous and moorland terrain with cliffs, crags and quarries for nesting and roosting plus grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. • The range of the population must not be contracting. • Distribution and extent of habitats supporting the species is maintained. • Developments should not be permitted where they can be shown to have likely adverse impacts upon peregrine. • Populations of legally controllable predator species, such as foxes and carrion crows, should not pose a threat to ground nesting birds.

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	<ul style="list-style-type: none"> • Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines. • There will be no disturbance of any nest location. • Illegal human persecution of protected bird species should not occur. • All factors affecting the achievement of these conditions are under control. <p><u>Red kite <i>Milvus milvus</i></u> The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population must be being maintained at 2 breeding pairs or increased beyond this. • Sufficient Broadleaf woodland required for nesting and roosting plus heath and rough grassland for feeding with an adequate supply of prey species in the form of carrion, small birds and small mammals to maintain successful breeding. (NOTE: Red kite do not nest within the SPA.) • Developments should not be permitted where they can be shown to have likely adverse impacts upon red kite. • Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines. • There will be no disturbance of any nest location. • Illegal human persecution of protected bird species should not occur. • All factors affecting the achievement of these conditions are under control
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to features and land management requirements.</p> <p>The site has many SAC, SPA and SSSI features which are seen within the numerous management units associated within this site.</p>

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<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Blanket Bogs. <p>The impoverished nature of this feature on Berwyn is a direct consequence of historical management practices, which in some cases continue to contribute to the decline in quality of the feature. These include drainage, burning, inappropriate grazing and damage by off-road vehicles.</p> <p><u>Grazing</u> Both under and over-grazing can be damaging. The pattern of grazing should be at a sustainable level, where a proportion of the years heather growth is removed leaving a proportion to flower and seed to ensure future generations of heather plants.</p> <p>Blanket bog is particularly sensitive to grazing during the autumn and winter months when the growth and palatability of the upland grasses and herbs has decreased and sheep are more likely to concentrate on the heather. It is desirable that stock numbers should be reduced or removed completely from areas between the months of October to March. If there is insufficient grazing the area can very quickly become prone to invasion by conifers & native scrub.</p> <p>Areas that have been damaged in the past by activities such as large burns or very heavy stocking may need lower, restoration, stocking rates for a period to allow the vegetation to recover.</p> <p>Shepherding of flocks to ensure even grazing throughout the area of the heft is to be encouraged to avoid damaging concentration of grazing.</p> <p><u>Burning</u> Historically, burning of blanket bog has been extensively practised on the Berwyn and as a result much of the habitat is now degraded, leading to poor species diversity and a loss of more sensitive species such as Sphagnum. Burning damages the surface of the peat body exposing it to the atmospheric oxidation of carbon, desiccation and erosion. All burning of blanket bog and other sensitive areas on the</p>

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	<p>Berwyn will be prohibited. The priority during summer fires will be to protect blanket bog, to ensure the fire doesn't persist and destroy the peat.</p> <p><u>Off Road Vehicles</u> Vehicles, particularly 4x4 and trail motorcycles, which can do significant damage to blanket bog, should not be taken off roads and tracks for recreational purposes. Work is required to educate interest groups about the damage caused to the vegetation and peat surface, to consider provision of alternative sites and to prosecute of persistent offenders.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heath. <p><u>Grazing</u> Where heather is affected by inappropriate levels of stocking a reduction should be implemented to ensure sustainable grazing i.e. for maintenance 0.33 ewes/ha/yr (0.05LSU/Ha/yr) or for Restoration 0.1 ewes/ha/yr (0.015LSU/Ha/yr). Even if the levels of stocking are within that recommended for the feature overgrazing and damage can still occur due to the accumulation of stock on one area of the hill. It is important that stock are evenly distributed across the area to prevent localised overgrazing. This can be achieved through shepherding or through the provision of feed blocks or mineral licks which are moved around the site on a regular basis to encourage movement of stock.</p> <p><u>Burning/Mowing</u> Appropriate burning on dry heath can be a valuable method to promote regeneration of young heather, create the diverse age structure and spread the grazing stock across the hill. The activity is dependent of the availability of trained labour, fire safety equipment, and suitable weather. Burning will be undertaken as specified in a Burning plan agreed with NRW and in compliance with the Heather and Grass Burning Code (WOAD 1992 or as amended).</p> <p>Heather burning should be carried out on a minimum of fifteen-year rotation to allow the vegetation adequate time to recover. Where carried out effectively and in accordance with the guidelines burning heather is a good technique for the spreading stock evenly across the hill.</p>

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	<p>On areas with insufficient grazing and heather management, scrub soon encroaches. In the absence of any management, succession to woodland would result. In such areas active management is required to cut & clear scrub and implement appropriate grazing to ensure the problem doesn't re-occur.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia). <p><u>Grazing</u> The stocking density for this feature should be set at a level which the habitat can support and at which levels of dung are not sufficient to encourage undesirable species associated with nutrient enrichment such as thistles and nettles. Stocking density for this feature should therefore not exceed 0.4lsu /ha. The nettles and thistles already present could be managed by cutting or alternatively selective Herbicide application e.g. weed wipe.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Transition mires and quaking bogs. <p><u>Drains</u> Due to a high dependence on the local hydrology by the transition mire, drainage is the primary threat to the vegetation. In areas where the feature is failing on the evidence of drainage, management is required such as ditch blocking with heather bales or the installation of plastic dams to restore the natural water levels within the habitat.</p> <p><u>Burning/Grazing</u> The effects of both are less likely to damage the habitat if it is in pristine condition; however, if drainage activities have occurred, the effect of both burning and grazing will be more pronounced, and in some cases may be catastrophic to the habitat.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii).

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	<p><u>Grazing</u> Although this plant community thrives in the crevices and crags of the limestone scree where stock are usually unable to reach, the failure of the feature to achieve favourable condition on account of heavy grazing suggests that stock can in fact gain easy access to these areas, and that the numbers of stock doing so are too high for the feature to be maintained. Some grazing is important in preventing colonisation by ash and hazel and subsequent succession to woodland but monitoring suggests that stocking levels should be reduced to below 1 ewe/ha. If due to the contiguous nature of this habitat with neighbouring grassland and heath the stocking levels cannot be reduced sufficiently to allow recovery of the feature then enclosure of stock from these sensitive areas may require consideration.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Calcareous rocky slopes with chasmophytic vegetation. <p><u>Grazing</u> Grazing is highlighted as the main contributing factor to the poor quality of the chasmophytic vegetation. Sheep can gain access to nearly all of the small ledges on the free faces (excluding the climbed areas). A reduction in overall sheep numbers to below 1 ewe/ha may be required for the recovery of this limestone feature which cannot tolerate the grazing pressures to which it is currently exposed. Should a reduction in stock numbers gaining access to these areas not be successful in improving the quality of this feature then complete stock exclusion from these sensitive areas may be required.</p> <p><u>Climbing</u> Climbing occurs at various locations, and was not considered to be having an adverse effect on the feature, since climbing is constrained to a small number of locations, and restrictions on timing and climbing practices are enforced at the site.</p> <p>SPA Features: <u>Hen Harrier <i>Circus cyaneus</i>.</u> Despite the Berwyn SPA also supporting some of the few remaining grouse shoots in North Wales the hen harrier does not appear to suffer from persecution at the hands on the shooting fraternity within this site.</p>

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	<p><u>Destruction Nesting Territory</u> Accidental destruction of nests through poorly planned burning is also becoming a problem of the past since the widespread implementation of burning plans developed with the historical nest locations taken into account during their preparation with shoot co-ordinators.</p> <p><u>Grazing</u> Loss of moorland habitat to grassland as a result of inappropriate grazing and lack of prey availability in marginal grasslands also through inappropriate management is a problem. Habitat prescriptions are required to target appropriate management of hunting territory such as cattle grazing to improve structural diversity and suitability for prey items. Reductions in stock numbers where the grassland sward is too short to support/attract prey and greater investment in predator control particularly of crows and foxes on the open hill.</p> <p><u>Further Survey/Research</u> More information is required on:</p> <ul style="list-style-type: none"> • Wintering quarters, both roost and winter-feeding locations need identifying & protecting. • Establish precisely where these birds are hunting during breeding season so management can be targeted. <p>This information is also crucial in informing wider management decisions. Until such information is made available targeting action to improve the conservation status of this feature will be severely restricted.</p> <p><u>Merlin <i>Falco columbarius</i>.</u> <u>Persecution</u> Egg collectors have targeted the Berwyn population in the past. Vigilance is required to monitor progress and implement appropriate surveillance to catch thieves.</p> <p><u>Destruction nesting territory</u> Accidental destruction of nests through poorly planned burning is also becoming a problem of the past since the widespread implementation of burning plans developed with the historical nest locations taken into account during their preparation with shoot co-ordinators.</p> <p>The main threats to merlin on Berwyn are the loss of moorland habitat to grassland as a result of inappropriate grazing and lack of prey</p>

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	<p>availability in marginal grasslands also through inappropriate management and predation.</p> <p>Habitat prescriptions are required to target appropriate management of hunting territory such as cattle grazing to improve structural diversity and suitability for prey. Reductions in stock numbers where the grassland sward is too short to support/attract prey items and greater investment in predator control particularly of crows and foxes on the open hill.</p> <p>Merlin have been known to nest in woodland at the moorland edge, particularly plantation and although there have been no recorded instances on the Berwyn the comparative success of tree nesting pairs might suggest that predation is a significant limitation on breeding success in this ground nesting species. The tree nesting strategy of merlin in avoiding predation should be taken into account at the forest design planning stage and in focussing monitoring effort.</p> <p><u>Further Survey/Research</u> Similarities between the ecological requirements of both merlin and hen harrier imply a certain degree of niche overlap between these two species. With no available data relating to prey abundance within the SPA it is difficult to predict whether or not competition for available food is, in some years at least, a limiting factor for one or both species.</p> <p><u>Peregrine <i>Falco peregrinus</i></u> Peregrine breed mainly on undisturbed cliffs and crags including disused quarries, most of which are located outside the SPA. The birds use the site for hunting, feeding on small birds. Disturbance of peregrine nests has been recorded on Berwyn in the past but in isolation is unlikely to represent a significant threat to the conservation status of the species on this site.</p> <p><u>Nesting sites</u> Availability of suitable nesting sites may be a limiting factor for this species but due to the nature of the habitat required there is no active management that could be implemented to remedy this. Emphasis must therefore be the safeguard of existing sites both current and historical.</p> <p><u>Red kite <i>Milvus milvus</i></u> The red kite nests in mature woodland, in the steep sided wooded valleys located outside the SPA. The open moorland habitat of the</p>

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	<p>Berwyn is used primarily for hunting. This hunting territory should be maintained and enhanced through appropriate grazing regimes aimed at producing a structurally diverse sward.</p> <p><u>Persecution</u> Persecution in any form cannot be ignored and increased vigilance around known nest sites and prevention of disturbance throughout the breeding season is important</p> <p>Reliance upon carrion leaves the red kite vulnerable to persecution by poisoned bait and such incidents have been recorded on the Berwyn. Vigilance should be maintained and prosecutions brought where there is evidence to do so.</p> <p>Education of land managers in the tolerance of this species should also be emphasised and the continued promotion of the red kite as a flagship conservation species in Wales.</p> <p>The success of the species over the last 40 years should not be allowed to foster complacency in continuing the conservation effort for this species. Monitoring of this feature is required to establish its current status and to inform decisions regarding its future management needs.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Blanket Bogs</p> <ul style="list-style-type: none"> • Fire <ul style="list-style-type: none"> ○ Upper limit – No burning of blanket bog. ○ Lower limit – N/A. • Grazing <ul style="list-style-type: none"> ○ Upper limit – Maintenance = 0.33 ewes/ha/yr (0.05LSU/Ha/yr) OR, Restoration = 0.1 ewes/ha/yr (0.015LSU/Ha/yr). ○ Lower limit – None set at present, may change following 2007 review payment scheme. • Stock distribution. <ul style="list-style-type: none"> ○ Upper limit – No evidence of concentrated stocking with associated suppressed heather growth forms (drumstick, topiarised and carpet forms). ○ Lower limit. • Heather management – burning & mowing.

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	<ul style="list-style-type: none"> ○ Upper limit – No burning on blanket bog. ○ Lower limit – Mowing may be undertaken in exceptional circumstances subject to assessment on a site-by-site basis. ● Tree/Scrub encroachment. <ul style="list-style-type: none"> ○ Upper limit – Absent. ○ Lower limit – N/A. ● Drainage. <ul style="list-style-type: none"> ○ Upper limit – No drains to be left open on the peat body. ○ Lower limit – N/A. ● Peat digging. <ul style="list-style-type: none"> ○ Upper limit – No peat digging to be undertaken. ○ Lower limit – N/A. ● Human Impact Recreation. <ul style="list-style-type: none"> ○ Upper limit – No areas of exposed peat greater than square 1m. No compaction of blanket bog and no infrastructure on the habitat. ○ Lower limit – N/A. ● Climate change. <ul style="list-style-type: none"> ○ Upper limit – not possible to set any. ○ Lower limit – N/A. ● Atmospheric Deposition and Acid Deposition. <ul style="list-style-type: none"> ○ Upper limit – Critical Load: 0.35 keq/ha/yr. ○ Lower limit – N/A. Nitrogen Deposition. <ul style="list-style-type: none"> ○ Upper limit – 5-10kg N/ha/year. ○ Lower limit – N/A. ● Heather beetle. <ul style="list-style-type: none"> ○ Upper limit – Not possible to set any since there is no way of controlling this species. ○ Lower limit – N/A. ● Invasive species. <ul style="list-style-type: none"> ○ Upper limit – No flowering (seed-bearing) Rhododendron present. ○ Lower limit – N/A. ● Game management. <ul style="list-style-type: none"> ○ Upper limit – No burning or mowing on blanket bog for game management. ○ Lower limit – N/A. <p>European dry heaths</p> <ul style="list-style-type: none"> ● Wild Fire.

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	<ul style="list-style-type: none"> ○ Upper limit – No wild fires. ○ Lower limit – N/A. ● Heather management – burning & mowing. <ul style="list-style-type: none"> ○ Lower limit – 10% of the area will be unmanaged. If burning is initiated on a mostly un-burnt management unit, the area burnt during the first 2-3 years should be sufficient to avoid any detrimental concentration of grazing on the pioneer stage re-growth. Reduced total area would then need to be burnt in the remained of the 15 subsequent years. ● Grazing. <ul style="list-style-type: none"> ○ Upper limit – 1.49 ewes/ha/yr (for all year round grazing on heath). ○ Lower limit – 0.5 ewes/ha/yr. ● Stock distribution. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – No evidence of concentrated stocking with associated suppressed heather growth forms (Drumstick, topiarised & carpet forms) and excessive dunging. ● Tree/scrub encroachment. <ul style="list-style-type: none"> ○ Upper limit – 10% cover along woodland edge and river corridors. 20% cover in designated Black grouse key leks areas. 2m in height. ○ Lower limit – N/A. ● Human impact recreation. <ul style="list-style-type: none"> ○ Upper limit – zero. ○ Lower limit – N/A. ● Climate change. <ul style="list-style-type: none"> Acid Deposition. <ul style="list-style-type: none"> ○ Upper limit – Not estimate available. ○ Lower limit – N/A. Nitrogen Deposition. <ul style="list-style-type: none"> ○ Upper limit – Critical load range: 10-20 kg N/ha/year. ○ Lower limit – N/A. ● Heather beetle. <ul style="list-style-type: none"> ○ Upper limit – mitigation strategy is to implement good heathland management (heather management above). ○ Lower limit – N/A. ● Invasive species. <ul style="list-style-type: none"> Rhododendron. <ul style="list-style-type: none"> ○ Upper limit – No flowering (seed-bearing) Rhododendron

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	<p>present.</p> <ul style="list-style-type: none"> ○ Lower limit – N/A. <p>Bracken.</p> <ul style="list-style-type: none"> ○ Upper limit – No increase in Bracken at expense of Heath. ○ Lower limit – N/A. <p>Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)</p> <ul style="list-style-type: none"> ● Grazing. <ul style="list-style-type: none"> ○ Upper limit – 0.4 Isu/ha. ○ Lower limit – 0.2 Isu/ha. Bare Ground. <ul style="list-style-type: none"> ○ Upper limit – 10%. ○ Lower limit – None set. Thistles, Docks and <i>Senico vulgare</i>. <ul style="list-style-type: none"> ○ Upper limit – zero. ○ Lower limit – none set. Livestock (Watering and Feeding). <ul style="list-style-type: none"> ○ Upper limit – no feeding or watering of stock on the habitat. ○ Lower limit – none set. ● Invasive species. <ul style="list-style-type: none"> Bracken. <ul style="list-style-type: none"> ○ Upper limit – Control bracken when/where it threatens the feature. ○ Lower limit – none set. Invasive plants. <ul style="list-style-type: none"> ○ Upper limit – zero. ○ Lower limit – none set. ● Trees and Scrub. <ul style="list-style-type: none"> ○ Upper limit – No increase from notification. ○ Lower limit – None set. ● Human disturbance. <ul style="list-style-type: none"> Bare ground. <ul style="list-style-type: none"> ○ Upper limit – limited to the legal public right of way & associated rights. Ensure surface appropriate to use & maintained for use. ○ Lower limit – N/A. Scree features. <ul style="list-style-type: none"> ○ Upper limit – No disturbance to scree slopes. ○ Lower limit – None set.

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	<p>Transition mires and quaking bogs</p> <ul style="list-style-type: none"> • Fires. <ul style="list-style-type: none"> ○ Upper limit – No burning of transition mires. ○ Lower limit – None set. • Grazing. <ul style="list-style-type: none"> ○ Upper limit – 0.1 ewes/ha/yr (0.015LSU/Ha/yr). ○ Lower limit – None set. • Drainage. <ul style="list-style-type: none"> ○ Upper limit – No drains to be left open on transition mires. ○ Lower limit – None set. • Nutrient enrichment. <ul style="list-style-type: none"> ○ Upper limit – No supplementary feeding or agricultural improvement on or near transition mire habitat. ○ Lower limit – None set. • Non-native species. <ul style="list-style-type: none"> ○ Upper limit – No non-native species on transition mires. ○ Lower limit – None set. • Vehicle damage. <ul style="list-style-type: none"> ○ Upper limit – No vehicle damage to transition mire habitat. ○ Lower limit – None set. • Atmospheric deposition. <ul style="list-style-type: none"> ○ Upper limit – critical load of 5-10 kg/h/ha/yr. ○ Lower limit – Unknown. <p>Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifoli)</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Upper limit – 1 ewe/ha/yr. ○ Lower limit – 0.5 ewe/ha. • Scrub/invasive species. <p>Insufficient grazing may result in loss of fern species.</p> <ul style="list-style-type: none"> ○ Upper limit – 10%. ○ Lower limit – None set. <p>Invasive species such as Bracken.</p> <ul style="list-style-type: none"> ○ Upper limit – No expansion in range. ○ Lower limit – None set. • Quarrying. <ul style="list-style-type: none"> ○ Upper limit – 10%. ○ Lower limit – None set.

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	<p>Calcareous rocky slopes with chasmophytic vegetation</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Upper limit – 1 ewe/ha/yr. ○ Lower limit – 0.5 ewe/ha. • Herbicides. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Adequate buffer sufficient to remove threat of herbicide drifting onto feature • Physical disturbance eg, quarrying, climbing etc. <ul style="list-style-type: none"> ○ Upper limit – No physical disturbance. ○ Lower limit – None set. • Air Pollution. <ul style="list-style-type: none"> ○ Upper limit – Unknown ○ Lower limit – Unknown • Scrub. <ul style="list-style-type: none"> ○ Upper limit – 25% cover scrub species. ○ Lower limit – determined by stocking density. • Non-native species. <ul style="list-style-type: none"> ○ Upper limit – Invasive & non-native species absent. ○ Lower limit – Unknown. <p>Hen Harrier <i>Circus cyaneus</i>.</p> <ul style="list-style-type: none"> • Availability of nesting sites. Ground layer sward height. <ul style="list-style-type: none"> ○ Upper limit – 100cm. ○ Lower limit – Maintain patches of heather at least 40cm deep on flat or gently sloping ground • Prey availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Prey availability = Biomass or number m² (Insufficient data). • Habitat extent. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Bogs 8824 ha; Heath 9191 ha; Grassland 5805 ha; Woodland 484 ha; Rocks/scree 241 ha. • Fires. <ul style="list-style-type: none"> ○ Upper limit – No fires within traditional nest locations. ○ Lower limit – N/A. • Persecution. <ul style="list-style-type: none"> ○ Upper limit – Zero.

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	<ul style="list-style-type: none"> ○ Lower limit – None set. ● Predation. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. ● Factors out with the site. <ul style="list-style-type: none"> ○ Upper limit – insufficient data. ○ Lower limit – Unknown. ● Disease. <ul style="list-style-type: none"> ○ Upper limit – no releases on site. ○ Lower limit – None set. ● Weather. <ul style="list-style-type: none"> ○ Upper limit – insufficient data. ○ Lower limit – Unknown. ● Development. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – sufficient buffer from nest to ensure zero impact. ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 500 m & dogs on lead. <p>Merlin <i>Falco columbarius</i></p> <ul style="list-style-type: none"> ● Availability of nesting sites. Ground layer sward height. <ul style="list-style-type: none"> ○ Upper limit – 70cm. ○ Lower limit – 30 cm with < 30% cover of trees overall. ● Prey availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Prey availability = Biomass or number m² (Insufficient data). ● Habitat extent. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – Bogs 8824 ha; Heath 9191 ha; Grassland 5805 ha; Woodland 484 ha; Rocks/scree 241 ha. ● Fires. <ul style="list-style-type: none"> ○ Upper limit – No fires within traditional nest locations. ○ Lower limit – n/a. ● Persecution. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. ● Predation.

<p>Site Name: Berwyn a Mynyddoedd de Clwyd / Berwyn and South Clwyd Mountains Location Grid Ref: SH917280 JNCC Site Code: UK0012926 Size: 27221.21 ha Designation: SPA / SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. ● Factors out with the site. <ul style="list-style-type: none"> ○ Upper limit – Insufficient data. ○ Lower limit – Unknown. ● Disease. <ul style="list-style-type: none"> ○ Upper limit – No releases on site. ○ Lower limit – None set. ● Weather. <ul style="list-style-type: none"> ○ Upper limit – Insufficient data. ○ Lower limit – Unknown. ● Development. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – sufficient buffer from nest to ensure zero impact. ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 500m & dogs on lead. <p>Peregrine Falcon <i>Falco peregrinus</i></p> <ul style="list-style-type: none"> ● Availability of nesting sites. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Extent at notification. Note majority of nest locations are outside the SPA Boundary and are not in SSSI. ● Prey availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Prey availability = Biomass or number m² (Insufficient data). ● Habitat extent. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – Bogs 8824 ha; Heath 9191 ha; Grassland 5805 ha; Woodland 484 ha; Rocks/scree 241 ha. ● Persecution. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. ● Predation. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. ● Factors out with the site. <ul style="list-style-type: none"> ○ Upper limit – Insufficient data. ○ Lower limit – Unknown.

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	<ul style="list-style-type: none"> • Disease. <ul style="list-style-type: none"> ○ Upper limit – No releases on site. ○ Lower limit – None set. • Weather. <ul style="list-style-type: none"> ○ Upper limit – Insufficient data. ○ Lower limit – Unknown. • Development. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – sufficient buffer from nest to ensure zero impact. • Disturbance. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 500m & dogs on lead. <p>Red kite <i>Milvus milvus</i></p> <ul style="list-style-type: none"> • Availability of nesting sites. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – <50% canopy overall with trees of >12m height. None nest within the site but pairs nesting adjacent to the site boundary forage extensively within the site. • Prey availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – In sufficient data. • Habitat extent. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – Bogs 8824 ha; Heath 9191 ha; Grassland 5805 ha; Woodland 484 ha; Rocks/scree 241 ha. • Persecution. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. • Predation. <ul style="list-style-type: none"> ○ Upper limit – Zero. ○ Lower limit – None set. • Disease. <ul style="list-style-type: none"> ○ Upper limit – No releases on site. ○ Lower limit – None set. • Weather. <ul style="list-style-type: none"> ○ Upper limit – Insufficient data. ○ Lower limit – Unknown. • Development. <ul style="list-style-type: none"> ○ Upper limit – n/a.

<p>Site Name: <i>Berwyn a Mynyddoedd de Clwyd / Berwyn and South Clwyd Mountains</i> Location Grid Ref: SH917280 JNCC Site Code: UK0012926 Size: 27221.21 ha Designation: SPA / SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<ul style="list-style-type: none"> ○ Lower limit – sufficient buffer from nest to ensure zero impact. ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 500m. <p>Refer to Core Management Plan (including conservation objectives) for Berwyn & South Clwyd Mountains R - Special Area of Conservation (2008) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=14310b9e-6477-4016-adde-3be9bdbd72b0&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Blanket Bogs: Unfavourable declining ▪ European dry heath: Unfavourable declining ▪ Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia): Unfavourable ▪ Transition mires and quaking bogs Unfavourable ▪ Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii) Unfavourable ▪ Calcareous rocky slopes with chasmophytic vegetation: Unfavourable <p>SPA Features:</p> <ul style="list-style-type: none"> ● Hen Harrier <i>Circus cyaneus</i>: Unfavourable ● Merlin <i>Falco columbarius</i>: Unfavourable ● Peregrine <i>Falco peregrinus</i>: Unfavourable ● Red kite <i>Milvus milvus</i>: Unknown
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Agricultural Processes</u> The blanket bog, heaths, fens, and grasslands have been threatened by inappropriate agricultural development including drainage, reseeded, application of fertiliser, burning, track construction and the adoption of damaging grazing regimes. Some areas of grassland and heath are also threatened by the encroachment of bracken. These problems are being addressed successfully by means of management agreements with owners and occupiers and through joint agreements with the Tir Gofal scheme.</p>

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	<p><u>Scrub Encroachment</u> Some areas of grassland and heath are also threatened by the encroachment of bracken.</p> <p><u>Tourism</u> Local tourist pressure and damage by recreational vehicles can cause erosion problems. This is being addressed by visitor management and wardening as well as positive management works of vegetation reinstatement on eroded areas.</p> <p><u>Burning</u> Over frequent burning, especially if associated with inappropriate grazing can result of loss of heather moorland and its conversion to poor quality grassland. Accidental destruction of nests through poorly planned burning is also becoming a problem of the past since the widespread implementation of burning plans developed with the historical nest locations taken into account during their preparation with shoot co-ordinators.</p> <p><u>Drainage</u> Due to a high dependence on the local hydrology by the transition mire, drainage is the primary threat to the vegetation. In areas where the feature is failing on the evidence of drainage, management is required such as ditch blocking with heather bales or the installation of plastic dams to restore the natural water levels within the habitat. Blanket bog habitat on Berwyn is drying out because of extensive drainage. Existing man-made grips and drains within a peat body should be blocked.</p> <p><u>Off Road Vehicles</u> Vehicles, particularly 4x4 and trail motorcycles, which can do significant damage to blanket bog, should not be taken off roads and tracks for recreational purposes. Work is required to educate interest groups about the damage caused to the vegetation and peat surface, to consider provision of alternative sites and to prosecute of persistent offenders.</p> <p><u>Persecution</u> Reliance upon carrion leaves the red kite vulnerable to persecution by poisoned bait and such incidents have been recorded on the Berwyn. Vigilance should be maintained and prosecutions brought where there is evidence to do so.</p>

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	<p><u>Lack of Positive Indicator Species</u> The absence of positive indicator species may be acting as an early warning system that optimal ecological conditions for the transition mire habitat may not be currently maintained within the sample plots. Conversely, the absence of positive indicator species may simply be a reflection of the species-poor nature of the habitat at the site, and absence of specific species is not a good indicator of poor quality habitat. However, until further monitoring/study is undertaken and more is known about the typical sward composition of the transition mires on Berwyn and South Clwyd Mountains SAC, an absence of positive indicator species will be interpreted as an indicator of poor condition habitat.</p>
<p>Landowner/ Management Responsibility</p>	<p>Conservation management has been aimed at limiting the grazing pressures on the habitats, through a number of management agreements, tenancy agreements, grazing licences which have resulted in a reduction in grazing pressure.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Anglesey County Council and Gwynedd Council Joint Local Development Plan (2011-2026) (May 2013) available at: http://www.gwynedd.gov.uk/upload/public/attachments/1182/habitats_regulation_assessment_screening_report.pdf</p> <p>Denbighshire's Local Development Plan Habitat Regulations Appraisal 2009 available at: http://denbighddms.wisshost.net/webfiles/Submission/CD%203/Local%20Development%20Plan%20docs%20DLDP/DLDP007%20Habitats%20Regulations%20Appraisal%20(Mai%202011).pdf</p>

<p>Site Name: Coedydd Nedd a Mellte Location Grid Ref: SN919093 JNCC Site Code: UK0030141 Size: 378.18 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p><u>Dyffrynoedd Nedd a Mellte, a Moel Penderyn SSSI</u> This site includes the wooded valleys of the rivers Nedd, Mellte, Pyrddin and Sychryd, and their tributaries above Pontneddfechan, as they pass through a Millstone Grit and limestone plateau, and Moel Penderyn, which lie to the east. The plateau lies at about 300 m, the rivers having eroded deep, narrow valleys with gorges, cliffs, block screes and waterfalls.</p> <p>There is an extensive and diverse range of semi-natural woodland types, important populations of flowering plants and outstanding assemblages of mosses, liverworts and lichens. The site includes a range of geological features. These include exposures at Moel Penderyn, Craig y Ddinas and Bwa Maen and geomorphological features within parts of the valleys of the Hepste and Mellte.</p> <p><u>Blaen Nedd SSSI</u> Blaen Nedd is situated in the upper valley of the Nedd Fechan, approximately 1km west of the village of Ystradfellte. It consists of a series of contiguous enclosures rising eastwards and north-eastwards from the river towards the lower flanks of Fan Nedd.</p> <p>The site supports a wide variety of habitat types including oak and ash woodland, neutral grassland, calcareous grassland, limestone pavement, marshy grassland and wet dwarf-shrub heath. Geological features include a cave system and associated karst (classic limestone landscape) surface features. The SAC habitats are spread across both the above SSSI. The SAC oak woodland habitat is mostly confined to the river valleys where the underlying geology is mainly carboniferous sandstones and coal measures. The SAC ash woodland is less widespread, occurring mainly on the more base rich sandstones, particularly along tops of crags, and on limestone in the north and south.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines

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<p>Conservation Objectives</p>	<p><u>Vision for the Site:</u></p> <p><u>Dyffrynoedd Nedd a Mellte, a Moel Penderyn SSSI</u> Three quarters of the site is covered by woodland, which includes areas of scrub and glades. Large parts of the canopy are dominated by oak and birch, with ash woodland in lime-rich areas and alder on damper soils. The woodland has trees of all ages, with a scattering of standing and fallen deadwood. Regeneration of these tree species is sufficient to maintain the woodland cover in the long term. Gaps in the canopy collectively occupy a significant but small proportion of the total site area.</p> <p>In most areas of oak woodland there is an understorey of hazel, hawthorn and rowan. The ground flora is diverse, with a wide range of plants, reflecting the varying soil conditions. Large areas are dominated by wavy hair-grass, bilberry and mosses and sometimes by purple moor-grass. Ferns are frequent through most of the woodland and wood sorrel and bluebell are common in some areas. On lime-rich soils, ash is the dominant tree species and in places there is also small-leaved lime. Hazel is generally abundant in the shrub layer, with false brome, dog's mercury, enchanter's-nightshade and hart's-tongue fern common on the woodland floor. Alder woodland occurs on flatter areas of valley floor and some has a ground layer of sphagnum moss. Marsh hawk's-beard is found in wet flushes on the valley sides.</p> <p>The river valleys and waterfalls are generally well shaded and constantly humid. These areas support a rich plant flora that clothes riverside rocks and cliffs and trunks of trees. Species include wood fescue, a wide variety of ferns such as hay-scented buckler-fern, beech fern, royal fern, green spleenwort, Tunbridge filmy-fern and Wilson's filmy-fern. There is a great variety of mosses and liverworts. The ground layer often has a mossy mat with greater fork-moss, little shaggy-moss and straggling pouchwort and, in the most humid places, scarce turf-moss. Boulders and oak trunks are covered in western earwort, wood-rust plasters fallen tree trunks and the diminutive Heller's notchwort and autumn flapwort grow on oak bark and decaying logs. Brown's four-tooth moss and horsehair threadwort occur in damp crevices in sandstone rock and patches of rock-bristle mosses can be found with a suite of other lime-loving species on damp limestone rocks. Mosses and liverworts are also prominent in rivers and streams, with boulders and waterfalls covered in species like rusty feather-moss and fox-tail feather-moss, and sometimes Hartmann's grimmia, river</p>

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	<p>pocket-moss, beck pocket-moss and Hutchin’s hollywort. Some crags have a powdering of the bright yellow lichen <i>Chrysothrix chlorina</i>, with lichens generally draping branches and trunks of less shaded trees.</p> <p>Trees and dead wood in these humid areas provide a specialised habitat for many plants and insects. The riverbanks are largely unmanaged and human disturbance is minimal. The network of footpaths is well maintained and recreational activities well managed. There are no invasive alien plants such as rhododendron, Himalayan balsam and Japanese knotweed and conifer saplings spreading from nearby plantations are regularly removed.</p> <p>Open areas are variously dominated by rushes, purple moor-grass, sheep’s-fescue, deergrass and cross-leaved heath. In terms of its geomorphological interest, the site demonstrates the natural processes that have affected the evolution of the landscape. Sections of the Afon Mellte and Afon Hepste show the effects of faulting on the evolution of waterfalls.</p> <p>Important rock exposures illustrate whole sequences of the Namurian including Basal Grits and Middle Shales and rocks of the oldest Coal Measures. Carboniferous rocks at Moel Penderyn, Craig Y Ddinas and along the Afon Sychryd show folds and fractures associated with the Variscan mountain chain (which includes the hills of Devon and Cornwall and mountains of eastern Europe).</p> <p><u>Blaen Nedd SSSI</u> The habitat features listed should in general not decrease in area and should not decline in quality.</p> <p>Ash woodland along the Nedd Fechan has associated trees and shrubs such as hazel and rowan and the ground flora includes typical woodland species such as false brome, creeping soft-grass, herb-Robert, enchanter’s nightshade and lady-fern. Wooded areas of limestone pavement continue to be actively managed, with some coppicing in places. Oak-dominated woodland along the Nedd Fechan has associated trees and shrubs such as downy birch, hawthorn and hazel, with a ground flora of grasses such as common bent, creeping soft-grass, sweet vernal-grass and wavy hair-grass and herbs including bluebell and wood-sorrel. Small stands of trees and scrub away from the main woodland blocks are maintained as these habitats.</p> <p>The dry neutral grassland (hay-meadow and pasture) has a range of grasses such as common bent, sweet vernal-grass and crested dog’s-</p>

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	<p>tail and herbs including common knapweed, yellow-rattle, great burnet, rough hawkbit, greater butterfly orchid and common spotted-orchid. Plants indicative of disturbance and nutrient enrichment, such as perennial rye-grass, white clover, docks and creeping thistle, and coarse grasses, such as cock's-foot, are not prominent in the sward.</p> <p>Calcareous grassland has a range of typical species such as sheep's-fescue, wild thyme, salad burnet, common rock-rose, limestone bedstraw, mountain everlasting and moonwort. Where the grassland is more open and rocky, species such as carline thistle and soft-leaved sedge occur. Species indicative of disturbance or enrichment, such as creeping thistle, perennial rye-grass and white clover are not be prominent in the sward.</p> <p>Areas of open limestone pavement and screes, rock outcrops and quarries should be maintained, mainly in association with the calcareous grassland. These areas support species such as lily-of-thevalley, globe-flower, limestone fern, mossy saxifrage, small scabious and narrow-leaved bitter-cress.</p> <p>The marshy grassland in general has a high cover of purple moor-grass or rushes. Some of this is species-rich with a prominence of plants such as meadow thistle, tawny sedge, flea sedge, devil's-bit scabious and bog pimpernel. Purple moor-grass and rushes are not overwhelmingly dominant at the expense of other grasses, sedges, herbs and bryophytes. Species indicative of disturbance and nutrient enrichment, such as creeping buttercup and white clover are uncommon, invasive trees and shrubs should be rare or absent and bare ground is kept to a minimum.</p> <p>Wet heath has a range of typical species including cross-leaved heath, heather, deer-grass, bilberry and lichens. Purple moor-grass or rushes are not dominant at the expense of other heathland species and poaching is kept to a minimum.</p> <p>Other habitats occupy about 30% of the site. Within this mixture, the best quality acid grassland, dry heath and flush are of good floristic quality. The main remaining habitats are bracken, mat-grass dominated acid grassland and semi-improved acid grassland, together with some semi-improved neutral grassland that is mainly associated with the more species-rich hay-meadows.</p> <p>There is no diminution of the geological evidence for the formation of the caves, provided underground by the cave passage morphology or</p>

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	<p>included sediments and cave decorations. There is no blocking or in-filling of surface features, such as springs, sink holes, dolines or emergences or leakage into the cave system of materials likely to damage the interests.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Upland ash woodland will occupy at least 18 ha of the total site area. • The canopy should be predominantly ash and the following trees will be common in the Woodland • Ferns will be common ground flora species. • Although they may be present in the canopy in small quantities, sycamore and beech should not become dominant at the expense of ash. • Introduced invasive species will be absent and any conifers seeding in from adjoining plantations will be removed whilst at the seedling/sapling stage. • Damage to the ground flora and soil erosion due to public pressure will be at a minimum. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Sessile oak woodland will occupy at least 175 ha of the total site area. • The canopy should be predominantly oak and locally native trees will be common in the woodland. • Ferns will be common ground flora species. • Bryophytes will continue to be abundant and the bryophyte flora will continue to include those western/Atlantic species that mark out this woodland type. A suite of rarer species and species at the edge of their geographical range will continue to be present.

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	<ul style="list-style-type: none"> • Heathy species such as bilberry and common heather <i>Calluna vulgaris</i> will be common in some areas. • Introduced invasive species such as rhododendron will be absent and any conifers seeding in from adjoining plantations will be removed whilst at the seedling/sapling stage. • Damage to the ground flora and soil erosion due to public pressure will be at a minimum. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on mainly on tenure and the presence of habitat and or geological interest.</p> <p>The Component SSSI's have been divided into two areas, the Blaen Nedd SSSI which contains 13 management units and the Dyffrynoedd Nedd a Mellte, a Moel Penderyn SSSI which makes up the remaining 15 management units.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. <p><u>General Maintenance</u> Much of Unit DNM16 has now been fenced under a management agreement, however a sufficient understorey will take time to develop and some thinning may be necessary to remove some of the nonnative species. Similar fencing has occurred in Units BN7 & BN9, with some thinning and coppicing initiated to reduce the frequency of sycamore.</p> <p>A management plan covering the wider 'waterfalls area' is being progressed (2008) by the BBNPA, FC and NRW, which amongst other things will be addressing issues arising from increasing numbers of visitors in the SAC and supporting SSSI.</p> <p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.

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	<p><u>General Maintenance</u> Units DNM2, DNM11, DNM16 are currently (2008) under management agreement but a sufficient understorey will take time to develop. Some thinning may be necessary to remove some of the nonnative species in Unit DNM2.</p> <p>Units DNM14 & DNM15 are largely unmanaged and ungrazed and an understorey should develop in time. Some thinning of non-native trees may be necessary. Units DNM4 & DNM8 are largely fenced from grazing, although trespassing sheep do enter the wood from time to time, and an understorey should develop in time. Some thinning of non-native trees may be required.</p> <p>A combination of agrienvironment schemes and management agreements offer the best mechanism for securing favourable management in these areas.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Old sessile oak woods with Ilex and Blechnum in the British Isles</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – grazing levels likely to be in the region of 0.1 LSU/ha/yr or less. ○ Lower limit – None. • Non-native species. <ul style="list-style-type: none"> ○ Upper limit – 5% cover of non-native trees in the canopy. No rhododendron (or other invasive non-native shrubs) in the understorey or shrub layer. ○ Lower limit – None. • Woodland Management. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. • Access and visitor management and human and grazing induced bare ground. <ul style="list-style-type: none"> ○ Upper limit – X% (to be determined) bare ground due to human or animal induced activities. ○ Lower limit – Unknown. <p>Tilio-Acerion forests of slopes, screes and ravines</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – grazing levels likely to be in the region of 0.1 LSU/ha/yr or less. ○ Lower limit – None.

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	<ul style="list-style-type: none"> • Non-native species. <ul style="list-style-type: none"> ○ Upper limit – 5% cover of non-native trees in the canopy. Sycamore – a limit. No invasive non-native shrubs in the understorey or shrub layer. ○ Lower limit – None. • Woodland Management. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. • Access and visitor management and human and grazing induced bare ground. <ul style="list-style-type: none"> ○ Upper limit – X% (to be determined) bare ground due to human or animal induced activities. ○ Lower limit – Unknown. <p>Refer to Core Management Plan (including conservation objectives) for Coedydd Nedd A Mellte - Special Area of Conservation (2008) for further information at: http://www.ccqc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=a6e381a4-aa7d-4df6-9751-46ae36342a84&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines: Unfavourable • Old sessile oak woods with Ilex and Blechnum in the British Isles: Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> The majority of the woodland is owned by the Forestry Commission and is ungrazed. However, stray livestock still gain access in places and could pose a threat to tree and shrub regeneration. Fencing against livestock would certainly be desirable in the areas currently subject to agricultural use.</p> <p><u>Competition</u> Stands of planted conifers, beech and sycamore within and adjacent to the site are seeding into semi-natural woodland communities in places. The Forestry Commission has agreed to remove most of these species from the site itself, but seedlings may still invade from other areas and an ongoing control programme should be considered.</p> <p><u>Tourism and Recreation</u> The area contains waterfalls which are a great attraction to the public and significant erosion damage has been caused by pedestrians,</p>

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	<p>horses and bicycles. An ongoing path repair programme has only been partially successful in addressing this problem and further restrictions on public access should be considered. Given the level of access to the site and surrounding plantations, there could be significant fire risk in prolonged dry periods.</p> <p><u>Pollution</u> Airborne acid and nutrient deposition may also be a problem, particularly for epiphytic lichens.</p>
<p>Landowner/ Management Responsibility</p>	<p>Over the past 10 years many small privately owned areas have been fenced and grazing excluded under S15 or Tir Gofal agreements. A large proportion of the site is owned by the Forestry Commission (FC), with significant areas owned by the Brecon Beacons National Park Authority (BBNPA) and National Trust (NT). Most of the woodland is subject to non-intervention management, but some small areas of ash and hazel are coppiced. The FC have declared their land as Open Access land.</p> <p>Blaen Nedd SSSI</p> <p>Unit BN1 - geological interest only (non-SAC). Unit BN2 - geological interest only (non-SAC). Unit BN3 - geological interest only (non-SAC). Unit BN4 - road - apart from a wide verge with habitat this unit is of geological interest only (non-SAC). Unit BN5 - sinkhole with trees (non-SAC). Unit BN6 - common land with above ground non-SAC habitats and geology. Unit BN7 - supports geological and biological features and lies within SAC. Unit BN8 - supports geological and biological features and lies within SAC. Unit BN9 - supports geological and biological features and lies within SAC. Unit BN10 - supports non-SAC habitats. Unit BN11 - supports non-SAC habitats and geology. Unit BN12 - supports non-SAC habitats and geology. Unit BN13 - supports non-SAC habitats and geology.</p> <p>Dyffrynoedd Nedd a Mellte, a Moel Penderyn SSSI</p> <p>All units apart from Unit DNM1 lie within the SAC. Units DNM2, DNM6,</p>

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	<p>DNM7, DNM9, DNM10, DNM11, DNM12, and DNM14 are privately owned and some are covered by management agreements.</p> <p>Unit DNM1 - Moel Penderyn part of the SSSI - mainly of geological interest but some grassland and species of note (non-SAC). Unit DNM3 - lies within Neath Port Talbot and in NRW's West Region. Unit DNM4 - Forestry Commission land - the main landowners at this SSSI. Unit DNM5 - lies within Neath Port Talbot and in NRW's West Region. Unit DNM8 - BBNPA owned land. Unit DNM13 - Powys CC. Unit DNM15 - various other small parcels of land.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Rhondda Cynon Taff County Borough Councils Local Development Plan (2006-2021): January 2010 available at: http://www.rhondda-cynon-taf.gov.uk/en/relateddocuments/publications/developmentplanning/evidencebase/eb18-habitatsregulationsassessmentappropriateass.pdf</p> <p>HRA Screening of the Neath Port Talbot County Borough Councils Pre-Deposit LDP (2011-2026): September 2011 available at: http://www.npt.gov.uk/PDF/planning_habitats_regulations_appraisal_note_sept11.pdf</p>

<p>Site Name: Elenydd Location Grid Ref: SN824704 JNCC Site Code: UK9014111 / UK0012928 Size 8609.42 ha Designation: SPA / SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Elenydd – Mallaen area occupies the southern section of the Cambrian Mountains in central Wales, stretching from the upper Cothi and Tywi valleys north-west of Llandovery to the Ystwyth, Elan and Wye valleys in the north. These hills are built of rocks of Silurian and Ordovician age and the landforms are typical of the 'slate uplands' of south-central Wales, with plateaux separated by steep-sided valleys.</p> <p>Elenydd is located in the centre of this area. It is one of the most important areas of hill land in Wales for nature conservation and is of outstanding interest for its range of breeding birds. Much of the hill vegetation is also of special interest. Elenydd is important in Mid Wales for its nutrient-poor upland lakes. The area supports a wide variety of uncommon plants and animals.</p> <p>Cwm Doethie – Mynydd Mallaen, consisting largely of steep-sided valleys and upland tracts, is located in the southern part of the Cambrian Mountains. It is of outstanding interest for its heath and woodland habitats and wildlife and, in particular, its birdlife.</p> <p>The Elenydd SAC, Coetiroedd Cwm Elan SAC and Cwm Doethie Mynydd Mallaen are closely linked.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Blanket bogs. • Old sessile oak woods with Ilex and Blechnum in the British Isles. • Calaminarian grasslands of the <i>Violetalia calaminariae</i>. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. • Tilio-Acerion forests of slopes, screes and ravines. • Oligotrophic to mesotrophic standing waters of the Isoeto-Nanojuncetea. <p>Annex II species that is a primary reason for selection:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>SPA Features:</p> <ul style="list-style-type: none"> • Breeding Red Kite <i>Milvus milvus</i>. • Breeding Merlin <i>Falco columbaris</i>.

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	<ul style="list-style-type: none"> • Breeding Peregrine <i>Falco peregrinus</i>.
<p>Conservation Objectives</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Blanket bogs. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent, quality and diversity of blanket bog vegetation within the constituent sites is maintained and, where possible, degraded bog is restored to good condition. • Populations of uncommon bog plants, such as tall bog-sedge, slender sedge, magellanic bog-moss and round-fruited collar-moss, are stable or increasing. • The bogs continue to provide suitable habitat for breeding birds, including golden plover, dunlin and red grouse, and invertebrates, such as large heath butterfly. • Peat profiles containing important pollen records are maintained. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Old sessile oak woodlands remain a significant and conspicuous feature of the upland valley sides within the plan area. Those in the Elan and Claerwen valleys and Rhayader area, the Dinas and Gwenffrwd area of the upper Tywi valley and the Cothi valley to the north of Mynydd Mallaen are particularly well developed and extensive. • The boundary between the woodland and adjacent upland habitat is often a flexible one where trees regenerate on to open ground. At many locations oak woodland forms patches in ‘ffridd’ areas where there is less grazing pressure on the upland fringe. • The oak woodland has of a variety of different structures and its character varies from place to place, ranging from long standing closed canopy areas to largely open wood pasture. • The dominant trees are sessile oaks, but in places birch is more

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	<p>conspicuous. Rowans and other trees occur as a minor component while at the foot of slopes where the oak woodland grades into wet woodland, there are some alders and willows. Non-native trees such as beech and sycamore will be present only in small numbers are generally scarce.</p> <ul style="list-style-type: none"> • Under-storey shrubs are generally quite sparse, but scattered groups of hazel or holly will be found in some woods. • Ground cover varies widely. Parts will be bracken covered, others grassy, others again have a wider range of flowering plants and ferns and are often carpeted with bluebells in spring. On thin soils in shaded moist situations there are luxuriant carpets of mosses and liverworts, with or without under-shrubs like heather and bilberry. • The larger trees support a variety of lichens on their trunks and branches. • In each woodland block, trees in most age classes are present and veteran trees are prominent in some areas, particularly where there is wood pasture. • In all areas except wood pasture, there is evidence of actual regeneration in the form of seedlings and saplings or potential for regeneration, while in some wood pasture areas the planting and protecting of young trees, especially oak, may be appropriate. • Dead wood is well distributed and sometimes abundant, both lying on the woodland floor and occurring as standing dead trees or branches of trees. • The majority of the oak woodland has a closed canopy, but there are some clearings and much larger areas that are effectively wood pasture. These conditions should be sympathetic to the important populations of mosses and liverworts on the one hand and lichens on the other. • The oak woods support a characteristic assemblage of birds, such as wood warbler, pied flycatcher and redstart. • The pattern and distribution of grazed and un-grazed woods may change over time as different conservation needs arise. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Calaminarian grasslands of the <i>Violetalia calaminariae</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The habitat covers at least its current measured area.

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	<ul style="list-style-type: none"> • Lichens dominate large blocks of metal rich spoil from mine workings, tips, walls and other built structures. • Lichens, mosses, ferns and a few higher plants such as sea campion are present on rock outcrops in cliffs, open cuts and about the entrances to shafts and adits. • On open, usually level ground, plant communities are found represented by the moss genus <i>Weissia</i> and a range of crustose metallophyte lichens. The moss <i>Ditrichum plumbicola</i> and sea campion occur in the most base-rich areas, usually associated with scattered lime mortar from adjacent buildings. • Heath, shrub, trees or other woody species are scarce or absent. • Light grazing prevents the growth of tall herbs, scrub and woodland. Grazing levels are carefully managed to avoid undesirable levels of ground disturbance. • Areas of disturbed bare ground occupy less than 10% of potential areas that could be occupied by this habitat. • There is less than 1% cover of non-native plants. • There is no newly dumped material. • The habitat is spreading gradually across this extensive site wherever suitable conditions exist. • All factors affecting the achievement of these conditions are under control. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent, quality and diversity of heath vegetation within the constituent sites is maintained and, where possible, degraded heath is restored to good condition. • The main heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. • Sunny slopes in certain areas support vegetation that includes bell heather and western gorse and steep north and east facing slopes have a rich variety of mosses and liverworts beneath the dwarf shrub canopy, including bog mosses in some areas. • Populations of uncommon plants, such as lesser twayblade, are stable or increasing. • The larger heathland areas provide suitable habitat for breeding

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	<p>birds, including red grouse and merlin.</p> <ul style="list-style-type: none"> • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Ash is prominent on some of the less acidic rock outcrops within the oak woodlands in the Elan and Claerwen valleys and Rhayader areas. Particularly well-developed stands of ash woodland can be found within the Coetiroedd Cwm Elan SAC at Cerrig Gwalch and at several locations within the Carn Gaffallt SSSI. • At Cerrig Gwalch, the rocks, ledges and damper soils in areas supporting ash woodland have plants that are typical of more fertile conditions, including dog's mercury, great woodrush, common dog-violet, meadowsweet, water avens, devil's-bit scabious, raspberry, lily-of-the-valley, stone bramble, slender St John's-wort, primrose, common valerian, ferns, wood sage, wild angelica, orpine, rock stonecrop, the locally rare lichen <i>Peltigera leucoplebia</i>, and a thriving population of mountain melick. • Some dead wood is present and this provides an important habitat for the woodland flora and fauna. • Generally, plants indicating disturbance and nutrient enrichment, such as large patches of nettles and cleavers, are not common and there are no extensive areas of bare ground within the woodland. • Non-native trees and shrubs, such as sycamore and conifers, are absent. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Oligotrophic to mesotrophic standing waters of the Isoeto-Nanojuncetea. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The plan area contains several upland lakes with mildly acidic, nutrient-poor (oligotrophic) water and fairly stoney beds. Water plants found here include shoreweed, water lobelia, alternate

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	<p>watermilfoil, quillwort, spring quillwort, bulbous rush, floating bur-reed, broad-leaved pondweed, intermediate water-starwort and water moss.</p> <ul style="list-style-type: none"> • Fully developed oligotrophic lake vegetation is present in each of the lakes, including all of the component species typical of the SAC feature, as represented in the Elenydd SAC. • For each of the lakes where it occurs, the extent and species composition of the oligotrophic lake vegetation is stable or increasing in range and/or diversity. • The rare stonewort <i>Nitella gracilllis</i>, scarce six-stamened waterwort and awlwort are found in Llyn Gynon. Six-stamened waterwort is also found growing in shallow water on the stony bed of Dolymynach Reservoir. • Populations of these water plants are all stable or increasing and the water quality of the lakes remains suitable for their survival in the long term. • Plants indicating unfavourable condition for these feature e.g. filamentous algae associated with eutrophication and invasive non-native species will absent or maintained or restored below an acceptable threshold level. • With the exception of Dolymynach Reservoir, near-natural hydrological and geomorphological processes and forms will be operating in the lakes e.g. water levels, water depth, stability of bed substrate, with no artificial regulation of water levels or altered sediment regimes. • Low nutrient and shade levels are maintained. • All factors affecting the achievement of these conditions are under control. <p>Annex II species that is a primary reason for selection:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The floating water-plantain populations are viable throughout their current distribution in the plan area (maintaining themselves on a long-term basis), namely in Llyn Cerrigllwydion Uchaf, Llyn Cerrigllwydion Isaf, Gwynllyn and Llyn Gynon. • Each floating water-plantain population will be able to complete sexual and/or vegetative reproduction successfully. • Potential for genetic exchange between floating water-plantain populations, in and/or outside the plan area, will be evident in the long-term. • Near-natural hydrological and geomorphological processes and forms will be operating in the 4 lakes e.g. water levels, water

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	<p>depth, stability of bed substrate, with no artificial regulation of water levels or altered sediment regimes.</p> <ul style="list-style-type: none"> • Low nutrient and shade levels will be maintained, with no species present indicative of unfavourable conditions e.g. filamentous algae. • The dispersal of floating water plantain will be unhindered. • There will be no non-native invasive species present. • All factors affecting the achievement of the above conditions are under control. <p>SPA Features:</p> <p><u>Breeding Red Kite <i>Milvus milvus</i>.</u></p> <ul style="list-style-type: none"> • The SPA area continues to support at least 15 pairs of breeding red kites, or 0.5% of the British population. • Traditional nest sites within the SPA continue to be used. • The extent of suitable semi-natural feeding habitat within the SPA is maintained. • Availability of carrion within the SPA is maintained. • Roosting sites within the SPA are maintained. • All factors affecting the achievement of these conditions are under control. <p><u>Breeding Merlin <i>Falco columbaris</i>.</u></p> <ul style="list-style-type: none"> • The SPA area continues to support at least 7 pairs of breeding merlins, or 0.5% of the British population. • Traditional nest sites within the SPA continue to be used. • The extent of suitable semi-natural feeding habitat within the SPA is maintained. • All factors affecting the achievement of these conditions are under control. <p><u>Breeding Peregrine <i>Falco peregrinus</i>.</u></p> <ul style="list-style-type: none"> • The SPA area continues to support at least 15 pairs of breeding peregrines, or 0.5% of the British population. • Traditional nest sites within the SPA continue to be used. • The extent of suitable semi-natural feeding habitat within the SPA is maintained. • All factors affecting the achievement of these conditions are under control.

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<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land ownership.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Blanket bogs: <p><u>Grazing</u> Bog vegetation is particularly sensitive to grazing damage, which may lead to serious erosion. A suitable mixed grazing regime should be established/maintained across the un-fenced parts of the sites.</p> <p><u>Drainage</u> Those plants restricted to the bogs and other wetland areas benefit from impeded drainage, and these also tend to be the areas that are most productive as feeding areas for waders, such as golden plover, dunlin, curlew and snipe. The natural drainage pattern must not be altered and any old drainage ditches should not be maintained. It may also be desirable to block some existing drainage channels to restore water levels and prevent the bogs from eroding.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low and bogs are particularly sensitive to nutrient inputs. Consequently, no fertilisers should be applied in the open hill areas. Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding, where necessary, should be confined to less sensitive upland vegetation or agriculturally improved areas. Care should be taken to avoid run-off into more sensitive areas.</p> <p><u>Access & Recreational Use</u> Unauthorised vehicle use is a threat to the moorland areas, which are easily accessible from designated By-ways. Bog and heath vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season. Some By-ways, such as sections of the Monks Trod, have become impassable to vehicles encouraging motorcycles to deviate onto sensitive bog areas. This causes considerable damage and disturbance. If a durable surface cannot be installed and maintained on these routes, then motor vehicles should be restricted or diverted away from sensitive areas.</p>

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	<p>Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage use by off-road vehicles away from legally designated routes. Although the hill land within the site is subject to rights of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to bird life. However, the impact of this use needs to be monitored and any significant damage or disturbance addressed by appropriate access restrictions if necessary.</p> <p>Some moorland areas within Elenydd SSSI are also used for military training and occasionally for other organized events and activities, such as orienteering and paragliding. Such use is entirely at the discretion of the landowners and occupiers, who should ensure there is no damage or disturbance to the features of interest. Generally, off-road vehicle use should be avoided, as should sensitive bird areas during the breeding season.</p> <p><u>Burning</u> Bogs, wet heath and other wetland areas should not be burnt, as burning is likely to damage important plant and animal species, especially bog mosses ground nesting birds. It can also encourage the growth of purple-moor grass and mat-grass and can cause peat erosion.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p><u>Grazing</u> Low levels of sheep grazing can be beneficial to the mosses, liverworts and lichens in the oak woodland. Different grazing regimes are required in different types of oak woodland. The more open ‘park-like’ areas require regular grazing during the growing season. The main oak woodland blocks may need periodic grazing to maintain a fairly open ground layer but would benefit from stock exclusion in the short-term to allow the woodland to regenerate, develop an understorey where possible and build up the levels of dead wood. In the longer term a continuous, very low stocking density may be more appropriate in some areas.</p> <p><u>Woodland Management</u> The woodland should be encouraged to develop a diverse structure, with mature and over-mature trees and sufficient natural regeneration</p>

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	<p>of native trees and shrubs. As far as possible natural processes will be allowed to operate, with any active management limited to that required for the control of non-native species (see below) and for safety reasons along the footpaths. The regeneration of oak and ash in particular requires plenty of light to encourage the growth of any seedlings into viable saplings. Natural instability on the steeper slopes, cliffs and scree may create large canopy gaps on a fairly regular basis but, elsewhere, gaps arising from tree death will be rare in the short to medium term and they may be too small to permit the establishment of young trees. In this case, the enlargement of natural gaps and the creation of new gaps by selective felling might be considered in the longer term.</p> <p>Very old trees are in short supply. The majority of trees in many of the plan units are of middle years and have yet to develop the characteristic holes, crevices and dead wood of veteran trees. Every effort should be made to extend the life of existing veteran trees for as long as possible. Judicious tree surgery can lighten large limbs without harming the lower plant interest and reduce the risk of collapse of the trunk or wind throw of the entire tree. Competing woody species and climbers can be removed by cutting. Dead and decaying wood should normally be retained in the woods, though some of this is likely to fall to the bottom of the steeper slopes. Wherever possible, standing dead trees should be allowed to fall naturally. Dead wood is important for its associated fauna and flora and is also essential to nutrient recycling and restoring soil nutrients. Dead wood continues to support lower plants and once the bark falls off, standing dead trees can support specialised lichen species. Movement and cutting/tidying of dead wood should be avoided unless essential for public and livestock safety. Any woodland management work should be undertaken between August and January so as not to disturb breeding birds and all trees providing important nesting sites should be retained.</p> <p>Many woodland mosses, liverworts and lichens need high humidity levels. Humidity may be reduced by excessive opening of the canopy, or loss of adjacent woodland cover. Any proposal to fell and replant within, or adjacent to, areas that are important for lower plants, should be assessed for its potential impact on the mosses, liverworts and lichens. Where felling and replanting is proposed, a “continuous-cover” system should be used to avoid excessive opening of the tree canopy. This could take the form of phased removal of non-native trees and restocking by natural regeneration.</p> <p><u>Control of invasive non-native trees and shrubs</u> Removal of beech and conifers may be agreed following assessment of</p>

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	<p>their wildlife interest. There may be areas where it would be desirable to retain these trees in the canopy in the short term in order to maintain humidity for the lower plants (see above).</p> <p>In the vicinity of the former Cwm Elan House and the Hafod Estate area, the large beech trees are a feature of the historic landscape and they also represent a large potential dead wood habitat of the future, so management should aim to control their spread into other areas. All sycamores should be removed from the ash woodland but mature trees supporting good lichen communities should be retained elsewhere, provided that all saplings and young trees are removed. All rhododendron should be cleared from the woodland and any re-growth spot-treated with herbicide. Work should be carried out outside the bird breeding season.</p> <p><u>Disturbance</u> Some woodland breeding birds are particularly sensitive to disturbance during the nesting season. Public access to areas used by these species should be restricted between February and July.</p> <p>Annex I habitats that are a primary reason for selection of this site: <u>Calaminarian grasslands of the <i>Violetalia calaminariae</i>.</u></p> <p><u>Grazing</u> Grazing limits the woodland's ability to regenerate naturally and is particularly damaging to the ash woodland ground flora. The majority of the ash woodland should be protected from grazing stock. However, light grazing may be needed in some areas to control the spread of the more competitive elements of the ground flora, like bramble. The long-term aim is to establish and maintain a grazing regime that most closely mimics the level that would be expected in a natural, unmanaged woodland.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: <u>European Dry Heaths</u></p> <p><u>Grazing</u> Heavy grazing, particularly in autumn and winter, is damaging to the dwarf shrubs and should be avoided. A suitable mixed grazing regime should be established/maintained across the un-fenced parts of the sites.</p> <p><u>Burning and Cutting</u></p>

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	<p>Burning can be a useful management tool for maintaining varied structure within the mature dry heathland areas on relatively level ground and for providing habitat for breeding grouse, provided that it forms part of an approved cycle of management. It is important to ensure that such management does not damage the woodland, rock, scree or ffridd areas or encourage the spread of bracken. Burning in combination with intense grazing can also result in the loss of those shrub species that give this habitat its characteristic appearance.</p> <p>Wet heath and other wetland areas, steep slopes and rocky areas should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses, clubmosses and ground nesting birds. Cutting is a possible alternative to burning for heathland management in the drier areas, where vehicle access is possible, and can also be usefully employed to create firebreaks. If cutting is carried out, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Care must be taken to ensure that machinery does not cause damage to fragile peat soils. In damper areas, where heather is layering, burning and cutting are not needed.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low and heathland areas are particularly sensitive to nutrient inputs. Consequently, no fertilisers should be applied in the open hill areas. Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding, where necessary, should be confined to less sensitive upland vegetation or agriculturally improved areas. Care should be taken to avoid run-off into more sensitive areas.</p> <p><u>Atmospheric Pollution/Acidification</u> Several widespread ongoing human-induced processes are changing the environmental and ecological conditions and are causing concern in upland areas in Britain. These include acidification, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. Dwarf shrubs, mosses, liverworts and lichens are particularly vulnerable to pollution from atmospheric sources.</p> <p>Much of this atmospheric pollution comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial</p>

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	<p>processes. If particularly damaging, current point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. However, it will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution.</p> <p><u>Access & Recreational Use</u> Unauthorised vehicle use is a threat to the moorland areas, which are easily accessible from designated By-ways. Bog and heath vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p> <p>Some By-ways, such as sections of the Monks Trod, have become impassable to vehicles encouraging motorcycles to deviate onto sensitive bog areas. This causes considerable damage and disturbance. If a durable surface cannot be installed and maintained on these routes, then motor vehicles should be restricted or diverted away from sensitive areas. Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage use by off-road vehicles away from legally designated routes.</p> <p>Although the hill land within the site is subject to rights of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to bird life. However, the impact of this use needs to be monitored and any significant damage or disturbance addressed by appropriate access restrictions if necessary.</p> <p>Some moorland areas within Elenydd SSSI are also used for military training and occasionally for other organized events and activities, such as orienteering and paragliding. Such use is entirely at the discretion of the landowners and occupiers, who should ensure there is no damage or disturbance to the features of interest. Generally, off-road vehicle use should be avoided, as should sensitive bird areas during the breeding season.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: <u>Tilio-Acerion forests of slopes, screes and ravines</u></p> <p><u>Grazing</u> Continued light grazing is required to prevent the growth of tall herbs, scrub and woodland, which could shade-out lichen communities. Heavy grazing could lead to disturbance of the substrate and nutrient enrichment, and stock feeding would cause similar problems.</p>

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	<p><u>Stock Feeding</u> Some of the mine areas have been used as hard standing for stock feeding. This activity needs to be carefully controlled and discussions should be entered into with the landowners to control this damaging activity.</p> <p><u>Dumping</u> Dumping of rubbish in shafts and buildings and at the side of the road has been an historical problem, but fencing of some of the shafts and adits for safety reasons has helped prevent this. Continued monitoring is needed along the roadside with action if necessary to clear dumped material and measures to discourage further activities.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: <u>Oligotrophic to mesotrophic standing waters of the Isoeto-Nanojuncetea:</u></p> <p><u>Water quality</u> A low nutrient status in the lakes should be maintained by avoiding heavy grazing, feeding of stock and use of fertilisers and pesticides where there is any potential for run-off into the lake.</p> <p><u>Hydrology</u> The upland lakes are dependent on the maintenance of a fairly constant water level throughout the year. Most of the water plants are adapted to grow in a particular depth of water, although some, such as floating water plantain, can withstand greater fluctuations in water level. The water levels in the upland lakes should not be altered artificially.</p> <p>Annex II species that is a primary reason for selection: <u>Floating water-plantain Luronium natans:</u></p> <p>Similar to the above conditions.</p> <p>SPA Features: <u>Breeding Red Kite <i>Milvus milvus</i></u></p> <p><u>Woodland Management</u> In broadleaved and coniferous areas used by breeding birds of prey any woodland management work should be undertaken between September and January so as not to disturb breeding birds and all trees providing important nesting sites should be retained.</p>

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	<p><u>Grazing</u> Appropriate grazing regimes should be established and maintained throughout the sites. This will ensure that the semi-natural habitats used by feeding kites will be maintained in a condition that supports sufficient prey animals and will ensure a continuing supply of carrion.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low, although some of the enclosed land is agriculturally improved pasture, maintained by the application of fertilisers. Occasional light applications of farmyard manure may actually maintain the plant diversity in some of the enclosed grassland areas.</p> <p><u>Burning and Cutting</u> See above.</p> <p><u>Drainage</u> See above.</p> <p><u>Engineering Works and Development</u> The area contains several major dams, water pipelines, roads, bridges and disused mines and quarries. Operational structures require periodic repair and maintenance and this work should be carefully planned and undertaken in a sensitive manner, so that there is minimal impact on the habitats and species of interest. Major new projects, such as dams, pipelines, and hydro schemes and power lines, could have a significant impact and should be carefully assessed in accordance with environmental regulations. Wind turbines may present a collision risk to birds of prey and may cause disturbance to breeding birds, such as ground nesting waders. Consideration of these effects on birds must be given when developments are proposed on or near to the site.</p> <p><u>Access & Recreational Use</u> Some rare breeding birds are sensitive to disturbance during the nesting season. Public access to some areas used by these sensitive birds may need to be restricted between February and July.</p> <p><u>Breeding Merlin <i>Falco columbaris</i></u> <u>Grazing</u> Appropriate grazing regimes should be established and maintained throughout the sites. This will ensure that suitable heather moorland habitat is present and that the other semi-natural habitats used for feeding are maintained in a condition that supports sufficient small birds.</p>

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	<p><u>Soil Fertility</u> See above.</p> <p><u>Burning and Cutting</u> See above.</p> <p><u>Drainage</u> See above.</p> <p><u>Woodland Management</u> See above.</p> <p><u>Engineering Works and Development</u> See above.</p> <p><u>Access & Recreational Use</u> See above.</p> <p><u>Breeding Peregrine <i>Falco peregrinus</i></u> <u>Engineering Works and Development</u> The site contains several major dams, water pipelines, roads, bridges and disused mines and quarries. Operational structures require periodic repair and maintenance and this work should be carefully planned and undertaken in a sensitive manner, so that there is minimal impact on the habitats and species of interest. Major new projects, such as dams, pipelines, and hydro schemes and power lines, could have a significant impact and should be carefully assessed in accordance with environmental regulations. The impact of re-opening of old quarries will also need to be considered in a similar way, although this may offer new opportunities for nesting peregrines.</p> <p>Wind turbines may present a collision risk to birds of prey and may cause disturbance to breeding birds, such as ground nesting waders. Consideration of these effects on birds must be given when developments are proposed on or near to the site.</p> <p><u>Access & Recreational Use</u> Breeding peregrines and other birds may be disturbed by climbers. Any rock climbing should be confined to suitable areas and be subject to an agreed code of conduct in order to minimise such damage and disturbance. Public access to some areas used by these sensitive birds may need to be restricted between February and July.</p> <p><u>Grazing</u></p>

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	<p>See above.</p> <p><u>Soil Fertility</u> See above.</p> <p><u>Burning and Cutting</u> See above.</p> <p><u>Drainage</u> See above.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Blanket bogs</p> <ul style="list-style-type: none"> • Peat erosion. <ul style="list-style-type: none"> ○ Upper limit – The total extent of active erosion over a 5 year period should not exceed the total extent of areas showing signs of peat accumulation and re-vegetation. May need a % upper limit (10%) Not possible to set. ○ Lower limit – There are always some areas of bare peat present as a result of natural erosive processes. • Burning. <ul style="list-style-type: none"> ○ Upper limit – No evidence of significant burning in any of the units where blanket bog is a key habitat. ○ Lower limit – N/A. • Drainage. <ul style="list-style-type: none"> ○ Upper limit – No evidence of new drains or major clearance of old drains or deepening of bog outlet streams. ○ Lower limit – N/A. • Air Quality. <ul style="list-style-type: none"> ○ Upper limit – No critical loads for acidic and nitrogen deposition are exceeded at 2 out of 3 Environment Agency monitoring stations in more than one year out of 5. ○ Lower limits – None. <p>Relevant monitoring stations are: SN854758, SN78-744 and SN770654.</p> <p>European dry heaths</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – No evidence of significant burning (patches larger than 0.5ha) in any parts of any units where a burning programme has not been agreed. In areas subject to a burning plan, no more than 33% of the total

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	<p>heathland area is burnt in 5 years. No evidence of burning in sensitive areas (see below).</p> <ul style="list-style-type: none"> ○ Lower limit – N/A. ● Erosion/Bare ground. <ul style="list-style-type: none"> ○ Upper limit – 10% bare ground in heathland areas in units where heathland is a key habitat. ○ Lower limit – N/A. ● Air Quality. <ul style="list-style-type: none"> ○ Upper limit – No critical loads for acidic and nitrogen deposition are exceeded (see 4.1). ○ Lower limits – None. <p>Old sessile oak woods with Ilex and Blechnum in the British Isles.</p> <ul style="list-style-type: none"> ● Grazing pressure. <ul style="list-style-type: none"> ○ Upper limit – 0.4 livestock units(LSU)/ha/year in key wood pasture areas (see maps in annex 4) 0.05 LSU/ha/year in other key oak woodland areas. ○ Lower limits – 0.2 LSU/ha/year in key wood pasture areas. Sufficient to suppress the growth of bramble and ivy in key woodland areas with well-developed moss and liverwort carpets and/or shade demanding lichens. ● Woodland Management <ul style="list-style-type: none"> ○ Upper limit – 10% of canopy gaps created artificially. 20% of areas of regeneration achieved by planting. <p>Tilio-Acerion forests of slopes, screes and ravines</p> <ul style="list-style-type: none"> ● Grazing pressure. <ul style="list-style-type: none"> ○ Upper limit – 0.05 LSU/ha/year. ○ Lower limit – None. <p>Applies to all key ash woodland units.</p> <ul style="list-style-type: none"> ● Non-native species. <ul style="list-style-type: none"> ○ Upper limit – 5% cover of nonnative trees in the canopy. No beech, sycamore (or other invasive non-native trees or shrubs) in the understorey. ○ Lower limit – None. Applies to key ash woodland units. <p>Calaminarian grasslands of the <i>Violetalia calaminariae</i></p> <ul style="list-style-type: none"> ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – 10% of areas that can potentially support metal tolerant vegetation (see Annex 5) bare or disturbed ground. No disturbance in areas in key stands of metal tolerant vegetation identified in Annex 5 of the plan (review in 10 years). No extension to existing areas of disturbance as identified by maps and photographs.

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	<p>No evidence of removal of spoil from site identified by maps and photographs.</p> <ul style="list-style-type: none"> ○ Lower limit – N/A. ● Grazing pressure. <ul style="list-style-type: none"> ○ Upper limit – 0.4 LSU/ha/year. ○ Lower limit – 0.2 LSU/ha/year. <p>Oligotrophic to mesotrophic standing waters of the Isoeto-Nanojuncetea</p> <ul style="list-style-type: none"> ● Water Quality. <ul style="list-style-type: none"> ○ Upper limit – Annual mean total phosphorus (TP) not exceeding 10 µg/l-1. ○ Lower limits – pH 5.5. Acid neutralising capacity (ANC) greater than 20 µeq/l-1. More than 5 µg/l-1 dissolved oxygen (O₂) throughout the water column. ● Hydrology. <ul style="list-style-type: none"> ○ Upper limit – No alterations to existing dams or creation of new structures that will reduce inflow or deepening, or enlargement of outflow points. No changes to the abstraction/compensation release regime that are likely to have a significant negative impact on Dolmynach Reservoir. ○ Lower limit – N/A. ● Sediment loads and lake substrate. <ul style="list-style-type: none"> ○ Upper limit – No cultivation, peat removal, ditch cleaning, burning or other activities likely to cause erosion in the catchments of lakes located in un-enclosed upland areas. No activities in the catchment of Dolmynach Reservoir that are likely to lead to a significant increase in sedimentation. ○ Lower limit – N/A. ● Air Quality. <ul style="list-style-type: none"> ○ Upper limit – No critical loads for acidic and nitrogen deposition are exceeded at 2 out of 3 Environment Agency monitoring stations in more than one year out of 5. ○ Lower limits – None. <p>Relevant monitoring stations are: SN854758, SN78-744 and SN770654.</p> <p>Floating water-plantain Luronium natans</p> <ul style="list-style-type: none"> ● Water Clarity. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – The water should be sufficiently clear for floating waterplantain beds to be clearly visible in water

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	<p>up to 1.5m deep.</p> <ul style="list-style-type: none"> • Water Quality. <ul style="list-style-type: none"> ○ Upper limit – Annual mean total phosphorus (TP) not exceeding 10 µg/l-1. ○ Lower limits – pH 5.5. Acid neutralising capacity (ANC) greater than 20 µeq/l-1. More than 5 µg/l-1 dissolved oxygen (O₂) throughout the water column. • Hydrology. <ul style="list-style-type: none"> ○ Upper limit – No alterations to existing dams or creation of new structures that will reduce inflow or deepening, or enlargement of outflow points. No changes to the abstraction/compensation release regime that are likely to have a significant negative impact on Dolymynach Reservoir. ○ Lower limit – N/A. <p>Breeding Red Kite <i>Milvus milvus</i></p> <ul style="list-style-type: none"> • Habitat Extent. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – The total extent of suitable semi-natural habitat within the SPA is the same as it was in 2006 (shown on aerial photographs) and the habitat proportions are roughly the same. • Availability of Carrion. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – There should continue to be some grazing on the main hill areas throughout the site. • Disturbance. <ul style="list-style-type: none"> ○ Upper limit – no breeding attempts to be known to fail because of impact of human disturbance. ○ Lower limit – None set. • Roosting sites. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – The woodland at Hafod remains suitable for roosting kites. <p>Breeding Merlin <i>Falco columbaris</i></p> <ul style="list-style-type: none"> • Habitat Extent. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – The total extent of suitable semi-natural habitat within the SPA is the same as it was in 2006 (shown on aerial photographs) and the habitat proportions are roughly the same. • Disturbance. <ul style="list-style-type: none"> ○ Upper limit – no breeding attempts to be known to fail

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	<p>because of impact of human disturbance.</p> <ul style="list-style-type: none"> ○ Lower limit – none set. <p>Breeding Peregrine <i>Falco peregrinus</i></p> <ul style="list-style-type: none"> ● Habitat Extent. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – The total extent of suitable semi-natural habitat within the SPA is the same as it was in 2006 (shown on aerial photographs) and the habitat proportions are roughly the same. ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – no breeding attempts to be known to fail because of impact of human disturbance. ○ Lower limit – none set. <p>Refer to Core Management Plan (including conservation objectives) incorporating Elenydd-Mallaen Special Protection Area, Elenydd Special Area for Conservation, Coetiroedd Cwm Elan and Cwm Doethie Special areas for Conservation (2008) (minor amendment 2013) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/dee-to-fenns-sac-list/idoc.ashx?docid=452b5711-ee14-470e-af92-0dd3e322a6c4&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● Blanket bogs: Unfavourable ● Old sessile oak woods with Ilex and Blechnum in the British Isles: Unfavourable. ● Calaminarian grasslands of the <i>Violetalia calaminariae</i>: Unfavourable. ● European Dry Heaths: Status within the Elenydd SAC: Unfavourable. Status within the Coetiroedd Cwm Elan SAC: Favourable ● Tilio-Acerion forests of slopes, screes and ravines Status within the Coetiroedd Cwm Elan SAC & Cerrig Gwalch SSSI: Favourable ● Oligotrophic to mesotrophic standing waters of the Isoeto-Nanojuncetea: Status within the Elenydd SAC: Unfavourable. ● Floating water-plantain <i>Luronium natans</i>: Unfavourable <p>SPA Features:</p> <ul style="list-style-type: none"> ● Breeding Red Kite <i>Milvus milvus</i>: Favourable ● Breeding Merlin <i>Falco columbaris</i>: Favourable. ● Breeding Peregrine <i>Falco peregrines</i>: Favourable.

<p>Site Name: Elenydd Location Grid Ref: SN824704 JNCC Site Code: UK9014111 / UK0012928 Size 8609.42 ha Designation: SPA / SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>The results of the national survey in 2002 indicated that the condition of the feature in the SPA area was favourable, maintained. The extent of potential feeding habitat within the sites is believed to be sufficient to support the breeding population in the long term.</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> Grazing in autumn and winter, particularly by sheep, is damaging to the dwarf shrubs and should be avoided. Areas used by breeding waders and other ground nesting birds should not be grazed too heavily during the breeding season so as to prevent trampling damage to nests and young. However, continuous grazing is likely to prevent tree regeneration in the long term and may damage the field and shrub layers, where these elements are present. Heavy stocking could also damage moss and liverwort carpets and cause soil erosion on the steeper slopes.</p> <p><u>Drainage</u> The bogs, wet heathland, springs, flushes and marshy grassland are all vulnerable to drying out as a result of drainage. The natural drainage pattern must not be altered and any old drainage ditches should not be maintained.</p> <p><u>Burning</u> Bogs, wet heath and other wetland areas should not be burnt, as burning is likely to damage important plant and animal species, especially bog mosses ground nesting birds.</p> <p><u>Access & Recreational Use</u> Recreational pressure, particularly motorbike scrambling, is a problem in localised areas. The habitat is easily damaged by such activities. A measure of control is being sought by modification of local authority highway regulations. Minimise damage and disturbance to bog and heath vegetation where unauthorised vehicles verge off the road.</p> <p><u>Agricultural Pollution</u> The application of any agricultural fertilisers, including lime, slurry and manure, will have a detrimental effect on the vegetation. Bogs, dry heathland and ffridd areas are particularly sensitive to nutrient inputs.</p> <p><u>Atmospheric Pollution/Acidification</u> Other man-induced threats include acidification via rainfall, and possible nitrate deposition, which may encourage the spread of <i>Molinia caerulea</i> to the detriment of other blanket bog species.</p>

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	<p>The threat of atmospheric pollutants to floating water-plantain in the naturally nutrient-poor lakes cannot at present be quantified. Leaf surfaces are frequently entirely overgrown by epiphyllous algae that might be further stimulated by nitrogen oxide pollution.</p> <p><u>Invasive, non-native trees and shrubs</u> Beech is a particular concern as it can regenerate vigorously under an oak canopy, and when mature can suppress and alter the ground flora. In mid Wales beech supports few lichens of any interest. Mature conifers can cast dense shade but are less able to regenerate from seed within the oak woodland. Sycamore has potential to invade areas where the soil is deeper and less acidic but large trees can support uncommon lichens. Rhododendron is highly invasive and represents a serious threat to the woodland in the absence of grazing.</p> <p><u>Disturbance</u> The metal mine sites in the vicinity to roads and tracks have suffered disturbance due to fly-tipping and the removal of metal-rich spoil for hardcore and track surfacing. Some rare breeding birds are sensitive to disturbance during the nesting season. Public access to some areas used by these sensitive birds may need to be restricted between February and July. Disturbance by off-road 4x4 vehicles and motorcyclists and cyclists has been a concern for some years, and erection of a joint NRW/Police notice on the road gate in 2005 has not been effective. Further signs are planned on the site, and work is underway to ascertain whether permission is necessary under Section 194 of the Law of Property Act 1925, as the land is common land. The landowners and neighbours are agreeable to the actions.</p> <p><u>Engineering Works and Development</u> The site contains several major dams, water pipelines, roads, bridges and disused mines and quarries. Operational structures require periodic repair and maintenance and this work should be carefully planned and undertaken in a sensitive manner, so that there is minimal impact on the habitats and species of interest. Major new projects, such as dams, pipelines, and hydro schemes and power lines, could have a significant impact and should be carefully assessed in accordance with environmental regulations. The impact of re-opening of old quarries will also need to be considered in a similar way, although this may offer new opportunities for nesting peregrines.</p> <p>Wind turbines may present a collision risk to birds of prey and may cause disturbance to breeding birds, such as ground nesting waders. Consideration of these effects on birds must be given when developments are proposed on or near to the site.</p>

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	<p>Site is vulnerable to water run-off as a consequence of engineering and development works. Pollution from run-off and metal mine workings including reopening of old mines and restoration. Additionally, the site would also be vulnerable to drainage from development and associated transportation.</p>
<p>Landowner/ Management Responsibility</p>	<p>The main land uses in the Elenydd – Mallaen area, are agriculture and commercial forestry. Much of the land forms the catchment area for Llyn Brienne, Teifi Pools and the Elan Valley Reservoirs. The area is also used for military training and is important for tourism and outdoor recreation. Large areas of upland habitats remain in poor condition and require specific restoration management.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

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<p>Site Description</p>	<p>The River Usk SAC rises in the Black Mountain range in the west of the Brecon Beacons National Park and flows east and then south, to enter the Severn Estuary at Newport. The overall form of the catchment is long and narrow, with short, generally steep tributaries flowing north from the Black Mountain, Fforest Fawr and Brecon Beacons, and south from Mynydd Epynt and the Black Mountains. The underlying geology consists predominantly of Devonian Old Red Sandstone with a moderate base status, resulting in waters that are generally well buffered against acidity. This geology also produces a generally low to moderate nutrient status, and a moderate base-flow index, intermediate between base-flow dominated rivers and more flashy rivers on less permeable geology. The run-off characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and arable in the lower catchment. The Usk catchment is entirely within Wales.</p> <p>The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p>Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reduction in flows may reduce the ability of the adults of migratory fish to reach spawning sites. Watercress vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</p> <p>Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and</p>

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	<p>other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally, factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.</p> <p>Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitats as breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved, for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p> <p>Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions</p>

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	<p>including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions; therefore, these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, for example lesser horseshoe bats, to migrate and disperse through the landscape. Connectivity should be maintained or restored where necessary as a means to ensure access for the features to sufficient habitat within the SAC.</p> <p>External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>). • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). • Twait shad (<i>Alosa fallax</i>). • Atlantic salmon (<i>Salmo salar</i>). • Bullhead (<i>Cottus gobio</i>). • European otter (<i>Lutra lutra</i>). <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site Selection</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). • Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation.
<p>Conservation Objectives</p>	<p>Vision for the site: Our vision for the River Usk SAC is to maintain, or where necessary restore the river to high ecological status, including its largely unmodified and undisturbed physical character, so that all of its special features are able to sustain themselves in the longterm as part of a naturally functioning ecosystem. Allowing the natural processes of erosion and deposition to operate without undue interference and maintaining or restoring connectivity maintains the physical river habitat, which forms the foundation for this ecosystem. The quality and quantity of water,</p>

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	<p>including natural flow variability, and the quality of adjacent habitats, are maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future. In places such as urban environments where natural processes are likely to cause significant damage to the public interest, artificial control measures are likely to be required.</p> <p>The aquatic plant communities that characterise parts of the river are not only attractive but also give a good indication of the overall quality of the environment. They contain the variety and abundance of species expected for this type of river, in conditions of suitably clean water and bed substrate combined with a relatively stable flow regime. Locally, there are patches of white-flowered water-crowfoots. In the more shaded reaches, aquatic plants may be scarce, consisting mainly of mosses and liverworts.</p> <p>The special fish species found in the river, both residents such as the bullhead and brook lamprey, and migratory species such as the Atlantic salmon, sea lamprey and shad, which swim up river to spawn and go through their juvenile stages in the river, are present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. The migratory fish are able to complete their migrations and life cycles largely unhindered by artificial barriers such as weirs, pollution, or depleted flows.</p> <p>The abundance of prey and widespread availability of undisturbed resting and breeding sites, allows a large otter population to thrive. They are found along the entire length of the river and its main tributaries.</p> <p>The presence of the River Usk SAC and its special wildlife enhances the economic and social values of the area, by providing a high quality environment for ecotourism, outdoor activities and peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water are recognised and promoted through appropriate land management. The river is a focus for education to promote increased understanding of its biodiversity and the essential life support functions of its ecosystems.</p> <p><i>The ecological status of the water course is a major determinant of FCS for all features. The required conservation objective for the water course is defined below.</i></p> <p>Conservation Objective for the water course</p> <ul style="list-style-type: none"> • The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly

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	<p>unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary.</p> <ul style="list-style-type: none"> • The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3. • Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC. • All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change. • Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. • The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided. • River habitat SSSI features should be in favourable condition. In the case of the Usk Tributaries SSSI, the SAC habitat is not underpinned by a river habitat SSSI feature. In this case, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone. • Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. weirs, bridge sills, acoustic barriers. • Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified. • Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered. • Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed by NRW as necessary. It is anticipated that these limits will concur with the

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	<p>standards used by the Review of Consents process.</p> <ul style="list-style-type: none"> • Levels of nutrients, in particular phosphate, will be agreed by NRW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process. • Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed by NRW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process. • Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects. • Levels of suspended solids will be agreed by NRW for each Water Framework Directive water body in the Usk SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.
<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on the following:</p> <ul style="list-style-type: none"> • SSSI boundaries. • Artificial barriers, where they significantly affect one or more of the features' range. • Major impacts, in particular major water abstractions. • Natural hydromorphology, where there are significant differences in management issues/key features between reaches. • Estuaries: the reach below the tidal limit is treated as a separate unit. • The units include one or more of NRW's River Basin Management Plan water bodies; as far as is practicable, unit boundaries coincide with these water body boundaries.
<p>Management Plan - Key Environmental Conditions (factors that</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>).

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<p>maintain site integrity)</p>	<p>The impacts of barriers to migration and flow depletion are highlighted in the assessment of conservation status for this feature. The impact of barriers should be assessed on a case-by-case basis.</p> <p><u>Reduce barriers</u> Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Crickhowell Bridge is considered to be the most significant barrier to fish migration in the Usk. Management to reduce or remove the effect of this barrier is a high priority for the River Usk SAC. An assessment of options will be carried out in conjunction with the other relevant competent authorities. The impact of acoustic (ie noise/vibration) and sediment/chemical barriers arising from plans or projects should also be assessed. When arising from construction or other development related activities it may be necessary to restrict the timing of such activities.</p> <p><u>Targets to reduce the impact of flow depletion</u> The impact of flow depletion resulting from a small number of major abstractions was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the impacts on SAC features. These targets are expressed as, 1) a flow duration curve using recent daily mean flow data, used to set abstraction licence conditions including 'hands-off flows', 2) hourly maximum abstraction rates for certain licences to reduce or remove the effect of diurnal flow variations. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p><u>Effect of water entrainment</u> Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed. The extent and quality of suitable sea lamprey habitat must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival.</p> <p>Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p>Annex II species that are a primary reason for selection of this site:</p>

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	<ul style="list-style-type: none"> • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). <p><u>Habitat Management</u> The extent and quality of suitable habitat for brook and river lamprey must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey.</p> <p>Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p><u>Effect of Water Entrainment</u> Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed.</p> <p>The currently favourable condition assessment suggests that there are no strongly adverse factors influencing these species. However, the species are likely to benefit from positive management for the other SAC features, and may see further improvement in condition as a result. On-going monitoring will allow a better understanding of population fluctuations, distributional changes etc.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Twait shad (<i>Alosa fallax</i>). <p>The impacts of barriers to migration and flow depletion are highlighted in the assessment of conservation status for these features.</p> <p>Any new provisions need to take their requirements into account. The impact of existing barriers in the Usk should be assessed on a case-by-case basis.</p> <p><u>Reduce Barriers</u> Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Crickhowell Bridge is considered to be the most significant barrier to fish migration in the Usk. Management to reduce or remove the effect of this barrier is a high priority for the River Usk SAC. Other barriers that may be significant include Trostrey Weir and Radyr Weir. An assessment of options will be</p>

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	<p>carried out in conjunction with the other relevant competent authorities.</p> <p><u>Targets to Reduce the Impact of Flow Depletion</u> The impact of flow depletion resulting from a small number of major abstractions was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the impacts on SAC features. These targets (given in Annex 1) are expressed as, 1) a flow duration curve using recent daily mean flow data, which is used to set abstraction licence conditions including ‘hands-off flows’, 2) hourly maximum abstraction rates for certain licences to reduce or remove the effect of diurnal flow variations. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile shad drifting downstream and post-spawning adult shad.</p> <p>The extent and quality of suitable shad habitat must be maintained. Spawning habitat is defined as stable, clean gravel/pebble-dominated (approximately 70%) substrate without an armoured layer and with <10% fines in the top 30 cm. Water depth during the spawning and incubation periods should be 50-75 cm. Holding areas are defined as pools of at least 200 cm depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence.</p> <p><u>Sustainable Fishing</u> Anglers occasionally fish for shad, and they are sometimes taken in quite large numbers. Further research is necessary to define sustainable levels of angling. If this shows there is cause for concern, a temporary cessation of fishing activity in the vicinity of known spawning grounds during the spawning period should be considered, particularly where shad are known to be taken regularly. Exploitation of shad is currently unregulated and controls are being considered through the review of freshwater fisheries legislation. Commercial fishermen also take shad as a by-catch, with whitebait and shrimp fishing being of particular concern. Changes in fishing methods need to be promoted to minimize captures, whilst both anglers and trawler men should be encouraged to return alive any individuals caught.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Atlantic salmon (<i>Salmo salar</i>). <p>The Atlantic salmon is the focus for much of the management activity carried out on the Usk. The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is a high priority. Measures to address these problems include the establishment of buffer</p>

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	<p>zones on reaches adjacent to intensively managed livestock grazing or arable land. Tree management, especially coppicing and pollarding to increase light levels to the channel, is also often carried out. The Wye and Usk Foundation through their Usk Project have carried out much of this work in recent years. Other work has included removal of weirs and construction of fish passes to ease artificial barriers to salmon migration, and reduction in exploitation pressure through buying out net fisheries in the estuary.</p> <p>Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg and fry survival. Clean substrate free from excessive siltation should predominate at suitable spawning sites.</p> <p>Spawning habitat is defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256 mm) but with the majority being <150 mm. Water depth during the spawning and incubation periods should be 15-75 cm. Fry habitat is indicated by water of <20 cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40 cm deep and similar substrate. Holding areas are defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, and provides cover for fish and a source of food for invertebrates.</p> <p><u>Prevent further Pollution and Soil Erosion</u></p> <p>In the Usk catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.</p> <p>Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and</p>

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	<p>industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with NRW Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations.</p> <p>Measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC.</p> <p>Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering, or likely to impact upon the site should be monitored, reviewed and altered if necessary.</p> <p><u>Habitat Management</u> Overhanging trees provide valuable shade and food sources, whilst tree root systems provide important cover and flow refuges for juveniles. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p><u>Reduce Barriers</u> In all river types, artificial barriers should be made passable. The impact of existing barriers in the Usk should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented.</p> <p><u>Reduce/Restrict Salmon Stocking</u> There is currently no stocking of salmon into the Usk. The management objectives for SAC salmon populations are to attain naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced</p>

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	<p>individuals, disease introduction and genetic alterations to the population. Therefore, there is a presumption against salmon stocking in the Usk SAC.</p> <p><u>Controlling Competition</u> The presence of artificially high densities of other fish can create unacceptably high levels of predatory and competitive pressure on juvenile salmon and the aim should be to minimise these risks in considering any proposals for stocking. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p>Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries. Net Limitation Orders are used to control the estuarine fishery. Exploitation of salmon by rod fisheries is regulated by NRW licensing and byelaws controlling the fishing season and allowable methods.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Intake screens must meet statutory requirements under the Salmon & Freshwater Fisheries Act.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Bullhead (Cottus gobio). <p>Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences. New instream structures should be avoided, whilst the impact of existing artificial structures needs to be evaluated.</p> <p><u>Provide Suitable Habitats</u> The extent and quality of suitable bullhead habitat must be maintained. Elevated levels of fines can interfere with egg and fry survival. Spawning habitat is defined as unsilted coarse (gravel/pebble/cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles/cobbles are therefore important.</p> <p>The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be limited to no</p>

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	<p>more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants. Slack-water areas provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.</p> <p>Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence.</p> <p>Maintenance of intermittent tree cover in conjunction with retention of woody debris helps to ensure that habitat conditions are suitable. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p><u>Control Fish Numbers and Introduction</u> Bullheads are relatively sedentary and interactions between populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact. There should be no stocking/transfers of bullhead unless agreed to be in the best interests of the population. In general, management for other SAC features is expected to result in favourable habitat for bullhead, through improvements in water quality and flow regime and maintenance of suitable physical habitat.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European otter (<i>Lutra lutra</i>). <p>The catchment should be capable of supporting at least 18 breeding females, based on one breeding female per 20km stretch of river. It is possible that if all the breeding sites achieve optimal habitat conditions and fish and amphibian stocks are secured that the catchment may then support further breeding animals. However, the amount of compression of home ranges that otters will accept cannot as yet be determined.</p> <p><u>Provide Suitable Habitats</u> Management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter population of a size determined by</p>

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	<p>natural prey availability and associated territorial behaviour. Food availability is an important factor. Fish biomass should stay within expected natural fluctuations.</p> <p>The involvement of river users and land managers will be important in improving potential breeding habitat near to the river. Agri-environment schemes and the Better Woodlands for Wales scheme provide possible mechanisms for maintaining suitable sites, such as lightly grazed woodlands, areas of dense scrub, and tussocky fens with purple moor-grass.</p> <p><u>Measures to Increase Safety</u> Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.</p> <p>Certain areas of the SAC are critical to the movement of otters both within the system and to adjacent sites. The Usk SAC provides a key movement corridor for otters passing between the relatively high densities in mid Wales and the south-east Wales coastal strip (Seven Estuary and Gwent Levels). The function of this aspect of the site should be protected through the maintenance of suitable resting sites (in terms of size, quality and levels of disturbance) through the major urban centre of Newport.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Sea lamprey (<i>Petromyzon marinus</i>)</p> <ul style="list-style-type: none"> • Distribution. <ul style="list-style-type: none"> ○ Units 1-5 – Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon</i> ammocoetes. • Ammocoete density. <ul style="list-style-type: none"> ○ Units 2-5 – Ammocoetes should be present in at least four sampling sites each not less than 5km apart. ○ Overall catchment mean >0.1m² (Harvey & Cowx 2003). 0.1 m² is a conservative threshold value for unfavourable condition. <p>Brook lamprey (<i>Lampetra planeri</i>)</p> <ul style="list-style-type: none"> • Age/size structure of ammocoete population. <ul style="list-style-type: none"> ○ Units 2-10 – Samples < 50 ammocoetes ~ 2 size classes. ○ Units 2-10 – Samples > 50 ammocoetes ~ at least 3 size

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	<p>classes.</p> <p>If recruitment rates outside about thresholds, further investigation as to the cause as opposed to automatic 'unfavourable condition' status.</p> <ul style="list-style-type: none"> • Distribution of ammocoetes within catchment. <ul style="list-style-type: none"> ○ Units 2-10 – Present at not less than 2/3 of sites surveyed within natural range. <p>The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit ie, all except unit 1. Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> ○ Units 2-10 – No reduction in distribution of ammocoetes. <p>Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit or sub-unit/tributary, and will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Ammocoete density. <ul style="list-style-type: none"> ○ Units 2-10 – Optimal habitat: >10m² Overall catchment mean: >5m². <p>Optimal habitat comprises beds of stable fine sediment or sand >15cm deep, low water velocity and the presence of organic detritus, as well as, in the Usk, shallower sediment, often patchy and interspersed among coarser substrate.</p> <p>Twait Shad (<i>Alosa fallax</i>)</p> <ul style="list-style-type: none"> • Spawning distribution. <ul style="list-style-type: none"> ○ Units 1-5 – No decline in spawning distribution. <p>Spawning distribution is assessed by kick sampling for eggs and/or observations of spawning adults. A representative sample of sites within units 2 to 5 will be monitored at 3 yearly intervals. Absence from any site in 2 consecutive surveys will result in an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Flow. <ul style="list-style-type: none"> ○ Units 1-5 – Targets are set in relation to river/reach type(s). <p>Targets equate to those levels agreed and used in the Review of Consents. Shad are particularly sensitive to flow. The ideal regime is one of relatively high flows in March-May, to stimulate migration and allow</p>

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	<p>maximum penetration of adults upstream, followed by rather low flows in June-September, which ensures that the juveniles are not washed prematurely into saline waters and grow rapidly under warmer conditions. The release of freshets to encourage salmonid migration should therefore be discouraged on shad rivers during this period.</p> <p>Atlantic Salmon (<i>Salmo salar</i>) Water Quality.</p> <ul style="list-style-type: none"> • Biological quality. <ul style="list-style-type: none"> ○ Units 6-10 – Biological GQA class A. <p>This is the class required in the CSM guidance for Atlantic salmon, the most sensitive feature.</p> <ul style="list-style-type: none"> • Chemical quality. <ul style="list-style-type: none"> ○ All units – RE1. <p>It has been agreed through the Review of Consents process that RE1 will be used throughout the SAC.</p> <p>Hydromorphology.</p> <ul style="list-style-type: none"> • Flow. <ul style="list-style-type: none"> ○ All units – Targets are set in relation to river/reach type(s). <p>Targets equate to those levels agreed and used in the Review of Consents.</p> <p>Bullhead (<i>Cottus gobio</i>)</p> <ul style="list-style-type: none"> • Adult densities. <ul style="list-style-type: none"> ○ Units 2-10 – No less than 0.2 m² in sampled reaches. <p>CSM guidance states that densities should be no less than 0.2 m⁻² in upland rivers (source altitude >100m) and 0.5 m⁻² in lowland rivers (source altitude ≤100m). A significant reduction in densities may also lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution. <ul style="list-style-type: none"> ○ Units 2-10 – Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current. <p>Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an unfavourable condition assessment.</p>

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	<ul style="list-style-type: none"> • Reproduction / age structure. <ul style="list-style-type: none"> ○ Units 2-10 – Young-of-year fish should occur at densities at least equal to adults. <p>This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.</p> <p>European otter (<i>Lutra lutra</i>)</p> <ul style="list-style-type: none"> • Distribution. <ul style="list-style-type: none"> ○ All – Otter signs present at 90% of Otter Survey of Wales sites. <p>Ref: NRW Environmental Monitoring Report No 19 (2005)³</p> <ul style="list-style-type: none"> • Breeding activity. <ul style="list-style-type: none"> ○ All – 2 reports of cub/family sightings at least 1 year in 6. <p>Ref: NRW Environmental Monitoring Report No 19 (2005)³</p> <ul style="list-style-type: none"> • Actual and potential breeding sites. <ul style="list-style-type: none"> ○ All – No decline in number and quality of mapped breeding sites in subcatchments. <p>Ref: NRW Environmental Monitoring Report No 19 (2005)³</p> <p>In the Usk catchment, 77 actual or potential breeding sites have been identified, distributed throughout the catchment on the main river and tributaries.</p> <p>Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</p> <ul style="list-style-type: none"> • Native Species. <ul style="list-style-type: none"> ○ Units 2, 3 & 10 – Cover of indicators of eutrophication maintained below threshold over the medium to long term. <p>CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals.</p> <p>For the Usk SAC: Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. And <i>Vaucheria</i> spp.) should not have an MTR cover value of greater than 5 (ie.10%) in 3 consecutive years in:</p>

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	<p>Any three representative sample 100m stretches of suitable habitat between Usk Town bridge and the bridge at Newbridge-on-Usk and in one representative sample 100m stretch of suitable habitat along the Senni.</p> <ul style="list-style-type: none"> • Alien / introduced species. <ul style="list-style-type: none"> ○ No impact on native biota from alien or introduced species. <p>In the CSM guidance, the SERCON scoring system for naturalness of aquatic and marginal macrophytes and naturalness of banks and riparian zone, are used to assess this attribute. SERCON protocols have not been applied in the Usk SAC, therefore assessment of this attribute relies on locally defined thresholds and expert judgement.</p> <ul style="list-style-type: none"> • River Lamprey (<i>Lampetra fluviatilis</i>). • Allis shad (<i>Alosa alosa</i>). <p>Refer to Core Management Plan (including conservation objectives) for River Usk Special Area of Conservation (2008) for further information at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=c097886a-9c9a-4e5e-b31d-aa04549c4917&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>): Unfavourable: Unclassified. • Brook lamprey (<i>Lampetra planeri</i>) and River Lamprey (<i>Lampetra fluviatilis</i>) Favourable. • Twait shad (<i>Alosa fallax</i>) Unfavourable: Unclassified. • Atlantic salmon (<i>Salmo salar</i>) Unfavourable: Unclassified. • Bullhead (<i>Cottus gobio</i>): Unfavourable: Unclassified. • European otter (<i>Lutra lutra</i>) Favourable.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>The River Usk is an excellent habitat for six Annex II freshwater fish. There are some concerns over longterm aquatic and riparian habitat degradation but these are being addressed in the Usk Catchment Management Plan, the Conservation Strategy, the River SSSI Management Plan, and by the Countryside Council for Wales and environment Agency encouraging owners and occupiers to carry out positive habitat management through agreements and agri-environment</p>

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	<p>schemes.</p> <p><u>Barriers Restricting Migration</u> There are few barriers to migration for the anadromous species and where barriers exist which restrict migration for some of the SAC species. Artificial physical barriers are probably the single most important factor in the decline of shad in Europe. Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of shad. Both species (but particularly allis shad) can make migrations of hundreds of kilometres from the estuary to spawning grounds in the absence of artificial barriers. Existing fish passes designed for salmon are often not effective for shad.</p> <p><u>Pollution</u> In the Usk catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately.</p> <p>Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p> <p><u>Water abstraction</u> There are requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed. Additionally, intake screens must meet statutory requirements under the Salmon & Freshwater Fisheries Act.</p> <p><u>Recreation and Leisure</u> Exploitation of shad is currently unregulated and controls are being considered through the review of freshwater fisheries legislation. Commercial fishermen also take shad as a by-catch, with whitebait and shrimp fishing being of particular concern.</p>

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	<p><u>Non-native species</u> Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. Non-native crayfish should be absent from the SAC.</p> <p>The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of fish should be avoided in the SAC. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p><u>Competition</u> Artificially enhanced densities of other fish may introduce unacceptable competition or predation pressure and the aim should be to minimise these risks in considering any proposals for stocking.</p> <p><u>Contamination and Development</u> Development pressure in the lower catchment can cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Noise/vibration e.g. due to impact piling, drilling, salmon fish counters present within or in close proximity to the river can create a barrier to shad migration. Land on both sides of the river in Newport is potentially highly contaminated. Contamination of the river can arise when this is disturbed e.g. as a result of development. Contamination can also arise from pollution events (which could be shipping or industry related).</p> <p><u>Decline in Species</u> A potential problem appears to be the decline in eel populations, and similar concerns are apparent with respect to amphibian numbers.</p>
<p>Landowner/ Management Responsibility</p>	<p><u>Lower Usk</u></p> <ul style="list-style-type: none"> • Twaite shad and sea lamprey spawn within Units 2 & 3 and migrate through Unit 1, where they may be subject to disturbance impacts, so are selected as key features in all units. • Management for twaite shad and sea lamprey should also be sympathetic for Atlantic salmon, river/brook lamprey (spawning habitat) and bullhead. • Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units. • The feature ‘Rivers with floating vegetation often dominated by water-crowfoot’ occurs in Units 2 & 3 in this SSSI and is selected as a key habitat.

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	<ul style="list-style-type: none"> • The status of allis shad is uncertain in River Usk (Lower Usk) SSSI. It is assumed to be present in the same units as twaite shad. <p><u>Upper Usk</u></p> <ul style="list-style-type: none"> • Atlantic salmon is a key feature in Unit 6 due to the presence of spawning sites, although salmon may occasionally also spawn within Units 4 & 5. • Twaite shad is recorded only infrequently in Unit 5 as their distribution is constrained by the barrier created by Crickhowell Bridge footings. • Sea lamprey is recorded more frequently than shad within Unit 5 but may also be affected to an extent by Crickhowell Bridge. The natural range of sea lamprey may extend upstream into Unit 6, however the degree to which their distribution may be constrained by Brecon weir is poorly understood. Sea lamprey is assumed to be generally absent from Unit 6 due to natural range limits. • Management for Atlantic salmon, twaite shad and sea lamprey is expected to be sympathetic for river/brook lamprey (spawning habitat) and bullhead. • Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units. • The status of the features Allis shad and 'Rivers with floating vegetation often dominated by water-crowfoot' is uncertain in River Usk (Upper Usk) SSSI. Allis shad is assumed to be present in the same units as twaite shad. <p><u>Tributaries</u></p> <ul style="list-style-type: none"> • Atlantic salmon spawns in all tributaries within this SSSI and so is selected as a key feature in all units. • Twaite shad, allis shad and sea lamprey are thought not to occur within this SSSI. • River/brook lamprey are selected as key features within Units 9 & 10, which are thought to contain a higher proportion of suitable ammocoete habitat compared to other units so are expected to hold important populations of these features. Monitoring confirms this to an extent. • Unit 10 is the only unit within this SSSI known to contain the feature 'Rivers with floating vegetation often dominated by water-crowfoot'. The good stands of water-crowfoot dominated vegetation justify its selection as a key feature in this unit.

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<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Pre-deposit and Deposit Stage Documents including relevant HRA Studies for the Brecon Beacons Local Development Plan for further information at: http://www.beacons-npa.gov.uk/the-authority/planning/strategy-and-policy/ldp-examination/sa/sustainability-appraisal-pre-deposit http://www.beacons-npa.gov.uk/the-authority/planning/strategy-and-policy/ldp-examination/sa/sustainability-appraisal-deposit</p> <p>Refer to Monmouthshire Council's Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

<p>Site Name: Tanat and Vyrnwy Bat Sites Location Grid Ref: SJ047259 JNCC Site Code: UK0014783 Size: 11.2 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site consists of six separate SSSI divided into ten management units, all situated within the northeastern part of Montgomeryshire. The greatest distance between any two sites is less than 20 kilometres. Two of the SSSI contain buildings that house maternity roosts (Bryngwyn and Hendre), whilst the other four are disused mines containing hibernation roosts. Five of the sites (the exception being Bryngwyn) also contain a small amount of associated habitat, in the form of broadleaved woodland or hedgerows. Other roosts of both types are known both within this locality and further south within Montgomeryshire. It is not known how the different sites relate to one another in terms of the seasonal movements of the bats, and so no judgement can be made as to whether they support one meta-population or several smaller populations.</p> <p>The numbers of bats at all the sites varies significantly from year to year, but at the time of writing Hendre contained the largest number of breeding bats (2nd largest in Montgomeryshire, in top ten in Wales) and Allt-y-Main Mine the largest hibernating group (2nd largest in Montgomeryshire, probably in top twelve in Wales). The overall population, as judged by annual counts, has shown an increase in recent years, consistent with the national trend, and the SAC is thought to support at least 4% of the UK population of this species. Numbers have not been increasing at all of the individual sites however. Bryngwyn suffered a major reduction for unknown reasons in between 1999 and 2003, from which it appears to be slowly recovering. Garth-eryr suddenly lost virtually all its bats between 1997 and 2002 (reasons again unknown), and yet the nearest maternity roost (Hendre) has increased its numbers. It appears that either the Hendre bats are now hibernating elsewhere, or the Garth-eryr bats were from an unknown maternity roost that may since been lost.</p>
<p>Qualifying Features</p>	<p>Annex I species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). <p>This area in central Wales contains a good mixture of lesser horseshoe bat maternity and hibernation sites, thought to support about 4% of the UK species population, though counts in hibernation sites suggest this may be an underestimate.</p>
<p>Conservation Objectives</p>	<p>Vision for the Site</p> <p>The two maternity roosts contain a minimum of 300 adult Lesser Horseshoe Bats in total every year, with at least 200 at Hendre Cottage</p>

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	<p>and at least 100 at Bryngwyn Hall Stables and Coach House. The buildings are maintained in a suitable condition for use by the bats, to ensure that the roofs are in good repair, not heavily shaded by surrounding trees, and the roof space is undisturbed (except in emergencies). Access for the bats to and from the buildings and roof spaces is unhindered and flight paths along surrounding hedgerows and woodland edges are protected. All other factors that affect the species are under control.</p> <p>The four hibernation roosts contain a minimum of 200 Lesser Horseshoe Bats in total every year, with at least 50 in each of Allt-y-main Mine and Penygarnedd Mine; and evidence of continued use of West Llangynog Slate Mine and Garth-eryr. All four sites are maintained in a suitable condition for use by the bats, by ensuring that they remain undisturbed (except for monitoring purposes), and that the entrance is free from obstruction. The extent, quality and connectivity of broadleaved woodland habitat is also maintained and may be enhanced if possible. All other factors that affect the species are under control.</p> <p>Annex I species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). <p>There is only one feature for the site, and so the vision for this feature is the same as that for the site. It is required that the feature be in a favourable conservation status, where all of the conditions set out in the Performance Indicators table are satisfied, and all factors affecting the achievement of these conditions are under control.</p>
<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land ownership.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). <p><u>Monitoring and Management</u> Close monitoring is undertaken at each management unit and the number of bats present at each recorded regularly in order to maintain the favourable condition.</p>

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	<p>Full protection of bat species depends upon no disturbance to both summer (breeding) and winter (hibernating) roosts and continuity of invertebrate food supply by appropriate traditional land management, for example, maintenance of continuous hedgerows.</p> <p>The winter roosts (hibernacula) are not vulnerable as all mine entrances are now securely grilled and the underground workings are considered to be stable. The bats which use two of the four mines may be vulnerable because the associated breeding roosts are not known. All roost sites are the subject of a programme of monitoring visits to check site integrity and count the numbers of bats. The quality of surrounding feeding habitats is maintained through land management agreements with owners/occupiers.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) <u>Condition of Maternity Roosts</u></p> <ul style="list-style-type: none"> • Site security. <ul style="list-style-type: none"> ○ Upper limit – Limited access, under the control of the owner/occupier and NRW staff, and locked if necessary. ○ Lower limit – None. Access doors/hatches are in sound condition. • Roost entrance(s). <ul style="list-style-type: none"> ○ Upper limit – If possible, large birds or other predators should be prevented from entering or otherwise deterred from using the roof space. ○ Lower limit – All entrances are unobstructed and large enough for the bats to fly through freely. This will normally require a gap of at least 300 x 200 mm. • External disturbance. <ul style="list-style-type: none"> ○ Upper limit – There has been no significant increase in human activity around the roost since the previous assessment, and no artificial lighting is shining on the entrance(s) or associated flight-paths. ○ Lower limit – None. • External condition of building. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – The structure of the building is sound and stable, with no significant deterioration since the previous assessment. In particular, the roof is weatherproof, to prevent rain and light from entering, and heat from escaping.

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	<ul style="list-style-type: none"> • Internal condition of roost area. <ul style="list-style-type: none"> ○ Upper limit – Light levels are low, with complete darkness in the core roosting area. There is a range of temperatures available to the bats, with a mean temperature in mid summer in excess of 20°C. There are no drafts, and no substances present that are damaging to the health of bats. ○ Lower limit – None. <p><u>Condition of hibernation roosts</u></p> <ul style="list-style-type: none"> • Site security. <ul style="list-style-type: none"> ○ Upper limit – Limited access is under the control of the owner/occupier and NRW staff. Entrances are grilled and locked, and the grills in sound condition. ○ Lower limit – None. • Roost entrance(s). <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – All entrances are unobstructed and large enough for the bats to fly through freely. This will normally require a gap of at least 300 x 200 mm. • Stability of roost. <ul style="list-style-type: none"> ○ Upper limit – No new, unplanned, entrances have opened up. ○ Lower limit – There is no likelihood of collapse to the extent that the remaining roost area would be unviable or the entrance blocked. • External disturbance. <ul style="list-style-type: none"> ○ Upper limit – There has been no significant increase in human activity around the roost since the previous assessment, and no artificial lighting is shining on the entrance(s) or associated flight-paths. ○ Lower limit – None. • Internal condition of the roost area. <ul style="list-style-type: none"> ○ Upper limit – Light levels are low, with complete darkness in the core roosting area. There are no substances present that are damaging to the health of bats. ○ Lower limit – None. Also, there is a range of temperatures available to the bats, with a mean temperature between November and March of 8-12°C. There has been no significant change in humidity. <p><u>Condition of habitat within SAC boundary</u></p> <ul style="list-style-type: none"> • Quantity of woodland/scrub/hedgerows. <ul style="list-style-type: none"> ○ Upper limit – None.

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	<ul style="list-style-type: none"> ○ Lower limit – There has been no net loss of such habitat within the boundaries of each site ● Quality of woodland/scrub/hedgerows. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – 90% of the habitat is composed of native broadleaved species. Hedgerows are at least 1.5 m high, with no gaps larger than 5m. <p>Refer to Core Management Plan (including conservation objectives) for Tanat and Vyrnwy Bat Sites Special Area of Conservation (2008) for further information at: http://www.ccg.gov.uk/landscape-wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=5404a5ac-10b8-4102-bd8f-d0f9626b27c2&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>): Favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Disturbance to Breeding Roosts</u> The two known breeding roosts are potentially vulnerable to accidental fire, and casual or deliberate human disturbance, for example blocking of entrances.</p>
<p>Landowner/ Management Responsibility</p>	<p>The two maternity roosts require the most input in terms of active management, as they are buildings and so need regular maintenance. At Hendre, the roost is leased by Vincent Wildlife Trust, an organization very experienced in bat conservation, and all expenses are covered by them. At Bryngwyn, the owner has had a Management Agreement with NRW for many years. The four hibernation roosts require very little ongoing management, other than maintenance of security grills and monitoring to ensure the entrances are unobstructed and that there is no increase in disturbance. Relationships with all the owners are again good.</p> <p>In the longer term, it is essential to closely monitor feature condition in all units on an annual basis, both formally and informally, to ensure that the feature remains at Favourable Conservation Status. Consideration should also be given to extending the SAC to include more roosts, as there are other very important roosts nearby, both maternity and hibernation, and the populations within these are almost certainly linked to those within the SAC. NRW staff also monitor these to maintain the fullest picture possible of population of the species in Montgomeryshire.</p>

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<p>HRA/AA Studies undertaken that address this site</p>	<p>Denbighshire's Local Development Plan Habitat Regulations Appraisal 2009 available at: http://denbighddms.wisshost.net/webfiles/Submission/CD%203/Local%20Development%20Plan%20docs%20DLDP/DLDP007%20Habitats%20Regulations%20Appraisal%20(Mai%202011).pdf</p>

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<p>Site Description</p>	<p>The River Wye rises on Plynlimon in the Cambrian Mountains and flows in a generally southeasterly direction to enter the Severn Estuary at Chepstow. The upper catchment comprises several large sub-catchments, including the Irfon on the generally infertile upland landscape in the north-west, the Ithon in the north-east often on more low-lying, fertile terrain and the Lugg in the east in a predominantly low-lying fertile landscape much of which lies within England.</p> <p>The underlying geology consists predominantly of impermeable, acidic rocks of Silurian and Ordovician age in the north-west and more permeable Devonian Old Red Sandstone with a moderate base status in the middle and lower catchment. This geology produces a generally low to moderate nutrient status and a low to moderate base-flow index, making the river characteristically flashy. The run-off characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and arable in the lower catchment and the Lugg.</p> <p>The Wye catchment is divided between Wales and England; the river forms the border from south of Monmouth to Chepstow and to the east of Hay-on-Wye.</p> <p>The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p>Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reductions in flow may reduce the ability of the adults of migratory fish to reach spawning sites. Watercress vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.</p> <p>Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream create the</p>

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	<p>physical structure of the river habitats. While some sections of the river are naturally stable, especially where they flow over bedrock, others undergo continual and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called ‘alluvial’ rivers).</p> <p>These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.</p> <p>Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and Version 1.2 21 7 February 2008 habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitat for breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p>

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	<p>Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions, therefore these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, for example lesser horseshoe bats, to migrate and disperse through the landscape. Connectivity should be maintained, or restored where necessary, as a means to ensure access for the features to sufficient habitat within the SAC.</p> <p>External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<p>Qualifying Features</p>	<p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>). • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). • Twait shad (<i>Alosa fallax</i>). • Atlantic salmon (<i>Salmo salar</i>). • Bullhead (<i>Cottus gobio</i>). • European otter (<i>Lutra lutra</i>). • Water courses of plain to montane levels with the (<i>Ranunculus fluitans</i> and <i>Callitriche Batrachion</i>) vegetation. • White-clawed crayfish (<i>Austropotamobius pallipes</i>). <p>Annex I habitats and Annex II species present as qualifying</p>

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	<p>features, but not primary reasons for site Selection</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). • Quaking bogs and transition mires.
<p>Conservation Objectives</p>	<p>Vision for the site: Our vision for the River Wye SAC is to maintain or, where necessary, restore the river to high ecological status, including its largely unmodified and undisturbed physical character, so that all of its special features are able to sustain themselves in the long-term as part of a naturally functioning ecosystem. Allowing the natural processes of erosion and deposition to operate without undue interference and maintaining or restoring connectivity maintains the physical river habitat, which forms the foundation for this ecosystem. The quality and quantity of water, including natural flow variability, and the quality of adjacent habitats are maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future. In places such as urban environments where natural processes are likely to cause significant damage to the public interest, artificial control measures are likely to be required.</p> <p>The aquatic plant communities that characterise parts of the river are not only attractive but also give a good indication of the overall quality of the environment. They contain the variety and abundance of species expected for this type of river, in conditions of suitably clean water and bed substrate combined with a relatively stable flow regime. Patches of white-flowered water-crowfoots are widespread in the main river and in many of the tributaries. In the more shaded reaches aquatic plants may be scarce, consisting mainly of mosses and liverworts.</p> <p>The special fish species found in the river, both residents such as the bullhead and brook lamprey, and migratory species such as the Atlantic salmon, sea lamprey and shad, which swim up river to spawn and go through their juvenile stages in the river, are present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. The migratory fish are able to complete their migrations and life cycles largely unhindered by artificial barriers such as weirs, pollution, or depleted flows.</p> <p>The abundance of prey and widespread availability of undisturbed resting and breeding sites allows a large otter population to thrive. They are found along the entire length of the river and its main tributaries.</p>

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	<p>The Wye catchment forms an important refuge for the globally endangered white-clawed crayfish. The species is abundant and widely distributed in suitable habitat and is protected from the harmful effects of pesticide pollution and non-native crayfish. Non-native crayfish such as American signal crayfish are eradicated from the Wye catchment.</p> <p>The presence of the River Wye SAC and its special wildlife enhances the economic and social values of the area by providing a high quality environment for ecotourism, outdoor activities and peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water are recognised and promoted through appropriate land management. The river is a focus for education to promote increased understanding of its biodiversity and the essential life support functions of its ecosystems.</p> <p>Conservation Objective for The Watercourse</p> <ul style="list-style-type: none"> ▪ The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary. ▪ The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. ▪ Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC. ▪ All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change. ▪ Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. ▪ The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone,

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	<p>concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.</p> <ul style="list-style-type: none"> ▪ River habitat SSSI features should be in favourable condition. Where the SAC habitat is not underpinned by a river habitat SSSI feature, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone. ▪ Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. weirs, bridge sills, acoustic barriers. ▪ Natural factors such as waterfalls, which may limit, wholly or partially, the natural range of a species feature or dispersal between naturally isolated populations, should not be modified. ▪ Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered. ▪ Flow objectives for assessment points in the Wye Catchment Abstraction Management Strategy will be agreed by NRW as necessary. ▪ Levels of nutrients, in particular phosphate, will be agreed by NRW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain nutrients below these levels. ▪ Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed by NRW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain pollution below these levels ▪ Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects. ▪ Levels of suspended solids will be agreed by NRW for each Water Framework Directive water body in the Wye SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>). • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). • Twait shad (<i>Alosa fallax</i>).

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	<ul style="list-style-type: none"> • Atlantic salmon (<i>Salmo salar</i>). • Bullhead (<i>Cottus gobio</i>). <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site Selection</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The population of the feature in the SAC is stable or increasing over the long term. ▪ The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions eg. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed as necessary. ▪ There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis. <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European otter (<i>Lutra lutra</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour. ▪ The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories.

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	<p>The whole area of the Wye SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.</p> <ul style="list-style-type: none"> ▪ The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers. <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the (<i>Ranunculion fluitantis</i> and <i>Callitricho Batrachion</i>) vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term. Suitable habitat and associated plant communities may vary from reach to reach. Suitable habitat is defined in terms of nearnatural hydrological and geomorphological processes and forms eg. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions. Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent. ▪ The area covered by the feature within its natural range in the SAC should be stable or increasing. ▪ The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species may be defined as appropriate. <p>Annex I habitats and Annex II species that are a primary</p>

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	<p>reason for selection of this site:</p> <ul style="list-style-type: none"> • White-clawed crayfish (<i>Austropotamobius pallipes</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The population of the feature in the SAC is stable or increasing over the long term. ▪ The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. substrate type, water hardness and temperature, and ecosystem structure and functions. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity will be assessed. ▪ There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis. <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site Selection:</p> <ul style="list-style-type: none"> • Quaking bogs and transition mires. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where nearnatural hydrological and geomorphological processes and landforms favour the development of this habitat. The feature need not be present in all suitable locations in the SAC but where present must be secured for the foreseeable future. ▪ The area covered by the feature within its natural range in the SAC should be stable or increasing. ▪ The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate NVC type(s), unless differing from this type due to natural variability/local distinctiveness when other typical/indicator species may be defined as appropriate.

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<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on the following:</p> <ul style="list-style-type: none"> ▪ SSSI boundaries. ▪ Natural hydromorphology, where there are significant differences in management issues/key features between reaches. ▪ Units partly within England coincide with Natural England's equivalent units, as far as is practicable. ▪ The units include one or more of EA's River Basin Management Plan water bodies; as far as is practicable, unit boundaries coincide with these water body boundaries.
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sea lamprey (<i>Petromyzon marinus</i>). <p><u>Effect of Flow Depletion</u> The potential impact of flow depletion resulting from a small number of major abstraction licences, if they were to be fully utilised, was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the potential impacts on SAC features. These targets are expressed as 1) a flow duration curve using recent daily mean flow data, used to set abstraction licence conditions including 'hands-off flows' and 2) hourly maximum abstraction rates for certain licences to reduce or remove the effect of diurnal flow variations. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed.</p> <p>The extent and quality of suitable sea lamprey habitat must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning</p>

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	<p>habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p>The currently favourable condition assessment suggests that there are no strongly adverse factors influencing this species. However, the species is likely to benefit from positive management for the other SAC features, and may see further improvement in condition as a result. On-going monitoring will allow a better understanding of population fluctuations, distributional changes etc.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). <p>The extent and quality of suitable habitat for brook and river lamprey must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Twaite shad (<i>Alosa fallax</i>). <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site Selection:</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). <p><u>Development</u> Development activities can cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Noise/vibration. Barriers resulting from vibration, chemicals, low dissolved oxygen</p>

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	<p>and artificially high sediment levels must be prevented at key times (generally March to June). The possible barrier effects that might be caused by the installation of an acoustic salmonid fish counter should also be evaluated.</p> <p><u>Effect of Flow Depletion and Entrainment</u> The potential impact of flow depletion resulting from a small number of major abstraction licences, if they were to be fully utilised, was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the impacts on SAC features. These targets are expressed as 1) a flow duration curve using recent daily mean flow data, which is used to set abstraction licence conditions including ‘hands-off flows’ and 2) hourly maximum abstraction rates for certain licences to reduce or remove the effect of diurnal flow variations. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile shad drifting downstream and postspawning adult shad.</p> <p>The extent and quality of suitable shad habitat must be maintained. Spawning habitat is defined as stable, clean gravel/pebble-dominated (approximately 70%) substrate without an armoured layer and with <10% fines in the top 30 cm. Water depth during the spawning and incubation periods should be 50-75 cm. Holding areas are defined as pools of at least 200 cm depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence.</p> <p><u>Sustainable Fishing</u> Anglers occasionally fish for shad, and they are sometimes taken in quite large numbers. Further research is necessary to define sustainable levels of angling. If this shows there is cause for concern a temporary cessation of fishing activity in the vicinity of known spawning grounds during the spawning period should be considered, particularly where shad are known to be taken regularly. Exploitation of shad is currently unregulated and controls are being considered through the review of freshwater fisheries legislation.</p> <p>Commercial fishermen also take shad as a by-catch, with whitebait and shrimp fishing being of particular concern. Changes in fishing methods need to be promoted to minimize captures, while both anglers and trawler men should be encouraged to return alive any individuals caught.</p> <p><u>Minimising Competition</u> Artificially enhanced densities of other fish may introduce</p>

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	<p>unacceptable competition or predation pressure and the aim should be to minimise these risks in considering any proposals for stocking.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Atlantic salmon (<i>Salmo salar</i>). <p><u>Enhancing the Accessibility of the River</u> The Atlantic salmon is the focus for much of the management activity carried out on the Wye. The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is a high priority. Measures to address these problems include the establishment of buffer zones on reaches adjacent to intensively managed livestock grazing or arable land. Tree management, especially coppicing and pollarding to increase light levels to the channel, is also often carried out. Liming has also been carried out in some of the acidified headwaters. The Wye and Usk Foundation through their pHISH project have carried out much of this work in recent years. Other work has included removal of weirs and construction of fish passes to ease artificial barriers to salmon migration, reduction in exploitation pressure through buying out net fisheries in the estuary and the introduction of ‘catch and release’ angling (both mandatory, through NRW by-laws, and voluntary).</p> <p>Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg and fry survival. Clean substrate free from excessive siltation should predominate at suitable spawning sites.</p> <p>In all river types, artificial barriers should be made passable. The impact of existing barriers in the Wye should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented.</p> <p>Spawning habitat is defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256 mm) but with the majority being <150 mm. Water depth during the spawning and incubation periods should be 15-75 cm. Fry habitat is indicated by water of <20 cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40 cm deep and similar substrate. Holding areas are defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence. Coarse woody debris should not be removed from rivers as it plays a significant role in</p>

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	<p>the formation of new gravel beds, and provides cover for fish and a source of food for invertebrates.</p> <p><u>Preventing Pollution</u> In the Wye catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.</p> <p>All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations.</p> <p>Measures to control diffuse pollution in the water environment, including ‘Catchment Sensitive Farming’, may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC.</p> <p><u>Maintaining the Habitat</u> Overhanging trees provide valuable shade and food sources, whilst tree root systems provide important cover and flow refuges for juveniles. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Intake screens must meet statutory requirements under the Salmon & Freshwater Fisheries Act.</p> <p><u>Natural Stocking</u> A small-scale salmon rearing and stocking programme is currently in operation in the Wye, run by the Wye and Usk Foundation. The management objectives for SAC salmon populations are to attain</p>

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	<p>naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. Therefore, there is a presumption that salmon stocking in the Wye SAC will be phased out over time.</p> <p><u>Minimising Competition</u> The presence of artificially high densities of other fish can create unacceptably high levels of predatory and competitive pressure on juvenile salmon and the aim should be to minimise these risks in considering any proposals for stocking. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p><u>Control Exploitation</u> Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries.</p> <p>Net Limitation Orders are used to control the estuarine fishery. Exploitation of salmon by rod fisheries is regulated by NRW licensing and by-laws controlling the fishing season and allowable methods.</p> <p>Fishing activities are implicated in the decline of the salmon; initiatives such as the Wye Salmon Action Plan will help to address this issue.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Bullhead (<i>Cottus gobio</i>). <p>Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences. New instream structures should be avoided, whilst the impact of existing artificial structures needs to be evaluated.</p> <p>The extent and quality of suitable bullhead habitat must be maintained. Elevated levels of fines can interfere with egg and fry</p>

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	<p>survival. Spawning habitat is defined as unsilted coarse (gravel/pebble/cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles/cobbles are therefore important.</p> <p><u>Maintaining the Habitat</u> The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be limited to no more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants. Slack-water areas provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.</p> <p>Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence.</p> <p>Maintenance of intermittent tree cover in conjunction with retention of woody debris helps to ensure that habitat conditions are suitable. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p><u>Minimising Competition</u> Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. Non-native crayfish should be absent from the SAC.</p> <p>The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of fish should be avoided in the SAC.</p> <p><u>Control on numbers of Bullheads</u> Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p>Bullheads are relatively sedentary and interactions between</p>

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	<p>populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact. There should be no stocking/transfers of bullhead unless agreed to be in the best interests of the population.</p> <p>In general, management for other SAC features is expected to result in favourable habitat for bullhead, through improvements in water quality and flow regime and maintenance of suitable physical habitat.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European otter (<i>Lutra lutra</i>). <p><u>Maintaining the Habitat</u> The catchment within Wales should be capable of supporting at least 17 breeding females, based on one breeding female per 20km stretch of river⁵. It is possible that, if all the breeding sites achieve optimal habitat conditions and fish and amphibian stocks are secured, the catchment may then support further breeding animals. However, the amount of compression of home ranges that otters will accept cannot as yet be determined.</p> <p>Management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter population of a size determined by natural prey availability and associated territorial behaviour.</p> <p>The involvement of river users and land managers will be important in improving potential breeding habitat near to the river. Agri-environment schemes and the Better Woodlands for Wales scheme provide possible mechanisms for maintaining suitable sites, such as lightly grazed woodlands, areas of dense scrub, and tussocky fens with purple moor-grass.</p> <p>Food availability is an important factor. Fish biomass should stay within expected natural fluctuations. A potential problem appears to be the decline in eel populations, and similar concerns are apparent with respect to amphibian numbers.</p> <p><u>Increase Safety</u> Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges,</p>

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	<p>tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.</p> <p>Certain areas of the SAC are critical to the movement of otters both within the system and to adjacent sites. The Wye SAC provides a key movement corridor for otters passing between the relatively high densities in mid Wales and the south-east Wales coastal strip (Seven Estuary and Gwent Levels). The function of this aspect of the site should be protected through the maintenance of suitable resting sites (in terms of size, quality and levels of disturbance) through urban centres such as Monmouth.</p> <p><u>Control Pollution</u> Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the (Ranunculion fluitantis and Callitriche-Batrachion) vegetation. <p><u>Maintaining the Habitat</u> Factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, producing unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient status, epiphytic algae may suppress the growth of aquatic flowering plants. Favourable management for this feature is therefore largely dependent on ensuring that sufficient depth, velocity and duration of flow and sufficiently low phosphate levels are maintained within the natural range of the vegetation. A favourable flow regime can be defined with reference to naturalised flows (removing the influence of artificial abstractions and discharges from flow records). While more sophisticated analysis of depth and velocity has been carried out locally for the Review of Consents process, a flow level criterion is generally applied to regulate abstractions. Based on current available information, the recent level of flow depletion downstream of major abstractions, and flow augmentation in middle reaches due to releases from the Elan Valley reservoirs, is not considered to be</p>

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	<p>damaging to this feature, either through limiting its range or adversely affecting its community composition.</p> <p><u>Control Pollution</u> The conservation objectives require that the area covered by the feature is stable or increasing within its natural range, which is likely to require catchment-wide measures to control diffuse pollution from agriculture, as the principal source of phosphate. Measures should be targeted initially at reaches identified as holding potentially important stands of this vegetation that are also known to be suffering from diffuse pollution, such as parts of the Ithon catchment.</p> <p><u>Control non-native species</u> Invasive non-native plants are a detrimental impact on this feature. Japanese knotweed, Himalayan balsam and giant hogweed should be actively managed to control their spread and hopefully reduce their extent in the SAC.</p> <p>Annex I habitats and Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • White-clawed crayfish (<i>Austropotamobius pallipes</i>). <p><u>Restrict non-native species</u> It is illegal to release non-native crayfish into the wild, to keep live crayfish in most of Wales or to trap crayfish without a licence from NRW. The regulations on the keeping, release and trapping of non-native crayfish in Wales should be strictly enforced. The signal crayfish eradication programme implemented by the statutory bodies and partner organisations should be continued.</p> <p>American signal crayfish and crayfish plague are widespread and abundant in nearby catchments such as the Lugg, Arrow and Severn. Crayfish plague can be transferred to streams on wet fishing gear, boots, canoes, machinery, stocked fish etc., so measures such as raising awareness, disinfection facilities and where appropriate restrictions on access, should be implemented where a significant risk is identified.</p> <p><u>Control Pollution</u> Contamination by synthetic pyrethroid sheep dips has a devastating impact on crayfish populations. Impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently</p>

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	<p>dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations. The statutory bodies and partner organisations should implement a programme of licensed translocations to enable white-clawed crayfish to be reintroduced to reaches where they have been wiped out by sheep dip pollution and/or crayfish plague outbreaks.</p> <p>Engineering works such as bridge repairs in reaches where white-clawed crayfish are known to occur should include appropriate pollution prevention measures and a crayfish rescue by a suitably licensed person where there is a risk of physical damage to crayfish.</p> <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site Selection:</p> <ul style="list-style-type: none"> • Transition Mires and Quaking Bogs: <p><u>Grazing</u> A suitable grazing regime should be implemented by agreement with the land managers. Any risk of elevated nutrient status due to run-off into the site should be addressed by measures including buffer zones around the mire area and inflow streams.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Sea lamprey (<i>Petromyzon marinus</i>)</p> <ul style="list-style-type: none"> • Distribution within catchment <ul style="list-style-type: none"> ○ Units 1A-D, 2A, 2B, 6, 7 – Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon ammocoetes</i>. <p>This attribute provides evidence of successful spawning and distribution trends. Spawning sites known to have been used within the previous 10 years and historical sites considered still to have suitable habitat are shown in Annex 4. Spawning locations may move within and between sites due to natural processes and new sites may be discovered over time. Silt beds downstream of all sites will be sampled for presence or absence of ammocoetes. Where apparently suitable habitat at any site is unoccupied feature condition will be considered unfavourable.</p> <ul style="list-style-type: none"> • Ammocoete density. <ul style="list-style-type: none"> ○ Units 1A-D, 2A, 2B, 6, 7 – Ammocoetes should be present in at least four sampling sites each not less

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	<p>than 5km apart.</p> <p>This standard CSM attribute establishes a minimum occupied spawning range, within any sampling period, of 15km.</p> <p>Brook lamprey (<i>Lampetra planeri</i>)</p> <ul style="list-style-type: none"> • Age/size structure of ammocoete population. <ul style="list-style-type: none"> ○ All units – Samples < 50 ammocoetes ~ 2 size classes. Samples > 50 ammocoetes ~ at least 3 size classes. <p>This gives an indication of recruitment to the population over the several years preceding the survey. Failure of one or more years recruitment may be due to either short or long term impacts or natural factors such as natural flow variability, therefore would trigger further investigation of the cause rather than leading automatically to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution of ammocoetes within catchment. <ul style="list-style-type: none"> ○ All units – Present at not less that 2/3 of sites surveyed within natural range. <p>The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit. Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> ○ All units – No reduction in distribution of ammocoetes. <p>Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit or sub-unit/tributary, and will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Ammocoete density. <ul style="list-style-type: none"> ○ All units – Optimal habitat: >10m² overall Catchment mean: >5m². <p>Optimal habitat comprises beds of stable fine sediment or sand >15cm deep, low water velocity and the presence of organic detritus, as well as, in the Wye, shallower sediment, often patchy and interspersed among coarser substrate.</p> <p>Twaite shad (<i>Alosa fallax</i>)</p> <ul style="list-style-type: none"> • Spawning distribution. <ul style="list-style-type: none"> ○ Units 1A-D, 2A – No decline in spawning distribution.

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	<p>Spawning distribution is assessed by kick sampling for eggs and/or observations of spawning adults. A representative sample of sites within units 1C and 2A will be monitored at 3 yearly intervals. Absence from any site in 2 consecutive surveys will result in an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Flow <ul style="list-style-type: none"> ○ Units 1A-D – Targets are set in relation to river/reach type(s). <p>Targets equate to those levels agreed and used in the Review of Consents. Shad are particularly sensitive to flow. The ideal regime is one of relatively high flows in March-May, to stimulate migration and allow maximum penetration of adults upstream, followed by rather low flows in June-September, which ensures that the juveniles are not washed prematurely into saline waters and grow rapidly under warmer conditions. The release of freshets to encourage salmonid migration should therefore be discouraged on shad rivers during this period.</p> <p>Atlantic salmon (<i>Salmo salar</i>)</p> <ul style="list-style-type: none"> • Adult run size. <ul style="list-style-type: none"> ○ All units – Conservation Limit complied with at least four years in five. <p>CSM guidance states: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-seawinter component. As fish counter data in the Wye is considered unreliable (NRW pers. comm.), adult run size is calculated using rod catch data. Further details can be found in the Wye Salmon Action Plan available at: http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/static/documents/Research/wyesap_e_603710.pdf</p> <ul style="list-style-type: none"> • Juvenile densities. <ul style="list-style-type: none"> ○ All units except 1A-D, 2A – Expected densities for each sample site using HABSCORE. <p>CSM guidance states: These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality. Assessed using electrofishing data.</p> <ul style="list-style-type: none"> • Water and Biological Quality. <ul style="list-style-type: none"> ○ Units 6-10 – Biological GQA class A.

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	<p>This is the class required in the CSM guidance for Atlantic salmon, the most sensitive feature.</p> <ul style="list-style-type: none"> • Chemical quality. <ul style="list-style-type: none"> ○ All units – RE1. <p>It has been agreed through the Review of Consents process that RE1 will be used throughout the SAC.</p> <ul style="list-style-type: none"> • Hydromorphology and Flow. <ul style="list-style-type: none"> ○ All units – Targets are set in relation to river/reach type(s). <p>Targets equate to those levels agreed and used in the Review of Consents.</p> <p>Bullhead (<i>Cottus gobio</i>)</p> <ul style="list-style-type: none"> • Population densities. <ul style="list-style-type: none"> ○ All units except 1A, 1B – No less than 0.2m² in sampled reaches. <p>CSM guidance states that densities should be no less than 0.2m² in upland rivers (source altitude >100m) and 0.5 m⁻² in lowland rivers (source altitude ≤100m). A significant reduction in densities may also lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution. <ul style="list-style-type: none"> ○ All units except 1A, 1B – Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current. <p>Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Reproduction / age structure. <ul style="list-style-type: none"> ○ All units except 1A, 1B – Young-of-year Fish should occur at densities at least equal to adults. <p>This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.</p> <p>European otter (<i>Lutra lutra</i>)</p> <ul style="list-style-type: none"> • Distribution.

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	<ul style="list-style-type: none"> ○ All units – Otter signs present at 82-90% of Otter Survey of Wales sites in sub-catchments ● Breeding activity. <ul style="list-style-type: none"> ○ All units – Reports of cub/family sightings (no specified limit). ● Actual and potential breeding sites. <ul style="list-style-type: none"> ○ All units – No decline in number and quality of mapped breeding sites in subcatchments. Increase from 5 to 9 sites in Middle Wye sub-catchment. <p>In the Wye catchment within Wales, 32 actual or potential breeding sites have been identified (19 within the Wye SAC), distributed throughout the catchment on the main river and tributaries. It is recommended that this should increase to at least 40 (23 within Wye SAC) 5. Note: breeding territories typically contain more than one breeding site.</p> <p>Water courses of plain to montane levels with the (Ranunculion fluitantis and Callitriche Batrachion) vegetation</p> <ul style="list-style-type: none"> ● Distribution within catchments. <ul style="list-style-type: none"> ○ All units – Distribution within site units. <p><i>Ranunculus</i> spp. will be present with a cover of at least 10% in any three representative sample 100m stretches of suitable habitat.</p> <ul style="list-style-type: none"> ● Typical species. <ul style="list-style-type: none"> ○ All units – Species list for reference vegetation type. ● Native species. <ul style="list-style-type: none"> ○ All units – Cover of indicators of eutrophication maintained below threshold over the medium to long term. <p>CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals.</p> <p>For the Wye SAC: Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. And <i>Vaucheria</i> spp.) should not have a cover value of greater than 10% in 3 consecutive years.</p> <ul style="list-style-type: none"> ● Alien / introduced species. <ul style="list-style-type: none"> ○ All units – No impact on native biota from alien or introduced species. <p>In the CSM guidance, the SERCON scoring system for naturalness of aquatic and marginal macrophytes and naturalness of banks and riparian zone, are used to assess this attribute. SERCON protocols</p>

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	<p>have not been applied in the Wye SAC, therefore assessment of this attribute relies on locally defined thresholds and expert judgement.</p> <p>White-clawed crayfish <i>Austropotamobius pallipes</i></p> <ul style="list-style-type: none"> • Adult/juvenile densities. <ul style="list-style-type: none"> ○ Units 3, 4, 5 & 6 – Abundance in habitat patches above threshold. <p>Average number of crayfish in each habitat patch surveyed by stone turning and trapping combined should be greater than 1.</p> <ul style="list-style-type: none"> • Distribution <ul style="list-style-type: none"> ○ Units 3, 4, 5 & 6 – Distribution in suitable reaches (monitoring units). <p>Suitable reaches within the relevant management units will be mapped using fluvial audit information validated with historic data and the results of population monitoring. Absence of white-clawed crayfish from any of these reaches revealed by on-going monitoring will result in an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Invasive non-native crayfish. <ul style="list-style-type: none"> ○ All units – Absence of non-native crayfish from the SAC. <p>Collation of <i>ad hoc</i> records of non-native crayfish in the Wye catchment and adjacent areas and monitoring in conjunction with control programmes using trapping.</p> <ul style="list-style-type: none"> • Porcelain disease in white-clawed crayfish. <ul style="list-style-type: none"> ○ Units 3, 4, 5 & 6 – Incidence <10%. <p>Incidence to be recorded during population monitoring.</p> <p>Quaking bogs and transition mires</p> <ul style="list-style-type: none"> • Habitat extent. <ul style="list-style-type: none"> ○ Unit 9 – No reduction in total extent. <p>This would be indicative of drying out due to a change in hydrological processes/wetland structure & function.</p> <ul style="list-style-type: none"> • Habitat composition. <ul style="list-style-type: none"> ○ Unit 9 – No significant increase in woodland/scrub. <p>This would be indicative of drying out due to a change in hydrological processes/wetland structure function and/or vegetation</p>

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	<p>succession due to a change in grazing pressure.</p> <ul style="list-style-type: none"> • Habitat structure. <ul style="list-style-type: none"> ○ Unit 9 – Cover of exposed substrate/litter. <p>May indicate either over- or under-grazing.</p> <ul style="list-style-type: none"> • Vegetation composition. <ul style="list-style-type: none"> ○ Unit 9 – Indicator species presence/frequency for reference vegetation type(s). No significant reduction in key type(s). <p>Should conform to appropriate NVC type(s) and/or locally defined vegetation composition criteria as appropriate. Shifts in vegetation composition may indicate change in hydrology, nutrient status and/or grazing pressure.</p> <ul style="list-style-type: none"> • Native species. <ul style="list-style-type: none"> ○ Unit 9 – Cover of indicators of under-grazing, drainage, eutrophication or disturbance maintained below threshold. <p>May include graminoids such as <i>Phragmites australis</i>, <i>Phalaris arundinacea</i>, <i>Glyceria maxima</i>, <i>Typha latifolia</i>, <i>Juncus</i> spp., <i>Molinia caerulea</i>; tall herbs such as <i>Epilobium hirsutum</i>, <i>Urtica dioica</i>, <i>Pteridium aquilinum</i>, <i>Rubus fruticosus</i>; bryophytes such as <i>Brachythecium rutabulum</i>, <i>Eurhynchium praelongum</i>, <i>Sphagnum recurvum</i>; tree and shrub spp. (CSM Lowland fens guidance).</p> <ul style="list-style-type: none"> • Invasive non-native species. <ul style="list-style-type: none"> ○ Unit 9 – No impact on native biota from invasive non-native or introduced species. <p>Possible invasive non-natives include New Zealand swamp-stonecrop <i>Crassula helmsii</i>: although not recorded at the site, any records should be verified and followed up with control measures.</p> <ul style="list-style-type: none"> • River Lamprey (<i>Lampetra fluviatilis</i>). • Allis shad (<i>Alosa alosa</i>). <p>Refer to Core Management Plan (including conservation objectives) for The River Wye Special Area of Conservation (2008) for further information at: http://www.ccqc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=ca855867-39a7-4900-9288-4c619292715f&version=-1)</p>

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<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Sea lamprey (<i>Petromyzon marinus</i>) Favourable: Unclassified. ▪ Brook lamprey (<i>Lampetra planeri</i>) and River Lamprey (<i>Lampetra fluviatilis</i>) Unfavourable: Unclassified. ▪ Twaité shad (<i>Alosa fallax</i>) Unfavourable: Unclassified. ▪ Allis shad (<i>Alosa alosa</i>) Unfavourable: Unclassified. ▪ Atlantic salmon (<i>Salmo salar</i>): Unfavourable: Unclassified. ▪ Bullhead (<i>Cottus gobio</i>) Unfavourable: Unclassified. ▪ European otter (<i>Lutra lutra</i>): Unfavourable. ▪ Water courses of plain to montane levels with the (<i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i>) vegetation: Unfavourable: Unclassified. ▪ White-clawed crayfish (<i>Austropotamobius pallipes</i>): Unfavourable: Declining ▪ Transition mires and quaking bogs: Unfavourable: Unclassified
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Agricultural Pollution</u> In the Wye catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off.</p> <p>Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life.</p> <p>Contamination by synthetic pyrethroid sheep dips has a devastating impact on crayfish populations. Impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally.</p>

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	<p><u>Pollution and Water Quality</u> Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering or likely to impact upon the site should be monitored, reviewed and altered if necessary.</p> <p>Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p> <p>Conservation objectives require the area covered by <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation are stable or increasing within their natural range, likely to require catchment-wide measures to control diffuse pollution from agriculture, as the principal source of phosphate. Measures should be targeted initially at reaches identified as holding potentially important stands of this vegetation that are also known to be suffering from diffuse pollution, such as parts of the Ithon catchment.</p> <p>Any risk of elevated nutrient status due to run-off into the site should be addressed by measures including buffer zones around the transition mires and quaking bogs area, and inflow streams.</p> <p><u>Competition from non-native species</u> The American signal crayfish is present in the Wye catchment and poses a very serious threat to the continued existence of the native white-clawed crayfish in the site and in Wales. Native crayfish are unable to co-exist where signal crayfish are present, due to the latter's superior competitive ability and a disease, crayfish plague, which it carries but to which native crayfish have no immunity. Signal crayfish are also extremely harmful to fish communities and the overall ecology of the river.</p> <p>Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. Non-native crayfish should be absent from the SAC.</p> <p>The presence of artificially high densities of other fish can create unacceptably high levels of competitive pressure on juvenile salmon and the aim should be to minimise these risks of illegitimate stocking and with proposals for stocking.</p>

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	<p><u>Development & Improved Infrastructure to Strengthen Safety</u> Development activities can cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Barriers resulting from vibration, chemicals, low dissolved oxygen and artificially high sediment levels must be prevented at key times (generally March to June).</p> <p>Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering, or likely to impact upon the site should be monitored, reviewed and altered if necessary.</p> <p>Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, and provides cover for fish and a source of food for invertebrates.</p> <p>Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence particularly in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods for bullheads.</p> <p>Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.</p> <p>Engineering works such as bridge repairs in reaches where white-clawed crayfish are known to occur should include appropriate pollution prevention measures and a crayfish rescue by a suitably licensed person where there is a risk of physical damage to crayfish.</p> <p>Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.</p> <p><u>Recreation and Leisure</u></p>

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	<p>Anglers occasionally fish for shad, sometimes taken in quite large numbers. Further research is necessary to define sustainable levels of angling. If there is cause for concern, a temporary cessation of fishing activity in the vicinity of known spawning grounds during the spawning period should be considered, particularly where shad are known to be taken regularly. Exploitation of shad is currently unregulated and controls are being considered through the review of freshwater fisheries legislation.</p> <p>Recreational activities (walking and gorge walking amongst others) and often associated tourist development could potentially have a variety of adverse impacts such as damage riparian habitats, developments increase run-off, excessive erosion and disturbance.</p> <p><u>Water Abstraction</u> The potential impact of flow depletion resulting from a small number of major abstraction licences, if they were to be fully utilised, was highlighted in the Review of Consents process. As a result of this process, flow targets have been set which are considered likely to significantly reduce or remove the potential impacts on SAC features. These targets are expressed as 1) a flow duration curve using recent daily mean flow data, used to set abstraction licence conditions including ‘hands-off flows’ and 2) hourly maximum abstraction rates for certain licences to reduce or remove the effect of diurnal flow variations.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes and other annex II species is required before acceptable levels can be assessed.</p> <p><u>Migration Barriers</u> There are also requirements for screening of water abstraction intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p>In all river types, artificial barriers should be made passable with impact of existing barriers assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented.</p> <p><u>Sedimentation / Siltation</u> Increased sedimentation can have an adverse affect on extent and quality of habitat, spawning area and overall survival rates of river</p>

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	<p>lamprey and other annex II species.</p> <p>Siltation impacts the demanding water quality and spawning substrate quality for salmon. Measures to address these problems include the establishment of buffer zones on reaches adjacent to intensively managed livestock grazing or arable land. Tree management, especially coppicing and pollarding to increase light levels to the channel, is also often carried out. Liming has also been carried out in some of the acidified headwaters.</p>
<p>Landowner/ Management Responsibility</p>	<p>River Wye (Lower Wye)</p> <ul style="list-style-type: none"> ▪ Twaite shad spawn in Unit 1C & possibly in 1D and migrate through Units 1A & 1B, where they may be subject to disturbance impacts, so are selected as key features in all units. Sea and river lamprey migrate though all units and may spawn. ▪ Management for twaite shad and sea lamprey is expected to also be sympathetic for Atlantic salmon, river/brook lamprey and bullhead. ▪ Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units. ▪ The status of allis shad is uncertain in River Wye (Lower Wye) SSSI. It is assumed to be present in the same units as twaite shad. ▪ White-clawed crayfish have been recorded in the River Wye at Hay-on-Wye and in adjacent tributaries including Clyro Brook and Dulas Brook. <p>River Wye (Upper Wye)</p> <ul style="list-style-type: none"> ▪ Atlantic salmon is a key feature in Unit 2B due to the presence of spawning sites, although salmon may occasionally also spawn within Unit 2A. ▪ Twaite shad is recorded spawning throughout Unit 2A but only infrequently upstream of the River Irfon confluence. ▪ The status of Allis shad is uncertain in the River Wye SAC. Allis shad is assumed to be present in the same units as twaite shad, but normally migrates further upstream and therefore would be expected to occur in the upper river. ▪ Sea lamprey is frequently recorded spawning within Unit 2A; spawning has also been recorded within Unit 2B as far upstream as Rhayader. ▪ Management for Atlantic salmon, twaite shad and sea lamprey is expected to be sympathetic for river/brook lamprey and bullhead.

<p>Site Name: River Wye Location Grid Ref: SO109369 JNCC Site Code: UK0012642 Size: 2234.89 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<ul style="list-style-type: none"> ▪ Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units. <p>River Wye (Tributaries)</p> <ul style="list-style-type: none"> ▪ The tributaries included in this SSSI form the core range of the white-clawed crayfish in the River Wye SAC. ▪ Atlantic salmon spawn in all tributaries within this SSSI although in the Sgithwen and Cletwr their natural range is limited to the lower reaches by waterfalls. ▪ Twaite shad, allis shad and sea lamprey are thought not to occur within this SSSI. <p>Afon Llynfi</p> <ul style="list-style-type: none"> ▪ An important population of white-clawed crayfish occurs in this SSSI. ▪ Twaite shad, allis shad and sea lamprey are not known to occur within this SSSI but habitat in the lower reaches may possibly be suitable. <p>Duhonw</p> <ul style="list-style-type: none"> ▪ An important population of white-clawed crayfish formerly occurred in this SSSI; restoration of the species here is a management objective. ▪ Twaite shad, allis shad and sea lamprey are thought not to occur within this SSSI. <p>Afon Irfon</p> <ul style="list-style-type: none"> ▪ Small populations of white-clawed crayfish are known to occur in the rivers Hafrena and Chwefri in this SSSI; restoration of the species here and to parts of its former range including the Garth Dulas is a management objective. ▪ Twaite shad is frequently recorded spawning in the lowest approximately 0.6km of the Afon Irfon and at the confluence with the River Wye. ▪ The status of Allis shad is uncertain in the River Wye SAC. Allis shad is assumed to be present in the same units as twaite shad, but normally migrates further upstream and therefore would be expected to occur in the upper river. ▪ Sea lamprey is reported spawning within the Afon Irfon. ▪ Atlantic salmon is recorded spawning throughout this SSSI but reproductive success is limited in parts of the upper Afon Irfon and Gwesyn due to acidification related to forestry. <p>River Ithon</p> <ul style="list-style-type: none"> ▪ White-clawed crayfish has been recorded in this SSSI, including in Howey Brook, however its restoration to this

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	<p>sub-catchment is not a current management objective.</p> <ul style="list-style-type: none"> ▪ Twaite shad, allis shad and sea lamprey are not known to occur within this SSSI but habitat in the lower reaches may possibly be suitable. <p>Upper Wye Tributaries</p> <ul style="list-style-type: none"> ▪ This SSSI forms an important part of the spawning range of Atlantic salmon. <p>Colwyn Brook Marshes (North & South)</p> <ul style="list-style-type: none"> ▪ This is the only component SSSI of the River Wye SAC that contains the feature 'quaking bogs and transition mires'. ▪ The site comprises 5 separate ownership units.
<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to The Brecon Beacons National Park Deposit Local Development Plan Sustainability Appraisal Report (incorporating Strategic Environmental Assessment) (2010) for further information at: http://www.beacons-npa.gov.uk/the-authority/planning/strategy-and-policy/deposit-local-development-plan/sustainability-appraisal-report</p> <p>Refer to Monmouthshire Council's Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

<p>Site Name: Usk Bat Sites Location Grid Ref: SO190145 JNCC Site Code: UK0014784 Size: 1868.4 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site encompasses a series of lesser horseshoe bat roosts, upland habitats, woodlands and cave systems located around the valley of the River Usk near to Abergavenny.</p> <p>Mynydd Llangatwg is an area of open moorland and bog, with an impressive limestone escarpment along the northeastern edge, and is one of the largest exposures of upland limestone crag in south Wales. The Craig y Cilau National Nature Reserve (NNR) covers a large proportion of this escarpment area, including most of the unquarried scarp, with areas of limestone grassland, scree and quarry spoil, woodland and scrub. A small raised bog (Waun Ddu) bordered by two small streams has developed below the escarpment. An extensive system of caves lies beneath Mynydd Llangatwg and the plateau is peppered with sinkholes.</p> <p>The main reason for the presence of the NNR is to help control and manage access to the cave system to protect the bat roosts and the underground geology and also the surface habitats, which support an outstanding assemblage of plants. Species include large and small-leaved lime, several species of whitebeam (including least whitebeam (<i>Sorbus minima</i>) which is unique to this area of Brecknock), limestone fern, endemic hawkweeds and alpine enchanter's-nightshade.</p> <p>The chasmophytic vegetation encompasses the various crevices, nooks and crannies on the cliffs, boulders and partially vegetated unstable slopes of the limestone escarpment. It supports a typical range of ferns, bryophytes and calcareous lichens; these include ferns such as maidenhair spleenwort, mosses like (<i>Tortella tortuosa</i>), and liverworts like <i>Scapania aspera</i>.</p> <p>This site is known to support a number of notable lichen species and provides some of the best examples in the area of calcicolous lichen communities, which include the jelly lichen (<i>Collema cristatum</i>) and examples of lichen communities like the (<i>Leproplacetum chrysodetae</i>) and (<i>Aspicilion calcarea</i>).</p> <p>Patches of Tileo-Acerion forest are also scattered along the length of the cliffs on Mynydd Llangatwg and intermixed with beechwood in the Clydach gorge. These areas also support a number of rare whitebeams (<i>Sorbus spp.</i>).</p>
<p>Qualifying Features</p>	<p>Annex II species present as a primary reason for site selection:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>).

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	<p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Blanket Bog. ▪ Tilio-Acerion forests of slopes, screes and ravines. ▪ Calcareous rocky slopes with chasmophytic vegetation. ▪ Caves not open to the public. ▪ Degraded raised bogs still capable of natural regeneration. ▪ European dry heaths.
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p><u>Mynydd Llangatwg SSSI</u> The cave system provides a winter hibernation site for large numbers of lesser horseshoe bats and other bat species, including Brandt's, whiskered, Daubenton's, Natterer's, brown longeared and, occasionally, greater horseshoe bats. Numbers of roosting bats, particularly lesser horseshoes, are stable or increasing in the system as a whole.</p> <p>The special underground features are accessible to allow study of the cave system and its many structures of interest, with both scientific and recreational use and cave exploration managed to safeguard the important sediments and cave features, and to prevent harmful disturbance of hibernating bats and other cave life.</p> <p>There are large funnel-shaped depressions (shake-holes) on the moorland plateau, caused by the collapse of caverns in the limestone below and some of these form swallow-holes allowing surface water to descend underground to feed into the cave system. Some of these are naturally blocked and form peaty pools and bog-filled hollows. Cave-related surface features are protected from physical disturbance or infilling. In places there are crags, pavements and large boulder fields of the acidic quartz-sandstones.</p> <p>A mixture of blanket bog, wet heath and dry heath habitats cover most of the upland plateau. Most of the bog and heathland is dominated by small shrubs like heather, bilberry, crossleaved heath and crowberry, which flower freely. Wetter areas have a carpet of bog-mosses, where bog rosemary, a plant more typical of northern Britain, is found. Round-fruited collarmoss is locally abundant on cattle and sheep dung, which decays slowly in the damp acidic, peaty conditions. In early summer the white 'cotton tufts' of hare's-tail cottongrass are prominent in boggy areas, although it is never overwhelmingly dominant. The red and golden yellow hues of common cottongrass</p>

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	<p>and deer-grass leaves mark out areas of bog and wet heath in the autumn. The raised bog at Waun Ddu exhibits a well-marked peat dome and is actively growing and covered with an abundance of peat-forming bog mosses.</p> <p>There may be a scattering of taller rushes and purple moor-grass in the bog and wet heath areas, but their growth is not so thick as to smother other plants.</p> <p>The heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. Grasses may be present between the dwarf-shrub bushes or on open areas, but they do not make up more than a quarter of the sward in these areas. The bog, heathland and the associated rock and grassland areas form a valuable habitat mixture for nesting and feeding by upland birds including waders, red grouse and skylarks. The shaggy tops of the moorland, developed on the acid quartz-sandstone, contrast sharply with the short-grazed, sweet grasslands of sheep's-fescue and bent grasses around the limestone cliffs, where small sedges, the pink of flowers of thyme and variety of colourful grassland fungi are common. Plants indicating disturbance and nutrient enrichment, such as thistles, perennial ryegrass, white clover and creeping buttercup, and those indicating of under-grazing, such as coarse grasses, and tree and shrub seedlings and saplings, are not prominent in the grassland sward. Hawthorn and bramble scrub occurs in places and it provides valuable habitat for birds and insects but it is not encroaching onto the more open grassland.</p> <p>The cliffs and rock screes also support patches of open woodland and scrub. Ash is the main canopy tree but there is also small-leaved lime, with some scattered beech and large-leaved lime, with hawthorn and hazel scrub common in places. Several types of rare whitebeam trees thrive on the cliffs. The ungrazed cliffs also provide a refuge for rare hawkweeds.</p> <p>Regeneration of young trees is sporadic as much of the area is common grazing land. As well as living trees with holes, hollows and rotten branches, there are also dead and dying trees providing the essential balance between decay and new growth and creating vital habitat for other wildlife like birds, insects and fungi.</p> <p>The flora on the cliffs, screes and woodland floor sometimes appears sparse, consisting of mainly grasses, ferns, mosses and liverworts, but it includes uncommon plants like mountain melick, alpine enchanter's-nightshade, angular Solomon's-seal and rare hawkweeds. The scarce limestone fern grows abundantly through</p>

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	<p>some of the limestone screes. Sparsely vegetated soil around the cliffs also supports a number of interesting plants that are adapted to summer drought conditions, including the scarce <i>Hutchinsia</i>. The limestone rocks themselves also have a well-developed lichen and moss flora, including many scarce and rare species. Vigorous plants, such as nettles, bramble and ivy, are nowhere dominant within the woodland and the rock faces, crevices and scattered boulders are free from disturbance.</p> <p>Wooded habitat is readily accessible to foraging bats, particularly the more flight-line dependant lesser horseshoe, with roost sites being connected to scrub and woodland via strong interconnecting linear habitat features such as hedges and wooded streams.</p> <p>For each habitat or species of particular interest, the area or population is stable, or increasing and its quality is maintained. The factors that may affect these habitats and species are all under control.</p> <p><u>Siambre Ddu SSSI</u> The cave is maintained in a near natural state, which benefits both wildlife and geological interests.</p> <p>The peak winter count in Siambre Ddu cave is 50 horseshoe bats and, when combined with concurrent counts at other caves in the vicinity, this indicates a stable or rising population trend. Scientific, recreational use and cave exploration are managed to safeguard the important cave features and to prevent harmful disturbance of hibernating bats and other cave life.</p> <p>Scattered scrub provides bat feeding habitat within the site and also a connection, or flightline along which the bats can navigate, between the roost and foraging habitat outside the SSSI.</p> <p><u>Buckland Coach House & Ice House SSSI</u> The coach house is home to a breeding population of at least 400 adult lesser horseshoe bats.</p> <p>The Ice house provides a winter hibernation site, with 300 or more lesser horseshoes using it in most years, although many of these bats may relocate to other associated winter roosts during particularly cold weather. The Ice house also continues to serve as a day time roost and a night time roost by smaller numbers of bats at other times of the year. Numbers of roosting bats should be stable or increasing in both buildings. Both the coach house and Ice house are maintained in a suitable condition for use by the bats.</p>

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	<p>They are in good repair and the roosting spaces are undisturbed. The correct temperatures and humidity are maintained in both roosting areas. The bats have unhindered access to both structures, with uninterrupted scrubby or wooded flight corridors between the roost entrances and away to foraging areas at Buckland Plantation and elsewhere. All other factors (see issues below) that affect the species are under control.</p> <p><u>Foxwood SSSI</u> The fissures/cavities within the site provide undisturbed day and night-time roosts throughout the year for the lesser horseshoe population. The peak winter count is around 140 or more and indicates a stable or rising population trend. The surrounding woodland is continuous and composed of mixed species native to the site and provides good undisturbed foraging opportunities with flight routes out to other roosts and foraging areas.</p> <p>Annex II species present as a primary reason for site selection:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The site will support a sustainable population of lesser horseshoe bats in the River Usk area. ▪ The population will viable in the long term, acknowledging the population fluctuations of the species. ▪ Buildings, structures and habitats on the site will be in optimal condition to support the populations. ▪ Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, and mortality from predation or vehicle collision, changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range. ▪ Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be neither reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat. ▪ There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines - there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management. ▪ All factors affecting the achievement of the above conditions are under control.

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	<p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Blanket Bog. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The extent, quality and species richness of the blanket bog vegetation is maintained and, where possible, degraded bog is restored to good condition so that this habitat occupies its full potential range within the site. ▪ The bog vegetation is largely a mixture of dwarf shrubs, hare's-tail cottongrass and mosses, including bog-mosses. ▪ Extensive areas of purple moor-grass or hare's-tail cottongrass show signs of recovery towards a more mixed dwarf shrub sward. ▪ The natural hydrological regime is maintained and there is continued peat formation and thus carbon storage. ▪ Areas of bare peat are not extensive and most areas show signs of recovery. ▪ Peat profiles containing important pollen records are maintained. ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in favourable conservation status within the site, as a functioning and regenerating ash woodland, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ There are extensive patches of semi-natural woodland on the cliffs of the Llangatwg escarpment and hillsides in the Clydach gorge. ▪ The woodland canopy is dominated by locally native species, including lime ash <i>Fraxinus excelsior</i>, <i>Tilia</i> spp., pedunculate oak <i>Quercus robur</i>, hazel <i>Corylus avellana</i>, birch <i>Betula</i> spp., whitebeams <i>Sorbus</i> spp. and, in the Clydach gorge, beech <i>Fagus sylvatica</i>. Rare whitebeams are a significant component of the canopy. ▪ Saplings of locally native species dominate the tree regeneration and there is evidence of sufficient regeneration to maintain the canopy in the long term. ▪ There is an accumulation of standing and fallen deadwood as the woodland develops. ▪ The woodland ground flora is composed of a range of typical native plants including enchanters-nightshade <i>Circaea</i>

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	<p><i>lutetiana</i>, dog's-mercury <i>Mercurialis perennis</i>, wood-sorrel <i>Oxalis acetosella</i>, hart's-tongue <i>Phyllitis scolopendrium</i> and wood sage <i>Teucrium scorodonia</i>.</p> <ul style="list-style-type: none"> ▪ The populations of rare whitebeams are stable or increasing. ▪ Young sycamore <i>Acer pseudoplatanus</i> trees are rare, as are beech <i>Fagus sylvatica</i> in areas away from the Clydach gorge. ▪ Plants indicating disturbance and nutrient enrichment, such as nettles, cleavers and weeds, are not dominant in the ground flora of the woodland. • All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Sufficient vegetation within crevices remains free from disturbance to support typical plants, including mosses, ferns and rare hawkweeds (<i>Hieracium</i> spp.) and allow them to sustain their populations into the future. ▪ Areas accessible to grazing animals should free from being smothered by ivy or heavily shaded by trees. ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Caves not open to the public. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The cave system provides a winter hibernation site for large numbers of lesser horseshoe bats and other bat species, including Brandt's, whiskered, Daubenton's, Natterer's, brown longeared and, occasionally, greater horseshoe bats. ▪ Numbers of roosting bats are stable or increasing in the system as a whole. ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Degraded raised bogs still capable of natural regeneration.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The extent, quality and diversity of raised bog vegetation is maintained and, where possible, restored to good condition, with active moss and peat growth across the raised bog surface. ▪ The vegetation consists of a mixture of dwarf shrubs, hare’s-tail cottongrass, deergrass and bog mosses, grading at the edges into acid and alkaline flushes influenced by acidic water draining from the bog and springs rising in the limestone catchment. ▪ All factors affecting the achievement of the above conditions are under control. <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The extent, quality and diversity of heath vegetation within the constituent sites is maintained and, where possible, degraded heath is restored to good condition. ▪ The main heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 21 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land tenure.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex II species present as a primary reason for site selection:</p> <ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). <p><u>Buildings or structures used by bats</u> The nursery roost sites need to be maintained in a suitable condition. This entails ensuring that bats have continued access to the buildings, and that the buildings themselves good repair, for example, by ensuring that the roofs are weatherproof. Alterations/neglect to the structure of the buildings could result in</p>

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	<p>the site becoming unsuitable as a nursery roost by causing changes to the internal conditions of the roost.</p> <p>A vital element of the bats' behaviour involves extensive flight within a roost prior to emergence, which occurs shortly after dusk. Therefore the bats require fairly large open areas within the coach house roof and first floor voids to fly before they emerge. It is important that these areas are unobstructed and that the flying space (volume) is not significantly reduced. Areas used for preemergence flight should not be used for storage.</p> <p>There should be no likelihood of the icehouse at Buckland collapsing due to instability of material or damage from tree roots. Vegetation close to entrances should be maintained, but should not obstruct them. The grill on the icehouse should be maintained to control the risk of disturbance. Any Forestry or other work near the icehouse must be assessed to ensure there is no risk of damage to the Ice House.</p> <p>Usage by machinery of the track in the forestry above the Ice House should be discouraged. Lesser horseshoe bats prefer to enter roosts through holes large enough for unimpeded flight. It is important that bat access points into the roost sites remain open and unaltered. If access holes are too small or become blocked it could result in the abandonment of the site by the colony. Ideally access holes should be 30 cm high by 40-50 cm wide. Vegetation close to entrances should be maintained, but should not obstruct them.</p> <p>If any works are required to the maternity roosts, or Buckland icehouse, the methods and timing of works will need to minimise disturbance to the bats. January and February are likely to be the best months for such works at the coach house, whilst at the icehouse any essential repairs will be best carried out during the May to September period. At both roosts the exact method and timing will need to be assessed carefully based on the detail. In areas where bats roost the materials used, any treatments and any fumes created or residues left will need to be non-toxic to bats. Likewise operations outside the roost will also need to avoid the creation of fumes that may enter the roost areas or persist in areas that the bats use.</p> <p><u>Cave structures used by bats</u> Lesser horseshoe bats prefer to enter roosts through holes large enough for unimpeded flight. It is important that bat access points into the roost sites remain open and of suitable size. Vegetation close to entrances should be maintained, but should not obstruct</p>

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	<p>them. Any structures placed at cave entrances to prevent unauthorized access should not hinder the passage of bats.</p> <p>Cave management should involve and build on existing measures which are principally voluntary mechanisms implemented by cavers, such as marking through routes, use of agreed codes of practice and provision of information on key areas used by bats.</p> <p>Occasionally excavation may be required to maintain cave entrances and clear debris that has fallen in the caverns and passages. Any excavation or clearance work needs to be carefully controlled. Early July is likely to be the best time for any works are required to the cave itself, with a higher chance of no bats being resident in day time hours. Any materials or treatments used and any fumes created or residues left will need to be non-toxic to bats. Likewise operations outside the roost will also need to avoid the creation of fumes that may enter the roost areas or persist in areas that the bats use.</p> <p>Underground hibernation roosts should be dark, cool and humid with stable temperature (8 -120C) beyond the entrance zone. However, the boulder roof of the Foxwood cave is gappy and internal temperatures are dependant on external temperatures, unlike the situation in many true caves. The consequence is that declining winter ambient temperature leads to a decline in roost temperature and in the colder winter months roost temperature falls below the required temperature range, triggering departures of bats to other unknown roosts. These may be within deeper unknown cave within the SSSI or elsewhere. By reducing the amount of airflow through the roof at Foxwood, it should be possible to increase temperature stability and winter temperatures. This is potentially of benefit to winter survival rates. As with any changes to the roost, works should only occur after careful consideration of the risks involved and with certainty of no adverse effect.</p> <p><u>Habitat Management</u> Connectivity of woodland, hedgerows, linear habitat and field boundary features should be maintained as lesser horseshoe bats tend to feed in wooded areas and use linear features to navigate their way between roosts and foraging habitat. Some management of woodlands and hedgerows and trees will be necessary to preserve these features in the landscape but such work should be carried out in a sensitive manner, particularly within the SAC itself, so as not to disrupt habitat continuity. The nursery roost areas require a range of temperatures, with a mean temperature of greater than 20 °C in July and trees nearby may need to be</p>

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	<p>managed to avoid shade to the roofs of the of the buildings used, or because of a risk of falling on the roosts.</p> <p>Lesser horseshoe bats feed on flies (mainly midges), small moths, caddis flies, lacewings, beetles, small wasps and spiders. Suitable foraging habitat includes open broadleaved woodland, scrub, parkland, scrubby wetland and permanent pasture. Lesser horseshoe bats do not normally fly across open land and when foraging, remain close to wooded canopy. The insects they eat, though, may be derived from other unimproved insect rich habitat nearby. Management of foraging habitat should aim to maximise the amount of insect food as well as provide sufficient canopy cover to maximise opportunities for the bats to find their prey.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Blanket Bog. <p><u>Grazing</u> Grazing levels at present (2008) may permit a gradual recovery of the vegetation, if other negative factors can be brought under control.</p> <p><u>Drainage</u> No new drainage ditches should be dug, and wherever possible old drainage ditches should be allowed to infill naturally. Sluices could also be considered on bog outlet channels that may be a causing drainage or erosion problems. There needs to be investigation of the possibility of blocking up at least some of the drains within the bog that feed into Pwll Gwy-rhoc.</p> <p><u>Burning</u> Blanket bog should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses and invertebrates, and encourage the growth of rank species, like hare's-tail cottongrass; it can also result in erosion of the peat which can then cause water quality problems in cave system and adjacent reservoirs. Past unplanned or uncontrolled burning is likely to be at least partly responsible for the scarcity of bog-mosses in some areas.</p> <p><u>Air Pollution</u> The impacts of air pollution on the vegetation need further investigation. If particularly damaging, point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. However, it will also be very important for wider measures to be taken, at Government and</p>

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	<p>international levels, to reduce air pollution.</p> <p><u>Recreational Activities</u> Unauthorised vehicle use is a threat to the moorland areas. Bog vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p> <p>Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage vehicle use by off-road vehicles.</p> <p>Although the common land within the site is subject to a right of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to birdlife. However, the impact of this use needs to be monitored.</p> <p><u>Development</u> The ground along the existing pipeline routes, which cross the Llangatwg hill, has been disturbed during the engineering phase. Some habitats naturally recover better than others, whilst some will require specific management to restore it to its natural state. If the vegetation along the existing pipeline routes does not naturally recover, restoration may be required to return the vegetation to its original character and quality.</p> <p>Generally, further pipeline construction or other engineering works affecting sensitive habitats within the site should be avoided. Any future engineering or pipeline works would need to show that the SAC features would not be adversely affected and if any licence was approved then there would be a requirement to restore the vegetation to its original character and quality.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines. <p><u>Grazing</u> In the cliff and woodland areas any more than light grazing may prevent tree regeneration and damage the populations of rare and scarce plants that may be accessible to grazing stock. On the common (units 1 & 2), maintain grazing at or below the current (2007) levels. Un-grazed areas (unit 5, 12, 13) should remain un-grazed.</p> <p><u>Woodland Management</u> Most of the woodland occupies cliffs and steeply sloping ground, such that active woodland management is not a practical or</p>

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	<p>desirable option and many of the cliff ledges are not accessible to grazing stock. As far as possible, natural ecological processes will be allowed to operate. Dead wood should ideally be left where it falls and standing dead trees should be allowed to fall naturally. Movement and cutting/tidying of dead wood should be avoided and/or limited, unless essential for public safety.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation. <p>The management requirements of this feature need to be balanced against achieving more favourable management for the other features of common.</p> <p><u>Grazing</u> Grazing needs to be maintained on the more accessible rocky areas in units 1 & 2 in order to prevent colonisation by tall vegetation and scrub. Heathland and woodland areas nearby may benefit from a reduction of grazing pressure but the presence of more palatable limestone grassland along the escarpment will always draw stock towards these rocky areas.</p> <p><u>Recreational Activities</u> Rare plants, and plants in general, on the cliffs and ledges, may be dislodged by climbers and some breeding birds are particularly sensitive to disturbance during the nesting season. Rock climbing at this site should be restricted to suitable areas and be subject to a suitable code of conduct in order to minimise such damage and disturbance.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Caves not open to the public. <p><u>Cave structures used by bats</u> See Lesser Horseshoe Bat.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Degraded raised bogs still capable of natural regeneration. <p><u>Grazing</u> A way of reducing the grazing to acceptable levels must be found. A period without grazing will promote recovery, although some light grazing, ideally by cattle or ponies, will be required in the longer term to prevent the development of scrub or the dominating growth</p>

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	<p>of dwarf shrubs or purple moor-grass.</p> <p><u>Stock Feeding</u> Supplementary stock feeding can lead to damage of the sward and cause poaching and gradual nutrient enrichment. Feeding should not occur on this habitat.</p> <p><u>Drainage</u> No new drainage ditches should be dug within the bog and outlet and inflow channels must not be deepened or altered in any way.</p> <p><u>Air Pollution</u> See Blanket Bog.</p> <p>Annex I habitats that present but that are not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heaths. <p><u>Grazing</u> Grazing levels are believed to be lower than they have been historically but they may still be too high in some parts of the common to enable the heathland to re-generate. It may not be possible to address this problem in unit 1 because the adjoining limestone grassland and rocky habitats require a relatively high stocking rate to maintain their interest but elsewhere, a mechanism needs to be found for reducing grazing pressure on the dry heathland, especially in autumn and winter.</p> <p><u>Stock Feeding</u> Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding should be confined to acceptable areas off the common, such as agriculturally improved land.</p> <p><u>Burning</u> This can be a useful management tool on the heathlands, provided that it forms part of an appropriate and controlled cycle of management. It is important to ensure that such management does not encourage the spread of bracken. Burning in combination with intense grazing can also result in the loss of those heathland shrub species that give this habitat its characteristic appearance, and which are so important to the value of these moorland habitats.</p> <p>A carefully planned burning programme should be considered in appropriate areas. However, Owners and occupiers should co-operate with the fire service, police and other statutory bodies to undertake enforcement action where possible and discourage</p>

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	<p>illegal burning.</p> <p><u>Bracken and Scrub Encroachment</u> Scrub invasion in the open moorland areas can be controlled by the correct combination of grazing and burning. Bracken however can be more problematical. Grazing may not prevent bracken invasion particularly if sheep rather than heavier animals are the main stock-type and burning can encourage the spread of bracken. Bracken control will be considered if there is significant spread within the drier heathy areas. Due to the abundance of scarce ferns and other species at the site, which are equally sensitive to the chemicals used to control the bracken, aerial spraying may not be an option over much of the SSSI, and other methods would have to be considered.</p> <p><u>Dumping</u> The plateau areas at Mynydd Llangatwg are easily accessible from nearby population centres, so the illegal dumping of domestic and commercial waste and abandoned vehicles is a problem. Landowners and occupiers should co-operate with the statutory authorities in relation to enforcement action, removal of waste and abandoned vehicles and other measures designed to minimise the impact of flytipping.</p> <p><u>Air Pollution</u> See Blanket Bog.</p> <p><u>Development</u> See Blanket Bog.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <ul style="list-style-type: none"> • Pre-parturition population in the maternity roost <ul style="list-style-type: none"> ○ On at least one occasion between 29th May and 17th June of every year, there will be: 320 or more bats at Buckland Coach House and 600 bats to be recorded at Buckland Coach House in at least one year during the six year monitoring cycle <p>The is the target for the number of adult bats required each year during early summer, when females gather to give birth and numbers are likely to be at their highest. The figure of 320 bats is based on the lowest number of bats at Buckland between 2000 and 2006.</p> <ul style="list-style-type: none"> • Population in hibernation roost <ul style="list-style-type: none"> ○ During at least one surveillance visit between 1st

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	<p>January and 28th February of every year, there will be:</p> <ul style="list-style-type: none"> - 270 or more lesser horseshoe bats at Agen Allwedd cave, and 500 (this figure may need revising as 500 is close to the maximum recorded, although current trends show an increasing population) or more present at least once during the six year monitoring cycle OR 220 or more lesser horseshoe bats at Agen Allwedd Cave excluding the Angel's roost section (see rationale below), AND - A total of 18 or more lesser horseshoe bats at the Clydach Gorge cave sites, and 47 to be recorded at least once during the six year monitoring cycle, AND <ul style="list-style-type: none"> o During at least one surveillance visit between 1st November and 28th February of each year, <ul style="list-style-type: none"> - 280 or more lesser horseshoe bats at Buckland Ice House and 470 to be recorded at least once during the six year monitoring cycle AND o During at least one surveillance visit between 1st November and 28th February of each year, when the internal temperature of the cave is 6°C or above there will be: <ul style="list-style-type: none"> - 60 lesser horseshoe bats at Foxwood cave AND <p>There is continued use by lesser horseshoe bats at Siambre Ddu (data collected from this site requires further examination in order to devise population limits).</p> <p>There are a large number of hibernation sites within the SAC, and also a number outside the SAC, which all contribute towards maintaining the SAC population of lesser horseshoe bats. For the performance indicators for the SAC, counts will therefore be undertaken at five key sites.</p> <p>Buckland Ice House, closely associated with the maternity roost, is the easiest site to count. The numbers in the performance indicators are based on maximum counts between 2000 and 2006, and have been devised using the same rationale as for the maternity site. However, there are some difficulties in timing of counts at Buckland Ice House. The site is used by large numbers of bats during relatively mild winters. In cold weather the ice house becomes unsuitable, and the bats relocate to another site not within the SAC, (Ogof Cynnes). For this reason counts for this hibernaculum will be accepted between 1st November and 28th February.</p>

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	<p>Counts at cave sites are technically very difficult. Bats are often difficult to see and also frequently move hibernation site, within the cave and between caves. They may use parts of the cave inaccessible to humans.</p> <p>There are also specific problems at the Usk Bat Sites hibernation sites. Agen Allwedd is a large cave system with a number of passages. One section particularly favoured by bats is known as Angel's Roost. However, it is occasionally impossible to survey this section, because bats are hibernating in the passage to it, and it cannot be reached without disturbing these bats. The Clydach Gorge sites consist of more than 10 caves, not all of which are continually used, but which collectively support a significant part of the wintering bat population. Foxwood is a drift cave with holes in the cave roof. This allows warm air in the cave to escape during the winter. As a result, bats frequently leave this site when it becomes too cold. The internal temperature when the site is surveyed is therefore critical to gaining an accurate picture of the importance of this site for lesser horseshoe bats.</p> <p>The numbers of bats expected at each site have been calculated using the same rationale as that used for the maternity site. An alternative lower number is provided for situations in which the Angel's Roost section of Agen Allwedd cannot be accessed. This count should not be used in years when Angel's Roost is accessible.</p> <p>Siambre Ddu is another large roost. Data recently collected from this site requires further examination in order to devise population limits. It is expected that the lower limit would be in the region of several 10s of bats. The performance indicator for this site at present requires only that bats be present. Droppings will not be used to make assumptions about bats using the site.</p> <p>Once more data is collected, it is possible that a moving (6yearly) average could be calculated, such that a fall in numbers of say 10% could flag up a potential decline in health of the population.</p> <p>Buckland House Maternity Roost (may also apply to other non-SAC maternity roosts)</p> <ul style="list-style-type: none"> • Site security <ul style="list-style-type: none"> ○ Access to the site under the control of the owner/occupier or site secured against unauthorised access. Doors, gates or security fences in sound condition and able to resist unauthorised access attempts • External condition of building

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	<ul style="list-style-type: none"> ○ Fabric of building sufficient to maintain roost conditions internally with: <ul style="list-style-type: none"> - Weatherproof roof. The roof covering materials (slates, tiles etc.) in weatherproof condition with no significant gaps, slippage or damage. - No holes large enough to allow soaking of roof timbers, excessive heat loss or high light levels in the roost area - Walls sound, rainwater goods in adequate condition. <p>The building is structurally stable. No significant deterioration in overall condition of the building</p> <ul style="list-style-type: none"> ● Roost entrance – buildings and underground sites <ul style="list-style-type: none"> ○ Unobstructed roost entrance large enough for bats to fly through unimpeded. Normal minima: 300 x 200 mm. No artificial lights shining on access or associated flight paths. ○ No artificial lights shining on access or associated flight paths ● External disturbance <ul style="list-style-type: none"> ○ Disturbance levels acceptable to bats with, no increase since previous visit AND, Human access to roost controlled and limited ● Internal condition of building/underground site in roost area <ul style="list-style-type: none"> ○ Low light levels with no through draught. No toxic substances present, which would adversely affect the health of the bats (e.g. chemical timber treatment within inappropriate substances). ● Temperature of roost area <ul style="list-style-type: none"> ○ Range of temperatures available to bats with mean temperature in July greater than 20°C ● Internal disturbance <ul style="list-style-type: none"> ○ Human access to roost area controlled and limited. Disturbance is kept to a minimum <p>Hibernation sites</p> <ul style="list-style-type: none"> ● Site entrance <ul style="list-style-type: none"> ○ Existing entrances unobstructed. No human-influenced new entrances causing a change to ventilation. No change in size sufficient to affect airflow and internal temperature ● External conditions of site <ul style="list-style-type: none"> ○ Vegetation present close to entrance (s) but not obstructing it (them). No artificial lights shining on entrance(s). ● Internal conditions <ul style="list-style-type: none"> ○ The temperature should remain constantly cool (8-

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	<p>12°C) and dark, once beyond the entrance zone. No significant man-induced changes to ventilation or temperature regime. No toxic substances present (dumping of oil or other substances).</p> <ul style="list-style-type: none"> • Internal disturbance <ul style="list-style-type: none"> ○ Human access to roost area controlled and limited (at Agen Allwedd the number of visitors is already controlled). Disturbance is kept to a minimum. <p>Foraging areas and links to roosts</p> <ul style="list-style-type: none"> • Habitat Quality <ul style="list-style-type: none"> ○ There should be no nett loss of suitable woodland, scrub and hedgerows within the SAC or adjoining areas used by the bats. <p>The bats mainly feed along the edges of woodland, large hedges and tree-lined rivers within and around the SAC areas and land situated between the SSSIs in the Usk valley area between Llangorse and Abergavenny.</p> <ul style="list-style-type: none"> • Connectivity <ul style="list-style-type: none"> ○ Major gaps in the continuity of these habitats should not be created. See Habitat Quality <p>The bats appear to prefer not to like crossing large areas of open ground and therefore retaining or providing new cover would be beneficial. Links between foraging areas, maternity roosts and hibernacula, are provided by hedgerows, woodland, scrub and lines of trees.</p> <p>There are quite a few maternity roosts in buildings in the Usk valley area that are not within in the SAC, so connectivity is important here too.</p> <p>Blanket Bog</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Upper limit – 280 ha, constrained by site topography and hydrology. ○ Lower limit – 150 ha (c 90% of extent as measured in 2003). <p>There have been past losses and degradation, so it is essential to maintain the current (2003) extent of the habitat and to restore degraded areas where possible.</p> <ul style="list-style-type: none"> • Quality of the Blanket Bog <ul style="list-style-type: none"> ○ Upper Limits – No more than 75% cover of purple moor-grass, hare's-tail cottongrass, deergrass or common haircap moss (<i>Polytrichum commune</i>). Less than 1/3 of shoots of all dwarf shrub species collectively showing signs of browsing.

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	<ul style="list-style-type: none"> ○ Lower limits – 6 positive indicator species present. 50% of vegetation cover comprising 3 or more of the positive indicators. Flat-topped bog-moss (<i>Sphagnum fallax</i>) should not be the only bogmoss present. Ideally <i>S. capillifolium</i> and other true ‘bog’ species would be present (further work required to elucidate the species present or likely to be present at this locality). <ul style="list-style-type: none"> ● Peat erosion <ul style="list-style-type: none"> ○ Upper limit – The total extent of active erosion over a 5-year period should not exceed the total extent of areas showing signs of peat accumulation and re-vegetation. ○ Lower limit – There are always some areas of bare peat present as a result of natural erosive processes. <p>There is a natural cycle of peat erosion and deposition but the balance can be upset by burning, heavy grazing, pollution and vehicle damage. The process is best measured across the whole plan area using aerial photography, backed by ground checks, where necessary.</p> <ul style="list-style-type: none"> ● Burning <ul style="list-style-type: none"> ○ Upper limit – No evidence of significant burning (patches larger than 1ha) in any areas of blanket bog ○ Lower limit: N/A. <p>Blanket bog is adversely affected by burning, which leads to surface drying and the replacement of bog-mosses by purple moor-grass and common haircap.</p> <ul style="list-style-type: none"> ● Drainage <ul style="list-style-type: none"> ○ Upper Limit – No evidence of new drains or major clearance of old drains or deepening of bog outlet streams. ○ Lower limit – N/A. <p>Significant new drains within the bog areas could cause surface drying and peat erosion. Most old drains are now blocked with peat.</p> <ul style="list-style-type: none"> ● Air Quality <ul style="list-style-type: none"> ○ Upper limits – No exceedence of critical loads for Sulphur dioxide – 20µg/m³ ; Nitrous Oxides – 30µg/m³ ; Ozone – 3000 ppb ; ammonia – 1 µg/m³ ; N – 5-10 kg/ha/yr ; acid – 0.35keq/ha/yr ○ Lower limit – None. <p>High levels of air pollution are believed to be damaging and there may be combined effects. Increased cover of hare’s-tail cottongrass and flat-topped bog-moss may be symptoms, as could increased</p>

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	<p>levels of peat erosion. The Environment Agency has set critical levels for these pollutants in relation to various types of vegetation (Refer to the APIS database at www.airquality.co.uk). Monitoring stations located at grid location: 319097.79 214637.88</p> <p>Tilio-Acerion forests of slopes, screes and ravines</p> <ul style="list-style-type: none"> • Extent of and distribution <ul style="list-style-type: none"> ○ Upper limit – a t: N/A ○ Lower limit – 13.5 ha, of which units 1 & 2 support at least 10 ha and unit 5 supports at least 3.5 ha. Small areas are also present in units 12 & 13. <p>To be assessed using aerial photography and ground checking. The total area of broadleaved semi-natural woodland, screes and ravines has been mapped as a baseline but extent of ash dominated types has been estimated as they can be intermixed with other types.</p> <p>Tilio-Acerion forests of slopes, screes and ravines is defined as: any area where there is a more-or-less continuous cover of shrubs over 3 metres tall, with or without woodland canopy trees such as ash. In the longterm, when a better woodland community has developed, then these objectives will need to be revisited.</p> <ul style="list-style-type: none"> • Canopy cover <ul style="list-style-type: none"> ○ Upper limit – 90% canopy cover OR: 60% on the south-west facing slopes of unit 1. ○ Lower limit – 75% canopy cover OR: 30% on the south-west facing slopes of unit 1 <p>The woodland is scattered over the lower slopes of Craig y Cilau and extends onto the cliff areas. The latter is secure from the effects of grazing and is probably more or less self-sustaining. The remaining woodland on the grazed slopes has been developing for sometime, and at present it is assumed that this development will continue, provided that the grazing is at a level to permit gradual regeneration. In the long-term (at least 50 years hence), when a better woodland community has developed, then these objectives will need to be revisited.</p> <ul style="list-style-type: none"> • Regeneration (Units 1, 2 & 5) <ul style="list-style-type: none"> ○ Upper limit – N/A ○ Lower limit – Canopy forming shrubs, trees or coppice re-growth at least 1.5m high present (should be evident in at least one location within each woodland block). <p>In the Clydach gorge on the southern slopes of Mynydd Llangatwg there are stands of ungrazed woodland, which are unlikely to ever be grazed. Therefore the same performance indicators can be applied to all areas. Regeneration to be met in at least 50% of</p>

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	<p>significant gaps in canopy. Such gaps should be recorded at each monitoring visit.</p> <ul style="list-style-type: none"> • Woodland structure (Units 1, 2 & 5) <ul style="list-style-type: none"> ○ Upper limit – N/A ○ Lower limit – An understorey at a height of 2–5m over at least 20% of the stand, composed of locally native species, such as yew, wych elm, whitebeams, hawthorn, limes, rowan, hazel and ash. In grazed areas there should be evidence of an understorey developing. <p>A functioning woodland system will have trees of all ages present. Veteran trees provide particularly important habitat for birds and invertebrates. 75% of the woodland should meet the criteria for an understorey.</p> <ul style="list-style-type: none"> • Canopy composition (Units 1, 2 & 5) <ul style="list-style-type: none"> ○ Upper limit – None ○ Lower limit – 95% of tree cover is composed of locally native species, such as ash, whitebeams, wych elm, rowan, field maple, hazel, or beech <p>In some areas non-native trees, such as sycamore, will be tolerated, as long as they are not freely re-generating to form large saplings in the understorey, which would likely change the canopy composition over time. Consequently, only 70% of the woodland need comply with the limits set.</p> <ul style="list-style-type: none"> • Ground flora (Units 1, 2 & 5) <ul style="list-style-type: none"> ○ Upper limit – The cover of nettles should not exceed 10%. ○ Lower limit – Typical ground flora species (see list below) should be evident throughout the woodland. <p>The ground flora is naturally quite sparse in the rocky areas of units 1 and 2, but a few typical ash woodland plants should be evident in all areas. Brambles and ivy can be locally abundant in ungrazed ash woodland but other indicators of disturbance and nutrient enrichment should not be. Limits should be met for 80% of the woodland.</p> <ul style="list-style-type: none"> • Deadwood (Units 1, 2 & 5) <ul style="list-style-type: none"> ○ Upper limit – None ○ Lower limit – Presence of standing and/or fallen deadwood. <p>Deadwood will be retained. The limits given here should be met in at least 50% of existing woodland.</p> <ul style="list-style-type: none"> • Grazing

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	<ul style="list-style-type: none"> ○ Upper limit – Sufficient to allow regeneration in the long term, as defined by the regeneration attribute above. ○ Lower limit – None required ● Non-native species <ul style="list-style-type: none"> ○ Upper limit – 5% cover of nonnative trees in the canopy. No cotoneaster (or other invasive non-native shrubs) in the understorey or shrub layer. ○ Lower limit – None ● Woodland Management <ul style="list-style-type: none"> ○ There should be no evidence of tree felling or coppicing within the past five years. (Tree surgery for safety reasons excluded). <p>Calcareous rocky slopes with chasmophytic vegetation</p> <ul style="list-style-type: none"> ● Extent of and distribution <ul style="list-style-type: none"> ○ Lower limit – 11ha of suitably open cliffs and scree and old quarry faces, mainly located in units 1 & 2, with outliers in unit 13 ● Condition <ul style="list-style-type: none"> ○ Upper limit – Alien species should be absent, especially cotoneasters. Brambles, nettles, bracken, ivy and shrubs should remain scattered and subdued by grazing, where accessible to livestock. ○ Lower limit – Chasmophytic and ledge vegetation should be diverse and abundant in available crevices and ledges. Crevices support a mixture of mosses and higher plants. ● Grazing (Limits apply to the key areas in units 1 & 2) <ul style="list-style-type: none"> ○ Upper limit – To be set in relation to the requirements of the limestone grassland. ○ Lower limit – Sufficient to prevent the development of scrub or spread of ivy and tall vegetation. ● Quarrying <ul style="list-style-type: none"> ○ No quarrying in the key areas as shown on the maps in Annex 1. ● Rock climbing <ul style="list-style-type: none"> ○ No rock climbing in the key areas of units 1 & 2 without agreement <p>Caves not open to the public</p> <ul style="list-style-type: none"> ● Extent and distribution of the habitat <ul style="list-style-type: none"> ○ No loss of suitable bat hibernating areas in units 1, 2, 5, 12, 13 and 19. ● Species of bat using the caves <ul style="list-style-type: none"> ○ Upper Limit – N/A ○ Lower limit – At least 6 of the species listed are

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	<p>recorded as using the caves as hibernation site in Unit 1. At least 3 of the species listed are recorded as using the caves as hibernation site in Unit 2.</p> <ul style="list-style-type: none"> • Condition of the habitat <ul style="list-style-type: none"> ○ See factors for lesser horseshoe bats above. <p>Degraded raised bogs still capable of natural regeneration</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Upper Limit – None, constrained by governed by site topography. ○ Lower limit – 3.4 ha • Condition <ul style="list-style-type: none"> ○ Upper Limit – The total cover of grasses is less than 50%. Dwarf shrub cover is less than 70%. Cover of bare peat is less than 10% ○ Lower limit – Cover of hummock forming bog-mosses is at least 10%. Vegetation must support at least 5 of the following plants: Heather, sundews, cross-leaved heath, common cottongrass, hare's-tail cottongrass, bog asphodel, non-crustose lichens, bog-mosses, deer-grass and bilberry. Vegetation is at least 10cm high. • Grazing <ul style="list-style-type: none"> ○ Upper limit – Overall grazing pressure of 0.05 livestock units/ha/year on the bog area. Minimal winter grazing. No stock feeding ○ Lower limit – Sufficient to prevent the establishment of trees and shrubs in the long term • Burning <ul style="list-style-type: none"> ○ There should be no evidence of recent burning. • Drainage <ul style="list-style-type: none"> ○ Upper Limit – No evidence of new drains or major clearance of old drains or deepening of bog outlet streams. ○ Lower limit – N/A. • Air Quality <ul style="list-style-type: none"> ○ Upper limits – No exceedence of critical loads for Sulphur dioxide – 20µg/m³ ; Nitrous Oxides – 30µg/m³ ; Ozone – 3000 ppb ; ammonia – 1µg/m³ ; N – 5-10 kg/ha/yr ; acid – 0.35keq/ha/yr ○ Lower limit – None. <p>European dry heaths</p> <ul style="list-style-type: none"> • Extent and distribution <ul style="list-style-type: none"> ○ Upper limit – N/A, constrained by site topography and hydrology. ○ Lower limit – 385 ha, largely confined to the drier

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	<p>areas of unit 2 and the top of the escarpment in unit 1.</p> <ul style="list-style-type: none"> • Quality of the habitat <ul style="list-style-type: none"> ○ Upper Limit – Cover of Western gorse <i>Ulex gallii</i> no more than 50 %, and cover of non-native plants and/or agricultural weeds is less than 1%, and cover of Bracken is less than 10%. Less than 1/3 of shoots of all mature dwarf shrub plants collectively showing signs of browsing. Less than 2/3 of young pioneer plants collectively showing signs of browsing. ○ Lower limit – At least 50% of vegetation cover made up of at least 2 dwarf shrub species and the height of the shrub canopy is at least 15cm. 1 species of moss, liverwort or noncrustose lichen present (excluding haircap mosses and <i>Campylopus</i> mosses - associated with burning). • Burning <ul style="list-style-type: none"> ○ Upper limit – In areas subject to any burning plan, only a maximum of up to 15% of the total heathland area should be burnt in any one year. ○ Lower limit – N/A. • Erosion/bare ground <ul style="list-style-type: none"> ○ Upper Limit – 10% bare ground ○ Lower limit – N/A • Air Quality <ul style="list-style-type: none"> ○ Upper limit – No critical loads are exceeded. Sulphur dioxide – 20µg/m³ ; Nitrous Oxides – 30µg/m³ ; Ozone – 3000 ppb ; ammonia – 1µg/m³ ; N – 10-20 kg/ha/yr ; acid – 0.35keq/ha/yr ○ Lower limit – None required <p>For further information refer to the <i>Core Management Plan (including Corer Objectives) for the Myndydd Llangatwg (Mynydd Llangatock) Site of Special Scientific Interest (SSSI), Siambre Ddu SSSI, Buckland Coach House and Ice House SSSI and Foxwood SSSI, which together comprise Usk Bat Sites Special Area of Conservation (SAC) (2008)</i> available at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=0fdd86a8-75c0-45f2-8bab-e5fdf7391606&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) Favourable ▪ Blanket Bog: Unfavourable ▪ Tilio-Acerion forests of slopes, screes and ravines:

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	<p>Favourable, maintained.</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation: Favourable, maintained. ▪ Caves not open to the public: Favourable, maintained. ▪ Degraded raised bogs still capable of natural regeneration: Unfavourable, declining. ▪ European dry heaths: Unfavourable, no change.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Human Disturbance</u> Minimal disturbance is required within the lesser horseshoe bat cave hibernacula. The population has been satisfactorily safeguarded from disturbance for many years, where necessary by gating cave entrances, providing access by permit only and promoting a code of conduct. The Annex I feature Caves not open to the public is also supported, all species being subject to the safeguards above.</p> <p>It is important that access to the cave systems is managed to protect the bats. Lesser horseshoe bats are very sensitive to disturbance and even the presence of a single person in close proximity can cause problems. Cavers and geologists should avoid areas where bats are likely to be disturbed during the winter months. Where there is a risk of disturbance by unauthorised persons, grilling the cave entrances should be considered</p> <p><u>Habitat Management</u> Connectivity of woodland, hedgerows, linear habitat and field boundary features should be maintained as lesser horseshoe bats tend to feed in wooded areas and use linear features to navigate their way between roosts and foraging habitat.</p> <p>Lesser horseshoe bats feed on flies (mainly midges), small moths, caddis flies, lacewings, beetles, small wasps and spiders. Suitable foraging habitat includes open broadleaved woodland, scrub, parkland, scrubby wetland and permanent pasture. Lesser horseshoe bats do not normally fly across open land and when foraging, remain close to wooded canopy.</p> <p><u>Grazing</u> Grazing levels are believed to be lower than they have been historically but they may still be too high in some parts of the common to enable the heathland to re-generate. The remaining SAC features are almost entirely located on common land with grazing rights. Control of grazing levels is presently difficult to achieve on common land and some reduction in grazing levels and/or change of grazing patterns appears desirable.</p>

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	<p><u>Invasive Plants</u> Introduced and invasive species such as cotoneaster can smother large areas of grassland and cliff habitats, displacing native species and would need to be controlled. Cotoneaster has spread on the south side of Mynydd Llangatwg above the Clydach gorge and some control is desirable to stop it spreading into feature habitats. As cotoneaster often grows in inaccessible places, specialists would need to be involved, as some climbing would be necessary, and the work required will be expensive in both time and money.</p> <p><u>Drainage</u> No new drainage ditches should be dug, and wherever possible old drainage ditches should be allowed to infill naturally. Sluices could also be considered on bog outlet channels that may be causing drainage or erosion problems.</p> <p><u>Burning</u> Blanket bog should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses and invertebrates, and encourage the growth of rank species, like hare's-tail cottongrass; it can also result in erosion of the peat which can then cause water quality problems in cave system and adjacent reservoirs. Past unplanned or uncontrolled burning is likely to be at least partly responsible for the scarcity of bog-mosses in some areas.</p> <p><u>Development</u> Generally, further pipeline construction or other engineering works affecting sensitive habitats within the site should be avoided. Any future engineering or pipeline works would need to show that the SAC features would not be adversely affected and if any licence was approved then there would be a requirement to restore the vegetation to its original character and quality.</p> <p><u>Recreational Activities</u> Unauthorised vehicle use is a threat to the moorland areas. Bog vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p> <p>Rare plants, and plants in general, on the cliffs and ledges, may be dislodged by climbers and some breeding birds are particularly sensitive to disturbance during the nesting season. Rock climbing at this site should be restricted to suitable areas and be subject to a suitable code of conduct in order to minimise such damage and disturbance.</p>

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	<p><u>Dumping</u> The plateau areas at Mynydd Llangatwg are easily accessible from nearby population centres, so the illegal dumping of domestic and commercial waste and abandoned vehicles is a problem.</p>
<p>Landowner/ Management Responsibility</p>	<p>As lesser horseshoe bat is the primary reason for the selection of the SAC, it is a key species in all units in which it is found. It is possible that the species roosts in cave system beneath some of the other units, but the units indicated here are mainly those with cave entrance at the surface. Habitats are key habitats when they are present in sufficient proportion to drive management in units, but are otherwise considered as being in sympathetic management.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Monmouthshire Council’s Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

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<p>Site Description</p>	<p>Aberbargoed Grasslands covers an area of 42.5ha and lies on a southwest facing hillside in the Rhymney Valley, 1km east of Bargoed. The site occupies an urban fringe position, between 200m and 290m above sea level.</p> <p>The fields in the south and west of Aberbargoed Grasslands have impeded drainage and contain a mixture of marshy grassland communities. Areas of particular interest are characterised by abundant purple moor grass <i>Molinia caerulea</i> and meadow thistle <i>Cirsium dissectum</i> with devil's bit scabious <i>Succisa pratensis</i> and carnation sedge <i>Carex panicea</i>.</p> <p>Other species such as saw-wort <i>Serratula tinctoria</i> and lousewort <i>Pedicularis sylvatica</i> occur frequently in heavily flushed areas. Associated stands of <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire contain abundant purple moor grass with tormentil <i>Potentilla erecta</i>, mat grass <i>Nardus stricta</i>, common sedge <i>Carex nigra</i> and spotted orchid <i>Dactylorhiza maculata</i>. Small stands of rush pasture are scattered across the site, with soft rush <i>Juncus effuses</i>, greater bird's foot trefoil <i>Lotus uliginosus</i> and marsh bedstraw <i>Galium palustre</i>.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Marsh fritillary Butterfly Euphydryas (Eurodryas, Hypodryas) aurinia. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>).
<p>Conservation Objectives</p>	<p>Vision for the site: Walking through this site on a hot sunny day you are enveloped by butterflies, most notably orange and black coloured (these are the colours of the marsh fritillary). The population is viable long term with enough marshy grassland and, more importantly, the butterfly's foodplant devil's bit scabious present to support them.</p> <p>Marshy grassland is seen over half of the site, preferably increasing to cover a wider area. Established woodland /scrub and bracken on this site does not occupy more than 20% of the site. The remainder</p>

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	<p>of the site is a mixture of neutral grassland, wet heath and mire.</p> <p>During the summer a walk over the site will show you the wide range of plants and insects that thrive here. There is a mixture of different grasses and flowers that add splashes of colour. The tallest common plants, standing at about knee-height, are grasses and sedges including purple moor-grass and carnation sedge. Growing amongst these plants you will also find Meadow-thistle, devil's-bit scabious and tormentil.</p> <p>Where the ground is particularly wet you see blunt-flowered rush, sharp flowered rush with common marsh bedstraw, greater bird's-foot trefoil and water mint.</p> <p>Where neutral grassland replaces marshy grassland the types of plants and animals that live there change. Here the tallest plant is black knapweed with common bird's-foot trefoil, red clover, oxeye daisy, devil's-bit scabious and autumn hawkbit growing amongst it.</p> <p>Species that show agricultural modification, such as perennial rye grass and white clover are uncommon. Scrub species such as willow and birch are also uncommon.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Marsh fritillary Butterfly (Euphydryas (Eurodryas, Hypodryas) aurinia). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The site will support a sustainable metapopulation of the marsh fritillary in the Aberbargoed area. This will require at least 50ha of suitable habitat, although not all of this will be within the SAC ▪ The population will be viable in the long term, acknowledging the extreme population fluctuations of the species. ▪ Habitats on the site will be in optimal condition to support the metapopulation. ▪ At least 25ha of the total site area will be marshy grassland suitable for supporting marsh fritillary, with <i>Succisa pratensis</i> present and only a low cover of scrub. ▪ At least 6.25ha will be good marsh fritillary breeding habitat, dominated by purple moor-grass <i>Molinia caerulea</i>, with <i>S. pratensis</i> present throughout and a vegetation height of 10-20cm over the winter period.

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	<ul style="list-style-type: none"> ▪ All factors affecting the achievement of the foregoing conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows on calcareous, peaty or clayey-siltladen soils (Molinion caeruleae). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Molinion marshy grassland will occupy at least 70% of the total site area. ▪ The remainder of the site will be other semi-natural habitat or areas of permanent pasture. ▪ The following plants will be common in the eu-Molinion marshy grassland: purple moor-grass <i>Molinia caerulea</i>; meadow thistle <i>Cirsium dissectum</i>; devil's bit scabious <i>Succisa pratensis</i>; carnation sedge <i>Carex panicea</i>; saw wort <i>Serratula tinctoria</i>; and lousewort <i>Pedicularis sylvestris</i>. ▪ Cross-leaved heath <i>Erica tetralix</i> and common heather <i>Calluna vulgaris</i> will also be common in some areas. ▪ Rushes and species indicative of agricultural modification, such as perennial rye grass <i>Lolium perenne</i> and white clover <i>Trifolium repens</i> will be largely absent from the eu-Molinion marshy grassland. ▪ Scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will also be largely absent from the eu-Molinion marshy grassland. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 2 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on mainly tenure, but also with reference to status and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Management Requirements for Qualifying Features:</u> It is essential that restoration management is undertaken at Aberbargoed Grasslands to improve the quality and quantity of habitat available to marsh fritillaries. This primarily needs to include the establishment of suitable grazing regime, scrub clearance and control of illegal burning.</p> <p><u>Recent Management Actions:</u></p>

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	<p>In 2005 Caerphilly were successful in gaining funding via the Heritage Lottery Fund, this along with money from NRW has lead to a full- time officer being appointed to Aberbargoed Grasslands. There is also a part-time stock handler. Work has progressed well on the site in the past few years; the site is now stock-proof and a mixture of Welsh Black and Belted Galloways graze the land with a Limousin bull. Scrub clearance and bracken control has begun and flight lines have been cut to improve the connectivity for the butterflies. A programme has been set up to educate the local community to understand why this area is important. A newsletter has been created detailing activities on the grassland and difficulties the site is facing. This and the presence of staff and stock onsite seem to have halted the illegal burning and off-roading.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Marsh fritillary butterfly <i>Euphydryas (Eurodryas, Hypodryas) aurinia</i></p> <ul style="list-style-type: none"> • Density of larval webs Marsh fritillary butterfly <i>Euphydryas (Eurodryas Hypodryas) aurinia</i>. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – In one year in six the number of larval webs is estimated to be: 200 per hectare of good condition habitat. • Extent of Marsh fritillary butterfly (<i>Eurodryas, Hypodryas) aurinia</i> Habitat. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 25ha of available habitat including 6.25ha of good condition habitat. <p>Approximately 50ha of habitat is required to maintain the population in the long term, with at least 10ha in good condition. Not all is expected to be within the SAC. The specified limits reflect the minimum contribution of the Aberbargoed Grasslands SAC towards the favourable conservation status of the species in the Caerphilly area. Good condition habitat is defined as: Grassland, with <i>Molinia</i> abundant where, for at least 80% of sampling points, the vegetation height is within the range of 10 to 20 cm and <i>Succisa pratensis</i> is present within a 1m radius. Scrub (>0.5 metres tall) covers no more than 10% of area. Suitable condition habitat is defined as: Stands of grassland where <i>Succisa pratensis</i> is present at lower frequencies but still widely distributed (>5% of sampling points) throughout the habitat patch and in which scrub (>0.5 metre tall) covers no more than 25% of area. Alternatively, <i>Succisa</i> may be present at high density in close-cropped swards.</p>

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	<p>Note: Available habitat is the total of Good Condition and Suitable habitat]. An assessment of Rhos Pasture habitat in Caerphilly CBC, in respect of its suitability and condition for the priority butterfly species, marsh fritillary <i>Euphydryas aurinia</i> was carried out in February 2005 by Richard Smith. This highlights areas around Aberbargoed Grassland that could support metapopulations of marsh fritillary.</p> <ul style="list-style-type: none"> • Condition of Marsh fritillary butterfly (<i>Eurodryas, Hypodryas</i>) <i>aurinia</i> Habitat. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 25ha of available habitat including 6.25ha of good condition habitat. • Livestock grazing <ul style="list-style-type: none"> ○ Upper limit – to be agreed. ○ Lower limit – as grazing is has only been happening for two years it will need constant review to make sure we get it right. The eu Molinion grasslands have been grazed hard for the first couple of year to get through the litter build up. Now light grazing by cattle is required. <p>The <i>eu-Molinion</i> marshy grassland needs to be maintained through traditional farming practices. Without an appropriate grazing regime, the grassland will continue to become rank and eventually turn to scrub and woodland. Light grazing by cattle and ponies between April and November each year is essential in maintaining the marshy grassland communities.</p> <ul style="list-style-type: none"> • Anti-social behaviours. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower Limit – None tolerated. <p>In previous years anti-social behaviour such as off-roading and burning have occurred at Aberbargoed grasslands. This issues need to be addressed to prevent the <i>eu-Molinion habitat</i> from being damaged.</p> <p>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</p> <ul style="list-style-type: none"> • Extent of <i>Eu Molinion</i> grassland. <ul style="list-style-type: none"> ○ Upper limit – As limited by other habitats. ○ Lower limit – Current extent (As shown in SAC monitoring report by Karen Wilkinson 2002).

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	<p>Lower limit is based on current extent. The draft mapping guidance developed by Adrian Fowles was used to map the habitat at Aberbargoed and is in itself a condition mapping exercise that has provided information on the quality of the habitat.</p> <ul style="list-style-type: none"> • Condition of <i>Eu Molinion</i> grassland. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Within fields H,L,M and W (on phase II map) 50% of the vegetation meets the following criteria: Within a 50cm radius: <i>Molinia</i> is present. The cover of <i>Succisa</i> is 5% or Greater, and the vegetation height is between 10-20cm when measured using a Boorman’s disc. Scrub (including seedlings of any tree species and bramble) is absent. <p>Habitat quality required within each of the four areas reflects that detailed in the generic guidance. In addition however sampling in good condition habitat at Aberbargoed indicated that <i>Succisa</i> is present at a density of 5% or more. This has therefore been incorporated into the sites based performance indicators.</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – to be agreed. ○ Lower limit – as grazing is has only been happening for two years it will need constant review to make sure we get it right. The eu <i>Molinion</i> grasslands have been grazed hard for the first couple of year to get through the litter build up. Now light grazing by cattle is required. <p>The <i>eu-Molinion</i> marshy grassland needs to be maintained through traditional farming practices. Without an appropriate grazing regime, the grassland will continue to become rank and eventually turn to scrub and woodland. Light grazing by cattle and ponies between April and November each year is essential in maintaining the marshy grassland communities.</p> <ul style="list-style-type: none"> • Burning/off-road vehicles. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower Limit – No burning. No off-road vehicles. <p>In previous years anti-social behaviour such as off-roading and burning have occurred at Aberbargoed grasslands. This issues need to be addressed to prevent the <i>eu-Molinion habitat</i> from being</p>

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	<p>damaged.</p> <p>For further information refer to the Core Management Plan (including Core Objectives) for Aberbargoed Grasslands Special Area of Conservation (SAC) (2008) available at: http://www.ccg.gov.uk/landscape-wildlife/protecting-our-landscape/special-sites-project/aber-to-brecon-sac-list/idoc.ashx?docid=0c378953-1c73-4bcd-b335-b53cce0c5568&version=-1)</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> Marsh fritillary Butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>: Unfavourable <i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinia caeruleae</i>): Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> The primary interest of this site is the population of marsh fritillary butterflies which are dependent upon habitats such as the <i>Molinia</i> meadows and the wet heath. The future of these habitats depends on traditional management of extensive grazing.</p> <p><u>Vandalism</u> At present, the site is under-grazed and under-managed and is prone to vandalism such as burning. However, these problems are being addressed through liaison with the site owners and the local authority. A management plan has been drawn up and discussions are currently being undertaken towards securing a management agreement with the owners. This will secure consistent management on the site and will maintain or enhance the conservation value of the site.</p>
<p>Landowner/ Management Responsibility</p>	<p>In 2005 Caerphilly County Borough Council took over the management of the site and a site manager and stock handler are now in post. With this presence on the site and other measures, arson, fly-tipping and offroading have become much less frequent.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Caerphilly's Deposit Local Development Plan Strategic Environmental Assessment/Sustainability Appraisal Report (2008) available at: http://www.caerphilly.gov.uk/pdf/Environment_Planning/LDP/SEA_SA-Part2-Doc5-Habitat-Regulations-Assessment.pdf</p>

<p>Site Name: Blaen Cynon Location Grid Ref: SN946066 JNCC Site Code: UK0030092 Size: 66.83 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Blaen Cynon contains an extensive complex of damp pastures and heaths supporting the largest metapopulation of marsh fritillary <i>Euphydryas aurinia</i> on the southern edge of the Brecon Beacons National Park. The marsh fritillary butterfly <i>Euphydryas aurinia</i> is found in a range of habitats in which its larval food plant, devil's-bit scabious <i>Succisa pratensis</i>, occurs. Marsh fritillaries are essentially grassland butterflies in the UK, and although populations may occur occasionally on wet heath, bog margins and woodland clearings, most colonies are found in damp acidic or dry calcareous grasslands. Populations of marsh fritillary vary greatly in size from year to year, and, at least in part, this is related to cycles of attack from parasitic wasps. Adults tend to be sedentary and remain in a series of linked metapopulations, forming numerous temporary sub-populations, which frequently die out and re-colonise.</p> <p>Blaen Cynon also supports a range of habitats. Marshy grassland, and flush and spring are of particular importance as they provide habitat for the marsh fritillary. Also present are areas of raised bog, species-rich neutral grassland, acid grassland and semi-natural broadleaved woodland.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for the selection of this site:</p> <ul style="list-style-type: none"> ▪ Marsh fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>.
<p>Conservation Objectives</p>	<p>Vision for the site: The site is part of a wider area used by a metapopulation of marsh fritillary butterfly. Cors Bryn-y- Gaer SSSI and the nearby Woodland Park and Pontpren SSSI will contribute towards supporting the metapopulation of marsh fritillary in the Penderyn/Hirwaun area. These two sites comprise the Blaen Cynon Special Area of Conservation (SAC).</p> <p>The various habitats within the SAC will be managed for the benefit of this butterfly. Wet grassland covers at least 50% of the total site area. The wet grassland is comprised of acid flush and marshy grassland. Small areas of the site should consist of habitats associated with the wet grassland, including wet heath, bog pools and swamp.</p> <p>The following plants are common throughout most of the marshy grassland: purple moor-grass, sharpflowered rush, soft rush,</p>

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	<p>tormentil and devil's-bit scabious. Grasses such as sweet vernal-grass and heath grass should be more prominent in some areas. The following plants are common in most of the acid flush vegetation: bog mosses, sharp-flowered rush, purple moor-grass, heath wood-rush and tormentil. Further areas of acid flush should include abundant carnation sedge and frequent bog asphodel.</p> <p>Lowland bog occupies a minimum of 15% of the total site area and is characterised by a carpet of bog moss species, with deergrass, hare's-tail cottongrass and round leaved sundew. In the wettest areas, common cottongrass is more frequent, whilst in slightly drier areas cross-leaved heath becomes more abundant and there is a wider range of bog moss species. Scrub species such as willow are largely absent from the lowland bog.</p> <p>Areas of particularly wet ground include small bog pools alongside patches of wet heath. The bog pools will be characterised by abundant common cottongrass and scattered bog moss. Species found in the areas of wet heath include cross-leaved heath, deergrass, bilberry and wavy hair-grass.</p> <p>Dry grassland occupies a minimum of 10% of the total site area. The dry grassland comprises both neutral and acid grassland. The remaining areas of the more free-draining land on the SSSI should be permanent pasture. Scattered scrub and existing field boundaries should be maintained at their current extent.</p> <p>The neutral grassland is characterised by a range of species including common bent, red fescue, common knapweed and common bird's-foot trefoil. In places, this grades into more acid grassland vegetation with species such as heath bedstraw, tormentil and devil's-bit scabious.</p> <p>Woodland and hedges at Woodland Park and Pontpren SSSI may provide some shelter for the marsh fritillary. However, scrub encroachment onto the wet grassland and bog habitats in particular is a continuing problem and scrub control will be necessary from time to time to ensure that there is no net loss of marsh fritillary habitat and other habitats of interest. The woodland cover of this SSSI is about 15% of the site area, consisting mainly of alder and willow in wetter areas, and oak and downy birch where the ground is drier.</p> <p>The drainage and hydrological conditions on the site should be maintained to favour the habitats that support the marsh fritillary and their management.</p>

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	<p>Annex II species that are a primary reason for the selection of this site:</p> <ul style="list-style-type: none"> ▪ Marsh fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The site will contribute towards supporting a sustainable metapopulation of the marsh fritillary in the Penderyn/Hirwaun area. This will require a minimum of 50ha of suitable habitat, of which at least 10ha must be in good condition, although not all is expected to be found within the SAC. Some will be on nearby land within a radius of about 2km. ▪ The population will be viable in the long term, acknowledging the extreme population fluctuations of the species. ▪ A minimum of 30% of the total site area will be grassland suitable for supporting marsh fritillary. (As the total area of the SAC is 66.62 ha, 30% represents approximately 20 ha.) ▪ At least 40% of the suitable habitat (approximately 8 ha) must be in optimal condition for breeding marsh fritillary. ▪ Suitable marsh fritillary habitat is defined as stands of grassland where <i>Succisa pratensis</i> is present and where scrub more than 1 metre tall covers no more than 10% of the stands ▪ Optimal marsh fritillary breeding habitat will be characterised by grassland where the vegetation height is 10-20 cm, with abundant purple moor-grass <i>Molinia caerulea</i>, frequent “large-leaved” devil’s-bit scabious <i>Succisa pratensis</i> suitable for marsh fritillaries to lay their eggs and only occasional scrub. In peak years, a density of 200 larval webs per hectare of optimal habitat will be found across the site.
<p>Component SSSIs</p>	<p>The plan area has been divided into 13 management units over two SSSI areas to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based primarily tenure, with reference to features and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Protection from Development</u> The site lies within the South Wales Coalfield on the fringes of an urban area, designated as SAC, which will help control threats from housing, opencast or other industrial development and pollution arising from such development in the immediate vicinity.</p>

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	<p><u>Grazing Management</u> Without an appropriate grazing regime, the grassland will become rank and eventually turn to scrub and woodland. Conversely, overgrazing, or grazing by inappropriate stock (particularly sheep) will also lead to unwanted changes in species composition, through selective grazing, increased nutrient inputs and poaching. Balancing grazing is the single most important issue in the management of this site. There is now considerable experience in managing sites for marsh fritillaries in Wales, and the needs of the species are now reasonably well understood.</p> <p>Scrub encroachment is an issue, particularly on some wet grassland areas. A programme of scrub control is currently (2008) being undertaken, but it is likely that even with the ideal grazing management, a more or less continuous programme of scrub control will be required at this site. It is clear from aerial photographs and from discussions with landowners, that many areas that are currently covered in alder and willow woodland were formerly wet pasture. Therefore a long-term aim would be to investigate returning some of this to wet pasture that would likely increase the availability of marsh fritillary habitat.</p> <p>Parts of Woodland Park and Pontpren, notably units 3 and 4 have been subject to improvement in preparation for tree planting, including draining, planting with trees and use of fertiliser. These areas have a programme of scrub removal and cattle grazing in place, to restore the grassland to a condition where it can be used by marsh fritillaries. Some drains have been blocked, to restore the hydrology of the site.</p> <p>There are no known off-site factors, such as pollution, that are affecting the marsh fritillary to any significant extent, although there is still much industry in the locality. The two overwhelming issues of grazing and scrub encroachment would probably obscure any off-site issues. As management of the site improves off-site factors may become more apparent.</p> <p><u>Owner/Occupier Objectives</u> The owners/occupiers of the land typically have an interest in securing some financial/agricultural benefit from the land. This return could be optimised by the agricultural improvement of the land, e.g. by installing new drainage, fertiliser application, or re-seeding; however these operations would cause significant long-term damage to the marsh fritillary habitat, namely the marshy grassland.</p>

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	<p>Additionally unimproved marshy grasslands that are waterlogged for much of the year are difficult to manage for many landowners, possibly resulting in a mixture of over- and undergrazing, with a tendency for scrub to spread. Because of the wet nature of some of the ground, some landowners may be reluctant to graze large stock. This factor will be controlled through management agreements and the SSSI legislation. An operational limit is not required.</p> <p><u>Weather Conditions</u> Weather conditions have an effect on the breeding success of the marsh fritillary. In particular, poor weather conditions during the adult flight period will reduce opportunities for mating, egg-laying and dispersal from core areas. Weather conditions during early spring influence the rate of larval development of the marsh fritillary and the effects of the parasitic wasp (see below). This site is situated in an area of relatively high rainfall, which will have a large influence on the population dynamics of the marsh fritillary. This factor is outside the influence of the site manager and an operational limit is not required.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Marsh fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>.</p> <ul style="list-style-type: none"> • Density of larval webs. <ul style="list-style-type: none"> ○ Upper limit – not required. ○ Lower limit – In one year in six the number of larval webs is estimated to be 200 per hectare of Good Condition habitat. <p>Larval web density in a ‘good’ year for marsh fritillary has been identified as a measurable performance indicator of the population. During peaks in the population cycle a density of 200 webs per hectare of suitable habitat is an appropriate target to set as defining favourable condition for strong populations. Wide fluctuations in abundance occur, with dramatic crashes in population size occurring every ten years or so. Recovery from these crashes may take 4 or 5 yrs.</p> <ul style="list-style-type: none"> • Extent and quality of the marshy grassland as habitat for marsh fritillary. <ul style="list-style-type: none"> ○ 20 hectares of Available marshy grassland, including: 8 hectares of Good Condition marsh fritillary habitat Within Areas 1, 2, 3 and 4 50% of the vegetation meets the following criteria: Within a 50cm radius: <i>Molinia</i> is present. The cover of

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	<p><i>Succisa</i> is 10% or greater. The vegetation height is 10-20 cm. The cover of <i>Juncus</i> spp. does not exceed 50%.</p> <p>For further information refer to the Core Management Plan (including Core Objectives) for Blaen Cynon Special Area of Conservation (SAC) (2008) available at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=d02dce21-0763-4fb8-9eba-b484c28ec1b0&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Marsh fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i>: Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Dependent on Management</u> The plant communities of Blaen Cynon are dependent on maintenance of the hydrological regime and the continuation of traditional agricultural management.</p> <p><u>Agricultural Processes</u> The owners/occupiers of the land typically have an interest in securing some financial/agricultural benefit from the land. This return could be optimised by the agricultural improvement of the land, e.g. by installing new drainage, fertiliser application, or re-seeding; however these operations would cause significant long-term damage to the marsh fritillary habitat, namely the marshy grassland.</p> <p><u>Grazing and Scrub encroachment</u> The marsh fritillary butterfly population is threatened in some parts of the site by a lack of grazing, leading to scrub encroachment.</p> <p><u>Inappropriate Tree Planting</u> The marsh fritillary butterfly population is threatened in some parts of the site by inappropriate tree planting.</p> <p><u>Burning</u> Burning for agricultural purposes is also a major threat.</p> <p><u>Parasites</u> The larvae of marsh fritillaries can be parasitised by species of braconid wasp of the <i>Cotesia</i> genus. The parasites can have good years and infect a large number of larval webs, causing a crash in the subsequent adult population of marsh fritillary. This factor is</p>

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	<p>outside the influence of the site manager; and an operational limit is not required.</p> <p><u>Weather Conditions</u> Weather conditions have an effect on the breeding success of the marsh fritillary. In particular, poor weather conditions during the adult flight period will reduce opportunities for mating, egg-laying and dispersal from core areas.</p>
<p>Landowner/ Management Responsibility</p>	<p>Cors Bryn y Gaer Unit 1 of Cors Bryn-y-Gaer has been horse grazed in the past, with drier more agriculturally improved areas being cut for hay. Unit 2 has been horse grazed in the past, but ownership has recently changed (2007), and there is no grazing now. Unit 3 and 4 are managed as one, since there is no fence between them. In the past, they have been managed with sheep and cattle grazing. There was then a two year period of no grazing, before cattle returned to the site in 2006. Unit 5 has been horse grazed for some years, and this management continues. Unit 6 receives little management, although it has been horse grazed in the past.</p> <p>Woodland Park and Pontpren Unit 1 of Woodland Park and Pontpren was grazed mainly by sheep until about 2004. However ownership has recently changed. Unit 2 is managed under a s15 agreement with NRW, that has involved reintroducing cattle grazing and the cutting of scrub. Unit 3 and 4 are owned and managed by NRW. In c.1995, they were ploughed, drained and planted with broadleaved trees and conifers. NRW now removed many of these trees, infilled some ditches and reintroduced cattle grazing in order to restore the marsh fritillary habitat. It could take many decades before the habitat is restored to anything like what it would have been prior to the tree planting and therefore management of Units 3 & 4 will primarily be aimed at providing suitable habitat and, in particular, abundant devil's-bit scabious, for the breeding marsh fritillary, rather than aiming to maintain species-rich habitat (note: - for monitoring of SSSI features these previously damaged habitats will not be included in the marshy grassland feature etc. However, the long-term aim would be look at ways of restoring the marshy grassland and other damaged habitats to a more species-rich natural state. Unit 5 is grazed by sheep and cattle, but there is a problem with scrub encroachment and removal of some of this is planned for the near future. Units 6 and 7 have mostly been managed with pony grazing with some scrub clearance aimed at improving connectivity between the fields and creating more habitats for the marsh fritillary.</p>

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<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Rhondda Cynon Taff County Borough Councils Local Development Plan (2006-2021): (2010) available at: http://www.rhondda-cynon-taf.gov.uk/en/relateddocuments/publications/developmentplanning/evidencebase/eb18-habitatsregulationsassessmentappropriateass.pdf</p>

<p>Site Name: Cadair Idris Location Grid Ref: SH704132 JNCC Site Code: UK0030104 Size: 3785.05 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site is located to the south of Dolgellau and is of special interest for its biological, Ordovician/igneous bedrock geology and Pleistocene/Quaternary geomorphology features. Cadair Idris SAC is underpinned by Cadair Idris SSSI. The woodlands on the northern edge of the SSSI form part of Coedydd Derw a Safleoedd Ystlumod Meirion SAC and are not covered by this plan.</p> <p>The site encompasses Cadair Idris mountain and the lower slopes, which are a mosaic of broadleaved woodland, wet meadows, upland habitats and grassland. It is a truly spectacular area with very many habitats and species, which are of national and international importance. The broad range of physical conditions gives rise to a wide range of habitat types. These include dwarf scrub heath communities, montane grasslands, herb- and fern-rich communities, blanket mire, soligenous flush communities, a spring-flush habitat, open water and oak woodland. The most prevalent are acid grasslands dominated by <i>Nardus stricta</i> and <i>Festuca ovina</i> and acid dry heaths dominated by <i>Calluna vulgaris</i>. In the context of the SSSI the site is also of special interest for its assemblage of higher plants, lichens, bryophytes and montane invertebrates. Nine higher plants are of special interest in their own right as is the (SAC feature) slender green feather moss <i>Hamatocaulis vernicosus</i> and an edge of range lichen species. Also of special interest are populations of the marsh fritillary butterfly, Welsh clearwing moth, and lesser horseshoe bat.</p> <p>Cadair Idris SAC includes five oligotrophic lakes, namely Llyn y Gadair, Llyn Gafr, Llyn Arran, Llyn Cyri, and Llyn Cau.</p> <p>The Cadair Idris National Nature Reserve forms an area of approximately 450 hectares in the heart of the site, including Cwm Cau and Penygadair. NRW also own and manage an area of mixed woodland adjacent to the NNR at Ystradlyn, and c81ha of undeclared reserve on the lower north slopes of the site at Tanygader. Cadair Idris is without doubt the walking honey-pot of south Eryri. An estimated 168,000 people visited the NNR in 2007.</p> <p>Cadair Idris SAC includes five oligotrophic lakes, namely Llyn y Gadair, Llyn Gafr, Llyn Arran, Llyn Cyri, and Llyn Cau. Lakes such as these are often vulnerable to acid deposition and nutrient enrichment. Llyn Gafr and Llyn Arran are relatively similar in terms of morphology, macrophyte species composition and their mosaic flora, although ANC values are very different. Llyn Cau is distinct within the Cadair Idris SAC in that it is very deep, with steeply shelving sides and consequently supports lower species diversity</p>

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	<p>and a more marked depth zonation pattern. Llyn Cau also supports a population of Brown Trout, although it is not known whether these fish have been stocked.</p>
<p>Qualifying Features</p>	<p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters. ▪ Siliceous scree. ▪ Calcareous rocky slopes with chasmophytic vegetation. ▪ Siliceous rocky slopes with chasmophytic vegetation. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Hydrophilous tall herb fringe communities. ▪ European dry heath. ▪ Northern Atlantic wet heath. ▪ Blanket bog. ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. ▪ Molinia meadows. ▪ Alkaline fens. <p>Annex II species present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Slender green feather-moss. ▪ Marsh fritillary.
<p>Conservation Objectives</p>	<p>Cadair Idris is a remarkable upland landscape, at the southern most limit for a number of alpine species and vegetation types in Britain. The site encompasses the mountain and lower slopes which are a mosaic of habitats including woodland and the species-rich <i>Molinia</i> grasslands of Tir Stent common.</p> <p>The low nutrient or clear-water lakes should be maintained as naturally clear and unpolluted, with hopefully reduced inputs of acid rain. The acid or base-poor nature of much of the underlying rock means that the lakes are especially vulnerable to acidification. The vegetated scree should be maintained in its current favourable condition. The tall herb ledges and chasmophytic vegetation should be maintained and preferably increased in area beyond the current ledges to which they are confined by current grazing.</p> <p>The dry heath, wet heath and blanket bog should be restored by grazing and water level management and be encouraged to increase at the expense of less desirable vegetation. The fragile damp, moss and liverwort rich heath should continue to flourish and</p>

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	<p>increase in cover on suitable north and northeast facing slopes. In the longer term, the development of open woodland and scattered trees onto heath, as a more natural tree line develops, is considered desirable. The woodland area should remain stable or increase by trees spreading up onto the mountain and by bracken communities developing into woodland or wood pasture. The woodland condition should be restored by eradication of rhododendron and invasive species and the managed removal of most conifers and other non-natives over the longer-term. The <i>Molinia</i> grassland, alkaline fen and slender green feather moss should be maintained in area and location by appropriate management particularly grazing. Similarly the population of marsh fritillary at Tir Stent, (and on neighbouring habitat off the SAC), would benefit from restoration habitat management so that this butterfly meta population does not decline.</p> <p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters. <p>The vision for the oligotrophic to mesotrophic (clear-water) lakes SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the clear-water lakes shall be maintained, including open water/swamp and immediate lake basin visible on air photographs. The catchments should also be maintained in at least their current condition. ▪ The typical species, as listed following, of the vegetation communities comprising the Clearwater lakes SAC feature will be common. The vegetation community is characterised by amphibious short perennial vegetation, with shoreweed <i>Littorella uniflora</i>, water lobelia <i>Lobelia dortmanna</i> and quillworts <i>Isoetes</i> spp. being the defining components. On Cadair Idris these species occur in association with bog pondweed <i>Potamogeton polygonifolius</i>, bulbous rush <i>Juncus bulbosus</i>, alternate water milfoil <i>Myriophyllum alterniflorum</i>, the stonewort <i>Nitella flexilis</i> and floating water bur-reed <i>Sparganium angustifolium</i>. ▪ Invasive non-native species are absent. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Siliceous scree.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the vegetated scree should be maintained. ▪ The scree vegetation should be made up primarily of either desirable species listed in the table below or by other lichen and bryophyte dominated communities characteristic of mobile scree ▪ The scree should be mobile and open and free from bracken, tree and scrub species such as birch <i>Betula</i> and rowan. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation. ▪ Siliceous rocky slopes with chasmophytic vegetation. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Hydrophilous tall herb fringe communities. <p>The vision for these features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the tall herb ledge and chasmophytic vegetation should be stable or increasing. ▪ The tall herb ledges, and chasmophytic vegetation should be made up primarily of the typical and desirable species listed in the table below. ▪ Non-native species are absent or rare. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heath. ▪ Northern Atlantic wet heath. <p>The vision for the heath land SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the dry heath, approximately 1451 ha, shall at least be maintained. The currently unfavourable areas of dry heath and acid grassland capable of restoration

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	<p>should be managed under a restoration programme. The area of dry heath should increase at the expense of less desirable vegetation communities such as acid grassland. The total extent of the wet heath, approximately 239 ha, shall at least be maintained. The area of wet heath should increase overall at the expense of less desirable vegetation communities. Some areas of wet heath which are degraded blanket bog may be restored to that priority habitat provided that there is no net loss of wet heath within the SAC.</p> <ul style="list-style-type: none"> ▪ The distribution of the dry and wet heath will at least be as mapped in Gray (2003) & Averis (2000) and will preferably be increasing as it is restored in additional areas. ▪ The typical species of the vegetation communities comprising the dry heath and wet heath will be frequent and abundant. ▪ The abundance and distribution of uncommon plants (see Table 2) will be maintained or increased. ▪ The structure of the heath should be maintained and restored, to show natural regeneration by layering and seeding, and to ensure that the component vegetation communities are naturally diverse (refer also to 3 and 4 above). In practise some stands will benefit from being taller with very mature heather (e.g NVC H 21) and others including wet heath from having a medium to short structure, less than 30cms height. Signs of overgrazing, including 'suppressed', 'topiary' or 'drumstick' growth habits will not be apparent. ▪ Invasive non-native species such as conifers, rhododendron, Japanese knotweed and Himalayan balsam will not be present. ▪ The surface of the heath will be generally free from trees and at most have only a few individuals at a density of no more than 2 per hectare. Exceptions to this rule are transition zones from woodland to heath land where trees may be denser grading to open heath. Limits for woodland transition zones should be set on a unit or sub-unit basis. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Blanket bog. <p>The vision for this priority blanket bog SAC feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the blanket bog area is stable at some

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	<p>200 ha in total of NVC blanket bog communities and some 73ha of vegetation on deep peat (Gray 2003), or increasing. Vegetation mapped as NVC M20, or not recognisable as a blanket bog community, is always considered to be unfavourable. The area of the blanket bog feature is increasing at the expense of less desirable vegetation communities or if wet heath is restored to blanket bog commensurate areas of land are gained to wet heath.</p> <ul style="list-style-type: none"> ▪ The location and distribution of the blanket bog is increasing at the expense of less desirable vegetation communities. ▪ The typical species of the vegetation communities comprising the blanket bog SAC feature are frequent. ▪ The structure of the blanket bog is maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. No significant areas of peat erosion should be present. ▪ Invasive non-native species such as conifers, rhododendron, Japanese knotweed and Himalayan balsam are not present within the SAC and a species specific buffer area. ▪ The blanket bog is free from all trees. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p>The vision for the Woodland SAC feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the woodland area, including woodland canopy and scrub, woodland glades and associated dry heath, bracken and grassland, of approximately 73ha shall be stable or increasing, ▪ The location of the woodland SAC feature will be at least as indicated on Map 1. The woodland covered by this feature is woodland often without clear boundary such as on Tir Stent (unit 9) and should be encouraged to spread up slope at Dol y Cae. ▪ The tree canopy percentage cover within the woodland area shall be no less than the current cover (excepting natural catastrophic events). ▪ The canopy and shrub layer comprises locally native species (Some areas are less oak and more birch

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	<p>dominated examples of this SAC feature).</p> <ul style="list-style-type: none"> ▪ There shall be sufficient natural regeneration of locally native trees and shrubs to maintain the woodland canopy and shrub layer, by filling gaps, joining fragments of woodland and allowing the recruitment of young trees, and encouraging a varied age structure. ▪ The typical ground layer species of the woodland SAC feature will be common. It is important that the vegetation does not become rank and overgrown with a height above 40cm and/or dominated by species such as bramble, ivy and young holly. Limits may be set on a unit or compartment basis. Typical lower plants including oceanic species should continue to be abundant and/or maintained. Dol y cae is known to support oceanic bryophytes of interest. ▪ The abundance and distribution of uncommon mosses, liverworts, lichens and ferns, will be maintained or increased. ▪ There will be a defined number of mature trees per hectare within the existing tree canopy on a unit basis. These are, as a guide, of c60cm diameter plus for oak and ash and/or with signs of decay, holes etc. ▪ Dead wood will be present and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). Volumes of deadwood are currently at relatively low levels because the woodlands, in general, have an even-age structure and lack mature trees. Some lower plants are dead wood specialists but these woodlands tend to lack the rare dead wood invertebrate assemblage found in other parts of the UK. ▪ Invasive non-native species such rhododendron, larch, sycamore, beech, ornamental broadleaved and conifer trees are not present. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Molinia</i> meadows. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the <i>Molinia</i> grasslands should be stable or increasing. Both upland <i>Molinia</i> grasslands and lowland <i>Molinia</i> grasslands should be represented at Tir Stent. ▪ The <i>Molinia</i> grasslands are composed of typical species.

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	<ul style="list-style-type: none"> ▪ Rare/uncommon species shall flourish. ▪ Species indicative of agricultural modification, such as perennial rye grass <i>Lolium perenne</i> and white clover <i>Trifolium repens</i> will be absent from the <i>Molinia</i> grasslands. ▪ Bare ground is limited. ▪ The vegetation is not rank and overgrown. ▪ Tree and scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will also be absent from the <i>Molinia</i> grasslands. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alkaline fens. <p>The vision for the feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the alkaline fen vegetation should be stable or increasing. ▪ The alkaline fens are vegetated primarily with the desirable species listed in the table. ▪ The alkaline fens have a low frequency/cover of <i>Molinia caerulea</i> and rushes. ▪ Tree and scrub species such as willow <i>Salix</i> and birch <i>Betula</i> are absent. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex II species present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Slender green feather-moss. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The population of <i>Hamatocaulis vernicosus</i> is stable or increasing. ▪ The habitats, which support the <i>Hamatocaulis vernicosus</i>, should be in good condition. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex II species present as a qualifying feature, but not a primary reason for selection of this site:</p>

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	<ul style="list-style-type: none"> ▪ Marsh fritillary. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The metapopulation of the marsh fritillary should be stable or increasing. ▪ The marshy grasslands which support the marsh fritillary should be in good condition for the marsh fritillaries. ▪ All factors affecting the achievement of these conditions are under control. The marsh fritillary breeding habitat within the Cadair Idris SAC and SSSI comprises marshy grassland, wet heath and neutral flushes. The primary habitat however, is the marshy grasslands M25 <i>Molinia caerulea</i>- <i>Potentilla erecta</i>, M24 <i>Molinia caerulea</i>- <i>Cirsium dissectum</i> fen meadow and M26 <i>Molinia caerulea</i>- <i>Crepis paludosa</i> mire. M24 and M26 make up the Annex II habitat <i>Molinia</i> meadows.
<p>Component SSSIs</p>	<p>The plan area has been divided into 40 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure and fenced management units under different management regimes. Some units are based on the distribution of a feature of interest.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters. <p><u>Monitoring</u></p> <p>It is recommended that all lakes surveyed within this SAC continue to be monitored. If funds are limited, then it is recommended that Llyn Arran and Llyn Cau receive greatest attention since both sites are sensitive to acid deposition and may be useful sites to monitor with respect to post-acidification recovery trends in both biological and chemical elements. WFD risk assessments have not been completed for Llyn Gafr and Llyn Arran because they are too small to be considered as 'water bodies' under the WFD. However, limited disturbance within the catchments of these lakes suggests a low risk of impact.</p> <p>Llyn Cau has been classified as being at risk from diffuse pollution, further supporting the recommendation that this site should be included in future monitoring programmes. The sources of diffuse pollution should be determined and monitored accordingly in order</p>

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	<p>to protect the lake from deterioration to unfavourable condition.</p> <p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Siliceous scree. <p>Direct management of this feature is minimal since this feature is governed primarily by natural factors such as disturbance and soil depth rather than by management.</p> <p><u>Grazing</u> The vegetation of the screes is maintained by physical factors such as disturbance from the mobile scree and soil depth rather than by grazing. However, some of the scree slopes below the level of the natural tree line have the potential to be covered by heath, scrub or trees if grazing on the adjacent habitats is very low or absent. Grazing can also keep the screes mobile, livestock moving across the scree can maintain disturbed conditions which favour the scree vegetation, preventing the establishment of tree and scrub species which are intolerant of disturbance. High grazing levels can lead to too much destabilisation of the scree by livestock. High grazing can also lead to the damage and loss of the scree vegetation by species being grazed out or repressed. Some paths created by livestock were noted within Units 1 and 5 however, these are currently not thought to be detrimental to the vegetation. Units 1 and 5 should continue to be lightly grazed.</p> <p><u>Access</u> Scrambling, walking and scree running are becoming more popular. Although mobile screes are desirable, too much disturbance can lead to total loss of all vegetation with even the development of lichen dominated communities being prevented. Damage to the screes within Units 1 and 5 by human pressure is not currently an issue however, elsewhere on site, for example on 'Foxes Path' the scree slopes are suffering from increased mobility.</p> <p>Access management should aim to minimise the impact of people pressure on the screes and to monitor any further damage to screes in particular those within Units 1 and 5.</p> <p>There should be no new paths or scree 'runs' established.</p> <p>Annex I habitats which are the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation.

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	<ul style="list-style-type: none"> ▪ Siliceous rocky slopes with chasmophytic vegetation. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Hydrophilous tall herb fringe communities. <p>Direct management of this feature is minimal since this feature is governed by natural factors such as soil depth and acidity and hydrology rather than by management.</p> <p><u>Grazing</u> The majority of the tall herb ledges and chasmophytic vegetation is out of reach from grazing livestock. However, the lowest ledges and some areas to the base of cliffs could potentially support tall herb vegetation if grazing was removed or very low. Grazing currently appears not to be significantly affecting the lower ledges but is preventing the vegetation surrounding the outcrops from developing into tall herb vegetation where the soils would allow. A relaxation in the grazing levels would clearly be beneficial to the tall herb and chasmophytic vegetation. Some of the lower and smaller outcrops below the level of the natural tree line have the potential to be covered up by trees in the absence of grazing. However, this is not currently a threat.</p> <p>Grazing levels within units 1, 13 and 14 needs to be reviewed. Management should aim to keep the grazing levels on adjacent habitats as low as possible.</p> <p><u>Access</u> Scrambling and climbing are becoming more popular. Although there are no current known impacts from climbing, this is a potential risk. Climbing can lead to the loss or damage to vegetation from trampling on ledges or the removal of vegetation from crevices. However, most summer climbing tends to take place on the more massive, siliceous rocks, so pressure on these habitats remains low. Winter climbing in minimal snow/ice conditions can pose a threat and should be monitored.</p> <p>The levels of climbing and related activities within the sensitive areas at Llyn Y Gafr (Unit 14), Cwm Cau (Unit 1) and Llyn Arran (Unit 13 and 14) should be monitored. If climbing increases in these areas and impinges on the tall herb ledges and chasmophytic vegetation then agreements should be drawn up with the British Mountaineering Council to restrict climbing to non sensitive parts of the site.</p> <p>Annex I habitats present as a qualifying feature, but not a</p>

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	<p>primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heath. ▪ Northern Atlantic wet heath. <p><u>Grazing</u> Review grazing management per unit and initiate a plan for restoration where appropriate. Through this process consider removal or reduction of winter grazing. The moorland has been grazed and burnt heavily in some areas leading to an increase in the grassland component. However NRW is discussing management agreements with owners on the site in order to reduce the grazing levels to an appropriate level, and to restrict heather burning.</p> <p><u>Drainage</u> Encourage water level control or blocking of ditches on areas of degraded wet heath.</p> <p><u>Access</u> Assess plans and projects regarding access to ensure heath is not damaged or degraded Invasive non-native species.</p> <p>Maintain vigilance for non-native plants including encroaching conifers, and instigate early control. Liaise with Forestry Commission Wales and contribute to Forest Design Plans concerning Fron Fraith, Waenllefenni and Coed Tŷ-glas with a view to clearing trees from, and avoiding any restocking adjacent to the SAC.</p> <p><u>Scrub control</u> Manage encroaching areas of scrub on wet heath.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Blanket bog. <p><u>Grazing</u> Review grazing management per unit and initiate a plan for restoration where appropriate. Through this process consider removal or reduction of winter grazing.</p> <p><u>Drainage</u> Encourage water level control or blocking of ditches on areas of degraded blanket bog.</p> <p><u>Access</u> Assess plans and projects regarding access to ensure bog is not</p>

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	<p>damaged or degraded. Maintain vigilance, record and report any illegal off-road use seen. No new routes on or very near blanket bog.</p> <p><u>Invasive non-native species</u> Maintain vigilance for non-native plants including encroaching conifers, and instigate early control. Liaise with Forestry Commission Wales and contribute to Forest Design Plans concerning Fron Fraith, Waenllefenni and Coed Tŷ-glas with a view to clearing trees from, and avoiding any restocking adjacent to the SAC.</p> <p><u>Scrub Control</u> Manage encroaching scrub and trees onto blanket bog.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p><u>Felling conifers and other non-natives</u> The current project to fell conifers and to maintain surveillance should be continued.</p> <p><u>Rhododendron</u> The programme of control and surveillance should be continued.</p> <p><u>Grazing</u> Grazing should be reviewed with consideration of regeneration and woodland flora including the moss and liverwort interest.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Molinia meadows. ▪ Alkaline fens. <p>Annex II species present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Slender green feather-moss <i>H. vernicosus</i>. <p>The management requirements below are set out in relation to Tir Stent which is the only management unit (9) where the <i>Molinia</i> meadows and Alkaline fens have a significant area and the only management unit where <i>Hamatocaulis vernicosus</i> is known to occur.</p> <p><u>Grazing</u></p>

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	<p>The <i>Molinia</i> meadows (NVC M24 & 26), alkaline fens (NVC M10) and Slender green feather-moss SAC features are maintained by grazing management of the whole unit comprising extensive 'other' <i>Molinia</i> mire, neutral fen and other habitats including woodland, bracken and scrub. During the 2004 monitoring and in the years prior to this Tir Stent was considered to be undergrazed. Subsequent site visits by NRW staff have confirmed that this situation continues. Tir Stent is a common and few of the commoners exercise their commoners' rights to graze livestock. Consequently the grazing levels are too low. The common is lightly grazed by sheep in winter and by cattle in summer but the exact grazing regime is unknown.</p> <p>Review current grazing levels, discuss the issues with the commoners and draw up an appropriate agreed grazing regime. This process is likely to include NRW advising more cattle or ponies graze Tir Stent in summer.</p> <p><u>Hydrology and Natural Drainage</u> A complex system of flushes and small water courses defines the vegetation distribution and mosaic at Tir Stent. The <i>Molinia</i> grasslands NVC M24 and M26 communities are characterised by species reliant on base rich flushing. The alkaline fens are maintained by base rich flushing in terms of both structure and species composition. <i>H. vernicosus</i> is found in areas with either flushing, up wellings from springs or a high water table which is at or slightly above the ground surface. It is restricted to 'Slightly basic (moderately acidic)' to 'moderately basic' conditions (from Hoylake, 1999). The preferred pH of the groundwater is probably in the range pH 6.0 to 7.0 but tolerances are not known. Alterations to the water chemistry or hydrological regime could therefore lead to a decrease in quality, or loss of the <i>Molinia</i> meadows or alkaline fens, or a decrease in the population or loss of colonies of <i>H. vernicosus</i>. The status of Tir Stent as a registered common, has probably protected the site from extensive ditching and artificial drainage. However, there are a small number of ditches on site along side the road and tracks. Small-scale water abstraction does occur on site for private water supplies. This is not considered to be affecting the feature currently. However, in 2004 there was some damage to SSSI features by the installation of new piping and it has become apparent that individuals with rights to abstract water from the common may not be aware of its status as SSSI and SAC. Water draining off the adjacent forestry may affect the SAC features. Many of the trees have now been cleared.</p> <p><u>Access</u> Physical damage or loss of vegetation can occur through access;</p>

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	<p>however, it is also possible to interfere with the delicate system of flushes and watercourses, which support these habitats. Tir Stent has suffered from damage by trail bikes in the past, when temporary signs were erected warning trail bikers that riding the bikes on the common is a criminal offence. Quad bike tracks have also been noted. Orienteering events need to be assessed as a plan or project as there can be significant trampling from such events whereby vegetation is reduced to mud/bare ground at key points.</p> <p>Review current situation, talk to commoners and take enforcement action as appropriate.</p> <p><u>Trees/Scrub Encroachment</u> Tir Stent supports a mosaic of open habitats including <i>Molinia</i> meadows, alkaline fens, flushes, heath, dry grassland which exists mainly in extensive glades within woodland, scrub and bracken. <i>H. vernicosus</i> is shade intolerant and therefore grows within open habitats are therefore, particularly vulnerable to scrub encroachment. Management should aim to maintain a balance between all of the different habitats at Tir Stent. Grazing helps to control scrub encroachment but rarely at the intensities appropriate here is able to stop tree and scrub encroachment. As Tir Stent has also had a period of under-grazing a programme of tree and scrub control is definitely required.</p> <p>Tree and scrub species within and adjacent to stands of <i>Molinia</i> meadows, alkaline fens or flushes and other open habitats supporting <i>Hamatocaulis vernicosus</i> should be removed as part of a programme of control on Tir Stent.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Marsh fritillary. <p><u>Grazing</u> The marsh fritillary <i>Molinia</i> grassland habitat with <i>Succisa</i> is maintained by grazing management of the whole unit comprising 'other' mire, neutral fen, woodland, bracken and scrub. Subsequent site visits by NRW staff have confirmed that this situation continues. Tir Stent is a common and few of the commoners exercise their commoners' rights to graze livestock. Consequently the grazing levels are too low. The common is lightly grazed by sheep in winter and by cattle in summer but the exact grazing regime is unknown.</p> <p>Review current grazing levels, discuss the issues with the commoners and draw up an appropriate agreed grazing regime.</p>

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	<p>This process is likely to include NRW advising more cattle or ponies graze Tir Stent in summer.</p> <p><u>Metapopulation Conservation</u> In most cases the marsh fritillary occurs in metapopulations where dispersal from a core population during good years permits colonisation of nearby patches of habitat. Periodic extinctions and colonisations of patches can be tolerated as long as sufficient habitat overall is in good condition for breeding. Tir Stent form part of a core population of marsh fritillaries with adjacent units within the SSSI, Tynsarn, Tyddyn Du and Bryn Castell. Metapopulations exist outside of the SAC and SSSI within 2 km of the core population, at Cross Foxes and Tyddyn Garreg. Management should aim to protect the metapopulations by providing advice and responding to consultations regarding any development work or agricultural changes at the meta population sites.</p> <p>Where NRW is consulted on any development, works or alterations to the agricultural/habitat management within areas where the marsh fritillary has been recorded, advice should be given on the maintenance and improvement of the marsh fritillary habitat and conservation of marsh fritillary populations.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Lower limit – current. • Typical species. <ul style="list-style-type: none"> ○ Lower limit – as present. <p>Characteristic species will be frequent in each of the clear-water lakes</p> <ul style="list-style-type: none"> • Invasive non-native species. <ul style="list-style-type: none"> ○ Lower limit – none present. <p>Non-native species are undesirable and can out compete native species. Species of water weed such as Canadian pondweed and birds e.g Canada geese may be an issue in the future.</p> <ul style="list-style-type: none"> • Water Quality: Nutrient levels. <ul style="list-style-type: none"> ○ Lower Limit – None set Upper Limit: Mean annual total phosphorus (TP) <10 microgrammes / litre.

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	<p>Phosphorus (P) and nitrogen (N) are important plant nutrients controlling growth. In naturally nutrient-poor lakes such as Rhinog these should be at barely detectable levels.</p> <ul style="list-style-type: none"> • Water Quality: water clarity. <ul style="list-style-type: none"> ○ Lower Limit: No decline in max depth of plant colonization. ○ Upper Limit: None Set. <p>Lakes within Cadair Idris SAC have clear water as a result of their low nutrient levels and lack of intensive agriculture / forestry in their catchments.</p> <ul style="list-style-type: none"> • Water Quality: acid neutralising capacity. <ul style="list-style-type: none"> ○ Lower Limit – Acid Neutralizing Capacity >20. ○ Upper Limit – None set. <p>Cadair Idris lakes are naturally low in calcium, but are very susceptible to acidification as a result.</p> <ul style="list-style-type: none"> • Catchment Management. <ul style="list-style-type: none"> ○ No new drainage ditches. We should also seek to block existing ditches wherever possible. Review enrichment. No agricultural improvement Assessment of plan and projects. <p>Drainage/moor grips can lead to drying of the adjacent peat, changes in soil chemistry, erosion, changes to the vegetation structure and increased sedimentation. Enrichment and other pollution draining into the lakes from the catchment is also undesirable.</p> <ul style="list-style-type: none"> • Recreation and access, inc fishing and watersports. <ul style="list-style-type: none"> ○ Current level is not of concern. <p>Llyn Arran and Cyri probably see very little or no use as they are so remote. Llyn Cau, Llyn y Gadair and Llyn Gafr are used occasionally for fishing and swimming. Diving takes place very rarely at Llyn Cau and Llyn y Gadair. Llyn Cau is the most well used lake on the SAC but this is still a low level of useage.</p> <ul style="list-style-type: none"> • Off road vehicle use. <ul style="list-style-type: none"> ○ Maintain vigilance and report incidents. <p>Off road vehicles could cause damage close to lakes and within catchments on the SAC.</p>

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	<p>Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</p> <ul style="list-style-type: none"> • Extent of the siliceous scree. <ul style="list-style-type: none"> ○ The extent of the all the screes within the Cadair Idris SAC should be maintained. <p>The lower limit is based on current known extent of the all scree. Areas of scree which have been recorded as supporting 'U21' or comparable habitats from the Wales Upland Field Unit survey are all included within the desired limits below.</p> <ul style="list-style-type: none"> • Typical species & structure (within units 1 & 5). <ul style="list-style-type: none"> ○ Lower limit – The scree slopes which are known to support U21 and other scree communities should be in good condition where: (i) <33% of the ground cover of the stand should be free from overgrowth by vascular plants. <p>These targets are based on targets outlined by the Upland Common Standards Monitoring Guidance adapted to make them site specific.</p> <ul style="list-style-type: none"> • Tree/scrub cover (within units 1 & 5). <ul style="list-style-type: none"> ○ Lower limit – The scree slopes which are known to support U21 and other scree communities should be in good condition where: (i) <25% of the ground cover of the stand should be made up by bracken, trees, or shrubs (collectively). • Grazing. <ul style="list-style-type: none"> ○ Within the Cadair SAC. The vegetation surrounding the screes should be lightly grazed. ○ Lower limit (within Units 1 & 5) – The scree slopes which are known to support U21 and other scree communities should be in good condition where: <ul style="list-style-type: none"> (i) Less than 50% of the live leaves (forbs) and/or the shoots (dwarfshrubs) should show signs of having been grazed or browsed, Or where this is too difficult to assess for health and safety reasons, (ii) The vegetation immediately adjacent to the screes should not show signs of being heavily grazed- the sward height must be >3cm and any herbs should be able to flower. • Pressure from people. <ul style="list-style-type: none"> ○ The scree slopes which are known to support U21 and other scree communities should be in good

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	<p>condition where:</p> <ul style="list-style-type: none"> (i) Within Cadair Idris SAC there should be no new paths or scree ‘runs’ established. (ii) less than 20% of the ground cover should be disturbed by human or animal paths, scree running or vehicles. <p>Walking, scrambling scree running and related activities are becoming ever more popular. Some scree slopes on Cadair are known to be suffering from the impacts due to pressure from people. Some scree slopes are becoming excessively destabilised.</p> <ul style="list-style-type: none"> • Burning <ul style="list-style-type: none"> ○ The current extent of the scree is acceptable and there should be no increase in the area of scree at the expense of heath which is also an Annex I habitat. <p>(i) There should be no burning for scree management.</p> <p>Some screes are covered by heath. If burning is carried out to as part of heath land management or accidental fires occur then the extent of the screes could increase as the heath vegetation covering them up is burnt off or more likely the heath is just degraded.</p> <ul style="list-style-type: none"> ▪ Calcareous rocky slopes with chasmophytic vegetation ▪ Siliceous rocky slopes with chasmophytic vegetation. ▪ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels <ul style="list-style-type: none"> • Extent of the tall herbs and chasmophytic vegetation. <ul style="list-style-type: none"> ○ Target – the desired extent of the tall herb ledge and chasmophytic vegetation is for it to extend to the lowest ledges and crevices currently accessible to grazing stock and for the tall herb vegetation to extend to the areas adjacent to the cliff bases wherever the soils allow for this vegetation type to develop. ○ Lower limit – the vegetation should be maintained at the current extent. <p>The tall herb ledge vegetation is currently found on cliff ledges and crevices which are mostly inaccessible to grazing animals. However, it is desirable in the long term to extent the tall herb vegetation to it’s full potential. The key areas for these vegetation types are the crags surrounding; Llyn Y Gafr (Units 14 and 16), Llyn</p>

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	<p>Cau (Unit 1) and Llyn Arran (Units 13 and 14). Tall herb vegetation has also been recorded in small amounts within Cwm Rhwyddfor (Unit 5) and Mynydd Rugog (Unit 38) and may occur elsewhere on the site. Calcareous and siliceous chasmophytic vegetation may occur on any rocky outcrop on Cadair wherever the climatic or 'soil' conditions allow.</p> <ul style="list-style-type: none"> • Typical species of tall herb ledges and chasmophytic vegetation. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – The tall herb and chasmophytic vegetation should be in good condition where: <ul style="list-style-type: none"> (i) The rocky outcrops are vegetated with desirable species such as those listed above. (ii) Cover of <i>Nardus stricta</i>, <i>Agrostis capillaris</i> and <i>Anthoxanthum odoratum</i> should be less than 10%. <p>These targets are based on targets outlined by the Uplands Common Standards Monitoring Guidance for tall herb ledges and chasmophytic vegetation. However, they have been adapted to reflect the species composition at Cadair Idris. The tall herb vegetation is variable and may vary from ledge to ledge in terms of the presence and abundance of species. The list of desirable species should be used as a guide, rather than a definitive list of every species which should be present</p> <ul style="list-style-type: none"> • Tree and shrub species. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – The tall herb and chasmophytic vegetation should be in good condition where: <ul style="list-style-type: none"> (i) Less than 25% of the ground cover should be made up of bracken. (ii) Less than 10% should be made up of trees or scrub excluding ericoids. <p>Bracken, trees or scrub, excluding ericoids, are not desirable.</p> <ul style="list-style-type: none"> • Non-native species. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – The tall herb and chasmophytic vegetation should be in good condition where: <ul style="list-style-type: none"> (ii) Non-native species such as <i>Rhododendron</i> are not present. (iii) The non-native species <i>Epilobium brunnescens</i> makes up less than 1% of the vegetation <p>Non-native species are not present.</p>

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	<ul style="list-style-type: none"> • Grazing (The tall herb ledges and chasmophytic vegetation is not maintained by grazing since succession to woodland here has been arrested by soil depth and exposure. Grazing can have a negative influence on the vegetation on the lower and more accessible ledges and crevices. No grazing adjacent is likely to benefit these SAC features). <ul style="list-style-type: none"> ○ Grazing levels within the units (1,13, 14 and 16) where tall herbs are a key habitat. ○ Lower limit – At least 50% of the tall herb stems should be >20cm tall or there should be few observable signs of grazing on tell herb, and chasmophytic vegetation and most tall herb species must be flowering or showing signs of being able to flower during the summer months. (ii) Less than 10% of the ground cover should be disturbed bare ground. (iii) The adjacent habitats should be lightly grazed as appropriate -refer to relevant section of this plan e.g. heath. • Hydrological regime (Many of the tall herb ledges are maintained by base rich flushing in terms of both structure and species composition. Flushing can also dictate the species composition of the chasmophytic vegetation. Although much of the chasmophytic vegetation is dry, where the chasmophytic vegetation is dominated by moisture-requiring bryophytes and ferns, it is likely to be dependent on flushing). <ul style="list-style-type: none"> ○ Maintain natural drainage–seepage. • Climbing (can lead to damage or to the loss of chasmophytic vegetation or tall herb ledges. Very little climbing takes place here as it is not particularly suitable). <ul style="list-style-type: none"> ○ Upper limit (Units 1, 13, 14, and 16) – There should be no damage to the tall herb ledge vegetation and chasmophytic vegetation by climbers. <p>European dry heath Northern Atlantic wet heath</p> <ul style="list-style-type: none"> • Extent of heath. <ul style="list-style-type: none"> ○ Upper limit – None, as defined by geology, soils and topography and provided expansion is at the expense of less desirable vegetation such as acid grassland.

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	<ul style="list-style-type: none"> ○ Lower limit – maintain current extent, including montane heath. <p>Lower limit is based on current extent of dry and wet heath estimated c.45% cover (1690 ha). Dry heath currently covers c.38% of the site (1451ha), and wet heath covers c.6% (239 ha) of the site.</p> <ul style="list-style-type: none"> ● Distribution of heath. <ul style="list-style-type: none"> ○ Maintain current distribution, and aim to increase distribution of montane heath on the Penygadair-Mynydd Moel plateau. ● Typical species. <ul style="list-style-type: none"> ○ Site-specific quadrats Averis (2000) are a guide to expected lower limit frequencies of desirable species. ○ (i)The desirable rush species (not <i>J. effusus</i>) and <i>Molinia</i> should be of an expected frequency and cover. ○ (ii)The cover of rank grasses such as <i>Deschampsia cespitosa</i> is low. ○ (iii)The combined cover of other grasses (<i>Holcus lanatus</i>, <i>Nardus stricta</i> and <i>Agrostis sp.</i>) is low. ○ (iv)<i>Arrhenatherum elatius</i>, <i>Trifolium repens</i> & <i>Ranunculus repens</i> should be absent or rare. ● Uncommon plants. <ul style="list-style-type: none"> ○ Upper Limit – None set. ○ Lower Limit – As recorded Averis (2000) and subsequently. ● Heath land structure. <ul style="list-style-type: none"> ○ Set limits relevant to particular location/stand in context of whole site. ● Non-native species. <ul style="list-style-type: none"> ○ Acceptable limit – None present within SAC. ○ Target – None present within species specific buffer zones around SAC. ● Trees <ul style="list-style-type: none"> ○ Limits depend on unit or sub-unit objective – Typically None or only a few individuals ie no more than 2 per hectare.

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	<p>Some stands may have limits set of 1 tree per 10mx10m or more as woodland is allowed to develop. Another exceptional case is for transition zones from heath land to woodland to where trees may be allowed to grade to open heath. Up to 20% tree cover as per CSM guidance may be acceptable in some locations</p> <ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes) for dry heath, and 0.3LSU/ha/yr (cattle/ponies) for wet heath with frequent/dominant purple moor grass. ○ There should be no signs of overgrazing such as ‘suppressed’, ‘topiary’ or ‘drumstick’ growth habits of heather. There should be no further loss of heath to acid grassland indeed such areas should be restored. <p>Heaths are likely to have always been grazed to some extent, by a variety of herbivores. In an unmodified heathland, species composition is regulated by soil composition, water levels, altitude and aspect, as well as factors such as grazing. Where grazing is too high, or where heavy grazing immediately follows an incident such as a burn, the species composition can become heavily modified and at worse can be replaced by acid grassland.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ (i) Burning should have clearly stated objectives and be limited to – appropriate areas of dry heath (usually NVC H12), at a small scale, well controlled and following good practice and codes. Hence burning of some stands of dry heath may be consented on a case-by-case basis. ○ (ii) Wet heath should not be burnt. ○ (iii) Heath on steep rocky slopes with thin soils, or heath with abundant lower plants (NVC H21) should not be burnt. ○ (iii) Montane heath should not be burnt can be damaging to some types of dry heath and should not be permitted in these areas. Past burning of dry heath, combined with intense grazing has resulted in the loss of areas of dry heath to acid grassland dominated by <i>Festuca/Agrostis</i> or <i>Nardus</i>. <p>In certain situations, controlled burning of specific patches may also be a useful management tool to encourage sheep to cover an area more evenly. Within species-poor stands of often NVC H12 burning</p>

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	<p>can be benign provided it is not followed by locally intense grazing as stock concentrate on recently burnt areas.</p> <p>The extent of Montane heath is largely limited by altitude, exposure and other climatic factors, but is also very vulnerable to over grazing, trampling and burning.</p> <ul style="list-style-type: none"> • Mowing. <ul style="list-style-type: none"> ○ Cutting limited to appropriate areas of heath, at a small scale, and agreed on a case-by-case basis. <p>Cutting can be a viable alternative to burning and offers a controlled, safe way to manage heather without the associated risks of fires. Machinery can sometimes access areas where burning would not be appropriate, although heather may be slower to regenerate, and build up of brash can also retard regrowth on occasions.</p> <ul style="list-style-type: none"> • Afforestation / conifer encroachment. <ul style="list-style-type: none"> ○ No planting of conifers or other trees on heath. Conifers should be removed from heath. ○ Limit – none. <p>Conifers shade out the heath vegetation and acidify the groundwater. Associated activities such as heavy plant access, planting, fertiliser input, construction and maintenance of access tracks, and drainage works lead to further damage of the heath. Conifers also seed onto heath.</p> <ul style="list-style-type: none"> • Drainage ditches / moor grips. <ul style="list-style-type: none"> ○ No new drainage ditches or drainage work affecting heath land. <p>Drainage works are carried out to dry the land out but this is not desirable where it leads to drying of the peat soils supporting heath, especially wet or humid 'dry' heath (NVC H21). Changes in soil chemistry, erosion and the changes to the vegetation structure covered in 'Grazing' above.</p> <ul style="list-style-type: none"> • Bracken. <ul style="list-style-type: none"> ○ Defined limits for bracken and bracken encroachment bordering heath. <p>Bracken is a natural component of the moorland edge communities and sparsely within H21. However, where bracken is encroaching at the expense of dry heath and where woodland development is not desirable, some form of control may be required.</p>

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	<ul style="list-style-type: none"> • Development. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>This factor covers any form of development including construction and maintenance of tracks, erection of infrastructure, masts, towers or turbines as well as quarrying.</p> <ul style="list-style-type: none"> • Recreation and access. <ul style="list-style-type: none"> ○ The site is designated as access land, although most recreational use is believed to be focused on the existing PROW network. ○ Surveillance and monitoring is required to define limits. <p>Certain areas such as the summit of Penygadair, and the main established paths are particularly vulnerable. Trampling by people, combined with the effects of high stocking levels may lead to erosion. This is of concern, particularly if access pressure increases.</p> <p>Ras y Gadair (fell race) has been held annually during the month of May. The race starts in Dolgellau and follows the Tŷ Nant path to the summit and back. The race has always stuck to the established route, and is well organised and marshalled, including some contribution by SNPA wardening staff. The numbers involved mean that it is not an activity that causes great concern regard feature condition, but any significant increase in participants may well be damaging.</p> <ul style="list-style-type: none"> • Off road vehicle use. <ul style="list-style-type: none"> ○ Maintain vigilance, record and report any illegal off-road use seen. • Non-native species. <ul style="list-style-type: none"> ○ No non-native species should be present. <p>Non-native species especially invasive species such as conifers, rhododendron, Japanese knotweed and Himalayan balsam should not be present.</p> <ul style="list-style-type: none"> • Agricultural improvement. <ul style="list-style-type: none"> ○ There should be a presumption against ploughing, fertilising and/or re-seeding any of the semi-natural habitats on this site. <p>Application of fertiliser causes a loss or reduction in many species</p>

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	<p>typical of seminatural habitats as they are no longer able to compete, while ploughing and reseeded causes direct destruction of the habitats.</p> <p>Blanket bog</p> <ul style="list-style-type: none"> • Extent of blanket bog. <ul style="list-style-type: none"> ○ Upper limit – None, naturally limited by geology, topography and rainfall. ○ Lower limit – c.273 ha ie current area. Land must be checked for this feature before any assessment takes place. No blanket bog area can be lost. <p>Lower limit is based on the current extent which must be maintained. The full extent is difficult to measure precisely as degraded blanket bog does not support characteristic blanket bog vegetation. The area given can only be regarded as approximate. The area of blanket bog should be increasing through restoration management.</p> <ul style="list-style-type: none"> • Location and distribution of blanket bog. <ul style="list-style-type: none"> ○ As current or increasing good quality blanket bog. <p>The current location and distribution within the SAC must be maintained.</p> <ul style="list-style-type: none"> • Typical species. <ul style="list-style-type: none"> ○ As guide to frequency refer to NVC tables and averis (2000) quadrats. <p>Typical species will be frequent and form the main dominants.</p> <p>Typical species of the Blanket Bog SAC.</p> <p><u>Bog pools.</u></p> <p>NVC vegetation community - M1 Sphagnum denticulatum bog pool community <i>Eriophorum angustifolium</i> <i>Menyanthes trifoliata</i> <i>Sphagnum auriculatum</i> <i>Sphagnum cuspidatum</i></p> <p>NVC vegetation community - M2 Sphagnum cuspidatum/Sphagnum recurvum bog pool community <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Drosera rotundifolia</i></p>

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	<p><i>Sphagnum recurvum</i> <i>Rhynchospora alba</i></p> <p>NVC vegetation community - M3 Eriophorum angustifolium bog pool community. <i>Eriophorum angustifolium</i></p> <p>Blanket Mire NVC vegetation community - M17 Trichophorum cespitosum-Eriophorum vaginatum blanket mire. (Characteristically frequent <i>Eriophorum vaginatum</i>, <i>Scirpus cespitosus</i> and <i>Molinia caerulea</i>) <i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Molinia caerulea</i> <i>Narthecium ossifragum</i> <i>Potentilla erecta</i> <i>Scirpus cespitosus</i> <i>Sphagnum capillifolium</i> <i>Sphagnum papillosum</i> <i>Vaccinium vitis-idaea</i>*</p> <p>NVC vegetation community - M19 Calluna vulgaris –Eriophorum vaginatum blanket mire. <i>Calluna vulgaris</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Sphagnum capillifolium</i> <i>Vaccinium vitis-idaea</i>* <i>Empetrum nigrum</i>*</p> <p>NVC vegetation community - M20 Eriophorum vaginatum raised and blanket mire. (Poor ombrogenous bog vegetation dominated by <i>Eriophorum vaginatum</i> tussocks) <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i></p> <ul style="list-style-type: none"> • Bog surface structure. <ul style="list-style-type: none"> ○ Limit – to be defined as a pragmatic proportion of the current mapped drains including those which will infill and revegetate naturally over time. <p>The structure of the blanket bog is maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or</p>

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	<p>moor grips are not present as functioning drains. Ditches should be in filled or blocked to create pools. There should be no significant peat erosion.</p> <ul style="list-style-type: none"> • Invasive non-native species. <ul style="list-style-type: none"> ○ None present within SAC and ‘buffer’ surrounding land for 1km. <p>Invasive non-native species are aliens within the natural blanket bog communities. Their invasive nature means they threaten the integrity of the habitat by competition, shading and often drying of the blanket bog by transpiration. Blanket bog area as in A1 and A2 is lost unless control takes place.</p> <ul style="list-style-type: none"> • Tree cover. <ul style="list-style-type: none"> ○ Blanket bog in favourable condition is tree less. <p>Blanket bog in Wales has been naturally tree-less for a long time. Trees are present occasionally where this habitat is in mosaic on drier areas such as heath and acid grassland or crags away from grazing stock. Blanket bog that has been drained, and planted with conifers and is then cleared or fails is particularly prone to tree regeneration.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year. (0.33 ewes) Ponies or cattle have advantages over sheep due to their tendency to graze coarser grass and rush vegetation without adversely affecting heather/ericaceous cover. Sheep will graze heather intensively in the autumn/winter. • Burning. <ul style="list-style-type: none"> ○ No burning. • Drainage ditches / moor grips. <ul style="list-style-type: none"> ○ No new drainage ditches. We should also seek to infill/block existing ditches wherever possible and to have targets for restoration. • Recreation and Access. <ul style="list-style-type: none"> ○ No significant erosion or compaction of blanket bog and no infrastructure on this priority habitat. No erosion at all in vulnerable locations. • Off Road Vehicle Use.

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	<ul style="list-style-type: none"> ○ Maintain vigilance, record and report any illegal offroad use seen. No new routes on or very near blanket bog. • Afforestation / conifer encroachment. <ul style="list-style-type: none"> ○ The blanket bog should be treeless. ○ No new afforestation or tree planting on blanket bog. <p>(Trees may be acceptable on neighbouring habitats as adjacent stands or mosaic provided seeding in to the blanket bog is not a problem and other interest has been considered).</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <ul style="list-style-type: none"> • Extent of broad-leaved woodland and associated habitats. <ul style="list-style-type: none"> ○ Upper limit – Some increases in woodland habitat would be desirable. ○ Lower limit – 73 ha as mapped with transitional zones to adjacent habitats provided this does not adversely affect other defined interest. • Location of woodland <ul style="list-style-type: none"> ○ Tan y Gader, Tir Stent and Dol y Cae, and COed Llwyn. • Tree canopy cover. <ul style="list-style-type: none"> ○ Tree canopy is maintained at the current 2008 woodland cover. <p>The tree canopy percentage cover within the woodland area (as defined on Map 2) is the current cover. If there is a natural catastrophic event, assessment should be made to see if follow up management is required.</p> <ul style="list-style-type: none"> • Canopy and Shrub Layer. <ul style="list-style-type: none"> ○ No non-natives unless they support recorded interest when a case may be made to retain them provided they are not invasive. See also ‘Non-native species’ (below). • Native tree and shrub regeneration. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – regeneration visible with limits set on a unit basis.

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	<ul style="list-style-type: none"> • Ground layer. <ul style="list-style-type: none"> ○ Woodlands should be open in character, not be overgrown and as a general guide not difficult to walk through because of rank vegetation such as bramble, ivy and holly. • Uncommon mosses, liverworts, lichens and slime moulds. <ul style="list-style-type: none"> ○ Lower Limit – The current abundance and distribution should be maintained or preferably increased. • Mature / Veteran trees. <ul style="list-style-type: none"> ○ Lower Limit – This is set at a level appropriate to each unit, which is usually above the current number. Achievement of this limit is dependant on time passing and lack of disturbance/destruction of mature and maturing trees so they may be allowed to grow into veterans. • Dead Wood. <ul style="list-style-type: none"> ○ Dead wood is present and consists of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). • Non-native species. <ul style="list-style-type: none"> ○ None- unless a case can be made for the non-invasive species that they support recorded wildlife interest or are valued in the landscape and not adversely effecting the interest. • Grazing <ul style="list-style-type: none"> ○ Favourable management is often light summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year. • Woodland Management & Humidity. <ul style="list-style-type: none"> ○ Tree felling leading to large gaps in the canopy should not take place and woodland cover should be protected so that further fragmentation does not take place. • Development such as tracks. <ul style="list-style-type: none"> ○ Plan or project should be assessed. <p>Molinia meadows</p>

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	<ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit (within Tir Stent (unit 9)) - None set. Molinia grasslands SAC feature. ○ Lower limit – 1.5ha Of which there will be 0.9 ha of lowland Molinia meadows and 0.6 ha of upland Molinia meadows. Map above shows the current extent of the Molinia meadows SAC feature. <p>Lower limit is based on current extent of the lowland <i>Molinia</i> grasslands and upland <i>Molinia</i> grasslands. The extent figures have been rounded down to account for the stands of <i>Molinia</i> grasslands found in mosaic.</p> • Typical Species. <ul style="list-style-type: none"> ○ (i)The grassland is species rich with at least two positive indicator species present throughout the sward. ○ (ii)There is a high density of <i>Succisa pratensis</i> plants. ○ An additional lower limit has been set for the presence of <i>Succisa pratensis</i> as this is the host plant for the marsh fritillary butterfly – a key SAC species on this site. <p>These targets are based on the Standard CSM attributes for this feature. Modified according to site specific requirements.</p> • Rare Species. <ul style="list-style-type: none"> ○ Rarities/ Notable species of the <i>Molinia meadows</i> feature should be maintained: <i>Dactylorhiza incanata</i>, <i>D.majalis ssp. purpurella</i>, <i>Gymnadenia conopsea</i>, and <i>Platanthera bifolia</i>, <i>P. chlorantha</i>, <i>Coeloglossum viride</i>, <i>Ophioglossum vulgatum</i>, <i>Dryopteris carthusiana</i>, <i>Trollius europeus</i>, <i>Hamatocaulis vernicosus</i>. • Undesirable Species & Cover. <ul style="list-style-type: none"> ○ (i)The desirable rush species (not <i>J. effusus</i>) and Molinia should be of an expected frequency and cover. ○ (ii)The cover of rank grasses such as <i>Deschampsia cespitosa</i> is low. ○ (iii)The combined cover of other grasses (<i>Holcus lanatus</i>, <i>Nardus stricta</i> and <i>Agrostis sp.</i>) is low. ○ (iv)<i>Arrhenatherum elatius</i>, <i>Trifolium repens</i> & <i>Ranunculus repens</i> should be absent or rare.

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	<p>Some species are indicative of degradation and loss of valued botanical biodiversity. <i>Juncus acutiflorus</i> cover-Rodwell (1991) for <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> fen-meadow is II (1-7) less than 50% and <i>Molinia caerulea</i> – <i>Crepis paludosa</i> mire is IV (1-5) less than 25%. <i>Molinia</i> for <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> fen-meadow and <i>Molinia caerulea</i> – <i>Crepis paludosa</i> mire is V (1-8) up to 80% cover.</p> <ul style="list-style-type: none"> • Bare Ground. <ul style="list-style-type: none"> ○ Bare ground is no more that 10% of the sward and no areas of bare ground should be present which are greater than 1m x 1m within the <i>Molinia</i> SAC feature. • Vegetation Height. <ul style="list-style-type: none"> ○ The grass height of the SAC feature should be below 45cms with at least 50% less than 30cms and of that at least 50% should be less than 20cm. This guidance would need to be field tested. Grass height close to and including <i>Succisa</i> is particularly important ie it should not be rank. <p>The botanical diversity and suitability for marsh fritillary is greatest when the vegetation is not rank and overgrown (between 10 and 25 cms).</p> <ul style="list-style-type: none"> • Trees, Scrub & Bracken. <ul style="list-style-type: none"> ○ Tree, or scrub species, over 30cm in height, bramble and bracken, are all absent. <p>Notes should be taken of any tree or scrub species present of a lesser height so that management action can be taken before the stand 'fails'.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ At Tir Stent (Unit 9) – 0.3 lsu/ha/yr is a guide. ○ Light summer grazing by cattle or ponies is essential. ○ Light winter grazing by sheep is acceptable. • Hydrological regime. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – There should be no artificial drainage or water abstraction on the site which would alter the hydrological regime of the <i>Molinia</i> grasslands. <p>Base rich flushing creates the conditions which suit the calcicolous species that characterise the <i>Molinia</i> meadows. It is essential that the hydrological regime is not altered by ditching or water</p>

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	<p>abstraction.</p> <ul style="list-style-type: none"> • Access. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – Trampled, heavily poached areas or tracks created by vehicle, or visitor damage should be absent or rare at vulnerable locations. <p>Pressure from people, livestock and vehicles including bicycles can be of concern. The delicate habitat mosaic at Tir Stent with it's complex system of flushes is easily damaged by trampling and the creation of tracks which cause loss or damage to vegetation, compaction and could even alter the system of flushing at the common.</p> <ul style="list-style-type: none"> • Scrub encroachment. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – ○ Upper limit – 65% of Tir Stent is made up of Bracken trees or scrub. ○ Lower limit – 40% of Tir Stent is Bracken, trees or scrub. <p>Alkaline fens</p> <ul style="list-style-type: none"> • Extent & location of the Alkaline Fen. <ul style="list-style-type: none"> ○ Limits – As yet the full extent of alkaline fens within the SAC is not known since the whole of Cadair Idris has not undergone vegetation mapping to such a fine level as to pick out all stands of alkaline fen. ○ (i)The current extent of the Alkaline Fen should be maintained (see core management plan). ○ (ii)Within Tir Stent (Unit 9) There should be at least 0.7 ha of Alkaline Fen. • Typical species of Alkaline Fen. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – ○ (i) The alkaline fen is vegetated primarily with the desirable species listed - dominated by one or more of the following; brown mosses, small sedges, <i>Eriophorum</i> spp. or <i>Menyanthes trifoliata</i>. ○ (ii)At least 10% of the vegetation is always made up of brown mosses such as such as <i>Scorpidium scorpioides</i>, <i>Cratoneuron commutatum</i> and <i>Drepanocladus revolvens</i>) and base demanding sedges such as <i>Carex dioica</i>, <i>Carex pulicaris</i>, <i>Carex hositana</i> or <i>Carex viridula</i> are frequent throughout the sward. ○ (iii)Less than 25% of the vegetation should consist of either <i>Juncus</i> sp. or <i>Molinia</i>.

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	<ul style="list-style-type: none"> • Molinia/Rush/Bracken. <ul style="list-style-type: none"> ○ (i) <i>Juncus</i> such as <i>J. squarrosus</i> and <i>J. acutiflorus</i> should have a frequency of 1 or zero. <i>Molinia</i> should have a cover of less than 25% and normally be towards the margins of this localised community. <i>Bracken</i> should be absent. • Trees, scrub & bracken. (Notes should be taken of any tree or scrub species present of a lesser height so that management action can be taken before the stand fails). <ul style="list-style-type: none"> ○ (i) There should be no trees shrub species (excluding seedlings <20cm in height). ○ (ii) There should be <25% disturbed bare ground. • Grazing. <ul style="list-style-type: none"> ○ At Tir Stent – 0.3 lsu/ha/yr is a guide. ○ Light summer grazing by cattle or ponies is essential. ○ Light winter grazing by sheep is acceptable. • Hydrological Regime. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – There should be no artificial drainage or water abstraction on the site which would alter the hydrological regime of the alkaline fens. • Access <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – Trampled, heavily poached areas or tracks created by vehicle, or visitor damage should be absent or rare at vulnerable locations. • Scrub encroachment. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – ○ Upper limit – 65% of Tir Stent is made up of Bracken trees or scrub. ○ Lower limit – 40% of Tir Stent is Bracken, trees or scrub. <p>Slender green feather-moss</p> <ul style="list-style-type: none"> • Population of <i>Hamatocaulis vernicosus</i>. <ul style="list-style-type: none"> ○ The whole of Cadair Idris SAC has not been surveyed and where the habitat conditions are right other populations of <i>Hamatocaulis</i> could exist outside of Tir Stent. ○ Within Tir Stent (Unit 9) – ○ (i) There should be at least 8 colonies of 100 or more

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	<p><i>Hamatocaulis</i> stems present within a stand of good quality flush vegetation (at least 1m x 1m in area) within 5 different flushes at Tir Stent.</p> <ul style="list-style-type: none"> ○ (ii) There should be least 2 colonies of over 1000 <i>H. vernicosus</i> stems present in good quality flush vegetation (at least 2m x 2m in area) within two different flushes (Flushes A-K highlighted on the map below) within Tir Stent. <ul style="list-style-type: none"> • Condition of the habitat supporting the <i>Hamatocaulis vernicosus</i>. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – The <i>Hamatocaulis</i> colonies should be supported by at least 1m x 1m of good quality habitat where – <ul style="list-style-type: none"> ○ (i) Rush cover should be 20% or less. ○ (ii) There should be <10% disturbed bare ground. ○ (iii) Bracken, and tree and scrub species >30cm in height should be absent. • Grazing. <ul style="list-style-type: none"> ○ At Tir Stent (Unit 9) – 0.3 Isu/ha/yr is a guide. ○ (i) Light summer grazing by cattle or ponies is essential. ○ (ii) Light winter grazing by sheep is acceptable. • Hydrological regime/ water chemistry. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – <ul style="list-style-type: none"> ○ (i) There should be no artificial drainage or water abstraction on the site which would alter the hydrological regime. • Pressure from people, livestock and vehicles including bicycles. <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – <ul style="list-style-type: none"> ○ (i) Trampled, heavily poached areas or tracks created by vehicle, or visitor damage should be absent or rare at vulnerable locations. • Scrub <ul style="list-style-type: none"> ○ Within Tir Stent (Unit 9) – <ul style="list-style-type: none"> ○ Upper limit – 65% of Tir Stent is made up of Bracken trees or scrub. ○ Lower limit – 40% of Tir Stent is Bracken, trees or scrub. <p>Marsh fritillary</p> <ul style="list-style-type: none"> • Population of the Marsh Fritillary butterfly – density of

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	<p>larval webs.</p> <ul style="list-style-type: none"> ○ One year in six the estimated number of larval webs should be 200 per ha of good condition marsh fritillary habitat in that year. Wide fluctuations in abundance occur, with dramatic crashes in population size occurring every ten years or so from natural causes. Recovery from these crashes may take 4 or 5 years therefore, the number larval web only has to be achieved on year in six. Reporting should only take place using counts from what is considered to be a good year. <ul style="list-style-type: none"> ● Extent of the marsh fritillary breeding habitat. <ul style="list-style-type: none"> ○ At Tir Stent there should be at least 18.5 ha of available marsh fritillary habitat. ● Condition of the marsh fritillary breeding habitat. <ul style="list-style-type: none"> ○ At least 10 ha of the available marsh fritillary habitat should be in good condition where – ○ (i) A vegetation height between 10 and 25cm in September and October. ○ (ii) <i>Succisa</i> present within any 1m radius. ○ (iii) Scrub (>0.5 m tall) absent. ● Grazing. <ul style="list-style-type: none"> ○ The grazing regime should aim to maintain a species rich sward within the 10-25 cm sward height range which is the optimal range for the marsh fritillary. The grazing levels should be high enough to prevent an ‘over dominance’ of <i>Molinia</i> or rushes and to suppress scrub encroachment but low enough to allow a good range of herbs to flourish including the marsh fritillary larval food plant, Devil’sbit scabious <i>Succisa pratensis</i>. ● Parasitic Wasps. <ul style="list-style-type: none"> ○ Limits are not applicable but knowledge of how limiting this factor can be to the local population is important. ● Weather. <ul style="list-style-type: none"> ○ Limits are not applicable but knowledge of how limiting this factor can be to the local population is important. ○ Monitoring data should only be ‘used’ from ‘good’ years for marsh fritillary.

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	<ul style="list-style-type: none"> • Survival of Metapopulations and the condition of their supporting habitat outside of the SAC. <ul style="list-style-type: none"> ○ Lower Limit – Metapopulations should not be lost as a result of anthropogenic factors such as changes to habitat management or habitat loss due to development. A lower limit has been set here but control over habitat management or development etc outside of the SAC/SSSI is itself limited. <p>For further information refer to the <i>Core Management Plan (including Core Objectives) for Cadair Idris Special Area of Conservation (SAC) (2012)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cadair-to-coed-y-sac-list/idoc.ashx?docid=898c3bdd-9efb-449a-b8f3-942ef0005fed&version=-1)</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters: Favourable ▪ Siliceous scree: Favourable: maintained. ▪ Calcareous rocky slopes with chasmophytic vegetation and Siliceous rocky slopes with chasmophytic vegetation. Favourable: maintained ▪ Hydrophilous tall herb fringe communities: Favourable: maintained ▪ European dry heath: Unfavourable: Declining ▪ Northern Atlantic wet heath: Unfavourable: Declining. ▪ Blanket bog: Unfavourable: Declining. ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles: Unfavourable: Recovering. ▪ Molinia meadows: Unfavourable: Declining ▪ Alkaline fens: Favourable Maintained. ▪ Slender green feather-moss: Favourable: Maintained ▪ Marsh fritillary: Unfavourable: Declining
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Land Erosion</u> The area is very popular for walking, with heavy visitor pressure causing localised damage to the vegetation. However this problem is being addressed by the Snowdonia Upland Path Partnership (NRW/SNPA/NT). The NNR section of the site is managed according to a NRW management plan, but suffers from the fact that NRW does not own the grazing rights.</p> <p><u>Grazing</u> Grazing-stocking levels on Cadair Idris should be monitored and</p>

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	<p>controlled to ensure that sediment and nutrient loadings to the lakes do not increase as a result of overgrazing. Grazing can damage or lead to the total loss of this habitat by preventing flowering, causing a decline in species diversity and an increase in grasses tolerant of grazing such as <i>Nardus stricta</i>, <i>Agrostis capillaris</i> and <i>Anthoxanthum odoratum</i>.</p> <p><u>Tourism/Disturbance</u> Scrambling, walking and scree running are becoming more popular. Although mobile screes are desirable, too much disturbance can lead to total loss of all vegetation with even the development of lichen dominated communities being prevented. Damage to the screes within Units 1 and 5 by human pressure is not currently an issue however, elsewhere on site, for example on 'Foxes Path' the scree slopes are suffering from increased mobility.</p> <p><u>Weather Conditions/Acidification</u> The high rainfall renders the site vulnerable to acidification.</p>
<p>Landowner/ Management Responsibility</p>	<p>Today, several of the farms who manage land in the SAC have Tir Gofal agreements, with some having taken part in its predecessor agri-environment scheme, Tir Cymen. These agreements have generally led to a reduction in livestock numbers on the mountain, with a further reduction, or removal of stock in some areas over the winter months. Some 500 hectares of the site, including the NNR and Tanygader is managed directly by NRW. In addition, the National Trust manage four blocks of land in the SAC. A formal partnership between NRW, SNPA and NT has sought to control some of the erosion caused to footpaths by the increasing isitor numbers, but European funding ends in 2008 leaving the partners facing a difficult redicament for the future of access management.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Gwynedd Unitary Development Plan Habitat Regulations Assessment (2008) available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

<p>Site Name: Coedydd a Cheunant Rheidiol Location Grid Ref: SN748789 JNCC Site Code: UK0012748 Size: 229.19 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Coed Rheidiol is situated about 12 miles east of Aberystwyth. It occupies parts of both banks of the Afon Rheidiol, upstream, and the south bank downstream of Devil's Bridge.</p> <p>The SAC comprises 229 hectares and is concurrent with the area of SSSI; the NNR comprises some 173.92 hectares (329.26 acres) of this. Coed Rheidiol lies between 150 metres and 240 metres (500 - 800 feet) above sea level on both sides of the deep gorge of the Afon Rheidiol near Devil's Bridge. It comprises four separate blocks of fairly even-aged sessile oak <i>Quercus petraea</i> woodland. In places birch <i>Betula</i> spp. and rowan <i>Sorbus aucuparia</i> are mixed with the oak. Small leaved lime <i>Tilia cordata</i> and ash <i>Fraxinus excelsior</i> occur on flushed areas.</p> <p>The acidic brown earth and podsol soils are thin and outcrops of rock and cliff occur in the gorge. The reserve lies on Silurian shales of the Upper Llandovery (Valentian) series. The Afon Rheidiol is a swift flowing river with a gradient of 25m per km (133ft per mile) through the site; its bed consists of deep pools and rapids with many waterfalls. The water is acidic with low calcium content.</p> <p>Management of the reserve is aimed at restoring a mixed age structure high forest. Extensive areas of the reserve were clear felled during the First World War. The section of the reserve known as Coed Simdde Llwyd (41ha) is owned and managed by The Wildlife Trust West Wales and there is a section 35 agreement in place. The remainder of the NNR is managed by NRW.</p>
<p>Qualifying Features</p>	<p>Annex I feature and the primary reason for selection of this site.</p> <ul style="list-style-type: none"> ▪ Old sessile oakwoods with <i>Blechnum</i> in the British Isles.
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p>The site will be covered by woodland consisting of locally native, broadleaved species. Oak will continue to be the dominant tree in the canopy, with other native species such as ash, birch and alder frequently found. Other less common canopy species will include small leaved-lime and wych elm.</p> <p>The canopy will not be completely closed throughout the wood. At any given time approximately 10-15% of the total woodland area will consist of gaps in the canopy. This will allow seedling trees to</p>

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	<p>grow up and eventually enter the canopy. These canopy gaps also enable more light-demanding woodland plants and lichens to grow. In the long term gaps will open up naturally as older trees die.</p> <p>Veteran trees (i.e. old trees that are starting to decay) are valuable to lichens, mosses, fungi, bats and insects, and will occur throughout the wood, along with both standing and fallen deadwood. Below the canopy hazel and holly will form a shrub layer. On the woodland floor there will be a variety of woodland plants including areas of bluebells, heather and bilberry and woodland grasses. Species such as meadow saxifrage, starry saxifrage, welsh poppy and rock stonecrop are present, along with woodland ferns such as hay scented buckler fern and oak fern.</p> <p>The presence of non-native species such as rhododendron, Japanese knotweed, sycamore and conifer seedlings will be restricted through a rolling programme to identify and control/remove these across the areas of the site where they occur.</p> <p>The woodland is rich in mosses, liverworts and lichens. These lower plants will be found growing on the woodland floor, on trees and rock outcrops. Old forest lichens will grow on the trunks and branches of canopy trees. Many of these are so rare they don't have common names – examples include <i>Sticta canariensis</i>, <i>Parmelia taylorensis</i> and <i>Deglia plumbea</i>.</p> <p>Mosses and liverworts typical of western oak woodlands such as Haller's Apple-moss, Autumn Flapwort, MacKay's Pouncewort, Hooked Veilwort and Hutchin's Hollywort will be abundant.</p> <p>The spoil heaps of old lead mines within Coedydd a Cheunant Rheidiol SSSI will provide a habitat for plants able to tolerate metal-rich substrates.</p> <p>Red kites will breed within the reserve annually and breeding success will match or exceed that of the Welsh population. Coedydd a Cheunant Rheidiol SSSI will have a diverse range of breeding birds and will include those species typical of western broad-leaved woodland such as redstart, pied flycatcher and wood warbler.</p> <p>Annex I feature and the primary reason for selection of this site.</p> <ul style="list-style-type: none"> ▪ Old sessile oakwoods with <i>Blechnum</i> in the British Isles.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The woodland area will cover the entire site. ▪ The woodland will be maintained as far as possible by natural processes. ▪ One quarter of the woodland canopy will be open at any time. ▪ The location of open glades will vary over time. ▪ Trees and shrubs will be mainly locally native broadleaved species such as sessile or hybrid oak, downy or pendulous birch, ash, rowan, holly, elm, hazel. ▪ Neither beech or conifers will be dominant anywhere in the canopy or under-storey. ▪ The abundance and density of individual native species will vary across the site. ▪ Trees and shrubs of a wide range of ages and sizes will be present. ▪ Tree seedlings will be plentiful throughout the site. ▪ Tree seedlings will develop into saplings in the open glades. ▪ Non-native invasive species such as rhododendron, Japanese knotweed, sycamore and conifer seedlings will be restricted through a rolling programme to identify and control/remove the species across all areas of the site where they occur. ▪ There will be abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches. Some dead and dying trees will be partially or completely hollow. ▪ Fallen dead wood will be dense enough to obstruct progress by foot across the entire site, except on established maintained paths. ▪ Dead wood dependent species of moss, liverwort, fungi and specialised invertebrates will be present, in spatially and temporally variable abundance, throughout the site • Field and ground layers will form a patchwork of vegetation communities characteristic of local soil and humidity conditions, including areas dominated by heather, bilberry, heather and bilberry, tussocks of wavy hair grass or purple moor grass, brown bent grass, sweet vernal grass with abundant bluebells ▪ The field layer will be fairly rank and well developed. ▪ Humidity levels will be high enough to favour the presence of many mosses and liverworts. ▪ In rocky areas and areas of thin acidic soil, the ground layer will be a thick, continuous or fairly continuous carpet of mosses and liverworts with few other plant species present.

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	<ul style="list-style-type: none"> ▪ In the vicinity of the gorge humid or wet rock faces on cliffs, crags and boulders will be adorned with mosses, liverworts and filmy ferns. ▪ Patches of bare rock and bare wood on older living tree trunks or fallen timber, where wefts of mosses or liverworts have peeled away, will provide opportunities for re-colonisation and species succession. ▪ Lichen flora will vary spatially according to the chemical properties of rock and tree surfaces and according to light levels. ▪ In the gorge and other especially damp, shady places, humidity loving lichen species will be common. ▪ Trees with lungwort and associated species will be common, especially on the well-lit woodland margins. ▪ The diversity of lower plant flora (mosses, liverworts, lichens and fungi) will be high, corresponding to the range of niches provided by the varied structure of the woodland. ▪ The woodland will support populations of birds (including pied flycatchers, redstarts, wood warblers) and mammals (including several bat species, otters and badgers). ▪ All factors affecting the achievement of the foregoing conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 12 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on tenure, with the NRW owned areas forming management units 1 and 2 split on the basis of different management approaches.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Minimum Intervention Woodland</u> The management option of Minimum Intervention is largely confined to those areas where, due primarily to health and safety reasons, it is not safe or practical to attempt any form of active management. The woodland in these areas is of mixed age and structure and will continue to grow into high forest without management intervention. The only cause for concern are various anthropogenic influences e.g. invasive alien species and livestock grazing.</p> <p><u>Managed High Forest</u> The woodland stands at Coedydd a Cheunant Rheidiol are generally very even-aged, lack more mature trees with very little new recruitment. As such in those areas deemed suitable for the</p>

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	<p>'Managed High Forest' option active management should be implemented to artificially increase the number of sufficiently large canopy gaps through continuous small-group felling in localities where conditions for regeneration are more favourable. Management of this nature should, as far as is possible, be timed to coincide with good mast years in order that maximum use is made of available seed. In the longterm this will increase the canopy rotation of the stand so diversifying the age structure and reducing the risk of catastrophic event leading to major canopy loss, reduce the likelihood of a prolonged period of open canopy (as all trees tend to die-off over a relatively short time period), and lead to greater structural and functional diversity essential to many organisms and biological processes within temperate forest ecosystems.</p> <p>Current thinking for this site is based on the concept of a 'normal' forest with equal numbers of all ages of stem present combined with mimicking of natural stand structures. This 'normative' age structure is believed to offer the best long-term stability and also ensures any organism which depends on a particular age class or regeneration phase will find some refuge. Once attained, regular canopy gap creation will maintain this 'normal' age structure indefinitely. The rate of canopy gap creation (natural or otherwise) will be dependent on the chosen length of canopy rotation for the woodland as a whole. For most stands in Coedydd a Cheunant Rheidiol the aim would be for a rotation of the canopy trees over a period of circa 250 years, together with the retention of some older canopy trees until natural death.</p> <p><u>Summary</u></p> <ul style="list-style-type: none"> ▪ In minimum intervention areas, management is limited to stock exclusion and control of invasive species. ▪ In managed high forest areas, in addition to the above there will be group felling to create a more diverse age range along with gradual conifer removal. ▪ Some planting may be carried out where natural regeneration is insufficient or of undesirable species. ▪ Invasive species including rhododendron, Japanese knotweed, conifers and sycamore will be controlled and whenever possible, eradicated. ▪ Stock will be excluded as required. <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British</p>

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	<p>Isles</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Extent as at SAC designation. • Tree canopy gap creation rate. <ul style="list-style-type: none"> ○ Minimum intervention – None set. ○ Managed high forest The gap creation rate within the area of Managed High Forest (excepting natural catastrophic event) is: <ul style="list-style-type: none"> ○ Upper limit – 1.0% of mature woodland canopy per annum (and where the maximum gap size is 0.25 ha per 2.5 ha of woodland, and not exceeding 50m distance across). ○ Lower limit – 0.25% of mature woodland canopy per annum. <p>Ideally there will be a gap creation rate of 0.4% of mature woodland canopy per annum (where a gap is any area equal or greater than 1.5 times the height of the tallest adjacent tree, or, any area of between 20 and 50m min/max distance across, not including areas of bare rock etc, and mature woodland canopy is any stand of c.50+ years). This equates to a Target canopy turn over rate of 250 years.</p> <p>The upper limit of 1% per annum is taken to mean that gaps covering a combined area of 1% of the total area of that block of managed high forest woodland will be created per year. In practice the creation of 'new' gaps should be recorded at years 0, 12, 24 etc (or in line with reporting cycle), therefore the target value for 'new' gaps (i.e. between 0 and 12 years old) will be 12%, the lower limit 6% and the upper limit 24%. However, it is not the intention to imply that the target gap rate equates to a total turnover of the entire canopy in that block of managed high forest in 100 years (200 or 50 years in the case of the lower and upper limits respectively), it being recognised that within that 100 year period some areas will exist in a gap stage more than once and other areas not at all. The ultimate aim is the development of a stand with a fairly normative age structure.</p> <p><i>Gap distribution</i> - priority areas for active gap creation need to be identified. Criteria for selection might include the most even-aged stands, aspect, landscape issues and species interest.</p> <p><i>Gap size</i> (and thereby number is already defined in above) as any area equal or greater than 1.5 times the height of the tallest adjacent tree, or, any area of between 20 and 50m min/max distance across</p>

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	<p><i>Gap shape</i> - the minimum to maximum distance across should not exceed a ratio of 1:4 (i.e. long thin gaps will be avoided).</p> <ul style="list-style-type: none"> • Canopy regeneration rate. <ul style="list-style-type: none"> ○ Natural regeneration of native trees within 80% of sampled canopy gaps over a 12 year period is – ○ Upper limit – none set. ○ Lower limit – 3 viable seedlings/saplings per 0.01 ha of gap. <p>Once gaps are created the rate of regeneration and species comprising the regeneration will be assessed. Viable seedlings/saplings are taken to be healthy/vigorous native tree species reaching a minimum height of 1.5m and comprise species that will replenish the canopy - namely sessile oak <i>Quercus petraea</i>, pedunculate oak <i>Q. robur</i>, <i>Q. hybrids</i>, downy birch <i>Betula pubescens</i>, silver birch <i>B. pendula</i>, ash <i>Fraxinus excelsior</i>, rowan <i>Sorbus aucuparia</i> and alder <i>Alnus glutinosa</i>.</p> <p>Only sample in canopy gaps of between 12 and 24 years old. This need only be monitored on a sample basis assuming management is consistent across site.</p> <ul style="list-style-type: none"> • Invasive species. <ul style="list-style-type: none"> Rhododendron ponticum. <ul style="list-style-type: none"> ○ Mature seed-bearing plants absent from site. ○ Upper limit – non-seed bearing plants account for up to 5% of the understorey. ○ Lower limit – absent. <p>The presence of this species will be restricted through a rolling programme to identify and control/remove the plant across all areas of the site where it is known to occur (management units 2 and 9), and the programme will (at least initially) target these areas of the site and any others deemed to be vulnerable to invasion. All areas of the site where the plant occurs must be treated within a 7 year period to prevent on-site seed production.</p> <ul style="list-style-type: none"> • Conifer Seedlings. <ul style="list-style-type: none"> ○ Upper limit – 10 seedling/saplings. ○ Lower limit – no conifers within the reserve. <p>The presence of conifer seedlings will be restricted through a rolling programme to identify and control/remove the plants across all areas of the site where it is known to occur (management units 1, 2, 3, 4, 9, 10 and 11). The programme will (at least initially) target</p>

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	<p>these areas of the site.</p> <ul style="list-style-type: none"> • Japanese Knotweed. <ul style="list-style-type: none"> ○ Upper limit – 10 stems in management Unit 2. ○ Lower limit – no Japanese Knotweed present. <p>The presence of Japanese Knotweed will be restricted through a rolling programme to identify and control/remove the plants across all areas of the site where it is known to occur (management unit 2). The programme will (at least initially) target these areas of the site.</p> <ul style="list-style-type: none"> • Sycamore. <ul style="list-style-type: none"> ○ Upper limit – 10 seedlings/saplings. ○ Lower limit – no sycamore present. <p>Sycamore in the reserve is concentrated around a gully in management unit 2. As this is found only at present in one small area and can be controlled, in this case it is sensible to do so.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Upper limit – some trespass of sheep from Bryn Bras Common(s). ○ Lower limit – stock exclusion. <p>Any grazing from stray animals needs to be prevented through routine boundary maintenance and repair.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – none set. ○ Lower limit – No uncontrolled / unconsented burning. <p>Burning is not carried out, but has been an issue in the past. This is included as a factor to stress that any uncontrolled or unconsented burning must be prevented.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Coedydd a Cheunant Rheidiol Special Area of Conservation (2008) available at:</i> http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=a063a782-d4ca-4f6f-9ecb-0cf9eb1ece2e&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Old sessile oakwoods with <i>Blechnum</i> in the British Isles: Unfavourable Declining

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<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Invasive Non-native species</u> Invasive non-native species could cause significant deleterious change, and there is a need to monitor and control them. This is dealt with by actions set out in the management plan.</p>
<p>Landowner/ Management Responsibility</p>	<p>Two management units under NRW ownership (Units 1 and 2) are separated due to the different management approach. Unit 1 is managed high forest with group felling due to the presence of coniferous species which are not desirable. Unit 2 is minimum intervention.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Coedydd Cwm Clydach Location Grid Ref: SO207123 JNCC Site Code: UK0030127 Size: 28.81 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site is situated on the southern side of the River Clydach valley, approximately 2km east, north east of Brynmawr. The underlying geology varies across the site, consisting of sedimentary rocks that range from Old Red Sandstone through Carboniferous Limestone into shales and sandstones of the Millstone Grit and Coal Measures. Soils mainly consist of typical brown earths and humo-ferric podsols. Altitude ranges from 170m by the River Clydach to 350m in Cwm Llamarch.</p> <p>Cwm Clydach is of special interest for its stands of broadleaved woodland dominated by beech, intergrading with more open habitats, which together support a number of rare and scarce vascular plants including whitebeams <i>Sorbus</i> spp. and soft-leaved sedge <i>Carex montana</i>. There are important woodland and grassland fungi assemblages with rare species such as <i>Squamanita paradoxa</i>. The site also includes two localities of national geological importance.</p>
<p>Qualifying Features</p>	<p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Beech forests (<i>Asperulo-Fagetum</i>). <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (<i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i>).
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p>Around two thirds of the site is covered by predominantly beech woodland (including temporary canopy gaps and glades), with mature sessile and hybrid oaks common in the canopy in the west of the site. The beech woodland has trees of all age classes with a scattering of standing and fallen deadwood. Regeneration of trees is sufficient to maintain the woodland cover in the long term. Whitebeam and yew trees are locally prominent. Ash and birch trees may also be present, but rarely dominate the canopy.</p> <p>The shrub layer and ground flora can be quite sparse in the beech woodland, but where present consist of locally native plants such as hazel and hawthorn, bramble, dog's mercury, enchanter's-nightshade, lords-and-ladies,</p>

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	<p>woodruff, male fern, sanicle, wood melick, ivy, false brome, violets, herb robert, wood avens, and tufted hair-grass. On more acidic soils where oak is prominent, the ground flora is often more heathy with bilberry and wavy hair-grass and in places mosses such as greater fork moss and swan’s-neck thyme-moss are abundant. Scarcer plants, such as soft-leaved sedge and bird’s-nest orchid are locally frequent and, more rarely, yellow bird’s-nest orchid and oak fern can be found.</p> <p>Rare whitebeam trees grow on steeper slopes and on limestone outcrops within and outside the woodland and on old railway cuttings. Their populations are stable or increasing.</p> <p>A wide range of fungi is present, with rose spindles, rosy pinkgill, olive earthtongue and waxcaps in the grassland habitats, which includes the unsurfaced parts of the disused railway trackbed, and giant club, powdercap strangler and coral fungi in the woodland.</p> <p>The important geological rock exposures need to be kept in a condition, which will enable researchers to re-examine the evidence available to previous workers and use them as a teaching resource.</p> <p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Asperulo-Fagetum</i> beech forests. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ At least 50% of the canopy-forming trees are beech. ▪ The canopy cover is at least 80% (excluding areas of crag) and composed of locally native trees. ▪ The woodland has trees of all age classes with a scattering of standing and fallen dead wood. ▪ Regeneration of trees is sufficient to maintain the woodland cover in the long term. ▪ The shrub layer and ground flora can be quite sparse, but where present consist of locally native plants such as yew, hawthorn, wych elm, ash, hazel, field maple and elder, bramble, dog’s mercury, enchanter’s-nightshade, lords-and-ladies, woodruff, male fern, sanicle, wood melick, ivy, false brome, violets, herb robert, wood avens, and tufted hair-grass. ▪ Scarcer plants, such as soft-leaved sedge and bird’s-nest orchid are locally frequent and, more rarely, yellow bird’s-nest orchid can be found. ▪ All factors affecting the achievement of the above conditions

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	<p>are under control.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (<i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ At least 75% of the woodland vegetation meets the criteria for intact acid beech wood, where: ▪ At least 10% of the canopy forming trees are beech. ▪ The canopy cover is at least 80% and composed of locally native species. ▪ The woodland has trees of all age classes with a scattering of standing and fallen dead wood. ▪ Regeneration of trees is sufficient to maintain the woodland cover in the long term. ▪ The shrub layer and ground flora can be quite sparse, but where present consist of locally native plants. ▪ All factors affecting the achievement of the above conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 5 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on tenure.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Asperulo-Fagetum</i> beech forests. <p><u>Woodland Management</u> Most of the woodland at the site is mature and appears to require little active management. Many of the beech trees, however, are old and of a rather even age and in recent years a significant number of these have fallen. In some areas there is good regeneration of beech, and in time, these should grow and fill gaps. Most management, apart from the removal of a small area of larch, would likely be aimed at aiding the spread and growth of beech, possibly by actively moving saplings into gaps where there is little or no natural regeneration and also by selectively thinning species such</p>

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	<p>as ash or sycamore, which might become dominant and displace beech. Dead and fallen trees should in general be left in situ to provide habitat for species such as birds, insects and fungi.</p> <p><u>Scrub Management</u> Some areas with the woodland should be retained as permanent open glades to benefit butterflies and other invertebrates and scrub encroachment should be controlled in these areas. Tree branches overhanging parts of the railway track with important grassland habitat will need cutting back from time-to-time to enable more light to reach the ground.</p> <p><u>Grazing</u> Past grazing has influenced the structure of the woodland, such as the dominance of beech in the canopy. It is therefore likely that occasional light grazing would be beneficial for the woodland habitat, although any increase in grazing pressure could prevent all tree and shrub regeneration and suppress the woodland ground flora. Some land within the site, mainly in the Llanelly quarry and Llam-march dingle areas, is common land. Small numbers of sheep graze the area and also graze adjoining open land along the old railway trackbed and adjacent vegetated spoil heaps.</p> <p><u>Dumping</u> Due to roads passing through the site, parts are accessible to vehicles and the illegal dumping of domestic and commercial waste and abandoned vehicles can be a problem. Barriers put in place several years ago have been successful in preventing vehicles (some of which have been later burnt) being driven along the railway track. It is essential that these barriers be maintained to prevent any future occurrences. Landowners and occupiers should co-operate with the statutory authorities in relation to enforcement action and the removal of waste and abandoned vehicles and measures designed to minimise the impact of fly-tipping or the ingress of any pollutants into watercourses and caves.</p> <p><u>Invasive Alien Plants</u> Japanese knotweed is also a problem in parts of the site, usually having been introduced by illegal dumping of waste material, and this species will be controlled as necessary.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion roburi-petraeae or Ilici-Fagenion).

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	<p><u>Woodland Management</u> Mostly minimum intervention (see 5.1 above). In the western part of the site, oak is common in the canopy and regeneration of this species should be accepted there. It might also be beneficial to encourage the spread of woodland into small areas of dense bracken on the edges of the main woodland blocks.</p> <p><u>Bracken Management</u> Bracken in canopy gaps or at the woodland edge may assist the establishment of new trees, providing that the bracken is not too dense and does not have deep litter. Cutting dense bracken and breaking up the litter can help with tree and woodland generation.</p> <p><u>Grazing</u> See above.</p> <p><u>Dumping</u> See above.</p> <p><u>Synthesised Conditions to maintain integrity</u></p> <p>Beech forests (<i>Asperulo-Fagetum</i>)</p> <ul style="list-style-type: none"> • Distribution and Extent (Units 1 & 5). <ul style="list-style-type: none"> ○ Upper limit – 25 ha. ○ Lower limit – 21 ha. • Canopy cover. <ul style="list-style-type: none"> ○ Upper limit – 90%. ○ Lower limit – 80%. ○ <p>75% of the woodland should meet the criteria for canopy cover.</p> • Canopy composition (Units 1 & 5). <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – 50% of the canopy forming trees are beech (except in those areas where whitebeam dominates) AND: 95% of tree cover is composed of locally native trees. <p>In some areas non-native trees, such as sycamore, will be tolerated, so long as they are not freely re-generating in the understorey. 75% of the woodland needs to comply with the limits set.</p> <ul style="list-style-type: none"> • Regeneration (Units 1 & 5).

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	<ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Canopy forming trees, shrubs or coppice re-growth at least 1.5m high present (there should be enough present to maintain the canopy in the long term). <p>To be met in at least 50% of significant gaps in canopy. Such gaps should be recorded at each monitoring visit. A gap is defined as an open area with a diameter of at least one average tree height. Beech will also regenerate under the canopy and some recording should also occur here.</p> <ul style="list-style-type: none"> ● Ground flora (Units 1 & 5). <ul style="list-style-type: none"> ○ Upper limit – The cover of nettles should not exceed 10%. ○ Lower limit – Typical ground flora species (see list below) should be evident throughout the woodland. <p>The ground flora can be naturally quite sparse under the beech canopy, but a few typical calcareous beech woodland plants should be evident in all areas. Brambles and ivy can be locally quite abundant but other indicators of disturbance and nutrient enrichment should not be. Limits should be met for 75% of the woodland.</p> <ul style="list-style-type: none"> ● Dead Wood (Units 1 & 5). <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – Presence of standing and/or fallen deadwood greater than 20 cm diameter. <p>It is difficult to set meaningful limits for dead wood but, in the short term. Much of the woodland is on steep ground and so removal of deadwood is unlikely. However, any fallen timber will tend to accumulate at the foot of the slopes. The limits given here should be met in at least 75% of existing woodland.</p> <ul style="list-style-type: none"> ● Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – Sufficiently low to allow regeneration in the long term, as defined by the regeneration attribute above. ○ Lower limit – None required. <p>There is a long-history of the woodland being open to casual grazing by sheep. This has probably skewed the species make up of the wood towards beech because sheep preferentially graze other species. This is not thought to be a major issue, but needs to</p>

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	<p>be kept under review.</p> <ul style="list-style-type: none"> • Non-native and invasive species. <ul style="list-style-type: none"> ○ Upper limit – No spread of Japanese knotweed into woodland. ○ Lower limit – None required. <p>Along the river corridor there is Japanese knotweed, which may pose a threat to the woodland habitat.</p> <p>Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (<i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i>)</p> <ul style="list-style-type: none"> • Distribution and Extent (Located mainly on the upper slopes at the western end of unit 1). <ul style="list-style-type: none"> ○ Upper limit – 3.5 ha. ○ Lower limit – 4.3 ha. • Canopy cover. <ul style="list-style-type: none"> ○ Upper limit – 90%. ○ Lower limit – 80%. <p>75% of the woodland should meet the criteria for canopy cover.</p> <ul style="list-style-type: none"> • Canopy Composition. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – 10% of the canopy forming trees are beech AND: 95% of tree cover is composed of locally native trees. <p>In some areas non-native trees, such as sycamore, will be tolerated, so long as they are not freely re-generating in the understorey. 75% of the woodland needs to comply with the limits set.</p> <ul style="list-style-type: none"> • Regeneration. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Canopy forming trees, shrubs or coppice re-growth at least 1.5m high present (should be enough present to maintain the canopy in the long term). <p>To be met in at least 50% of significant gaps in canopy. Such gaps should be recorded at each monitoring visit. A gap is defined as an open area with a diameter of at least one average tree height.</p> <ul style="list-style-type: none"> • Ground flora.

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	<ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Typical ground flora species (see list below) should be evident throughout the woodland. <p>The ground flora can be naturally quite sparse under the beech canopy, but a few typical acid beech woodland plants should be evident. Bracken can be locally quite abundant but should not dominate large areas of the woodland floor. Limits should be met for 75% of the woodland.</p> <ul style="list-style-type: none"> ● Dead Wood. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – Presence of standing and/or fallen deadwood greater than 20 cm diameter. <p>It is difficult to set meaningful limits for dead wood but, in the short term. Much of the woodland is on steep ground and so removal of deadwood is unlikely. However, any fallen timber will tend to accumulate at the foot of the slopes. The limits given here should be met in at least 75% of existing woodland.</p> <ul style="list-style-type: none"> ● Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – Sufficiently low to allow regeneration in the long term, as defined by the regeneration attribute above. ○ Lower limit – None required. <p>There is a long-history of the woodland being open to casual grazing by sheep. This has probably skewed the species make up of the wood towards beech because sheep preferentially graze other species. This is not thought to be a major issue, but needs to be kept under review.</p> <ul style="list-style-type: none"> ● Non-native and invasive species. <ul style="list-style-type: none"> ○ Upper limit – No increase in the area of woodland floor that is dominated by invasive species. ○ Lower limit – None required. <p>There are localised problems with bracken on the upper slopes in the western part of the site, but this is mainly confined to more open areas at the edges of the woodland. Once a canopy has established, shading usually limits the growth of bracken.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Cwm Clydach Site of Special Scientific Interest Incorporating Cwm Clydach Woodlands Special</i></p>

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	<p>Area of Conservation (2008) available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cors-fochno-to-cwm-sac-list/idoc.ashx?docid=13831fa4-69af-4101-9706-1cf8c5849ef6&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Asperulo-Fagetum beech forests: Favourable, maintained. ▪ Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) Favourable, maintained.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> The woodland was formerly grazed by sheep from the nearby common land, but better fencing here has reduced livestock trespass to a level that does not prevent regeneration of trees and shrubs or damage the woodland ground flora. However, the impact of grazing needs to be monitored and fencing against livestock considered if necessary.</p> <p><u>Dumping and Vandalism (via urban areas and cars)</u> Due to roads passing through the site, parts are accessible to vehicles and the illegal dumping of domestic and commercial waste and abandoned vehicles can be a problem.</p> <p>Also, due to the close proximity to urban areas, fly-tipping and vandalism are a particular problem in these woodlands. Rubbish is regularly cleared but an increased wardening effort would be needed to bring these problems under control. The woodlands may be threatened by road improvement plans and associated development but these proposals will be subject to appropriate assessment under the Habitats Regulations 1994.</p>
<p>Landowner/ Management Responsibility</p>	<p>Unit 1 is owned by NRW and comprises the bulk of the SAC beech woodland. Most of the acidophilous beech woodland is found towards the western part of Unit 1.</p> <p>Unit 2 is owned by NRW but supports non-SAC habitats and geology.</p> <p>Unit 3 is the old railway track, where the main interest on the track bed itself is the fungi assemblage. The trackbed habitats also support some vascular plant interest.</p>

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	<p>Unit 4 - the bulk is included within the SSSI for its geological interest and much is also common land. There is some biological interest, mainly grassland habitats supporting fungi, non-SAC broadleaved woodland and a variety of scarce and rare plants - the most notable being whitebeams and hawkweeds that mainly grow on the railway cuttings and low crags, which are also tend to be of geological note. There is therefore potential for some management conflict between the need to keep the geology exposed and a natural tendency for the areas to scrub over (sometimes with rare species), but exposures are generally extensive enough for management conflicts not to be a significant issue.</p> <p>Unit 5 is other land within the SAC not owned by NRW.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Monmouthshire Council’s Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

<p>Site Name: Coed Cwm Einion Location Grid Ref: SN690947 JNCC Site Code: UK0030117 Size: 21.01 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Coed Cwm Einion has developed on steep valley sides along a section of the Afon Einion. The SAC has been chosen as a prime example of <i>Tilio-Acerion</i> woodland, which describes small-leaved lime woodland on steep rocky slopes; this type of woodland is supported within more base-enriched areas of the site where ash dominates over oak and where wych elm occurs. <i>Tilio-Acerion</i> is a scarce habitat recognised as internationally important and Coed Cwm Einion is considered to support one of the best examples in Britain. Cwm Einion is also of Special Scientific Interest because it supports a good example of ancient semi-natural mixed broad-leaved woodland with sessile oak, rowan and downy birch. The associated shrub and ground layer of both the oak and ash components of Coed Cwm Einion are currently impoverished due to grazing pressure.</p> <p>The woodland is important for its rich communities of ferns, lichens (177 species) and bryophytes (mosses and liverworts) (154 species). In addition to the rare lichen <i>Parmotrema robustum</i>, which is known to occur at only three other sites in Britain, there are nationally scarce species of lichens, liverworts and mosses. Locally distinctive species, namely marsh hawk's-beard, Tunbridge filmy-fern and hay-scented buckler fern also occur here.</p> <p>Bracken covers part of the hillside at the north-western end. The southern side of the SSSI is covered by Forestry Commission plantations mainly composed of beech, Douglas fir, Sitka spruce, Japanese larch and Lawson cypress. The plantations help maintain the shade and high humidity in the valley.</p>
<p>Qualifying Features</p>	<p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines.
<p>Conservation Objectives</p>	<p>Vision for the site: Broadleaved woodland will cover the entire site and its varied structure will be maintained as far as possible by natural processes. Conifers and non-native broadleaved species will have been gradually removed and natural regeneration of native broadleaved species will be encouraged and will extend into the denser bracken and grassland areas. In the longer term all stages of tree growth from saplings to overmature trees will be present. Gaps resulting from natural wind-blow caused by gales and natural tree death and</p>

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	<p>the associated disturbance will promote the germination of dormant seeds in the ground. The available light and nutrients will support the growth of seedlings to saplings, forming in time the future canopy of woodland; thereby assuring the continuity and self-sustainability of Coed Cwm Einion.</p> <p>The shrub layer and ground layer will be characteristic of the soil type, light availability and location of the woodland, with frequent Dog's Mercury, Bluebell, Enchanter's Night-Shadow, Wood Aven, Herb Robert and False Wood-Brome. Primrose, Common Dog-Violet, Ground Ivy, Barren Strawberry, Germander Speedwell, Wood Speedwell, Wood Anemone and Lesser Celandine will be scattered throughout with meadow-grass and tufted hair-grass. Male-Fern, Broad Buckler-Fern and Lady Fern will occur in damp pockets.</p> <p>Very light sheep grazing will occur in parts of the wood. Saplings of canopy species and shrubs like Hazel, Ivy, Honeysuckle and Bramble will provide a varied food source for Dormice, other mammals and the typical western woodland birds.</p> <p>Throughout the wood there will be frequent dead and dying trees, standing and fallen, that provide a variety of habitat for woodland species dependant on dead wood at some stage of their lifecycle. Mosses and liverworts will clothe the trees and rock faces, supporting species associated with a variety of trees, rocks and soil types, including several nationally scarce species dependent upon the shaded, humid river gorge. Patches of bare rock, where tufts of mosses or liverworts have peeled away naturally, will provide opportunities for recolonisation and species succession. A rich variety of lichens will be present throughout the woodland from ground level to the high tree canopy, including the nationally rare and critically endangered lichen <i>Parmotrema robustum</i> found in the gorge.</p> <p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The Tilio-Acerion woodland habitat will occupy a minimum area of approximately 6 hectares. ▪ The woodland will be maintained as far as possible by natural processes and receive minimum management intervention.

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	<ul style="list-style-type: none"> ▪ Gaps in the woodland canopy will occupy 5-10% of the area. The location of open gaps/glades will vary over time in response to natural processes and occasional direct management. ▪ Trees and shrubs will be locally native broadleaved species such as sessile oak, downy birch, small leaved lime, ash, rowan, holly, elm, alder, hazel and crab apple. ▪ Non-native species such as beech, sycamore, rhododendron, laurel and conifers will have been gradually removed through a control programme and subsequent regeneration addressed. ▪ Trees and shrubs of a wide range of ages and sizes will be present, including mature canopy trees. ▪ Tree seedlings will be plentiful throughout the site and develop into saplings in the open glades. ▪ There will be abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches. Fallen dead wood will be dense enough to obstruct progress by foot across the entire site, except on established maintained paths. ▪ The field and ground layers will be rich in flowering plants, supporting species typical of <i>Tilio-Acerion</i>, such as hart's-tongue fern, broad buckler fern, enchanter's nightshade, wood avens, bluebell, herb Robert, dog's mercury, wood false-brome and common dog violet. ▪ Species of moss, liverwort, fungi and specialised invertebrates dependent on deadwood will be abundant throughout the area. ▪ The diversity of mosses, liverworts, lichens and fungi will be high, corresponding to the range of niches provided by the varied structure of the woodland. ▪ In rocky areas and in areas of thin acidic soil the ground layer will be a thick, continuous or fairly continuous carpet of mosses and liverworts with few other plant species present. ▪ Patches of dense bramble will be infrequent. ▪ Locally distinctive species, namely marsh hawk's-beard, Tunbridge filmy-fern and hayscented buckler fern will continue to be present in the woodland at the locations recorded in past surveys. ▪ Grazing levels will be controlled to achieve regeneration while maintaining the lower plant interest. ▪ The woodland will support populations of birds including pied flycatchers, redstarts, wood warblers and mammals including several bat species, dormouse, otter and badger. ▪ All factors affecting the achievement of the foregoing conditions are under control.

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<p>Component SSSIs</p>	<p>The plan area has been divided into 4 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on tenure.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I feature and the primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines. <p>The conservation value of Coed Cwm Einion is dependent on the operation of natural woodland processes. The woodland has been modified through the planting of non-native conifer and beech trees, and in other areas natural regeneration is restricted though over-grazing and the presence of dense bracken. The Forestry Commission has worked with NRW to produce a Forest Design Plan, which includes the parts of the site in their ownership. The plan gives priority to conservation objectives and prescribes the gradual removal of non-native species. Negotiations to reach agreements with other owners to exclude livestock and encourage natural regeneration will continue.</p> <p><u>Grazing</u> Unit 1 has been recently part fenced which will effectively remove grazing from the feature. Priority should now be given to the exclusion of sheep from Unit 2. The spread of bramble will be monitored and grazing levels adjusted as required to maintain lower plant interest.</p> <p><u>Tree Management</u> The closed canopy of ash in Units 1 and 2 will be opened through thinning or ring barking in small coupes to create gaps to speed regeneration after the exclusion of sheep. Trees will be selected to avoid examples supporting important epiphytic communities or single species of local or national importance.</p> <p>Consideration should also be given to the potential effects of loss of humidity resulting from local thinning to lower plant interest and should be undertaken following advice from NRW Lower Plant Ecologist. Management should be targeted at areas showing good regeneration of ash. In the long-term this will increase the canopy rotation of the stand so diversifying the age structure and reducing the risk of catastrophic event leading to major canopy loss, reduce the likelihood of a prolonged period of open canopy.</p>

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	<p>Tree clearance may occur through routine power line clearance and maintenance of Public Rights of Way.</p> <p><u>Rhododendron Clearance</u> Rhododendron bushes should be removed from all 4 units.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Tilio-Acerion forests of slopes, screes and ravines</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – No decrease in extent of this feature except through natural events such as storm damage, wind-blow or disease. Mapped as NVC community W9a: 6.1 ha (1992) And, no decrease in extent of surrounding semi-natural woodland except through natural events such as storm damage, wind-blow or disease (6.2 ha (1992). <p>No upper limit is set, the edaphic conditions and underlying geology will limit the potential maximum extent of Tilio-Acerion woodland on this site.</p> <ul style="list-style-type: none"> • Canopy cover within the <i>Tilio-Acerion</i> woodland. <ul style="list-style-type: none"> ○ Upper limit – 10% of the area mapped as <i>Tilio-Acerion</i>. ○ Lower limit – 5% of the area mapped as <i>Tilio-Acerion</i>. <p>The uniform age structure explains the absence of any significant gaps in the canopy in Units 1 and 2.</p> <ul style="list-style-type: none"> • Natural processes and structural development. <ul style="list-style-type: none"> ○ Lower limit (within any 25m² sample area) – 1 or more native canopy forming trees with girth >50 cm (dbh) and, 20% shrub layer comprised of locally native species (N.B. If greater than 60% remedy through grazing programme) and, 2 or more dead trees, standing or lying, of >20 cm diameter or equivalent. <p>Characteristics indicative of a selfperpetuating natural woodland structure. Active intervention involving thinning/felling would accelerate recreation of a more natural structure. However this requires specialist advice in areas supporting notable lower plant communities.</p>

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	<ul style="list-style-type: none"> • Regeneration. <ul style="list-style-type: none"> ○ Lower limit (within any 25m² sample area) – 20 or more ash saplings and, more than 3 saplings comprised of locally native species such as sessile oak, downy birch, wych, rowan and alder. <p>Characteristics indicative of a naturally regenerating woodland.</p> <ul style="list-style-type: none"> • Species composition of the <i>Tilio-Acerion</i> woodland, Canopy and shrub-layer. <ul style="list-style-type: none"> ○ Upper limit (within any 25m² sample area) – No non-native species/exotics. ○ Lower limit (within any 25m² sample area) – Small-leaved lime (<i>Tilia cordata</i>) should continue to be present in each mapped section. <p>The woodland canopy and shrub-layer will be comprised of locally native species.</p> <p>Field and ground layer.</p> <ul style="list-style-type: none"> ○ Lower limit – 50% or more of the field layer should support vascular plants associated with good quality ash woodland. (N.B. areas currently subject to felling management are excluded from monitoring). <p>The poor field layer in unit 5 is a special cause for concern. Monitor in spring or early summer</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Limit – No grazing acceptable for at least 10 years, then review. <p>In the absence of any fencing between the woodland and the adjacent fields in Unit 5, grazing by sheep severely affects the ground flora and prevents tree and shrub regeneration.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Coed Cwm Einion - Special Area of Conservation (2011) available at:</i></p> <p>http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cadair-to-coed-y-sac-list/idoc.ashx?docid=cf9f52-1355-4946-af1c-e723b366cd59&version=-1)</p>

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<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Tilio-Acerion forests of slopes, screes and ravines: Unfavourable Declining.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> Failure to control sheep grazing lead to lack of regeneration, severely suppressed ground flora, physical damage to lower plant and soil erosion.</p> <p><u>Invasive Species</u> Rhododendron bushes should be removed from all 4 units.</p>
<p>Landowner/ Management Responsibility</p>	<p>Current management plans cover land owned by NRW and the RSPB (Royal Society for the Protection of Birds).</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Coed y Cerrig Location Grid Ref: SO291210 JNCC Site Code: UK0012766 Size: 9.1 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site includes a large area of species-rich fen meadow, in association with some rush pasture. There is also an important area of alluvial ash and alder woodland, with transitions to drier woodland dominated by ash and oak.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>.
<p>Conservation Objectives</p>	<p>Around a third of the site is covered by wet alder and willow woodland. The understorey includes locally native shrubs typical of this habitat and the ground flora consists of a variety of typical wetland plants, such as lesser pond-sedge, common marsh-bedstraw, meadowsweet, yellow pimpernel, opposite-leaved golden-saxifrage, marsh-marigold, hemlock water-dropwort, water mint, lady fern and rushes. A stable or increasing population of marsh fern is also present. Canopy shading from trees and shrubs should be low in the vicinity of at least one of the colonies, to improve the potential for the fern to grow spore-producing fronds. This wet woodland grades into areas of permanent open swamp dominated by lesser pond-sedge or other typical wetland plants, where the hydrological conditions are suitable. Adjacent areas of marshy grassland and spring-fed mire are intimately linked to the wet woodland and swamp. The wet woodland has a variable canopy structure, based on a small-scale patchwork, with alder of different ages and some standing as well as fallen dead wood. Ash does not make up more than 25% of the canopy. Plants associated with nutrient enrichment, such as stinging nettle and cleavers, are not dominant over large areas and invasive alien plants like Japanese knotweed and Indian balsam are absent.</p> <p>The drier ground supports woodland, which is mainly composed of ash, oak and beech, although the latter species occupies no more than about 5% of the site. In the past, elm was an important component of the woodland, but Dutch elm disease killed many of these trees. It is possible, and desirable, that elm could again feature prominently in the canopy. There is an understorey here that includes abundant hazel, some wych elm and evidence of natural regeneration of trees and shrubs. The ground flora in these areas includes a wide range of typical woodland plants, such as dog's mercury, herb-robert, hart's-tongue, tufted hair-grass, bluebell, enchanter's-nightshade, honeysuckle, wood sorrel, creeping soft-grass and ferns and locally uncommon plants,</p>

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	<p>including nettle-leaved bellflower. The dry woodland is developing a diverse structure with mature and ancient trees, natural regeneration, canopy gaps and areas of fruiting hazel. Hazel nuts are an important food source for the dormouse population. The canopy and understorey structure have many branches overlapping with each other and with tree trunks to allow easy movement by dormice around the wood. Invasive tree species such as sycamore and patches of young beech are rare or absent. Dead wood, including fallen and standing trees are found throughout the drier woodland. A system of wide paths on south-facing slopes are kept open to maintain the population of nettle-leaved bellflower and other light demanding plants, such as violets and brambles, which provide food for a variety of species including silver-washed fritillary butterfly and dormice.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ Around a third of the site is covered by wet alder and willow woodland. ▪ This wet woodland grades into areas of permanent open swamp dominated by lesser pond-sedge or other typical wetland plants, where the hydrological conditions are suitable. Adjacent areas of marshy grassland and spring-fed mire are intimately linked to the wet woodland and swamp. ▪ The remainder of the site supports mainly dry semi-natural woodland. ▪ The wet woodland has a variable canopy structure, based on a small-scale patchwork, with alder of different ages and some standing as well as fallen dead wood. Ash does not make up more than 25% of the canopy. ▪ Young trees/saplings and/or vegetative re-growth of the above species are present. ▪ The understorey includes locally native shrubs typical of this habitat and the ground flora consists of a variety of typical wetland plants, such as lesser pond-sedge, common marsh-bedstraw, meadowsweet, yellow pimpernel, opposite-leaved golden-saxifrage, marsh-marigold, hemlock water-dropwort, water mint, lady fern and rushes. ▪ Plants associated with nutrient enrichment, such as stinging nettle and cleavers, are not dominant over large areas and invasive alien plants like Japanese knotweed and Indian balsam are absent. ▪ This wet woodland grades into areas of permanent open

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	<p>swamp dominated by lesser pond-sedge or other typical wetland plants, where the hydrological conditions are suitable. Adjacent areas of marshy grassland and spring-fed mire are intimately linked to the wet woodland and swamp.</p> <ul style="list-style-type: none"> ▪ There is no significant input of nutrient-rich water from ditches and surrounding land. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. In this plan the management units have been based on ownership, but also with reference to land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>. <p><u>Woodland Management</u> Small-scale coppicing over a long cycle is desirable to maintain the dominance of alder and create a varied canopy structure in the wet woodland. More frequent coppicing is required to maintain the open glades that are dominated by sedge swamp.</p> <p>Standing and fallen dead timber provides an important habitat for a variety of wildlife, including fungi, invertebrates and birds and is also essential for nutrient recycling and restoring soil nutrients. Therefore dead and decaying trees should normally be retained. Wherever possible, standing dead trees should be allowed to decay and fall naturally. Movement and cutting/tidying of fallen trees and dead wood should be avoided unless essential for legal obligations or public safety.</p> <p><u>Grazing</u> Past sporadic grazing in the wet woodland may have restricted the ash content and light grazing can have some positive benefits on overall species composition. However, the marsh fern and other grazing sensitive plants would be at risk from uncontrolled and anything more than light grazing.</p> <p>Consequently, exclusion of stock may be the best policy for Units 2 & 4.</p> <p>In the open wetland area of unit 5, light grazing in spring, summer</p>

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	<p>and autumn would prevent domination by rushes and purple moor-grass, maintain the diversity of plant species and prevent the spread of scrub. However, heavier grazing is likely to eliminate sensitive species and could cause localized physical damage to the sward leading to invasion by “weedy” species. Fencing may be required in order to graze this area.</p> <p><u>Drainage and Road Maintenance</u> The alder woodland and associated swamp, marshy grassland and spring-fed mire, as well as the marsh fern, are found in areas of impeded drainage in the valley bottom. There should be no drainage works that could interfere with the springs and the generally waterlogged ground. Drainage maintenance along the roads (units 9 & 10) must be undertaken in a very sensitive manner.</p> <p>Maintenance of the road itself need to be carefully considered so as not to affect the drainage and adjoining habitat; NRW needs to be consulted before any materials are brought in to maintain the road so that there is no risk of invasive species such as Indian balsam being imported.</p> <p><u>Nutrient Enrichment</u> The wet woodland has developed relatively fertile valley soils because nutrients accumulate here as a result of down-slope water movement and leaf-fall. However, further enrichment from agricultural run-off would promote dominance by weed species, such as nettles. No new agricultural drains should be routed into the site and existing drains may need to be diverted if they are causing an enrichment problem.</p> <p><u>Public Access</u> Maintain boardwalks and footpaths to minimise trampling damage within the wet woodland.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – 7.7 ha of wet woodland within the whole site; AND: 0.5 ha of fen meadow in unit 5; AND: 0.7 ha of open sedge swamp in units 2 and 4. ○ Lower limit – 7.3 ha of wet woodland within the whole site; AND: 0.4 ha of fen meadow in unit 5; AND: 0.4 ha of open sedge swamp in units 2 and 4.

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	<p>The extent of wet woodland should be maintained, but not increased at the expense of the open sedge-swamp, fen meadow or spring-fed bog areas.</p> <ul style="list-style-type: none"> • Location. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Wet woodland in units 2 and 4, AND: Fen meadow/springfed bog present in unit 5, AND: Open sedge swamp in present units 2 and 4. <p>The distribution of the wet and dry woodland is determined by hydrology. Wet woodland is largely confined to units 2 and 4.</p> <ul style="list-style-type: none"> • Canopy cover. <ul style="list-style-type: none"> ○ Upper limit – 90%. ○ Lower limit – 50% AND: There should be a varying pattern of canopy breaks over time <p>Cover should be sufficient to maintain the presence of shade tolerant plants but there should also be enough open areas to support light demanding plants and encourage tree and shrub re-generation.</p> <ul style="list-style-type: none"> • Canopy composition. <ul style="list-style-type: none"> ○ Upper limit: N/A AND: The canopy should consist entirely of locally native trees, such as alder and rusty willow. AND: Ash should make up no more than 25% of the canopy. ○ Lower limit: Alder is present within 10m radius of a sampling point. <p>The canopy should consist of locally native trees that are typical of wet woodland. Limits should be met in at least 90% of habitat in Units 2 & 4.</p> <ul style="list-style-type: none"> • Regeneration. <ul style="list-style-type: none"> ○ Upper limit – 20% young re-growth under 10 years old. ○ Lower limit – 1% young re-growth over 1.5m tall and under 10 years old present. <p>There should be signs of regeneration (mainly from coppice re-growth) throughout the wet woodland. Limits should be met in at least 90% of habitat area in units 2 & 4.</p> <ul style="list-style-type: none"> • Understorey and ground flora. <ul style="list-style-type: none"> ○ Upper limit – Japanese knotweed and Indian balsam are absent.

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	<ul style="list-style-type: none"> ○ Lower limit – Within the alluvial forest, vegetation within a 20m radius of a sample point will be in ‘good condition’ (see below). <p>A shrub layer and ground flora, typical of the alluvial forest plant communities should be present. There should be no extensive cover of ‘weedy’ plants, which are indicative of disturbance and nutrient enrichment. Limits should be met in at least 80% of habitat in units 2 & 4</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Upper limit – No significant grazing in units 2 and 4; AND: No significant grazing outside the growing season in unit 5 or heavy grazing at any time during the summer. ○ Lower limit – Unit 5 should be subject to light summer grazing by cattle and/or ponies at least 4 in every 5 years. <p>In Units 2 & 4 there should be no deliberate grazing but light grazing, preferably by cattle or ponies, is desirable in Unit 5 to maintain the fenmeadow vegetation.</p> <ul style="list-style-type: none"> • Drainage. <ul style="list-style-type: none"> ○ Upper limit – No new drainage ditches to be installed within units 2, 4 & 5. <p>Hydrology is important in maintaining wet woodland. New drainage ditches could cause drying out of the site, leading to a loss of alluvial forest in favour of drier woodland types.</p> <ul style="list-style-type: none"> • Public access. <ul style="list-style-type: none"> ○ Upper limit – No more that 30% bare ground with signs of trampling within 10m radius of a sample point; AND: No net loss of habitat to provide additional boardwalks. ○ Lower limit – N/A. <p>In theory, public access to the Nature Reserve area could cause a lot trampling damage but in practice the ground is so wet that visitors tend to keep to the boardwalks provided. Limits should be met in at least 90% of habitat area in unit 2.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for COed y Cerrig Site of Special Scientific Interest including Coed y Cerrig Special Area of Conservation (2008) available at:</i></p>

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	<p>http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cadair-to-coed-y-sac-list/idoc.ashx?docid=959d03ba-7be8-4351-9be5-01da15a31e43&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> Favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>The naturally high, largely spring-fed water table is essential to the ecological character of the site, as is the maintenance of an appropriate woodland management regime. The majority of the site is managed as a National Nature Reserve, the remainder subject to a management agreement; these ensure that there are no current management problems.</p> <p><u>Grazing</u> Heavy grazing is likely to eliminate sensitive species and could cause localized physical damage to the sward leading to invasion by “weedy” species.</p> <p><u>Agricultural Run-off</u> Further enrichment from agricultural run-off would promote dominance by weed species, such as nettles.</p> <p><u>Drainage and Road Maintenance</u> There should be no drainage works that could interfere with the springs and the generally waterlogged ground. Drainage maintenance along the roads (Units 9 & 10) must be undertaken in a very sensitive manner.</p>
<p>Landowner/ Management Responsibility</p>	<p><u>Unit 1</u> - NNR broadleaved woodland (non-SAC). <u>Unit 2</u> - NNR alder woodland (SAC). <u>Unit 3</u> - Private broadleaved woodland (non-SAC). <u>Unit 4</u> - Private broadleaved woodland (SAC). <u>Unit 5</u> - Marshy grassland included in SAC boundary, with small area of alder woodland by stream and on boundaries. <u>Unit 6</u> - Private broadleaved woodland. <u>Unit 7</u> - Private broadleaved woodland. <u>Unit 8</u> - Private broadleaved woodland. <u>Unit 9</u> - Road straddling SAC habitat. <u>Unit 10</u> - Road straddling SSSI.</p>

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<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Monmouthshire Council’s Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

<p>Site Name: Cors Caron Location Grid Ref: SN691638 JNCC Site Code: UK0014790 Size: 862.03 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>A classic and extensive raised mire system, comprising three distinct mires. The system is bisected by the Afon Teifi which separates the largest and least disturbed mire from the other areas. The site supports an unusually diverse flora, and is important for invertebrates and its avifauna.</p> <p>Cors Caron is a very extensive raised mire system developed over a late-glacial lake which once occupied the broad valley of the river Teifi. The raised mires lie at an altitude of about 160m (524ft), extend for 4km (2 miles) along the valley and reach 2km (1- mile) in width.</p> <p>Three distinct mires are separated either by the Teifi or by lagg streams which join the river. The largest single expanse, the West bog lies to the west of the river; while the North-East and South-East bogs, to the east are separated by the morainic knoll on which Maes-llyn farm is situated. This mire was the first true raised mire to be described in detail in Britain and is regarded as a classical site where the development sequence from aquatic conditions through flood plain mire to an ombrogenous mire surface is well demonstrated in the stratigraphy.</p> <p>The vegetation of the mire expanse shows an unusually wide range of variation, including <i>Sphagnum</i>-rich vegetation (exhibiting a small-scale hummock-hollow topography), heather <i>Calluna vulgaris</i> dominated areas and areas in which both purple moor-grass <i>Molinia caerulea</i> and deer-grass <i>Trichophorum cespitosum</i> are major components. This variation is largely the effect of past burning and probably also drainage. Fortunately the regeneration of an active mire surface has been so successful that little clear evidence of fire now remains; only the mosaic of vegetation types and the somewhat lowered water table, with consequent loss of species richness, still provide evidence of past damage. The cover and composition of the bog-moss (<i>Sphagnum</i> flora) is diminished over significant areas of all three bogs, suggesting past large-scale disturbance of all the three mires. The West Bog in particular would be expected to bear an active mire plan flora, with more extensive areas of comparatively open <i>Sphagnum</i> rich vegetation. However, such features are comparatively confined in extent and appear to have succumbed to a locally high cover of graminoids and/or ericoids. Active restorative management should help reverse this trend, although atmospheric nitrogen deposition remains a key concern.</p> <p>River terraces, which are regularly flooded, show a zonation of plant</p>

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	<p>communities parallel to the river. Reed canary-grass <i>Phalaris arundinacea</i> and tufted hair-grass <i>Deschampsia cespitosa</i> occur along the river edge and a broad zone of soft rush <i>Juncus effusus</i> with incipient carr formation occurs between this and a Molinia-rich lagg community. A wide rand is present which is mainly dominated by vascular plants with a discontinuous <i>Sphagnum</i> carpet.</p> <p>The bog, including the river and open water, is a valuable breeding and overwintering area for several species of wader and wildfowl - including redshank, curlew, mallard, teal and wigeon. It is also noted for its flock of whooper swans, the most southerly one of any size wintering regularly in Britain. About 70 species of bird breed on the reserve or in the immediate surroundings. There has been a large number species of invertebrate recorded and the reserve is one of the most southerly localities known in Britain for the large heath butterfly. It is also one of only two sites in the Britain where the rosy marsh moth has been recorded since its extinction from eastern England.</p> <p>The old railway track which forms part of the south-east boundary and then crosses part of the northern bog is raised and does not flood. It provides good access and, due to the relatively base-rich nature of the material, supports a flora and insect fauna found nowhere else on the reserve</p> <p>Most of the reserve is owned by NRW, the remainder is subject to a Nature Reserve Agreement with the owners. The Reserve has previously been known as Cors Tregaron, Tregaron Bog and Cors Goch Glan Teifi.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Active Raised Bogs. ▪ Degraded raised bogs still capable of natural regeneration. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Transition mires and quaking bogs. ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>. <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Otter. <p>Ramsar Features:</p> <ul style="list-style-type: none"> • Ramsar criterion 2: Populations of <i>Coenonympha tullia</i>

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	<p>(large heath butterfly), <i>Coenophila subrosea</i>, otter, water vole.</p> <ul style="list-style-type: none"> • Ramsar criterion 3: Supports a rich vegetation assemblage and possesses a surface pattern characteristic of this mire habitat type.
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <ul style="list-style-type: none"> ▪ The active raised bog at Cors Caron will show the typical features of a fully functional raised bog. The vegetation will be dominated by species of bog moss in lawns and hummocks. The peat domes should be waterlogged with the watertable at the surface or within a few centimetres of the surface for most of the year. ▪ Plants such as cross-leaved heath, heather and hare's tail cotton grass form a lowgrowing patchy canopy. Other species such as bog rosemary, deer grass and round leaved sundew will be less frequent but still fairly abundant. Purple moor grass, <i>Cladonia</i> lichens and hypnaceous mosses will be scarce. ▪ There will be wet hollows on the mire surface which will contain bog mosses such as golden bogmoss, feathery bogmoss, bog asphodel, many headed cotton grass and white beak sedge. ▪ The central area of the raised mires will be free from trees and large saplings and invasive species such as <i>Rhododendron ponticum</i> will not be present. ▪ Plant communities dominated by bog mosses will extend down the sloping sides of the raised bog (the rand) where there will be a series of transitions to other plant communities. Typically this would be into a wet heath with purple moor grass, crossleaved heath, tormentil and deer grass. ▪ Surrounding the raised bogs is a network of streams that eventually reach the Afon Teifi. This is known as the lagg fen and is a mixture of tall fen vegetation such as meadowsweet and Hemlock water dropwort and willow woodland. The groundlayer will have abundant mosses and liverworts. ▪ The rhynchosporion pool vegetation forms an intimate mix with the plant communities of the active raised mire. The hollows should be wet all year round except during very dry periods. Bog mosses that favour these very wet conditions should dominate the vegetation. Plants such as many-headed cotton grass, bog asphodel and white beaked sedge should form a scattered canopy over the lawns of bog moss. These hollows should be frequently encountered on the tops

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	<p>of the raised mires.</p> <ul style="list-style-type: none"> ▪ The flood-plain of the Afon Teifi is dominated by marshy grassland and swamp vegetation. The swamp vegetation tends to have very few species with the main one being the tall reed, Reed Canary Grass. However this habitat is very important for breeding birds and is uncommon in Ceredigion. This habitat is home to the diminutive liverwort Bog earwort. ▪ The marshy grassland will be predominantly purple moor grass and soft rush. There will be some tussocky areas but generally there will be an open structure with a variety of other flowering plants such as marsh cinquefoil, lady's smock, yellow rattle and occasionally common spotted and heath spotted orchids. ▪ The great variety of habitats at Cors Caron accounts for the wide range of insects and other invertebrates recorded. The Rosy Marsh Moth, the Large Heath Butterfly and the spider <i>Singa hamata</i> are only found on the type of wetlands found at Cors Caron. These animals will occupy all areas of suitable habitat and this will be in a suitable condition for them to complete their life-cycle. ▪ The Afon Teifi runs through the middle of Cors Caron and is designated a Site of Special Interest in its own right. Floating water plantain grows in the river channel and it is a key habitat for otters and water vole. <p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Active Raised Bogs. <p>The active raised bog at Cors Caron will be at Favourable Conservation Status where all the following are met:</p> <ul style="list-style-type: none"> ▪ The active raised bog at Cors Caron will show the typical features of a fully functional raised bog including central microform patterning, steep peripheral rand and marginal lagg fen. The peat domes should be waterlogged with the watertable at the surface or within a few centimetres of the surface for most of the year. ▪ The surface of the mire expanse will show the typical microform hollow/hummock patterning. The vegetation will be dominated by species of bog moss in lawns and hummocks. ▪ Vascular plants such as cross-leaved heath, heather and hare's tail cotton grass form a lowgrowing patchy canopy. Other species such as bog rosemary, deer grass and round leaved sundew will be less frequent but still fairly abundant. ▪ Purple moor grass will be scarce; <i>Cladonia</i> lichens and

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	<p>hypnaceous mosses will be locally frequent on naturally drier mature hummocks.</p> <ul style="list-style-type: none"> ▪ There will be wet hollows on the mire surface which will contain bog mosses such as Sphagnum pulchrum, S. cuspidatum, S. auriculatum, bog asphodel, many headed cotton grass and white beak sedge. ▪ The central area of the raised mires will be free from trees and large saplings. Invasive species such as Rhododendron ponticum will not be present. ▪ Plant communities dominated by bog mosses will extend down the sloping sides of the raised mire where there will be a series of transitions to other plant communities. Typically this would be into a wet heath with purple moor grass, cross leaved heath, tormentil and deer grass. This in turn would grade into purple moor grass 'grassland' but still with abundant mire species. ▪ At the bottom of the lagg fen a poor-fen and wet woodland communities will be present. The poor-fen will be dominated by sedges such as star sedge, purple moor grass and rush species. The groundlayer will have abundant bryophytes. ▪ The rhynchosporion pool vegetation forms an intimate mix with the plant communities of the active raised mire. The hollows should be wet all year round except during very dry periods. The vegetation should be dominated by bog mosses that favour these very wet conditions. Plants such as many-headed cotton grass, bog asphodel and white beaked sedge should form a scattered canopy over the lawns of bog moss. These hollows should be frequently encountered on the tops of the raised mires. ▪ All factors affecting the feature will be under control <p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Degraded raised bogs still capable of natural regeneration. <p>The degraded raised bog at Cors Caron will be at Favourable Conservation Status where all the following are met:</p> <ul style="list-style-type: none"> ▪ 80% of the degraded raised bog resource is restored to a point commensurate with the definition of active raised bog. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Transition mires and quaking bogs. <p>The transition mire at Cors Caron will be at Favourable Conservation Status where all the following are met:</p> <ul style="list-style-type: none"> ▪ The transition mire at Cors Caron occupies small areas

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	<p>scattered over a number of compartments.</p> <ul style="list-style-type: none"> ▪ The transition mire will be a quaking raft of vegetation over soft peats with constantly wet surface for most of the year. ▪ Bottle sedge will be a dominant plant with other sedge species present. Devil's bit scabious, marsh cinquefoil and many headed cotton grass will also be seen. ▪ The ground layer will be dominated by bog mosses. ▪ Willow trees will be absent from the transition mire. ▪ All factors influencing the feature will be under control. <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Otter. <p>Otter is listed as an SAC feature for Cors Caron but is more appropriately dealt with under the Afon Teifi SAC plan. Refer to the Afon Teifi SAC plan for the conservation objective for Otter, this has not been repeated here in order to prevent duplication.</p>
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land tenure including relevant agreements and management practices.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Active Raised Bogs. ▪ Degraded raised bogs still capable of natural regeneration. ▪ Transition mires and quaking bogs. ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>. <p><u>Hydrological Management</u> Past peat cutting on the margins of the raised mires (in areas which are out with boundary of the SAC feature) is cited as the factor offering the most plausible explanation for the water-loss/shrinkage currently observed across the primary surface on all three domes at Cors Caron. The main courses of action to counteract the damaging effects of peat cutting, are to raise the water table by a continuation of the ongoing programme of blocking cuttings and associated drains with peat dams, and construction of large bunds on the marginal areas outside of the 'feature' area. This management should increase the height of the water table and stabilise its seasonal and inter-year variation across the areas of primary</p>

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	<p>surface (the central domes - refer to Bunding & ditch blocking map). It is hoped that this will induce renewed or accelerated peat accumulation.</p> <p>Consideration must also be given to blocking/in-filling or sluicing certain of the main drains that bisect the site as whole. At present NRW are obliged to maintain many of these as they provide drainage for parts of the site subject to agricultural tenancies and/or for neighbouring land. A project needs to be set up to establish which drains NRW can and should block/in-fill or sluice, which they must keep open, and which they might seek agreement to block. Where the blocking of a drain may restrict normal drainage or even flood adjacent land and/or land subject to a tenancy, negotiations and agreement/acquisition must be pursued - see above. Consideration must also be given to de-canalising the River Teifi (NB. the blocking/in-filling or sluicing of main drains or de-canalising the River Teifi is arguably more relevant to the management of the flood-plain mire (feature 4), but will have an overall impact on the hydrological budget of the site- entire so benefiting the raised mire.</p> <p>It is not possible to define the condition of the habitats which we would wish to develop in the marginal areas. However, at present it is not necessary to do so, all 'objectives' for these areas being definable in terms of operations, e.g. pressure-bunding, ditch blocking and scrub removal.</p> <p><u>Scrub</u> Birch <i>Betula</i> spp. is colonising drier areas, principally on the higher ridges of old peat cuttings and to lesser extent on the raised bog domes. Scrub control operations must therefore continue. Priority areas for the removal of scrub have been determined and mapped. Some areas of existing wet broad-leaved woodland and willow carr will be allowed to develop.</p> <p><u>Invasive species</u> Invasive <i>Rhododendron ponticum</i> is currently a minor problem on this site. Management to eradicate/control it must continue.</p> <p><u>Burning</u> Fire presents a significant threat to the raised mire. This is most likely to be caused by neighbours burning <i>Molinia</i> dominated pasture to obtain an early bite for their livestock. There needs to be regular liaison with the neighbouring farmers to ensure their awareness of the vulnerability of the site to fire damage.</p> <p><u>Agricultural Tenancies</u> Parts of all three raised mires lie within areas subject to agricultural</p>

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	<p>tenancies. This may present some obstacles in the progression of planned management work, as all operations must have the agreement of the relevant tenant. Concerns over stock safety may result in some resistance to operations that will raise the water table. Some renegotiation will be required when the period of current tenancies expires with an alteration of the terms of the agreement where necessary.</p> <p><u>Peat Cutting</u> Although this stopped many years ago, a small amount of 'demonstration' digging is carried out by NRW as part of interpreting the history of the site. This will be limited to ten peat turves per annum.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Otter. <p>Otter is listed as an SAC feature for Cors Caron but is more appropriately dealt with under the Afon Teifi SAC plan. Refer to the Afon Teifi SAC plan for the Conservation Status and Management Requirements for Otter, this has not been repeated here in order to prevent duplication.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Active Raised Bogs Depressions on peat substrates of the <i>Rhynchosporion</i></p> <ul style="list-style-type: none"> • Extent of active raised bog. <ul style="list-style-type: none"> West Bog. <ul style="list-style-type: none"> ○ Lower limit – 140 hectares. ○ Upper limit – not set. North East Bog. <ul style="list-style-type: none"> ○ Lower limit – 30 hectares. ○ Upper limit – not set. South East Bog. <ul style="list-style-type: none"> ○ Lower limit – 16 hectares. ○ Upper limit – not set. <p>These are all parts of management unit 1. There is no opportunity to increase the extent or alter the distribution of active raised bog except in areas of degraded raised which in time will be returned to active raised bog.</p>

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	<ul style="list-style-type: none"> • Proportion of hummock / hollow vegetation. The proportion of the primary surface intact active raised bog communities referable to a hummock - wet hollow complex is: <ul style="list-style-type: none"> ○ Upper limit – none set. ○ Lower limit – 80% of the vegetation. • Ratio of hollows within the hummock / hollow microform. <ul style="list-style-type: none"> ○ Ratio of hummock - wet hollow ○ Lower limit – a mosaic of 20% wet hollow vegetation within a 10 m radius of any point. ○ Upper limit – a mosaic of 30% wet hollow vegetation within a 10 m radius of any point and, where wet hollow vegetation in favourable status is recognised by/defined as – within 0.5 m of a given sampling point - <i>Sphagnum cuspidatum</i> with at least 1 plant of <i>Rhynchospora alba</i>, <i>Narthecium ossifragum</i> and/or <i>Sphagnum tenellum</i> with the following species absent: <i>Calluna vulgaris</i>, <i>Cladonia spp.</i>, <i>Molinia caerulea</i> and <i>Empetrum nigrum</i>. • Presence of <i>Rhynchosporion</i> pool vegetation. <ul style="list-style-type: none"> ○ <i>Rhynchosporion</i> pool vegetation will cover – ○ Lower limit – 15% of the primary raised bog surface. ○ Upper limit – 70% of the primary raised bog surface. Where <i>Rhynchosporion</i> vegetation is defined as wet vegetation where, in any 1metre radius: <i>Sphagnum cuspidatum</i> and/or <i>S. pulchrum</i> form >20% cover; at least two of <i>Rhynchospora alba</i>, <i>Andromeda polifolia</i> and <i>Narthecium ossifragum</i> are present. <i>Molinia caerulea</i> is absent. • Water levels. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Within 20cm of the surface for 6 months per year and within 30cm at all times. • Water quality. <ul style="list-style-type: none"> ○ Upper limit – pH of surface water is 4.5. ○ Lower limit – pH of 2.7. <p>Polluted / minerotrophic / fertiliser loaded water will not be used to raise the water table.</p> <ul style="list-style-type: none"> • Scrub. <ul style="list-style-type: none"> ○ Lower limit – none set. ○ Upper limit – No scrub present on the active mire

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	<p>plain. No greater than 5% cover of scrub in any given 1 ha area of the site, and a maximum scrub block size 0.04 ha or >20m across, and a maximum height of scrub of 3 metres.</p> <ul style="list-style-type: none"> • <i>Rhododendron ponticum</i>. <ul style="list-style-type: none"> ○ Lower limit – no <i>Rhododendron ponticum</i> on the mire expanse. ○ Upper limit – 2 <i>Rhododendron</i> plants (non-seed bearing) on each mire expanse and development to seed bearing maturity prevented. • Fire. <ul style="list-style-type: none"> ○ No fires shall be tolerated across the active mire surface. • Grazing / agricultural tenancies. <ul style="list-style-type: none"> ○ There will be no livestock grazing on the primary intact domes. • Atmospheric nutrient deposition. <ul style="list-style-type: none"> ○ Lower limit – None set. ○ Upper limit – 10 kg N/ha/yr. <p>Degraded raised bogs still capable of natural regeneration</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Extent mapped in 1996. ○ Lower limit – Extent mapped in 1996. • Habitat Quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – >50% of the sampling points are active secondary raised bog vegetation. >10% of sampling points are active peat forming pool vegetation. <p><u>Active secondary raised bog vegetation</u> In any 1m radius. a) <i>Sphagnum</i> cover is > 20%. b) Cover of graminoids (grasses and cyperaceous species) other than <i>Rhynchospora</i> form <50% cover c) <i>Calluna vulgaris</i> forms <50% cover.</p> <p><u>Active peat forming pool vegetation</u> Vegetation where, in any 1m radius, <i>Sphagnum cuspidatum</i> and / or <i>S. pulchrum</i> form >20% cover</p> <ul style="list-style-type: none"> • Ratio of hollows within the hummock / hollow microform

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	<ul style="list-style-type: none"> ○ Ratio of hummock - wet hollow – ○ Lower limit – a mosaic of 20% wet hollow vegetation within a 10 m radius of any point. ○ Upper limit – a mosaic of 30% wet hollow vegetation within a 10 m radius of any point and, where wet hollow vegetation in favourable status is recognised by/defined as – within 0.5 m of a given sampling point - <i>Sphagnum cuspidatum</i> with at least 1 plant of <i>Rhynchospora alba</i>, <i>Narthecium ossifragum</i> and/or <i>Sphagnum tenellum</i> with the following species absent: <i>Calluna vulgaris</i>, <i>Cladonia spp.</i>, <i>Molinia caerulea</i> and <i>Empetrum nigrum</i>. <ul style="list-style-type: none"> ● Presence of <i>Rhynchosporion</i> pool vegetation <ul style="list-style-type: none"> ○ <i>Rhynchosporion</i> pool vegetation will cover – ○ Lower limit – 15% of the primary raised bog surface ○ Upper limit – 70% of the primary raised bog surface. Where <i>Rhynchosporion</i> vegetation is defined as wet vegetation where, in any 1metre radius: <i>Sphagnum cuspidatum</i> and/or <i>S. pulchrum</i> form >20% cover; at least two of <i>Rhynchospora alba</i>, <i>Andromeda polifolia</i> and <i>Narthecium ossifragum</i> are present. <i>Molinia caerulea</i> is absent ● Water levels <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Within 20cm of the surface for 6 months per year and within 30cm at all times. ● Water quality <ul style="list-style-type: none"> ○ Upper limit – pH of surface water is 4.5. ○ Lower limit – pH of 2.7. <p>Polluted / minerotrophic / fertiliser loaded water will not be used to raise the water table.</p> <ul style="list-style-type: none"> ● Scrub <ul style="list-style-type: none"> ○ Lower limit – none set. ○ Upper limit – No scrub present on the active mire plain. No greater than 5% cover of scrub in any given 1 ha area of the site, and a maximum scrub block size 0.04 ha or >20m across, and a maximum height of scrub of 3 metres. ● <i>Rhododendron ponticum</i> <ul style="list-style-type: none"> ○ Lower limit – no <i>Rhododendron ponticum</i> on the mire expanse. ○ Upper limit – 2 <i>Rhododendron</i> plants (non-seed bearing) on each mire expanse and development to

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	<p>seed bearing maturity prevented.</p> <ul style="list-style-type: none"> • Fire <ul style="list-style-type: none"> ○ No fires shall be tolerated across the active mire surface. • Grazing / agricultural tenancies. <ul style="list-style-type: none"> ○ There will be no livestock grazing on the primary intact domes. • Atmospheric nutrient deposition. <ul style="list-style-type: none"> ○ Lower limit – None set. ○ Upper limit – 10 kg N/ha/yr. <p>Transition Mire</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Lower limit – 1.5ha. ○ Upper limit – none set. • Vegetation Quality <ul style="list-style-type: none"> ○ Lower limit – In at least 1 of the 3 monitoring plots established in 2004, >15% of the sampling points are good quality transition mire vegetation. ○ Upper limit – none set. <p>Definition of good quality transition mire vegetation: In any 50cm radius – Sphagnum cover is >50%, and at least 2 of <i>Carex rostrata</i>, <i>Potentilla palustris</i>, <i>Menyanthes trifoliata</i> are present and <i>Salix</i> saplings are absent.</p> <ul style="list-style-type: none"> • Water Levels <ul style="list-style-type: none"> ○ Lower limit – water table at the surface for 10 months of year and visible on foot-fall. ○ Upper limit – none set. • Water Quality <ul style="list-style-type: none"> ○ No limits set until exact requirements determined through research. In lieu of this, there should be an absence of tall graminoids indicative of enrichment, notably Typha and Phragmites. • Scrub <ul style="list-style-type: none"> ○ No scrub will be tolerated on the transition mire. • Burning <ul style="list-style-type: none"> ○ No fires shall be tolerated on the transition mire.

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	<ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ Grazing in the transition mire is generally beneficial - it controls the dominance of rush and <i>Molinia</i> and therefore maintains structural and species diversity. All of this feature lies within an area subject to a NRA with the owner. The owner has a farm tenant and the tenant has entered the area into a Tir Gofal scheme. <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Cors Caron Special Area of Conservation (SAC, RAMSAR, and SSSI) (2008)</i> available at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=a88526a0-0693-4c01-84bc-cc4958d93189&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Active Raised Bogs: Unfavourable Recovering ▪ Degraded raised bogs still capable of natural regeneration: Unfavourable Recovering ▪ Transition mires and quaking bogs: Unfavourable Recovering ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>: Unfavourable Recovering ▪ Otter <p>Otter is listed as an SAC feature for Cors Caron but is more appropriately dealt with under the Afon Teifi SAC plan. Refer to the Afon Teifi SAC plan for the Conservation Status and Management Requirements for Otter, this has not been repeated here in order to prevent duplication.</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Peat Cutting</u> In the past few centuries, changes in hydrology due to peat-cutting and burning have taken place, and birch and willow scrub has increased, mainly at the expense of the lagg fen communities.</p> <p><u>Agriculture</u> Agricultural drainage and grazing by farmstock have also caused hydrological changes and the loss of raised bog flora and fauna. Cessation of agricultural tenancies or management agreements are needed to remedy these threats and these are now under consideration. Monitoring of the hydrology and remedial management works as set out in the management plan have been implemented.</p>

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	<p><u>Tourism</u> 20,000 visitors use the site each year but they are not considered to be causing deleterious changes at present.</p> <p><u>Invasive Species</u> Invasive <i>Rhododendron ponticum</i> is currently a minor problem on this site. Management to eradicate/control it must continue.</p> <p><u>Burning</u> Fire presents a significant threat to the raised mire. This is most likely to be caused by neighbours burning <i>Molinia</i> dominated pasture to obtain an early bite for their livestock.</p>
<p>Landowner/ Management Responsibility</p>	<p>The majority of the area of Cors Caron SAC is now managed for nature conservation as a National Nature Reserve through direct management by NRW, agricultural tenancy or Nature Reserve Agreement</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Cors Fochno Location Grid Ref: SN631913 JNCC Site Code: UK0014791 Size: 652.71 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The peatland complex of Cors Fochno lies on the southern flank of the Afon Dyfi, within the estuarine floodplain. It is a rare and striking landscape feature, and considered to be the 'locus typicus' for estuarine raised mire in the UK. Although reduced in size by drainage and reclamation, the remaining expanse at Borth comprises one of the largest actively growing raised bogs in the lowlands of Britain, and accounts for around 4% (200ha) of the total British resource of primary surface (i.e. uncut) raised mire.</p> <p>Cors Fochno is a site of national geological importance containing a 7m deep peat archive, continuously developed over 5000 years and storing information on sea level, climate and other environmental change. This, together with the site being one of only a handful in the UK considered representative of active northern peatland complexes make the site highly valued for research, particularly relating to climate change. The bog also contains important archaeological remains including the best example of a medieval timber trackway known in Wales.</p> <p>The intact central dome of the bog has a gently undulating mosaic of hummocks and hollows supporting classic oceanic raised bog vegetation, in which <i>Sphagnum pulchrum</i> and bog myrtle <i>Myrica gale</i> are prominent. Other rare sphagna include <i>Sphagnum austinii</i> and <i>Sphagnum fuscum</i>, while all three species of British sundews <i>Drosera</i> spp. are present, and brown beaked sedge <i>Rhynchospora fusca</i> occurs in old peat cuttings. A wide range of habitat including poor-fen, reedswamp and carr woodland occur around the modified margins of the bog, supporting a diverse flora which includes uncommon species such as royal fern <i>Osmunda regalis</i> and lesser butterfly orchid <i>Platanthera bifolia</i>. In areas of saline influence transitional communities typified by the presence of black bog rush <i>Schoenus nigricans</i> are a notable feature.</p> <p>The invertebrate assemblages are of great interest and include a wide range of nationally scarce species, such as large heath butterfly <i>Coenonympha tullia</i>, bog bush-cricket <i>Metrioptera bracyptera</i> and small red damselfly <i>Ceragrion tenellum</i>. The rosy marsh moth <i>Eugraphe subrosea</i> has its major British stronghold here. Also present at its only locality in England and Wales is <i>Heliophanus dampfi</i>, a spider found only on a small number of highest quality raised bogs.</p> <p>The site also supports regionally important breeding and wintering</p>

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	<p>bird assemblages. Amongst the former are teal, curlew, grasshopper warbler, skylark and reed bunting, whilst wintering species include hen harrier and merlin. Mammal populations include resident otter. The reptile assemblage includes a strong population of adder.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs. ▪ Degraded raised bogs still capable of natural regeneration. <p>Annex 1 habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>. <p>Ramsar Features:</p> <ul style="list-style-type: none"> • Estuarine raised bog.
<p>Conservation Objectives</p>	<p>Vision for the site: <i>This plan covers the 653 ha of Cors Fochno SAC which is part of the larger Dyfi SSSI (3792ha). The management plan for the remainder of Dyfi SSSI is currently being developed.</i></p> <p>NRW's vision for Cors Fochno will encompass both biological (the flora and fauna) and geological features (the peat deposit archive) the condition of which, are highly dependent upon each other, and upon the surrounding hydrological conditions.</p> <p>On the active raised bog and where possible on the degraded raised bog the peat, both surface and subsurface layers will be restored, and maintained in waterlogged, anoxic condition thereby: protecting the unique record of post-glacial environmental development and enabling its continued development; and, improving the site carbon balance by enhancing peat growth and reducing oxidation. Additionally, and importantly, re-hydration of the peat body will enable the raised bog vegetation to attain and maintain good condition, increase its robustness in the face of environmental change and reduce the requirement for future management intervention.</p> <p>The central, uncut area of the bog will display a shallow domed profile, with a spongy surface, capable of responding to variable rainfall patterns by small adjustments in surface elevation. Prominent in the vegetation will be a typical range of raised bog <i>Sphagnum</i> mosses, which together will contribute a ground cover of</p>

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	<p>at least 25% across the primary bog surface.</p> <p>Across the greater part of the central dome the vegetation will exhibit a patterned micro-topography, with quaking hollows interspersed with bog moss lawns and hummocks. Carpets of the scarce, oceanic bog moss, <i>Sphagnum pulchrum</i> will be common in hollows and lawns, along with white beak-sedge and greater sundew. Bog rosemary will be present throughout the central dome, which will also support healthy populations of two nationally scarce hummock mosses <i>Sphagnum fuscum</i> and <i>S. austinii</i>. Locally, and especially towards the margins of the uncut dome, the vegetation will contain a higher proportion of hare's-tail cottongrass, heathers and bog myrtle, but the vegetation will be substantially free from tree species and purple moor grass.</p> <p>The greater part of the old peat cuttings will have vegetation very similar to that of the central dome. The cuttings will support bog pool and hollow vegetation, and the baulks will be sufficiently wet to support 20% or more bog mosses cover. Vegetation dominated by purple moor grass and/or bog myrtle and/or common reed will occur around the degraded bog margins but will not be encroaching on the sphagnum bog communities. Bog mosses will have frequent occurrence in these other communities and tree encroachment will be absent or at a low level. Woodland habitat will not be increasing in extent.</p> <p>Assemblages of key plant and animal species characteristic of the diverse range of mire and associated wetland communities of the bog margins and transitions will be maintaining favourable populations, while species intolerant of surface waterlogging such as bracken and most grass species will be absent or rare throughout the site, as will alien invasive species such as rhododendron.</p> <p>In some areas of the bog periphery subject to past or present salt-water influence there will be examples of salt-influenced vegetation typified by the presence of sea rush and black bog rush. There will also be some areas showing transitions from peat to mineral soils which The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to conservation features and land management requirements.</p> <p>Annex I habitats that are a primary reason for selection of this</p>

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	<p>site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs. <p>Annex 1 habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>. <p>The vision for these feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ NVC type M18 <i>Sphagnum papillosum-Erica tetralix</i> raised mire and M2 <i>Sphagnum cuspidatum</i> bog pool communities will occupy > 95% of the ‘primary’ (i.e. uncut) bog area. ▪ The cover level of characteristic bog mosses (<i>Sphagnum</i> species) will be sufficiently high (>25%) to indicate healthy peat growth. ▪ ‘Hummock and hollow’ patterning will be present across the centre of the bog dome. ▪ The hollows (ie. <i>Rhynchosporion</i> depressions) will usually have greater sundew <i>Drosera anglica</i> present and will be increasing or maintaining their extent. ▪ The following species will be common in the active raised bog: <i>Sphagnum capillifolium</i>, <i>S. papillosum</i> and <i>S. magellanicum</i>, bog rosemary <i>Andromeda polifolia</i> and white-beak sedge <i>Rhynchospora alba</i>. ▪ The rare hummock forming bog mosses <i>Sphagnum austinii</i> and <i>S. fuscum</i> will be have stable or increasing populations. ▪ Purple moor grass <i>Molinia caerulea</i> will be largely absent from the active raised mire ▪ Scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will also be largely absent. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Degraded raised bogs still capable of natural regeneration. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ 80% of the degraded raised bog resource is restored to active raised bog, with the remainder, being hydrologically compatible with active bog. ▪ Vegetation corresponding to National Vegetation Classification raised mire communities types M2 and/or M18 will be stable or increasing in extent relative to that mapped in 2003.

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	<ul style="list-style-type: none"> ▪ Areas/ stands of M18 vegetation will have a 20% or more cover of bog moss, and tree species and rhododendron will be rare or absent. ▪ Other non-woodland semi-natural vegetation communities, including poor fen, brackish fen and swamp will have tree species not exceeding their extent in 2003. ▪ Characteristic plant species of the mire margins and transitions, including alder buckthorn, black bog rush, brown beak-sedge, greater tussock sedge, lesser butterfly orchid, marsh cinquefoil, royal fern and veilwort will have stable or increasing populations. ▪ Species intolerant of impeded drainage such as bracken and most grass species will be absent or rare throughout the site, together with alien invasive species such as rhododendron. ▪ All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 11 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to conservation features and land management requirements.</p> <p><u>Ramsar Features</u></p> <ul style="list-style-type: none"> ▪ Estuarine raised bog.
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Active raised bogs. <p><u>Drainage</u> The principal requirement of management is to maximise the capacity of the primary bog to retain rainfall above the permanently waterlogged zone, i.e. within the surface peat-forming layer (the acrotelm), and counter any accelerated rate of drainage resulting from human actions.</p> <p>This could arise from damage to the vegetation e.g. by fire or trampling as well as by drainage within and peripheral to the primary bog. Since the drainage issues which affect the degraded raised bog also impact on the quality of the central ‘active bog’ the requirements set out under that feature apply here also. Significant</p>

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	<p>advances have been made in implementing the necessary hydrological restoration on and around the primary bog, but further improvements to water retention are still required .including securing more favourable management of the peripheral drainage – see below.</p> <ul style="list-style-type: none"> ▪ Degraded raised bogs still capable of natural regeneration. <p><u>Drainage</u> There are two principal aspects of artificial drainage which need to be addressed: i) internal ditches and peat cuttings; and, ii) drainage on the site boundaries. In the case of i), work has been carried out since at least 1982 and annually since at least 1991. This was initially confined to damming large drains and some bunding to counteract peat shrinkage near the bog margins. Currently, an extensive programme of damming old peat cuttings within the NNR is in progress and is improving the condition of a significant area of the feature. Completion of this work is expected to take a further 5-6 years. ii) JNCC Report no.365 'Characterisation of Hydrological Protection Zones at the Margins of Designated Lowland Raised Bog Sites' recommends restoration of near-surface water levels and shallow hydrological gradients at the site margins. of. The land drainage issue at Cors Fochno is complicated by the potential for sea-water flooding and the issue of sustainability of coastal defences in the face of climate change. To help address this issue expert-led site-specific research into the drainage impacts and management options at the site have been carried out. NRW is working together on advancing agreement with stakeholders as part of a Cors Fochno SAC Water Level Management Plan (WLMP) based on the research findings.</p> <p>Annex 1 habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>. <p><u>Ditch Blocking</u> All of the major internal ditches within the NNR associated with past drainage reclamation and peat cutting have now been blocked, this work being centred on the northern and north-western sections of the site where the problem was greatest. There is an on-going project to block all of the smaller drainage ditches and peat cuttings across the NNR.</p> <p><u>Bunding</u> A peat bund 1200 m long was constructed in 1992/3 along a part of the southern periphery of the site, to reduce water loss into the Pwll Du ditch. This is viewed as a short-term measure and no further</p>

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	<p>bunding is planned pending further assessment of this and other possible re-wetting strategies.</p> <p><u>Scrub Clearance</u> A programme of willow and birch scrub removal and control is in progress and will need to be continued until such a time as further invasion is prevented by the restoration of conditions favouring raised mire vegetation. Attempts to eradicate <i>Rhododendron</i> from degenerate parts of the mire have so far met with limited success and will need to be pursued for a considerable time yet.</p> <p><u>Grazing & Mowing</u> Grazing with native Welsh Mountain ponies and mowing are being employed on some peripheral bog areas modified by past drainage and agricultural use, in order to reduce the dominance of purple moor grass and encourage re-colonisation of characteristic bog species.</p> <p>Vulnerability of the intact mire has been significantly reduced in recent decades by land acquisition and designation, such that a broad 'buffer zone' of modified mire is now under conservation management. The maintenance of peripheral drains is the main threat to successful rehabilitation. NRW is addressing this problem through liaison with the Environment Agency, and input to a water level management plan. Monitoring of the hydrology and the mire vegetation indicates a positive response to ditch-blocking works commenced in 1981. Further remedial actions are being addressed, as set out in the management plan</p> <p><u>Synthesised Conditions to maintain integrity</u></p> <p>Active raised bogs Depressions on peat substrates of the <i>Rhynchosporion</i></p> <ul style="list-style-type: none"> • Extent of active raised bog. <ul style="list-style-type: none"> ○ Upper limit – 100% of primary bog surface. ○ Lower limit – 166 ha. • Condition of active raised bog. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – >50% of sample points in 'active raised bog' monitoring plots 3,4,& 7 (established 2003) have: i) 25% or more ground cover of characteristic raised bog Sphagnum species; ii) Presence of one or more hummock-forming Sphagnum species per sample plot; iii) <i>Molinia caerulea</i> is absent and; iv) The <i>Rhynchosporion</i> depressions on peat substrates of the are above the lower limit for extent/ condition.

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	<ul style="list-style-type: none"> • Extent and condition of Depressions on peat substrates of the <i>Rhynchosporion</i>. <ul style="list-style-type: none"> ○ Upper limit – none set. ○ Lower limit – > 15% sample points in Plots 1,2,5 & 6 are referable to ‘Rhynchosporion pool’ vegetation. • Hydrology – water table. <ul style="list-style-type: none"> ○ Upper limit – mean bog surface level (at established central dome sample site). ○ Lower limit – 90% residence within 30cm of mean surface (at established central dome sample site). • Water chemistry <ul style="list-style-type: none"> ○ Upper limit – surface water chemistry to be free of saline influence across the entire primary bog dome. • Atmospheric deposition of nitrogen (N) <ul style="list-style-type: none"> ○ Upper limit – 9kg/ha/yr inorganic Nitrogen. • Fire <ul style="list-style-type: none"> ○ Fire will be prevented as far as possible. • Scrub <ul style="list-style-type: none"> ○ Upper limit – Extent of scrub/ woodland mapped in 2003. • Livestock grazing <ul style="list-style-type: none"> ○ Upper limit – No livestock grazing on active raised bog. <p>Degraded raised bogs still capable of natural regeneration</p> <ul style="list-style-type: none"> • Extent of degraded bog with <i>Sphagnum papillosum</i>-<i>Erica tetralix</i> raised mire and M2 <i>Sphagnum cuspidatum</i> bog pool communities raised bog vegetation. <ul style="list-style-type: none"> ○ Upper limit – No limit set. ○ Lower limit – Extent of degraded bog mapped in 2003. • Condition of degraded bog with <i>Sphagnum papillosum</i>-<i>Erica tetralix</i> raised mire and M2 <i>Sphagnum cuspidatum</i> bog pool communities raised bog vegetation. <ul style="list-style-type: none"> ○ In plots 1,2,3 and 4 (established in 2003) > 50% of sampling points have: i) 20% or more ground cover of characteristic raised bog <i>Sphagnum</i> species; ii) All tree species and <i>Molinia caerulea</i> are absent.

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	<ul style="list-style-type: none"> • Hydrology – water table <ul style="list-style-type: none"> ○ Lower limit – Minimum values for representative locations in degraded bog locations to be determined. <p>Hydrology is probably the single most important condition influencing peatland ecology, development, functions and processes. The water table within active raised bogs normally lies within the range 0-15cm below mean surface level and falls to 30cm or more are rare. Drainage around and internal to the bog is a key determinant of water table residence time within the optimal range.</p> <ul style="list-style-type: none"> • Water Chemistry <ul style="list-style-type: none"> ○ Upper limit – saline influence restricted to areas of historic tidal flooding, as indicated by the presence of saltmarsh rush <i>Juncus maritimus</i>. • Livestock grazing <ul style="list-style-type: none"> ○ Upper limit – The Molinia mire areas will be lightly summer grazed by Welsh mountain ponies and/ or suitable cattle (eg Highlands), annually. Light summer grazing is defined as cattle and/or ponies at a rate of 0.4 SU/Ha/year for the period May-October. • Fire <ul style="list-style-type: none"> ○ Fire will be prevented as far as possible. • Scrub <ul style="list-style-type: none"> ○ Upper limit – Extent of scrub/ woodland mapped in 2003. <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Cors Fochno Special Area of Conservation (SAC, RAMSAR, and SSSI) (2011) available at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cors-fochno-to-cwm-sac-list/idoc.ashx?docid=3ab6a416-897d-49ed-8361-3fbc8570a069&version=-1</i></p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Active raised bogs: Unfavourable ▪ Degraded raised bogs still capable of natural regeneration: Unfavourable ▪ Depressions on peat substrates of the <i>Rhynchosporion</i>: Unfavourable: no change.

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<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Drainage</u> The quality and extent of the raised mire and transitional brackish mire habitats have been affected by past drainage works, agricultural conversion, peat cutting and fire.</p> <p><u>Flooding</u> A significant proportion of the degraded mire is protected from seawater incursion by artificial structures and is therefore vulnerable to flooding. The potential for restoration of brackish transitions requires detailed assessment.</p> <p><u>Scrub and Invasive Species Clearance</u> A programme of willow and birch scrub removal and control is in progress and will need to be continued until such a time as further invasion is prevented by the restoration of conditions favouring raised mire vegetation. Attempts to eradicate Rhododendron from degenerate parts of the mire have so far met with limited success and will need to be pursued for a considerable time yet.</p>
<p>Landowner/ Management Responsibility</p>	<p>Units 1 - 7 – NRW Owned.</p> <p>Units 8 - 9 – Common Land.</p> <p>Units 10-11 – Private Ownership.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites Location Grid Ref: SH660386 JNCC Site Code: UK0014789 Size: 2813.7 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Meirionnydd Oakwoods and Bat Sites SAC is made up of a series of woodlands, stretching from Dolgellau in the south to Eryri in the north.</p> <p>The majority of the SAC is classified as the woodland type known as “Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles”, which covers approximately 84% of the SAC and is the dominant woodland type at most of the sites. A key feature of European importance is the rich Atlantic bryophyte communities that are often well developed within this Annex I type. These include numerous rare species, such as <i>Campylopus setifolius</i>, <i>Sematophyllum demissum</i>, <i>Adelanthus decipiens</i>, <i>Leptocyphus cuneifolius</i> and <i>Plagiochila atlantica</i>.</p> <p>Another key feature of the Meirionnydd Oakwoods and Bat Sites SAC is the lichen flora which is exceptionally rich and includes numerous rare species such as, <i>Micarea xanthonica</i>, <i>Parmelinopsis horrescens</i>, <i>Phyllopsora rosei</i>, <i>Micarea stipitata</i> and <i>Tyothallia biformigera</i>. Frequently the oak woodland occurs as part of a mosaic of woodland types including other Annex I Habitats, “Bog woodland”, “Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>” and “<i>Tilio-Acerion</i> forests of slopes, screes and ravines” which occur in small areas and are only significant at a few of the component SSSI/units. The transitions between these different woodland types are important in terms of maintaining the structure and function of the habitat type and vary across the U.K.</p> <p>The heath is characterised by abundant <i>Calluna vulgaris</i>, <i>Ulex gallii</i> and <i>Erica cinerea</i> growing on thin, poor acidic soils. There are many small areas of dry heath interspersed amongst the woodland, which have not been measured, but the three largest areas of dry heath, together comprise 1% of the area of the SAC.</p> <p>The feature “Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation” occurs within the Afon Glaslyn, within the Glaslyn SSSI and currently outside the SAC but within a proposed extension to the SAC.</p> <p>Lesser horseshoe bats have over 20 known roosts within the SAC and forage widely within the SAC’s woodlands, associated habitats and the surrounding countryside. The SAC includes maternity roost sites in various types of buildings and structures, and winter</p>

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	<p>hibernation sites, especially in mines. There are other types of roost such as night, transitional, leks and swarming sites, about which very little is known.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (EU code 91A0). ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser horseshoe bat <i>Rhinolophus hipposideros</i>. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Tilio-Acerion</i> forests of slopes, scree and ravines. ▪ Bog woodland. ▪ European dry heath. ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation.
<p>Conservation Objectives</p>	<p>Our vision for the Meirionnydd Oakwoods and Bat Sites SAC is to maintain, or where necessary restore, the woodland and the bat sites to good condition so that all of its typical and uncommon species are able to sustain themselves in the long-term as part of a naturally functioning ecosystem.</p> <p>The majority of the SAC comprises “Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles” and it is within the oak woods (and the “mixed woodland on base-rich soils associated with rocky slopes <i>Tilio-Acerion</i>”, see below) that the rare and scarce lower plants (mosses, liverworts, lichens and slime moulds), for which the Meirionnydd oak woods are famous for, occur. The lower plants are able to thrive in the most humid locations, usually by streams, rivers, waterfalls and in gorges. An exception to this is the rich lichen flora occurring on mature trees in open parkland.</p> <p>The oak woodland comprises native broadleaved species such as sessile oak, downy birch, ash, alder, rowan, holly, hazel and hawthorn. The field layer supports typical woodland species such as wood sorrel, greater stitchwort, bluebell, bilberry, ferns and</p>

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	<p>grasses and plenty of tree seedlings. However, the most obvious component of the field layer is the luxuriant carpet of mosses and liverworts.</p> <p>Amongst the oak woods, there are smaller areas of mixed woodland on rocky slopes. This “<i>Tilio-Acerion</i>” or small-leaved lime woodland supports species indicative of base-rich and less acid soils such as dog’s mercury, false brome grass and the mosses <i>Ctenidium molluscum</i>, <i>Eurhynchium striatum</i> and <i>Thamnobyrum alopecurum</i>. There is also a small area of “Bog woodland” with downy birch, willow sp., purple moor grass, bottle sedge, bog-mosses (<i>Sphagnum</i> sp.) and <i>Polytrichum</i> sp.</p> <p>The “Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>” occur on the floodplain of the Afon Glaslyn. The canopy is dominated by alder, ash, willow sp., downy birch and other locally native species. Meadowsweet, creeping jenny, remote sedge, marsh marigold, yellow flag and <i>Dryopteris</i> ferns form the field layer. The dry heath consists of tall and bushy heather (<i>Calluna vulgaris</i>), with western gorse and bell heather (<i>Erica cinerea</i>), with scattered trees such as downy birch and mountain ash. The area of heath should remain stable.</p> <p>The lesser horseshoe bat population is thriving and the nursery roosts continue to provide good conditions for breeding and the hibernation roosts provide cool stable temperatures for hibernation, that are free from disturbance. Important navigational flight lines from the roosts to feeding areas are intact.</p> <p>“Rivers with floating vegetation often dominated by water crowfoot” occur in the Afon Glaslyn. The physical channel should be maintained or restored as far as possible to a nearnatural state in order to support the coherence of the ecosystem structure and function.</p> <p>All factors affecting the achievement of favourable condition shall be under control. The presence of the Meirionnydd Oakwoods and Bat Sites SAC and its special wildlife enhances the economic and social values of the area, by providing a high quality environment for peaceful enjoyment by local people and visitors.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British

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	<p>Isles.</p> <ul style="list-style-type: none"> ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ <i>Tilio-Acerion</i> forests of slopes, screes and ravines. ▪ Bog woodland. <p>The vision for the Woodland SAC feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the woodland area, including woodland canopy and scrub, woodland glades and associated dry heath, bracken and grassland shall be maintained as indicated on maps, some 1826 ha in total. ▪ The location of the different woodland SAC features, as listed in the title above, will be as shown in Annex 2. The distribution of these woodland communities is largely a reflection of the topography, soils, geology and aspect and is unlikely to change. ▪ The tree canopy percentage cover within the woodland area for the whole SAC (see maps in Annex 2) shall be no less than 80%, 87% being the current canopy cover (excepting natural catastrophic events). Some units will have a lower canopy cover which is acceptable provided this is compatible with safeguard of the habitat, features and special interest. ▪ The canopy and shrub layer comprises locally native species, see Table 2 for the relevant species for each woodland SAC feature. ▪ There shall be sufficient natural regeneration of locally native trees and shrubs to maintain the woodland canopy and shrub layer, by filling gaps and allowing the recruitment of young trees, and encouraging a varied age structure. ▪ The typical ground layer species of each woodland SAC feature will be common, see Table 2. It is important for most of the woodland SAC that the vegetation does not become rank and overgrown with a height above 40cm and/or dominated by species such as bramble, ivy and young holly. Limits may be set on a unit or compartment basis. ▪ The abundance and distribution of common and typical (Atlantic, sub-Atlantic, western, oceanic) mosses and liverworts, lichens (and slime moulds), will be maintained or increased.

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	<ul style="list-style-type: none"> ▪ The abundance and distribution of uncommon mosses and liverworts, lichens and slime moulds, will be maintained or increased. ▪ There will be a scattering of 5 mature trees per hectare within the existing tree canopy or parkland, that is trees of c60cm diameter plus for oak and ash and/or with signs of decay, holes etc. In the longer-term, by 2060 there should be 1 veteran trees per hectare that is trees of 100cm diameter plus for oak and ash and 75cms birch. ▪ The volume of dead wood will exceed 30 cubic metres per hectare throughout and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). Volumes of deadwood are currently at relatively low levels because the woodlands, in general, have an even-age structure and lack mature trees and any quantity of deadwood because of past silvicultural management. Some lower plants are dead wood specialists but these woodlands tend to lack the rare dead wood invertebrate assemblage found in other parts of the UK. ▪ Invasive non-native species such as rhododendron, Japanese knotweed and Himalayan balsam will not be present. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heath. <p>The vision for the dry heath feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The total extent of the dry heath area, approximately 21 ha, shall be maintained. ▪ The distribution of the dry heath will at least be as shown on Map. ▪ The typical and uncommon species of the vegetation communities comprising the dry heath will be frequent and abundant. ▪ The structure of the heath should be maintained and restored, to show natural regeneration by layering and seeding, and to ensure that the component vegetation communities are naturally diverse.

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	<ul style="list-style-type: none"> ▪ Invasive non-native species such as conifers, rhododendron, Japanese knotweed and Himalayan balsam will not be present. ▪ The heath will be generally free from trees and at most have only a few individuals at a density of no more than 2 per hectare. Exceptions to this rule are transition zones from woodland to heath land where trees may be denser grading to open heath. Limits for woodland transition zones should be set on a unit or sub-unit basis. ▪ All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho- Batrachion</i> vegetation. <p>The vision for this feature is for it to be in favourable conservation status, where all the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent of suitable river habitat within which the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation can occur should be stable. • The current distribution (not known) of the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation should be stable or increasing. • The river with floating vegetation may be dominated by water crowfoot species usually <i>Ranunculus fluitans</i>, (but this species is not recorded in Meirionnydd), <i>Callitriche stagnalis</i> and bryophytes. • Species indicative of unfavourable condition for this feature eg. filamentous algae associated with eutrophication and invasive non-native species, should be absent or below an acceptable threshold level, indicative of high ecological status, within the SAC. This attribute is considered further under factors. • All factors affecting the achievement of these factors are under control. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser horseshoe bat <i>Rhinolophus hipposideros</i>.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of lesser horseshoe bats should be maintained at its current size and encouraged where possible to increase. See Table 7 for summaries of population counts at recorded roost sites and maps in Annex 4, showing the locations of the roosts. As there has been an upward trend in lesser horseshoe bats numbers in Wales it is reasonable to expect the Gwynedd population to increase. • There are sufficient breeding roosts (buildings, structures and trees) and hibernation roosts (mines and buildings) of appropriate quality. The other types of roost such as night, transitional, leks and swarming sites, should also be maintained as our knowledge of these often significant roosts improves. • Foraging or feeding habitat in the SAC and surrounding countryside, including grasslands and some gardens, is of appropriate quality, extent and connectivity across the range. • The range of the population within the SAC/Gwynedd is stable or increasing. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>To enable practical communication about features, objectives, and management, this SAC, which comprises whole or parts of 31 SSSIs, has been sub-divided into management units which have been based on the individual SSSI, and additional land parcels which are SAC but not yet SSSI. See attached map showing the management units referred to in this plan.</p> <p><i>All units (1-45) are SAC. Units 32-45 are SAC but not SSSI. Parts of Units 8, 9, 16, 17, 20 and 24 are NNR. The whole of Unit 11 is NNR.</i></p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (EU code 91A0). • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>.

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	<ul style="list-style-type: none"> • Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • <i>Tilio-Acerion</i> forests of slopes, screes and ravines. • Bog woodland. <p><u>Grazing</u> Management of the key features of these woodlands i.e. the Atlantic bryophyte and lichen assemblages requires light grazing of the field layer vegetation, usually by sheep grazing. This must be balanced against the requirements to allow natural regeneration of trees. Within the NNRs, fencing is maintained to allow grazing regimes ranging from total exclusion to relatively heavy periodic grazing. Mosses and liverworts in gorges where recreational activities such as gorge-walking and extreme canoeing take place are threatened by over-use. A Code of Conduct is being drawn up, combined with restrictions on use. There are NRW management plans for the areas declared as National Nature Reserves. In other areas there are S15 management agreements with landowners and occupiers where appropriate grazing regimes have been implemented.</p> <p>Feral goats present within some of the sites require careful control to prevent bark-stripping and browsing damage to sapling and seedling trees. NRW undertakes annual monitoring of the herds throughout the cSAC and implements control measures when numbers exceed set limits. Due to the very acid nature of the soils throughout the woodlands, they are vulnerable to acidification. In the past the heathland has been threatened by inappropriate burning/grazing and afforestation. These issues are being addressed through agri-environment schemes (Tir Cymen/Tir Gofal) and S15 Management Agreements. The populations of lesser horseshoe bats are most vulnerable in their summer and winter roosts. They are also affected by a reduction in the availability of insect prey due to changes in agricultural practices and pesticide use. Roosts are most often protected through the planning system, by incorporating the bats' requirements into the plans at an early stage. Also many roosts in mine adits have now been grilled to prevent disturbance to hibernating bats.</p> <p><u>Humidity</u> The uncommon lower plants (mosses, liverworts and lichens) are generally restricted to "hotspots", often but not always in or close to river gorges where humidity is highest. The requirements vary</p>

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	<p>according to the species, with some species requiring high humidity, but not being able to tolerate total immersion in water, and others requiring total immersion but unable to tolerate periods of drought. The humidity and river flow regime should be sufficient to maintain the common, typical and the rare and scarce lower plants that occur within each individual SSSI/unit. Refer to tables 3&4 in the main plan and 5 & 6 (nationally rare and scarce species) in the Annex. A reduction in the humidity within the gorge woodlands could result in gradual or rapid loss of moss, liverwort or slime mould species especially if ambient humidity levels frequently fall below the high levels required by individual species or communities. Inappropriate tree felling or natural events in key areas can result in damage to the special interest due to reduced shading and thereby reduced humidity levels. Significant water abstraction from any of the rivers, upstream of the lower plant interest, would result in a reduction in humidity that is also likely to be damaging.</p> <p>1. No loss of canopy cover or an increase in abstraction from rivers particularly where important lower plant communities occur.</p> <p><u>Drainage</u> The bog and alluvial woodland habitat would be damaged by drainage but this is not currently likely as the only stands are in conservation management.</p> <p>2. A presumption against drainage works especially where this may affect wet woodland</p> <p><u>Grazing and Woodland Management</u> Across the Meirionnydd oak woodlands it is important that we recognise that different forms of woodland management may produce very different woodland structures, each of which can be of high conservation value in its own right supporting quite different suites of associated species. These can be covered by the following four categories: ‘wood pasture’; ‘conservation management with grazing’; ‘conservation management without grazing’ and; ‘silvicultural management’. All of these types are represented across the SAC, mostly lightly grazed or completely ungrazed. We must be able to respond when an area becomes over-grazed or lacks sufficient regeneration of trees (by reducing grazing levels, or closing them to stock altogether for a period of time) or at the opposite end of the scale, where ungrazed woodlands are becoming overgrown with dense brambles or holly</p>

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	<p>and/or with ivy covering the trunks of trees (by re-introducing grazing). We can infer from the unfavourable (over grown) ground layer assessment therefore that grazing generally is too low and/or not extensive enough across the SAC. Important lichen trees are threatened by tree regeneration, shrubs such as holly, bramble and ivy growing on some key trees. Bog woodland condition is affected by neglect, that is lack of grazing management, or some other control of the bracken and bramble, such as by cutting. Woodland management, which may include tree felling and scrub clearance, can be beneficial if carried out appropriately. It could however cause damage if for example important trees are felled or if mosses, other plants and/or wildlife are damaged or disturbed as a result, or if the tree-canopy is opened-up, causing reduction in humidity in lower plant “hotspots”. Care also needs to be taken with pruning trees within parkland situations, as even small branches can be important for the lichens they support. Expert ecological advice should be sought before planning such work.</p> <p>3. Review current attributes relating to woodland structure and grazing on a unit basis and action changes to grazing regimes where appropriate. Favourable management is often light summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year.</p> <p>4. Continue to assess whether woodland management will be deleterious or beneficial on a caseby- case basis, informed by expert ecological advice.</p> <p><u>Protection of mature trees and tree planting</u> Lichens generally require trees in open sunny yet sheltered situations. Many good lichen trees are at the edge of the wood, or where the woodland is fairly open as in parkland situations, or next to a watercourse, where the habitat is fairly open and also humid. The lack of mature-veteran trees attribute will recover over time provided management ensures the protection of mature trees in the longer term by appropriate siting of paths so that health and Safety reasons are not then invoked as reasons to prune and fell them. Power lines and other development should be encouraged to go round, under or re route to avoid mature-veteran trees and there should be tree planting, on a parkland scale where possible, out in the open.</p> <p>5. Retain mature/veteran trees and ensure plans and projects</p>

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	<p><i>(such as access and recreation with the associated health and safety requirements or power lines and development) do not indirectly threaten their long-term survival. Ensure the number of veteran/over-mature trees increases gradually with time so that trees lost are more than compensated by others aging.</i></p> <p>6. Plant parkland and individual trees in appropriate locations</p> <p><u>Non-natives</u> The non-natives present species are generally beech, sycamore, sweet chestnut, conifers and rhododendron. Many organisations have combined efforts to control non-native and exotic species including NRW, Snowdonia National Park, Forestry Commission, Woodland Trust, RSPB, National Trust and also through the Meirionnydd Oakwoods Habitat Management Project (MOHMP-a consortium of the above-named bodies and private forestry companies). In most woodlands (but not all) action is being taken to control particularly invasive non-natives so this factor may be considered as under control provided financial support and projects continue to be approved. Both Rhaglen Tir Eryri and MOHMP are about to finish and there are as yet no replacement projects. Infestation by non-native species is seen as a potential threat to the bog woodland and no non-native species (including Scot's pine) should be present. This is currently an issue as the bog woodland is unfavourable.</p> <p>Rhododendron is problematic wherever it occurs, because even one bush can release millions of seeds in a year. There is a lot of work being undertaken throughout Meirionnydd to remove rhododendron, not only in the designated woodlands, but also in surrounding non-wooded areas that may be acting as a seed source, such as gardens and road verges.</p> <p>Beech trees are not recognised as being native in Britain beyond a line drawn between the Wash and the Severn, according to the pollen record since the last Ice Age. It is a recognised native species south of that approximate line. In Wales, and specifically Meirionnydd, beech has been extensively planted in 'avenues', as individual trees, hedges and plantations. It has then established itself in the oak woodlands by being able to regenerate under dense canopy shade, and by being at home with even the most acidic soils and with the local climate. A group of beech trees in woodland will result in a patch of bare ground underneath, due to the extremely dense shade cast, as beech foliage is highly efficient at</p>

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	<p>light absorption. Only the most shade tolerant of plant species can survive there, and often it is too shady for any plants to survive under them. This would have serious implications for rare and restricted lower plant species such as mosses, liverworts and lichens for which the oak woodlands in Meirionnydd are famous. In addition, beech seedlings and saplings are extremely shade tolerant. They survive and grow slowly even under a dense and shady oak canopy, and can often be seen scattered throughout an oak woodland where mature beech is present, within a few years after removing or controlling sheep grazing. The end result of this process is domination of beech in the canopy. This is why we are effectively treating beech in some sites as an undesirable exotic species, which threatens to alter a valued habitat and its communities.</p> <p><i>7. Non-native, particularly invasive, species must continue to be controlled under a long-term sustainable programme of funding, vigilance and active management.</i></p> <p><u>Dead wood</u> Dead wood should ideally be left where it falls and standing dead trees should be allowed to decay naturally. The removal of dead and decaying wood will lead to a reduction of the diverse wood decay conditions that many specialised plants and animals of woodland habitats depend upon. Without a continuous supply of dead wood of various sizes at various stages of decay, many of these species may not be present. Dead-wood specialists of moss, liverwort, lichen, fungi and insect species only occur if there is an abundance of large trunks that take a very long time to rot. Smaller branches rot much more quickly, so cannot support such a good range of the less mobile species. Movement and cutting and tidying of dead wood should be avoided unless essential for public and livestock safety.</p> <p><i>9. Encourage site managers to leave deadwood in situ including standing dead wood so this attribute increases gradually with time.</i></p> <p><u>Woodland fragmentation</u> This can happen anywhere within the SAC over time by a combination of natural events and management and is measured to a certain extent by canopy cover. This ‘factor’ is also particularly relevant where the remaining SAC woodland is only a small fragment of its former size and there, woodlands should be</p>

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	<p>enlarged wherever possible.</p> <p>10. Ensure that action is taken if the tree canopy attribute is unfavourable within the SAC and increase the size and connectivity of woodlands where possible by encouraging natural regeneration and where appropriate planting on adjacent land.</p> <p><u>Recreation within gorges</u> Recreational activities such as gorge walking and white-water canoeing and rafting need to be assessed carefully if they are considered to be plans and projects using the precautionary principle. Any proposed mitigation measures must be completely enforceable at all times. Obtaining regulation of an uncontrolled activity may however be seen as management for conservation. Legal opinion should be sought on this point.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ European dry heath <p><u>Grazing</u> The three largest areas of heath are ungrazed, as they are part of larger management units containing woodland. Grazing is excluded from the management compartments to allow regeneration of tree seedlings and establishment of young trees.</p> <p>1. Consider re-introducing grazing in the relevant woodland/heath compartments, if tree regeneration is sufficient. Consider possible action, which can be agreed with land managers.</p> <p><u>Burning</u> 2. Continue the current presumption against burning dry heath unless a case can be made.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho- Batrachion</i> vegetation <p>A base line survey should be carried out before considering management requirements further than already outlined in section 4</p>

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	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Lesser horseshoe bat <i>Rhinolophus hipposideros</i> <p>Nursery roosts should have a range of temperatures in the region of 20°C in July, large apertures to access roost, unobstructed access routes and no artificial light onto the access point or flight line. Building work should be avoided during the breeding season. The roosts should not be subject to light or water penetration or temperature, humidity or ventilation changes. Excessive tree shading can be an issue. Mine water levels should be kept to a minimum.</p> <p>1. Conversion of buildings used as roosts will not take place except in ways that will enhance, or do not affect, the living conditions of the bats. Roof coverings of buildings and the structures used should be maintained sufficiently to prevent deterioration in roost conditions.</p> <p><u>Disturbance</u> Lesser horseshoe bats are very sensitive to disturbance. Even the presence of a person nearby causes a lot of activity, and excessive regular disturbance will mean the loss of the location as a suitable roost. In particular, disturbance during winter may cause the bats to arouse from hibernation resulting in increased use of stored body fat, which increases the risk of mortality before spring. There should be no artificial light around entrances, nor any noise or other disturbing activity. Human access inside the building and mine sites should be limited to monitoring visits by licensed bat workers. Grilling or fencing will be considered if there is evidence of continuing unauthorised disturbance. Grilles and fences need to be constructed with advice from a bat expert to ensure they are suitable for use by bats.</p> <p>2. Human access should be controlled and disturbance kept to minimum levels, which do not negatively impact on the bat population.</p> <p><u>Flight lines</u> Lesser horseshoe bats use linear vegetation features, (hedgerows, lines of trees, areas of scrub, ditches, streams and rivers) for navigation between roosts and feeding grounds and these should be maintained, particularly in the vicinity of roost entrances. It is</p>

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	<p>also important to ensure that access points and flight lines to nearby foraging habitat are not illuminated.</p> <p>3. There should be no loss or decline in the quality of physical features used as flight lines. There should be no clearance of vegetation, trees or shrubs right by the roost without assessment of likely impact. New planting of hedgerows/rows of trees could be considered in places where few other flight lines exist.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (EU code 91A0) Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> <i>Tilio-Acerion</i> forests of slopes, screes and ravines Bog woodland</p> <ul style="list-style-type: none"> • Extent of broad-leaved woodland and associated habitats. <ul style="list-style-type: none"> ○ Lower limit – 1832ha. <p>Lower limit is based on current extent of SAC woodland.</p> <ul style="list-style-type: none"> • Location of woodland types. <ul style="list-style-type: none"> ○ Map in Annex 2. • Tree canopy cover. <ul style="list-style-type: none"> ○ Upper Limit – Tree canopy 87% of woodland area. ○ Lower Limit – Tree canopy may only be less after a natural catastrophic event. <p>The tree canopy percentage cover within the woodland area is about 87% of the woodland area. If there is a natural catastrophic event assessment should be made to see if follow up management is required.</p> <ul style="list-style-type: none"> • Canopy and shrub layer. <ul style="list-style-type: none"> ○ Some non-native species may be tolerated where they support important species such as lichens and are not highly invasive. Phased removal of non-natives is often appropriate with long term management to control regrowth/ reinvasion. • Native tree and shrub regeneration. <ul style="list-style-type: none"> ○ Upper Limit – none set.

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	<ul style="list-style-type: none"> ○ Lower Limit – This may vary considerably compartment to compartment depending on ecological assessment. A general guide is 2 viable seedlings/saplings per 0.01 ha (100 square metre ie 200 per hectare) of gap, within 15 years of gap formation (where viable seedlings/saplings are taken to be healthy and vigorous native* tree species reaching a minimum height of 3m and comprise species that will replenish the canopy. ● Ground layer. <ul style="list-style-type: none"> ○ Upper Limit – Areas of overgrown vegetation (eg bramble, ivy and holly) may be mapped for individual sites/compartments with planned management such as grazing reintroduction when the upper limit of taller vegetation is exceeded. ○ Lower Limit – none set. ● Common mosses, liverworts, lichens and slime moulds. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – the current abundance and distribution should be maintained or preferably increased. ● Uncommon mosses, liverworts, lichens and slime moulds. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – the current abundance and distribution should be maintained or preferably increased. ● Mature / Veteran trees <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – This is set at a level appropriate to each unit which is usually above the current number. Achievement of this limit is dependant on time passing and lack of disturbance/destruction of mature and maturing trees so they may be allowed to grow into veterans. ● Dead wood <ul style="list-style-type: none"> ○ Upper Limit – Not required. ○ Lower Limit – 30 cubic metres per hectare N.B In the very long term a target of 40+ cubic metres might be appropriate, but only when the active management associated with non-native removal has been

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	<p>completed and the wood is essentially operating under natural processes.</p> <ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ Favourable management is often light summer grazing by sheep, cattle and /or ponies at a rate of 0.15 LSU/ha/year. This guidance level of grazing is based on recent trials and observations at Coed y Rhygen. • Non-native species <ul style="list-style-type: none"> ○ Non-native species should be absent, unless individual trees are known to be important for maintaining humidity or for defined wildlife interest and there are mechanisms in place to ensure no seeding or encroachment. Exceptionally individual trees may be retained for landscape reasons provided there is no adverse impact on nature conservation. • Humidity <ul style="list-style-type: none"> ○ High humidity must be maintained. • Goats <ul style="list-style-type: none"> ○ Keep grazing by goats under control. • Woodland Management <ul style="list-style-type: none"> ○ Any woodland management that is proposed will be considered by looking carefully at the advantages and disadvantages on a case-by-case basis. • Woodland Fragmentation <ul style="list-style-type: none"> ○ Increase the size of woodlands where only fragments remain. • Adventure gorge walking & white water canoeing rafting. <ul style="list-style-type: none"> ○ Gorge walking and kayaking at sensitive sites may be permitted through access agreements with local users providing monitoring shows that there is no risk to rare and notable species. <p>Lesser horseshoe bat <i>Rhinolophus hipposideros</i></p> <ul style="list-style-type: none"> • Population of Lesser horseshoe bats. <ul style="list-style-type: none"> ○ We expect roost counts to be within the normal

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	<p>range for that particular site, but also to be in line with current trends identified by the National Bat Monitoring Program. If numbers are lower (or higher) than usual we consider factors such as roost integrity, weather, disturbance, predation and annual and longerterm trends within Wales/UK.</p> <p>Emergence counts in June for SAC roosts. See table 3 above. Some roosts are split between buildings or adits but counts are combined to form a 'site' count. If a decline or lack of increase cannot be explained, a licensed bat worker should investigate.</p> <ul style="list-style-type: none"> • Roosts <ul style="list-style-type: none"> ○ See Building or Structure including mine; Disturbance to roosts; Bat Navigation flight lines, and Roads and development below. • Foraging or feeding habitat <ul style="list-style-type: none"> ○ No loss of foraging habitat or decline in its quality affecting invertebrate availability, such as over intensive woodland or grassland management and drainage of marshes or bogs. • Range of the population <ul style="list-style-type: none"> ○ See map (below) of known roosts which should be maintained. We expect to continue to find new roosts. • Building or Structure including mine <ul style="list-style-type: none"> ○ Condition of breeding and hibernating roosts should be enhanced wherever possible, see below for more detail. <p><u>Nursery roosts</u> should have a range of temperatures in the region of 20C in July, large apertures to access roost, unobstructed access routes and no artificial light onto the access point or flight line. Building work should be avoided during the breeding season. The roosts should not be subject to light or water penetration or temperature, humidity or ventilation changes. Excessive tree shading can be an issue. Mine water levels should be kept to a minimum.</p> <ul style="list-style-type: none"> • Disturbance to roosts <ul style="list-style-type: none"> ○ Human access should be controlled & disturbance kept to minimum levels, so that they do not

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	<p>negatively impact on the bats, see below for more detail.</p> <p><u>Disturbance.</u> Lesser horseshoe bats are very sensitive to disturbance. Even the presence of a person nearby causes a lot of activity, and excessive regular disturbance will mean the loss of the location as a suitable roost. In particular, disturbance during winter may cause the bats to arouse from hibernation resulting in increased use of stored body fat, which increases the risk of mortality before spring. There should be no artificial light around entrances, nor any noise or other disturbing activity. Human access inside the building and mine sites should be limited to monitoring visits by licensed bat workers. Grilling or fencing will be considered if there is evidence of continuing unauthorised disturbance. Grilles and fences need to be constructed with advice from a bat expert to ensure they are suitable for use by bats</p> <ul style="list-style-type: none"> • Bat Navigation flight lines. <ul style="list-style-type: none"> ○ There should be no loss or decline in the quality of physical features used as flight lines. There should be no clearance of vegetation, trees or shrubs near the roost without assessment of likely impact. See below for more detail. <p><u>Flight lines</u> Lesser horseshoe bats use linear vegetation features, (hedgerows, lines of trees, areas of scrub, ditches, streams and rivers) for navigation between roosts and feeding grounds and these should be maintained, particularly in the vicinity of roost entrances. It is also important to ensure that access points and flight lines to nearby foraging habitat are not illuminated:</p> <ul style="list-style-type: none"> • Roads and development. <ul style="list-style-type: none"> ○ Maintain closed canopy crossings over roads with connectivity to hedges and tree lines to foraging sites and roosts. Lighting should be avoided. <p><u>Roads/development.</u> Roads, particularly new widened routes, can cause increased mortality through collision with vehicles. This may also be through interruption to flight lines by removal of traditional safe flight lines along linear features or by lighting. Lighting of roosts can have similar effects. Other developments, particularly those with tree and</p>

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	<p>vegetation clearance and lighting could have Similar effects to roads within and adjacent to the SAC.</p> <ul style="list-style-type: none"> • Weather. <ul style="list-style-type: none"> ○ We must always be mindful of the effects of weather when analysing trends and interpreting data and bat behaviour. <p>This is very significant factor acting on bats through temperature and severe unseasonable weather, including storms & unusually high temperatures. Thus weather affects bat emergence from roosts, feeding (availability of prey), hibernation timing, activity, breeding timing and success.</p> <p>European dry heath</p> <ul style="list-style-type: none"> • Extent of dry heath. <ul style="list-style-type: none"> ○ Lower limit – Dry heath: 21 ha. ○ Upper limit – Dry heath: 21 ha. <p>Lower limit is based on the most recent estimate from the NRW SAC feature assessment report (2006).</p> <ul style="list-style-type: none"> • Distribution of dry heath. <ul style="list-style-type: none"> ○ As mapped. • Vegetation composition. <p>H8 <i>Calluna vulgaris-Ulex gallii</i> heath <u>Constants:</u></p> <ul style="list-style-type: none"> ○ <i>Calluna vulgaris</i> ○ <i>Ulex gallii</i> ○ <i>Erica cinerea</i> <p>H10 <i>Calluna vulagirs – Erica cinerea</i> heath <u>Constants:</u></p> <ul style="list-style-type: none"> ○ <i>Calluna vulgaris</i> ○ <i>Erica cinerea</i> ○ <i>Potentilla erecta</i> <p>H12 <i>Calluna vulgaris – Vaccinium myrtillus</i> heath <u>Constants:</u></p> <ul style="list-style-type: none"> ○ <i>Calluna vulgaris</i> ○ <i>Descampsia fleuxuosa</i> ○ <i>Vaccinium myrtillus</i>

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	<ul style="list-style-type: none"> ○ <i>Dicranum scoparium</i> ○ <i>Hypnum jutlandicum</i> ○ <i>Pleurozium schreberi</i> <ul style="list-style-type: none"> ● Heath land structure. <ul style="list-style-type: none"> ○ Set limits relevant to particular location/stand in context of whole site. ● Non-native species. <ul style="list-style-type: none"> ○ Acceptable limit – None present within SAC. ○ Target – None present within species specific buffer zones around SAC. ● Grazing <ul style="list-style-type: none"> ○ Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes). ● Burning <ul style="list-style-type: none"> ○ There is a general presumption against burning of heath within Meirionnydd Oakwoods and Bat Sites SAC. Burning of some stands of dry heath may be consented on a case-by-case basis. ● Mowing <ul style="list-style-type: none"> ○ May be consented where practical. ● Afforestation / conifer encroachment. <ul style="list-style-type: none"> ○ No planting of conifers or other trees on heath. <p>The presence of conifers (and other invasive non-native species) on heaths immediately places the conservation status of the heath as 'unfavourable'. Conifers/trees shade out the heath vegetation and acidify the groundwater. Associated activities such as heavy plant access, planting, fertiliser input, construction and maintenance of access tracks, and drainage works lead to further damage of the heath. The trees also provide seed-source of future conifers to encroach further out onto the heath.</p> <ul style="list-style-type: none"> ● Bracken <ul style="list-style-type: none"> ○ Defined limits for bracken and bracken encroachment bordering heath where it is not expected that woodland may expand.

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	<p>Bracken is a natural component of the moorland edge communities, however, where bracken is encroaching at the expense of dry heath, some form of control may be required.</p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho- Batrachion</i> vegetation</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Part of the river Glaslyn (5.2 ha) will be included in the SAC. Currently no river habitat is included in the SAC. • Distribution. <ul style="list-style-type: none"> ○ Site unit 27. • Typical species. <ul style="list-style-type: none"> ○ Sub-type 3. • Undesirable and non-native species. <ul style="list-style-type: none"> ○ Non-native and algal species indicative of eutrophication maintained below threshold over the medium to long term. • Flow regime. <ul style="list-style-type: none"> ○ No increase in water abstraction upstream that will alter flow regime. <p>Requires moderately swift flows. <i>Ranunculion</i> vegetation can withstand fast flows, but cannot tolerate spatey conditions, so prefers medium-width rivers in lowland situations as in Afon Glaslyn.</p> <ul style="list-style-type: none"> • Water quality. <ul style="list-style-type: none"> ○ No reduction in water quality. <p>Mesotrophic conditions required (i.e. not eutrophic or calcareous).</p> <ul style="list-style-type: none"> • Water quantity. <ul style="list-style-type: none"> ○ No reduction in water quantity. <p><i>Ranunculion</i> vegetation needs considerable water movement to maintain good growth & deeper channels usually of at < 1m + deep.</p> <ul style="list-style-type: none"> • Channel morphology – river engineering.

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	<ul style="list-style-type: none"> ○ No modification of channel or banks. <p>The physical channel should be maintained or restored as far as possible to a near-natural state in order to support the coherence of the ecosystem structure and function.</p> <ul style="list-style-type: none"> • Channel substrate. <ul style="list-style-type: none"> ○ No modification of channel substrate. <p>The riverbed should consist of stable stony beds of gravel or pebbles, sometimes with larger stones or boulders.</p> <ul style="list-style-type: none"> • Shading. <ul style="list-style-type: none"> ○ No shading of rivers less than 20m wide. <p>Shading by tree-growth on the bankside is important in rivers less than 20m wide.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Meirionnydd Oakwoods and Bat Sites Special Area of Conservation (2008)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/coedwigoedd-to-cors-caron-sac/idoc.ashx?docid=4796d0b0-5846-4ad6-9d0c-2da6db90123a&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles Unfavourable: Recovering ▪ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>: Unfavourable: Unclassified ▪ <i>Tilio-Acerion</i> forests of slopes, screes and ravines: Favourable: maintained ▪ Bog woodland: Unfavourable: Unclassified ▪ European dry heath: Unfavourable ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche- Batrachion</i> vegetation: Unknown ▪ Lesser horseshoe bat <i>Rhinolophus hipposideros</i>: Unfavourable: unclassified
<p>Vulnerabilities (includes existing pressures and</p>	<p><u>Roads/Development</u> Roads, particularly new widened routes, can cause increased</p>

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<p>trends)</p>	<p>mortality through collision with vehicles. This may also be through interruption to flight lines by removal of traditional safe flight lines along linear features or by lighting. Lighting of roosts can have similar effects. Other developments, particularly those with tree and vegetation clearance and lighting could have Similar effects to roads within and adjacent to the SAC.</p> <p><u>Non-Native invasive species</u> The non-natives present species are generally beech, sycamore, sweet chestnut, conifers and rhododendron</p> <p><u>Recreation within Gorges</u> Activities such as gorge walking and kayaking should be discouraged within sensitive sites/units to reduce risk of damage to uncommon mosses, liverworts and ferns growing within the gorges. If allowed, these activities must be regulated and the effects of measured access levels on the vegetation monitored Refer to tables 5 & 6 in the Annex, which indicates likely sensitive sites. Sometimes the nationally rare or scarce species is present in minute amounts and very locally distributed to the extent of sometimes being present as one tiny weft, which is obviously extremely vulnerable to damage from one 'boot' in the wrong place.</p> <p><u>Grazing</u> Feral goats present within some of the sites require careful control to prevent bark-stripping and browsing damage to sapling and seedling trees. They are also affected by a reduction in the availability of insect prey due to changes in agricultural practices and pesticide use.</p> <p><u>Disturbance</u> Lesser horseshoe bats are very sensitive to disturbance. Even the presence of a person nearby causes a lot of activity, and excessive regular disturbance will mean the loss of the location as a suitable roost. In particular, disturbance during winter may cause the bats to arouse from hibernation resulting in increased use of stored body fat, which increases the risk of mortality before spring. There should be no artificial light around entrances, nor any noise or other disturbing activity.</p>
<p>Landowner/ Management Responsibility</p>	<p>The main areas of heath have been largely unmanaged over the past 30 years, as they occurs as part of larger woodland compartments, where stock have been deliberately excluded to</p>

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	<p>ensure tree regeneration.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Gwynedd Unitary Development Plan Habitat Regulations Assessment (2008) available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

<p>Site Name: Sugar loaf Woodlands Location Grid Ref: SO295166 JNCC Site Code: UK0030072 Size: 173.84 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>This is an internationally important area of western sessile oak woodland, at the extreme south-eastern limits of its occurrence in Britain. Large areas of oak woodland are now rare in Wales. The woodland also supports a smaller area of beech woodland and a large colony of red wood ants, which are more commonly found in southern and eastern Britain.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with Ilex and Blechnum in the British Isles.
<p>Conservation Objectives</p>	<p>Vision for the site: Around 70% of the site is covered by woodland (including temporary canopy gaps and glades), with mature sessile and hybrid oaks being dominant in the canopy. The oak woodland has trees of all age classes with a scattering of standing and fallen deadwood. Regeneration of oak trees is sufficient to maintain the woodland cover in the long term. Young ash and rowan trees may also be present in places but young beech trees are rare.</p> <p>The shrub layer (where present) and ground flora consist of locally native plants that are typical of oak woodland, such as hazel, holly, common bent, wavy hair-grass, creeping soft-grass, wood sorrel, heath bedstraw and bracken. A generally grassy woodland ground flora is found in some areas, including bracken where the canopy is open or leaf litter and scattered woodland flowers where the ground is more shaded. In other areas bilberry and moss carpets are prominent. The southwest facing slopes of St Mary's Vale are important for red wood ants and here the canopy is broken providing sun warmed 'hotspots' on the woodland floor where the ants build their nests. Elsewhere in St Mary's Vale, a dense tree canopy protects the well-developed carpets of mosses and liverworts on the woodland floor, which require dense shade to retain moisture.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>The vision for this feature is for it to be in favourable conservation</p>

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	<p>status within the site, as a functioning and regenerating* oak wood, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> ▪ The wooded area is no less than 122 ha. ▪ The remainder of the site is semi-natural acid grassland, heathland, bracken and scrub, often forming a transition zone at the woodland edge. ▪ Saplings of birch <i>betula spp</i>, oak <i>Quercus petraea</i>, alder <i>Alnus glutinosa</i> or holly <i>Ilex aquifolium</i> dominate the tree regeneration. ▪ Young beech <i>Fagus sylvatica</i> and sycamore <i>Acer pseudoplatanus</i> trees are rare; ▪ The woodland ground flora is composed of a range of typical native plants including bilberry <i>Vaccinium myrtillus</i>, wavy-hair grass <i>Deschampsia flexuosa</i> and the mosses <i>Plagiothecium undulatum</i>, <i>Rhytidiadelphus loreus</i>, <i>Dicranum majus</i>. ▪ The liverwort <i>Bazzania trilobata</i> to continue to be present in its core area of Unit 1. ▪ All factors affecting the achievement of these conditions will under control. • A "functioning and regenerating oak woodland" would include all the positive attributes described in the performance indicators.
<p>Component SSSIs</p>	<p>The plan area has been divided into 4 management units to enable practical communication about features, objectives, and management.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>The following management requirements reflect the currently rather even-aged structure of the canopy trees and the constraints placed on units 1&3 by being grazed as part of the wider Sugar Loaf Common:</p> <p><u>Liaison</u> Owners/commoners – discuss possible means of managing grazing to encourage natural regeneration in the woodland areas, including possible agreements to fence all new and some existing canopy gaps.</p> <p>Most of Unit 4 is already fenced and stock free and regeneration is now taking place, though some periodic grazing may be required to control bramble.</p> <p>For the other areas NRW may wish to consider its options for</p>

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	<p>encouraging the commoners to manage the use of the woodland areas to permit some regeneration with the wood.</p> <p><u>Manage Non-native species</u> Tree/shrub – if necessary, control the spread of non-native species (principally beech) through a programme of selective removal of saplings to ensure no further trees get into the canopy.</p> <p><u>Manage Woodland by Thinning/Small Group Felling</u> Trees could be thinned to create a more uneven age structure or open gaps in the canopy when an appropriate means of controlling grazing levels have been identified and all dead/felled timber to be left <i>in situ</i>. This is already taking place in Unit 4 but elsewhere the grazing regime may be unsuitable.</p> <p>Much of the woodland lacks structure due to past woodland management to remove timber. It is likely to be decades before a more natural woodland structure can develop.</p> <p><u>Increase Amounts of Deadwood</u> Deadwood is present on the site, but much has been removed in the past. In future, the owners should be encouraged to leave as much dead wood as possible.</p> <p><u>Veteran Trees</u> Retain all veteran trees.</p> <p><u>Manage Bracken</u> Bracken may require management where it is thought to be hindering successful regeneration, largely in the open areas and gaps. However, this needs to be balanced against the protection bracken offers for young saplings against browsing and its place as a key natural component of acidic woodlands.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (EU code 91A0)</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – none except unit 2 which should remain as a glade. ○ Lower limit – Unit 1- 49 ha; Unit 2- None (as aforementioned); Unit 3- 46.5 ha; Unit 4- 26.5 ha. • Canopy cover. <ul style="list-style-type: none"> ○ Upper limit – No upper limit.

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	<ul style="list-style-type: none"> ○ Lower limit – 75% canopy cover OR: 30% on the south-west facing slopes of unit 1. • Regeneration. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – Presence of viable saplings of native species at least 1.5m high within 10 – 15 years of a gap appearing. • Woodland structure. <ul style="list-style-type: none"> ○ No limits set BUT the canopy should show the full age range of native trees in the majority of site, including at least 10% veteran trees. • Tree and shrub composition. <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – 95% of tree cover is composed of locally native species, such as oak, birch, alder and ash • Ground flora. <ul style="list-style-type: none"> ○ Upper limit – Neither tufted hairgrass or bracken should be present at over 25% cover. ○ Lower limit – 75% cover of key oak woodland plants. These include Ferns, (excluding bracken), bilberry, wavy hair-grass and moss & liverwort carpets (which should include at least one of: waved silkmoss, little shaggy-moss or greater fork-moss). AND: The liverwort, greater whipwort is present in unit 1. • Deadwood. <ul style="list-style-type: none"> ○ Upper limit – None at present. ○ Lower limit – Presence of some standing and/or fallen deadwood including dead mature trees. • Bracken and Bramble Cover. <ul style="list-style-type: none"> ○ Upper limit – Together, these plants should cover less than 75% of the woodland floor. ○ Lower limit – None. • Non-native species <ul style="list-style-type: none"> ○ Upper limit – 5% cover of non-native trees in the canopy. AND: No beech (or other invasive nonnative shrubs) in the understorey or shrub layer ○ Lower limit – None.

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	<p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Sugar Loaf Woodlands SAC/SSSI (2008) available at:</i> http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=7060b0c3-0991-4dd0-b68e-c90b4a3ab6ba&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles: Unfavourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Tree Regeneration</u> The majority of the woodland is on common land that is grazed by sheep. So long as tree regeneration is sufficient to maintain the canopy, it should not be necessary to control grazing within the majority of the woodland. Part of the woodland is presently subject to livestock exclusion. Removal of non-native trees and shrubs may be necessary in this area. Agri-environment schemes offer the best mechanism for securing favourable management in the longer term.</p> <p><u>Burning</u> The accumulation of bracken litter on the common poses a fire risk in dry weather. Restrictions on public access could be considered, but it would be very difficult to control most incidents as they appear to be the result of children deliberately setting fires. Control of bracken in a buffer strip at the wood edges may be a more sensible consideration.</p> <p><u>Pollution</u> Airborne acid and nutrient deposition may also be a problem, particularly for epiphytic lichens on the oak trees.</p>
<p>Landowner/ Management Responsibility</p>	<p>In this plan the management units have been largely based on the three woodland blocks that make up the SAC and SSSI. The SAC feature is the same for each block of woodland and units 1 & 3 are on the same common and so are under broadly the same management, but their geographical isolation from each other gives them the status of separate units. Unit 2 is a small privately owned and enclosed area within Unit 1. Unit 4 is on a farm in the Tir Gofal agri-environment scheme and so is easily separated from the other two units. Unit 3 includes one isolated area of woodland joined to the enclosed Unit 4, but on the common and so potentially under the same management regime as the rest of Unit 3.</p>

<p>Site Name: Sugar loaf Woodlands Location Grid Ref: SO295166 JNCC Site Code: UK0030072 Size: 173.84 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>Refer to Monmouthshire Council’s Sustainability Appraisal/Strategic Environmental Assessment/Habitat Regulations Assessment Documents for further information at: http://www.planningpolicy.monmouthshire.gov.uk/?page_id=96</p>

<p>Site Name: Cwm Cadlan Location Grid Ref: SN961098 JNCC Site Code: UK0013585 Size: 83.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Cwm Cadlan is situated approximately 1km north-east of the village of Penderyn and about 4km north of Hirwaun, near Aberdare. The site was notified in 2000 and incorporates the former Cwm Cadlan Grasslands SSSI and Glyn-Perfedd Meadow SSSI. The SAC interests are:</p> <p>Cwm Cadlan has the largest recorded example of ‘Molinia meadows’ (or fen-meadow) in Wales. The typical form of purple moor-grass–meadow thistle (<i>Molinia caerulea</i>- <i>Cirsium dissectum</i>) fen-meadow (NVC type M24b) is extensively developed, and there are clearly displayed transitions to a range of associated habitats, including base-rich flush and neutral grassland.</p> <p>Cwm Cadlan supports an outstanding suite of flushed short-sedge mire communities on glacial drift overlying Carboniferous limestone within the valley of the Nant Cadlan on the southern fringe of Brecon Beacons National Park. Communities referable to National Vegetation Classification (NVC) type M10 dioecious sedge–common butterwort (<i>Carex dioica</i>-<i>Pinguicula vulgaris</i>) mire occur widely, often in close association with flushed examples of M24 fen-meadow. Characteristic species include common butterwort <i>Pinguicula vulgaris</i>, bog pimpernel <i>Anagallis tenella</i>, marsh arrowgrass <i>Triglochin palustris</i> and the moss <i>Campylopus stellatum</i>. Other sedge-rich swards are also present which display floristic affinities to both M10 and M24; basiphilous elements of this vegetation include tawny sedge <i>Carex hostiana</i>, flea sedge <i>Carex pulicaris</i> and quaking-grass <i>Briza media</i>.</p> <p>Both these habitats are considered to be ‘best areas in the United Kingdom’. Part of the site is owned by NRW and was declared NNR in 2006.</p> <p>The grassland communities, which constitute the SAC features are scattered across the site and occur in most of the management units. Some of the communities present, namely M10, M24 and base-rich sedge community are very close in their floristics, and it is possible that the latter vegetation is derived from one or both of M10 and M24 through some form of agricultural modification (possibly drainage or heavy grazing in the past). It is also possible that some of the fen-meadow is derived from alkaline fen through past drainage.</p> <p>Additional SSSI features include:</p> <ul style="list-style-type: none"> • Marshy Grassland – this includes all the SAC fen-meadow marshy grassland and other forms of marshy grassland not

<p>Site Name: Cwm Cadlan Location Grid Ref: SN961098 JNCC Site Code: UK0013585 Size: 83.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>included in the SAC habitat description.</p> <ul style="list-style-type: none"> • Unimproved neutral grassland (NVC MG5). • Population of globeflower <i>Trollius europaeus</i> <p>The stands of neutral and acidic grassland, which are normally regarded as dry grassland types, generally have constant purple moor-grass, and often grade into wet grassland types.</p> <p>Similarly, at the head of the valley, marshy grassland grades into heathland, thus the site provides fine examples of transition zones between communities.</p> <p>The globeflower population is possibly the largest in south Wales. Globeflower is found scattered across the site, mainly in stands on fen-meadow, alkaline fen and neutral grassland.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • <i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>). • Alkaline Fen.
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p>Around half of the site is covered by marshy grassland. The majority of this is speciesrich fen-meadow with a range of typical plants, including purple moor-grass, sharpflowered rush, quaking-grass, flea sedge, tawny sedge, meadow thistle, devil's-bit scabious, marsh valerian, bog pimpernel and orchids. The remainder of the marshy grassland has a high cover of rushes, purple moor-grass, or tall herbs, such as meadowsweet. Plants indicating disturbance or nutrient enrichment, such as docks, nettles, creeping buttercup and white clover are uncommon or present at low cover, trees and shrubs are no more than scattered, and where bare ground occurs, it is present only in small patches, such as occasional hoof prints. Purple moor-grass and rushes are not overwhelmingly dominant within the fen-meadow areas.</p> <p>About a sixth of the site supports alkaline fen associated with springs and flushes, with a high cover of small sedges, such as carnation sedge, tawny sedge and flea sedges and liverworts and mosses, including greasewort, intermediate hook-moss, yellow starry feather-moss and claw-leaved hook-moss, with a variety of other typical plants including butterwort, marsh arrowgrass, bogbean and marsh lousewort. This habitat is particularly important for populations of many uncommon plant species, including broad-</p>

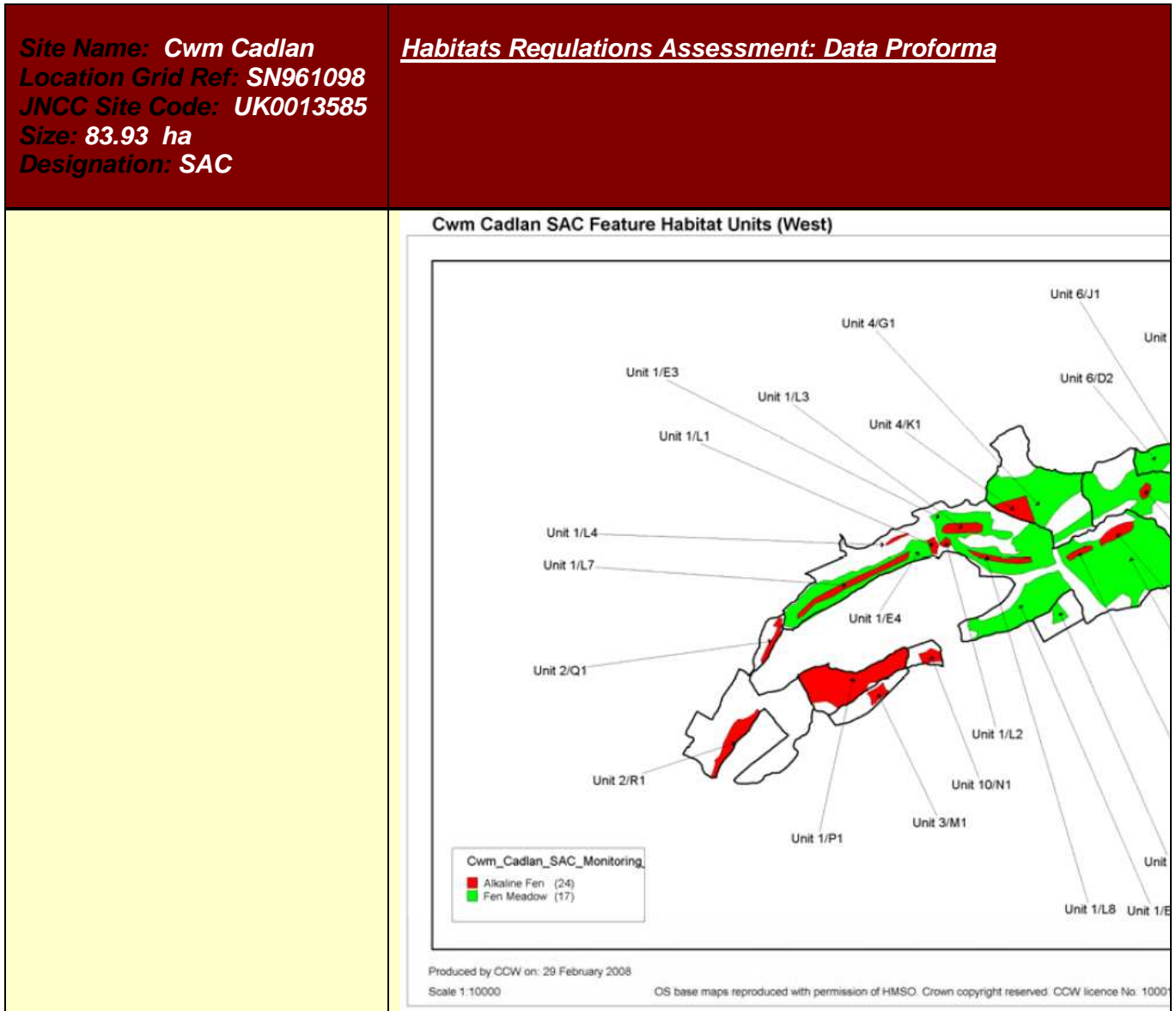
<p>Site Name: Cwm Cadlan Location Grid Ref: SN961098 JNCC Site Code: UK0013585 Size: 83.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>leaved cottongrass, dioecious sedge, long-stalked yellow-sedge, knotted pearlwort and marsh helleborine. Plants indicating disturbance or nutrient enrichment, such as creeping buttercup and white clover are uncommon and there is minimal build-up of dead vegetation.</p> <p>Scattered across the site, on better-drained soils, are small stands of unimproved neutral grassland with grasses such as common bent, red fescue, crested dog's-tail and sweet vernal-grass, and a variety of typical herbs including common bird's-foot trefoil, common knapweed, red clover, rough hawkbit, lady's-mantle and great burnet.</p> <p>The majority of this grassland supports plants adapted to mildly acid or leached soils, including tormentil, devil's-bit scabious and heath-grass, but plants more typical of alkaline soils, such as salad burnet and lady's-mantle species, are locally prominent in places. Plants indicating nutrient enrichment, such as perennial rye-grass) are rare. Scrub and bracken are absent.</p> <p>Other habitats present include acid grassland, dominated by bent grasses, sheep's fescue and heath bedstraw, acidic flushes with frequent soft-rush, small sedges and bog-moss, and wet heath with deer-grass, cross-leaved heath, heather and bilberry. The wet heath mainly occurs at the head of the valley.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Molinia meadows on calcareous, peaty or clayey-siltladen soils (Molinion caeruleae). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Fen-meadow will occupy at least 26 ha of a total area of marshy grassland habitat which itself will cover at least 42 ha. • The remainder of the site will mainly consist of other semi-natural habitat, including alkaline fen. • Typical fen-meadow plants will be common. • Plants indicating agricultural modification or alteration to hydrology and drying of soils will be absent or present at only low cover. • Although rushes are frequent, the more bulky species will not exceed 33% cover. • Bare ground will generally not exceed 5% cover and vegetation litter 25%. • Dense scrub will be largely absent from the fen-meadow,

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	<p>but it is probably desirable for invertebrates and birds to have a sparse scattering of shrubs or trees.</p> <ul style="list-style-type: none"> • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Alkaline Fen. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Alkaline Fen will occupy about 11 ha or more. • The remainder of the site will mainly consist of other semi-natural habitat including fenmeadow. • Typical alkaline fen plants will be common. • Plants indicating agricultural modification or alteration of hydrology and drying of soils will be absent or present only at low cover. • Although rushes are frequent, the more bulky species will not exceed 33% cover. • Bare ground will generally not exceed 5% cover and vegetation litter 10 %. • Scrub species will be largely absent from the alkaline fen. • At selected springheads, water should flow in all but the most severe drought conditions. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have largely been based on tenure and management.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • <i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>). <p><u>Grazing</u> The fen-meadow is mixed in with other marshy grassland and mire types, but each management unit is subjected to one prescription (excepting those areas that are mown for hay). Management should focus on maintaining or restoring the condition of the fen-meadow</p>

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	<p>and therefore the condition of the remaining areas of marshy grassland will be of secondary importance, but it is likely that if management is suitable for the fen-meadow it should also benefit most other forms of marshy grassland/</p> <p>Maintaining or restoring the marshy grassland should be attainable through the implementation of the present grazing regime and scrub control, with cattle producing the best sward structure. The site has been managed under a relatively light grazing regime in recent years. The present management is considered to be generally acceptable for recovery of modified stands in the long term, and site management will be reviewed periodically. Stocking rates should be guided by the values listed in the Lowland Grassland Handbook.</p> <p>Some grazing earlier in the year and mowing to remove the ranker vegetation should help to encourage grazing in those areas of ranker grassland, control scrub development and reduce the buildup of any litter. Grazing levels need monitoring and management agreements adjusted if required.</p> <p>Monitoring structural elements (bare ground, litter) will identify any problems with the intensity of grazing management. Any excessive grazing pressure would be expected to increase the frequency and cover of bare ground and agricultural species. These are all covered by attributes in the feature objectives</p> <p>Stocking levels are dependant on the growth of vegetation, which may vary from year to year, but the agreed management policy allows for this. Cessation of cattle farming could affect the vegetation, as sheep are more selective grazers.</p> <p><u>Control of Nutrient Inputs</u> There has been concern about fertilizer run-off from some adjacent improved fields causing localised nutrient enrichment. Any effects from agricultural run-off from adjacent fields will be identified through monitoring the quality of the vegetation under the feature objectives, looking for increases in the cover of perennial ryegrass and white clover and other indicator plants and reductions in the frequency of sedges and other plants of value. Management agreements on adjacent land will partly address this problem.</p> <p><u>Scrub Encroachment</u> Scrub developing within the areas of marshy grassland will on the whole be controlled, although the presence of a few scattered scrub and trees will benefit invertebrates and birds. The marshy grassland areas could be increased beyond the current extent by cutting back</p>

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	<p>the scrub edges and is something that needs to be kept under review, should opportunities arise.</p> <p>The established stands of alder and willow woodland should not be viewed unfavourably as they lend structure to the site and also provides habitat for invertebrates and birds, with the ground vegetation also containing plant species of note (e.g. meadow saxifrage) and the trees themselves supporting good moss and liverwort communities and uncommon lichens. In addition, some stands afford a refuge for colonies of globeflower. However, woodland and scrub should not encroach further into the unimproved grassland, in particular the communities of highest conservation value (alkaline fen, fenmeadow and neutral grassland).</p> <p><u>Drainage</u> The networks of ditches throughout the SSSI have obviously affected the hydrology and vegetation. These ditches should be allowed to infill naturally (as some have already). Where possible, active restoration of the hydrology should be considered, although this may be difficult in some areas as there would be conflict with the monitoring associated with the quarrying activities. Should dewatering of Penderyn quarry affect the hydrology of the SSSI and/or if the recent run of very dry summers in which watercourses have dried-up continue, then floristic changes are likely to occur.</p> <p><u>Other Marshy Grassland</u> Non-SAC marshy grassland mainly comprises rush and purple moor-grass dominated vegetation and tall-herb fen. Management the SAC features should ensure that the non-SAC marshy grassland is kept in favourable condition. There may be a need from time to time to cut rushes where they have thickened up.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Alkaline Fen. <p><u>Grazing</u> These areas will be subject to the same grazing regime as the marshy grassland because they occur together in the same management units. Therefore it is considered inappropriate to specify specific grazing regimes for this habitat. Structural attributes will help to ensure that this habitat is grazed appropriately, so long as this is compatible with achieving the required condition for the marshy grassland. As the alkaline fen is some of the wettest habitat at the site, damage by overgrazing, e.g. excessive poaching, is likely to be readily observed.</p>

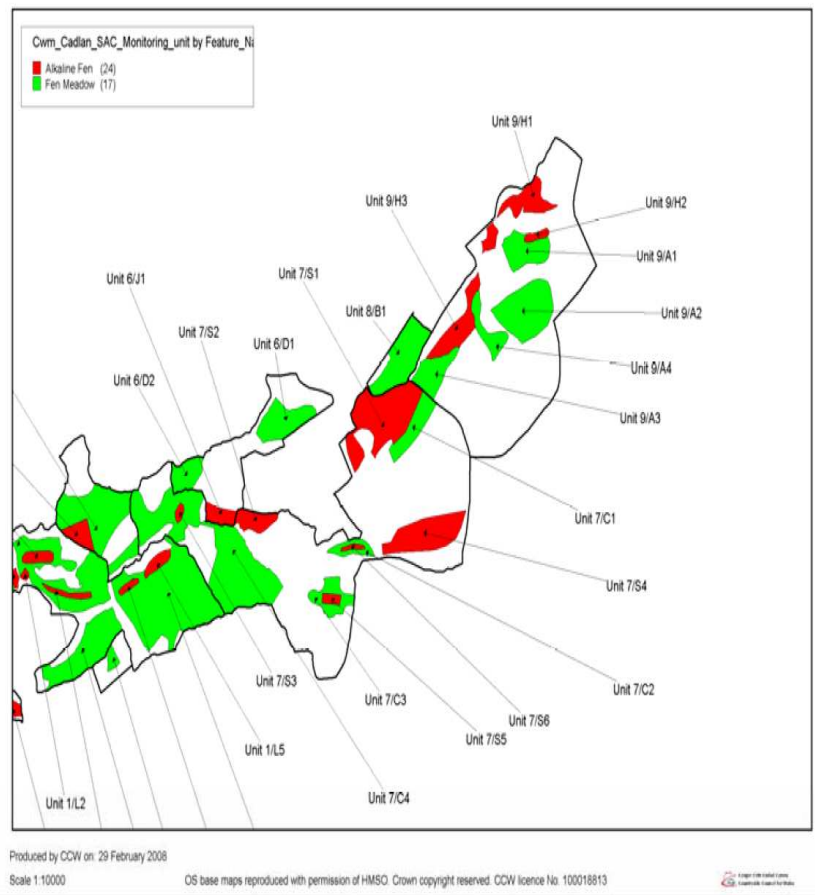
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	<p><u>Scrub Encroachment</u> Scrub can be monitored by a simple inspection of the site; in most cases the limits should not be exceeded before those limits for other attributes. This and compliance with the management agreement can be determined while monitoring other attributes. See also 5.1 above.</p> <p><u>Drainage</u> See above.</p> <p><u>Atmospheric Deposition</u> N deposition emanates from point and diffuses sources. Reductions in N emissions from the latter require ongoing policy reform and advice at national (Wales and UK) levels. Point source impacts need to be evaluated and minimised through RoC and the planning system. Dust deposition from the quarry should be minimised by standard good working practice. Dust deposition should be monitored by the quarry, and appropriate thresholds sought from the literature. Comparison of the two may reveal the need for modifications to working practice.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p><i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>)</p> <ul style="list-style-type: none"> • Extent and distribution of marshy grassland (Units 1-9). <ul style="list-style-type: none"> ○ Upper limit: N/A, constrained by hydrology. ○ Lower limit: 42 ha, of which 26 ha is fen-meadow (these figures represent the extent indicated by the most recent vegetation surveys). • Habitat quality. <ul style="list-style-type: none"> ○ Upper limit – 100% of the vegetation meets the criteria listed below. ○ Lower limit – In each of the fenmeadow areas shown on the map (see below), at least 75% of the vegetation meets the definition listed below for fen-meadow AND: 75% of the remaining marshy grassland meets the definition listed below for ‘marshy grassland’.



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Size: 83.93 ha
Designation: SAC

Habitats Regulations Assessment: Data Proforma

Cwm Cadlan SAC Feature Habitat Units (East)



- Livestock grazing.
 - Lower limit – The wetland areas will be subject to light summer grazing by cattle and/or ponies at least 4 in every 5 years.
 - Upper limit – No significant grazing outside the growing season or heavy grazing at any time during the summer. Light summer grazing is defined as - cattle and/or ponies at a rate of 0.4 LSU/ha/year for the period April to October. Heavy grazing is defined as greater than 1 LSU/ha/year (1 LSU is equivalent to a cow/horse, plus calf/foal).
- Drainage.
 - Upper limit – No new drainage ditches to be installed within the open meadow areas of the site. NB. It is not possible to set more specific pending a fuller understanding of current situation and habitat requirements.

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	<ul style="list-style-type: none"> ○ Infilling some of the many ditches at the site is likely to lead to re-wetting of some marshy grassland – Rewetting could lead to a switch from marshy grassland to alkaline fen, which should be acceptable as this would be the more natural (and scarcer) community. ○ Dewatering of the adjacent quarry has potential to affect the hydrology of the site – Monitoring of the quarry dewatering should give an early indication that the dewatering is affecting the site. <ul style="list-style-type: none"> ● Adjacent Land Use. <ul style="list-style-type: none"> ○ No limits set. Monitoring vegetation should indicate any changes. Much adjoining land is under sympathetic management, and so the risk of any adverse impact is low. <p>Management of adjoining land has potential to affect the nutrient status of soils (some marshy grassland is at the base of slopes with the rest of the field managed as hay-meadow).</p> <ul style="list-style-type: none"> ● Scrub encroachment (Scattered scrub will be tolerated within the following limits). <ul style="list-style-type: none"> ○ Upper limit – No scrub covering area greater than 5m x 5m within stands mapped as marshy grassland. ○ Lower limit – Scattered scrub present in defined locations. ● Atmospheric pollution. <ul style="list-style-type: none"> ○ Upper limit – Suggest 15 kg N / ha / year for N. None yet defined for dust – further advice needed. ○ Lower limit – None set – very low dust and N deposition regimes may be beneficial. <p>Alkaline fens</p> <ul style="list-style-type: none"> ● Extent and distribution. <ul style="list-style-type: none"> ○ Upper limit – N/A, constrained by hydrology. ○ Lower limit – 11 ha. <p>Located in Units 1-4, 6-9 (NB – some of the quarry monitoring is carried out in small stands in Unit 1 L7 (- here the alkaline fen occurs mainly as small runnels too small to map individually).</p> <ul style="list-style-type: none"> ● Habitat Quality. <ul style="list-style-type: none"> ○ Upper limit – 100% of the vegetation meets the criteria listed below. ○ Lower limit – In each of the main areas of fen at least

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	<p>75% of the vegetation meets the definition listed below.</p> <p>Definition of alkaline fen: In any 0.5m radius, the vegetation height is between 5 and 20 cm tall; And at least 5 out of the following are present: tawny sedge; flea sedge; dioecious sedge; intermediate hook-moss <i>Drepanocladus cossonii</i>; yellow starry feather-moss <i>Campylium stellatum</i>; curled hookmoss <i>Palustriella commutata</i>; marsh bryum <i>Bryum pseudotriquetrum</i>; maidenhair pocket-moss <i>Fissidens adianthoides</i>; bog pimpernel; marsh lousewort; common butterwort; quaking grass; water mint; marsh pennywort; marsh valerian and marsh arrowgrass. and, the cover of ‘brown’ mosses (see above) is over 10%. and, the cover of creeping buttercup, lesser spearwort and white clover does not exceed 10%. and the cover of tall rushes and purple moor-grass does not exceed 33%. and there is no discernable cover of vegetation litter - less than 10%. and the cover of bare ground does not exceed 5%. and scrub/woody species are largely absent.</p> <ul style="list-style-type: none"> • Livestock grazing. <ul style="list-style-type: none"> ○ Lower limit – The wetland areas will be subject to light summer grazing by cattle and/or ponies at least 4 in every 5 years. ○ Upper limit – No significant grazing outside the growing season or heavy grazing at any time during the summer. Light summer grazing is defined as - cattle and/or ponies at a rate of 0.4 LSU/ha/year for the period April to October. Heavy grazing is defined as greater than 1 LSU/ha/year (1 LSU is equivalent to a cow/horse, plus calf/foal). • Drainage. <ul style="list-style-type: none"> ○ Upper limit – No new drainage ditches to be installed within the open meadow areas of the site. NB. It is not possible to set more specific pending a fuller understanding of current situation and habitat requirements. ○ Infilling some of the many ditches at the site is likely to lead to re-wetting of some marshy grassland – Rewetting could lead to a switch from marshy grassland to alkaline fen, which should be acceptable as this would be the more natural (and scarcer) community.

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	<ul style="list-style-type: none"> ○ Dewatering of the adjacent quarry has potential to affect the hydrology of the site – Monitoring of the quarry dewatering should give an early indication that the dewatering is affecting the site. ● Adjacent Land Use. <ul style="list-style-type: none"> ○ No limits set. Monitoring vegetation should indicate any changes. Much adjoining land is under sympathetic management, and so the risk of any adverse impact is low. <p>Management of adjoining land has potential to affect the nutrient status of soils (some marshy grassland is at the base of slopes with the rest of the field managed as hay-meadow).</p> <ul style="list-style-type: none"> ● Scrub Encroachment (Scattered scrub will be tolerated within the following limits) <ul style="list-style-type: none"> ○ Upper limit – No scrub covering area greater than 5m x 5m within stands mapped as marshy grassland. ○ Lower limit – Scattered scrub present in defined locations. ● Atmospheric pollution. <ul style="list-style-type: none"> ○ Upper limit – Suggest 15 kg N / ha / year for N. None yet defined for dust – further advice needed. ○ Lower limit – None set – very low dust and N deposition regimes may be beneficial. <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Cwm Cadlan SAC (2008) available at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cors-fochno-to-cwm-sac-list/idoc.ashx?docid=a7cfb8fa-5327-465a-b6cb-dbbc6a531608&version=-1</i></p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ <i>Molinia</i> meadows on calcareous, peaty or clayey-siltladen soils (<i>Molinion caeruleae</i>): Unfavourable. No change ▪ Alkaline Fen: Unfavourable Recovering.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> These grasslands are dependent on the continuance of low intensity agricultural management with no, or minimal, use of agro-chemicals. Where necessary, agreements secure appropriate grazing levels and management.</p>

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	<p><u>Quarrying</u> Base enrichment and moisture content are also important factors influencing the ecological character of the vegetation. This enrichment appears to derive from rising groundwater. Quarrying or other operations within the groundwater catchment may influence groundwater movements. The operation of an adjoining quarry is subject to a conditioned planning permission, site investigation and monitoring that will constrain operations in order to safeguard the grassland vegetation.</p> <p><u>Nutrient Inputs</u> There has been concern about fertilizer run-off from some adjacent improved fields causing localised nutrient enrichment. Any effects from agricultural run-off from adjacent fields will be identified through monitoring the quality of the vegetation under the feature objectives.</p> <p><u>Drainage</u> The networks of ditches throughout the SSSI have obviously affected the hydrology and vegetation. These ditches should be allowed to infill naturally (as some have already). Where possible, active restoration of the hydrology should be considered</p> <p><u>Atmospheric Pollution</u> Dust deposition from the quarry should be minimised by standard good working practice.</p>
<p>Landowner/ Management Responsibility</p>	<p>These fields were traditionally managed as pasture and some as hay-meadow but there has long been a liver fluke problem in this area and there have been past attempts to drain many fields within the SAC - there is an extensive network of drainage ditches within the site. Some of these are slowly infilling, but some vegetation is likely to have been permanently modified by these drains.</p> <p>An extensive system of deep ditches was dug over most of the wet pasture in the National Nature Reserve (Unit 1 - see map below) in 1980/81 under a farm improvement scheme. Over the past 50 years much of the land has been grazed by a mixture of cattle and sheep, although between 1997 and 2003, grazing was mainly by sheep. Under NRW's management, the land has been returned to mainly cattle grazing. The south western-most enclosure (formerly Glynperfydd Meadow SSSI) was in the past cut, on average, every three years using horses, with the last cut in 1976. NRW intend to resume the hay-management in this field in an attempt to encourage the populations of some plant species, which appear to have become scarcer over the past 20 years.</p>

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	<p>The south western-most part of the site (Unit 2) is mainly wet pasture and is currently (2007) grazed by cattle and sheep, with a small area cut for hay. The small area near the quarry (Unit 3) currently (2007) receives little grazing, with scrub encroachment a problem. Some scrub and trees were removed by NRW c.2003. The field was part of a larger enclosure that existed before quarry tipping and the re-routing of a farm access track. These changes appeared to have occurred in 1980 or thereabout, being completed by 1983 when a fence was erected against the track. Unit 4 (see below) receives only occasional grazing by sheep and ponies, currently (2007) some of the vegetation is rather rank. Part of the field was burned c. 2003. A hay crop used to be taken in Unit 5 (see below) but this has not occurred for many years.</p> <p>Currently (2007), this field is managed with an adjoining improved hay field (outside the SSSI), therefore, the SSSI field tends to be grazed in autumn, winter and spring and rested in the summer months. The notified field is not treated with fertilizer, although some is applied to the adjoining field. Winter stock-feeding occurs in the adjoining field and this may be affecting the SSSI habitat. A spring in the field appears to be the main water supply to the farm house. The central part of the site (Units 6 & 7) to these east of the NNR is currently (2007) under sympathetic management but, in the past, lime and basic slag were applied to the eastern-most enclosures (last in c.1985). The hay meadows, including the field supporting mainly dry grassland in the south-east of the site, were ploughed during the 1939-45 War. The drainage ditches were dug by POWs around this time and were last cleaned out c. 1985. The hay meadows tend to be cut towards the end of July. Some winter stock feeding occurs on drier ground within the SSSI.</p> <p>Unit 8 was planted with alder trees by the Brecon Beacons National Park Authority c.1988. Some of these trees were removed by NRW in 2003 and eventually all will be removed. The eastern-most fields (Unit 9) are grazed throughout the summer mainly by cattle, with varying numbers of sheep at periods throughout the grazing season. There appears to be little or no grazing in winter. According to the owner, the wet pasture used to consist of large tussocks of purple moor-grass, but grazing by cattle over many years has reduced the tussocks. Unit 10 is a small area of wet pasture land crossed by an access track and with a pool that provides water for farm stock.</p> <p>In general, the alkaline fen and fen-meadow are considered to be the main focus of management in all the units. Globeflower (the key</p>

<p>Site Name: Cwm Cadlan Location Grid Ref: SN961098 JNCC Site Code: UK0013585 Size: 83.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>species on the site) is strongly associated with these habitats and also a field (unit 5) largely comprising a damp form of neutral grassland. Other (non-SAC) forms of marshy grassland, together with neutral grassland and a variety of other habitats types occur as a patchwork across the site and management of the SAC habitats is generally compatible.</p> <p>Globeflower is declining nationally and the population at Cwm Cadlan also seems to have declined since it was notified in 2000. Management in the units where it occurs should aim to maintain or increase the population. Parts of units 5 & 7 are managed for hay and these appear to be the main areas where the species flowers regularly. Until relatively recently, one of the fields in unit 1 supported a reasonable population of globeflower, but this seems to have declined rapidly – formerly this field was periodically cut for hay and the intention is to return to this management regime. Most of the neutral grassland occurs as small areas associated with damper pasture such as fen-meadow, where it occupies areas with more freely draining soils.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Rhondda Cynon Taff County Borough Councils Local Development Plan (2006-2021): January 2010 available at: http://www.rhondda-cynon-taf.gov.uk/en/relateddocuments/publications/developmentplanning/evidencebase/eb18-habitatsregulationsassessmentappropriateass.pdf</p>

<p>Site Name: Grogwynion Location Grid Ref: SN708719 JNCC Site Code: UK0030160 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Along the River Ystwyth, a combination of active river processes and heavy metals in the river deposits from past mining, has led to the development of a mosaic of habitats on some of the river gravels, known as shingle heath, and a series of heathland areas occur along the river. These types of heathland communities are highly distinctive and very unusual in southern Britain, and the section of the river Ystwyth known as Grogwynion SAC is the largest known area of such communities in England and Wales. They comprise open areas of bare shingle and heather, rich in lichen species, (the SAC features Calaminarian grassland and European dry heath) amongst bands of great wood- rush, acid grassland, scrub, marshy grassland, broadleaved woodland, and small streams and backwaters.</p> <p>The river deposits and spoil heaps and buildings of abandoned metal mines at Grogwynion support a rich assemblage of rare lichens, including a number of species that are specially adapted to the concentrations of heavy metals, known as metallophyte lichens. Lichen species that are normally montane are present at low altitudes at this site and contribute to making this lichen assemblage unique. One species, <i>Epigloea filifera</i>, found at Grogwynion, is known no-where else in Britain.</p> <p>Grogwynion is also of national geomorphological importance because it represents a very rare, if not unique, example of a braided river system in Wales. The broad floodplain is characterized by a river channel displaying a pattern of long diagonals connected by shorter crossovers, together with a series of abandoned or partially abandoned channels and extensive shingle bars. The presence of the latter reflects the high mobility of the river channel, which can rapidly change its course in response to high magnitude floods. The site has been the subject of much research in recent years, with significant effort being directed to understand the relationship between former metal mining and the subsequent evolution of the river system. It is one of best localities in Wales for the study of river evolution and fluvial processes.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calaminarian grassland. <p>Annex I habitats SAC is considered to support a significant presence.</p> <ul style="list-style-type: none"> • European dry heaths.

<p>Site Name: Grogwynion Location Grid Ref: SN708719 JNCC Site Code: UK0030160 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Conservation Objectives</p>	<p>Vision for the site: The river Ystwyth will move as freely as possible within the present-day floodplain, and operation of the natural river processes of erosion, sediment transport and deposition will be maintained. River flow will naturally fluctuate and change with the shifting gravel banks and at Grogwynion the river channel will frequently change course and re-occupy old channels.</p> <p>A mosaic of habitats will occur throughout the site, ranging from unstable shingle beach communities to heath, grassland, scrub and woodland. The vegetation communities will tend to occur in bands, reflecting the presence of a series of shingle ridges and depressions underlain by sediments of varying grain size and metal concentrations. The extent and location of individual communities will vary in response to natural processes such as flooding, drought and river movement, but exposed shingle and heath will each cover at least 10% of the site. The heath will be very open, with much visible gravel amongst scattered plants of heather. The heather may appear to be dead after periods of drought, but will recover again, and this dieback will help to maintain the open conditions. Lichens will be abundant, including many rare species, and in places Cladonia species will form delicate white mounds. In less dry areas, there are extensive carpets of mosses and liverworts, including species normally found in upland habitats. There will be little grass and scrub growing in open areas but scattered plants of sea campion and sheep's-bit will occur. The mine buildings and spoil heaps at Grogwynion will be undisturbed and support many rare metallophyte lichen species. Non-native species such as Japanese knotweed, Himalayan balsam and rhododendron will be absent from the site.</p> <p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calaminarian grassland. <p>Annex I habitats SAC is considered to support a significant presence.</p> <ul style="list-style-type: none"> • European dry heaths. <p>The vision is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Open shingle heath (Calaminarian grassland and European dry heath) will occupy between 20% and 70% of the total site area. • The remainder of the site will be mine spoil, the river and small streams and backwaters and bands of great wood-

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	<p>rush, acid grassland, scrub, marshy grassland, broadleaved woodland and small blocks of conifer plantation.</p> <ul style="list-style-type: none"> • The open shingle heath will have much visible gravel with scattered heather <i>Calluna vulgaris</i> in places, or in less dry areas, heather will be dominant with a mossy understorey. • Lichens will be abundant, including many rare metallophyte species, and in places Cladonia species will form delicate white mounds. • There will be little grass and scrub growing in the open shingle heath but scattered plants of sea campion and sheep's-bit will occur. • The remains of mine buildings and spoil heaps at Grogwynion will be undisturbed and support many rare metallophyte lichen species. • Non-native species such as Japanese knotweed, Himalayan balsam and rhododendron will be largely absent from the site and conifers will not be regenerating on the floodplain. • The river levels will fluctuate naturally, causing drought and floods. • At least at Grogwynion, the river will be highly mobile, rapidly changing its course during floods and migrating freely across the remaining floodplain. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based primarily on tenure, sub-divided further by land parcels.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calaminarian grassland. <p>Annex I habitats SAC is considered to support a significant presence.</p> <ul style="list-style-type: none"> • European dry heaths. <p>The management requirements are principally the control of invading scrub, mainly gorse, and eradication of invasive non-native species. The continuation of occasional light grazing is probably also required on two of the units.</p>

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	<p><u>Scrub</u> Gorse has increased in all units, except on the mine spoil in unit 5, which is too toxic for most higher plants. Scrub control is planned in all designated FC and NRW units and, with the agreement of the owners, in units 8, 9 and 10. Work will be targeted around remaining good quality heath and where invasion has been most rapid by comparing aerial imagery in 2003 and 2006.</p> <p><u>Self-Seeding Conifers</u> Conifer regeneration in open shingle heath is occurring mainly in units 1, 2 and 3 owned by FC, despite previous work to clear them. A programme of further removal is planned and much of the surrounding plantations are being gradually converted to broad-leaves under the Forest Design Plan. Much of the conifer regeneration on NRW land in unit 4 has been removed, but occasional invasion continues to occur and will need periodic clearance.</p> <p><u>Invasive Species</u> Rhododendron control work has been carried out on NRW and FC units and follow-up work is planned in unit 3 to clear remaining bushes.</p> <p>Despite work to control it in units 3,4, 6 and 10, small clumps of Japanese knotweed continue to invade Units 3 & 4 and heavy invasion has occurred in the gorge in unit 6. A further programme of control is planned by FC in Units 3, 4 and 6. The success of treatment of knotweed in unit 10 needs to be assessed. Small amounts of Himalayan balsam are invading Units 3, 4 and 6, and its status needs to be assessed in Units 8 and 10. A programme of removal by FC is planned in Units 3 and 4.</p> <p><u>Grazing</u> Light and occasional grazing occurs under management agreements in Units 8 and 10. In Unit 8, the Rest, the agreement stipulates that very light occasional grazing by sheep should occur between the end of November and the beginning of February and cattle can be moved across the site approximately 6 times per year. These are continuations of previous practice. In Unit 10, Llanddwy, the agreement allows limited grazing by up to 10 cows and calves between May and October in conjunction with adjacent fields. However, a problem with a neighbour's fence has meant that grazing may have been impractical in the short term. Units 8 and 10 need to be monitored and the effectiveness of the management prescriptions reviewed. Other units across the site are not grazed by agricultural stock, except for occasional trespass by small numbers of sheep in Unit 4 at Grogwynion, which is not an issue. It</p>

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	<p>is impractical and probably undesirable to introduce grazing to any of these units. Rabbits graze on the north side of the river in Unit 4, very usefully eating young gorse.</p> <p><u>Nutrient Levels</u> In Units 7, Pont Llanafan and 8, the Rest, there is evidence of some nutrient enrichment from adjacent pastures. The shingle heath in Unit 7 has been lost, and its restoration is not a high priority. Shingle heath remains however in unit 8 and the use of fertilisers along the adjacent strip of pasture should be discussed with the landowner with a view to reducing the nutrient input to the SSSI.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Calaminarian grasslands of the <i>Violetalia calaminariae</i> European dry heaths.</p> <ul style="list-style-type: none"> • Area. <ul style="list-style-type: none"> ○ Lower limit – The extent of shingle with open vegetation (European dry heath and Calaminarian grassland) is no less than: Units 1 & 2- 0.1 ha; Units 3 & 4 - 10ha; Units 7, 8 & 9 - 0.2 ha; Unit 10 - 1 ha. The extent of open habitat will be mapped from aerial photographs and ground truthed. ○ Upper limit (Determined by substrate): Units 1 & 2 - 1 ha; Units 3 & 4 – 27 ha; Units 7, 8 & 9 - 2 ha; Unit 10 - 7 ha. • Quality. <ul style="list-style-type: none"> ○ Lower limit – At least 2 out of the 3 SAC units and 4 out of the 6 SSSI units should be assessed as ‘good condition shingle with open vegetation’. ○ Upper limit – No limit set. • Form and function. <ul style="list-style-type: none"> ○ Lower limit – No limit set. ○ Upper limit – The course of the river will not be further modified on, or immediately upstream of the site by any man-made objects or constructions. No substratum will be removed from or adjacent to the river. <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Grogwynion SAC (2008)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/glannau-to-gweunydd-sac-list/idoc.ashx?docid=b6ea9cc9-3c46-46e8-9f3a-6b7ab29556a7&version=-1</p>

<p>Site Name: Grogwynion Location Grid Ref: SN708719 JNCC Site Code: UK0030160 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Calaminarian grassland: Unfavourable, declining • European dry heaths: Unfavourable, declining
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>NRW hold a long-term lease over the majority of the site and management will prevent gradual encroachment by alien species and will address occasional problems of trespass by vehicles and bicycles. The majority of the remainder of the site is owned and managed sympathetically by the Forestry Commission.</p> <p><u>Invasive Species</u> Rhododendron control work has been carried out on NRW and FC units and follow-up work is planned in Unit 3 to clear remaining bushes. Small amounts of Himalayan balsam are invading Units 3, 4 and 6, and its status needs to be assessed in Units 8 and 10. Despite work to control it in Units 3, 4, 6 and 10, small clumps of Japanese knotweed continue to invade Units 3 & 4 and heavy invasion has occurred in the gorge in Unit 6.</p> <p><u>Nutrient Input</u> In Units 7, Pont Llanafan and 8, the Rest, there is evidence of some nutrient enrichment from adjacent pastures. The shingle heath in Unit 7 has been lost, and its restoration is not a high priority. Shingle heath remains however in Unit 8 and the use of fertilisers along the adjacent strip of pasture should be discussed with the landowner with a view to reducing the nutrient input to the SSSI.</p> <p><u>Scrub encroachment</u> Gorse has increased in all units. Scrub control is planned in all designated FC and NRW units and, with the agreement of the owners, in units 8, 9 and 10.</p>
<p>Landowner/ Management Responsibility</p>	<p>The Wildlife Trust leased Grogwynion from 1991, and NRW took over the lease in 2001.</p> <p>The special interest in Unit 1 and 7 has been lost, in Unit 1 probably due to natural successional changes rather than mis-management. Unit 7 has probably suffered from nutrient run-off from the adjacent field. It is possible that some interest may be recoverable with drastic management such as bulldozing off the surface layers, but this experimental management is not being advocated at present.</p> <p>Unit 6 covers areas included within NRW's lease at Grogwynion, but does not support features and is not designated. It includes a gorge, and a car park and picnic area for the nature reserve, used</p>

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	<p>and managed by FC for their adjacent woodland walks. Although Unit 5, toxic mine dumps, does not include shingle heath habitat, it is integral to the functioning of the ecosystem at Grogwynion since the presence of the dumps briefly narrows the floodplain and causes the river to flow faster which then increases its movement downstream. The dynamic nature of the river is essential for the creation and maintenance of shingle heath. Metallophyte lichens have been recorded on the remains of mine structures in this Unit.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Afon Teifi / River Teifi Location Grid Ref: SN515508 JNCC Site Code: UK0012670 Size: 715.58 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Source (unless otherwise cited)</p>	<p>http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=3c827c66-806e-46ad-ba01-859713c29bd2&version=-1</p>
<p>Site Description</p>	<p>At 122 km, the Afon Teifi is one of the longest rivers in Wales, with one of the most pristine river catchments in lowland Britain. From its source in the oligotrophic Teifi Pools, situated at 455m in the Cambrian Mountains, the river descends steeply through the upland pastures and flows through the raised mire complex of Cors Caron. Below Cors Caron the Teifi meanders through lowland farmland, joined by a number of small tributaries from either side of the valley. Rocky, tree-lined sections are a feature of the lower part of the river, and there are several impressive gorges, particularly at Alltycafán, Henllan and Cilgerran, with spectacular waterfalls at Cenarth. Below Cilgerran gorge the estuary begins, winding its way past the wildlife-rich Teifi Marshes and the town of Cardigan before flowing out into Cardigan Bay. The whole of the river from source to sea is included in the SAC, as are ten tributaries: the Groes, Brefi, Dulas, Grannell, Clettwr, Cerdin, Tyweli, Ceri, Cych and Piliau.</p> <p>The underlying geology consists of Ordovician and Silurian mudstones, siltstones and sandstones, which are extensively mantled by Quaternary deposits of variable, but sometimes considerable thicknesses. These consist of sands and gravels, glacial lake clays, alluvium and peat. This geology produces a generally low to moderate nutrient status and a low to moderate base-flow index, making the river characteristically flashy. The runoff characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and a limited amount of arable in the lower catchment.</p> <p>The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p>Hydrological processes in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and</p>

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	<p>base-flows is essential. Reductions in flow may reduce the ability of the adults of migratory fish to reach spawning sites. Watercress vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be as near to natural as constraints will allow in order to support the functioning of the river ecosystem. Two of the Teifi Pools, Llyn Teifi and Llyn Egnant, are artificially regulated for water abstraction, and this affects the species composition of the oligotrophic lake vegetation they contain. The compensation flows released below the dams ensure that downstream river flow is not adversely affected.</p> <p>Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream create the physical structure of the river habitats. While some sections of the river are naturally stable, especially where they flow over bedrock, others undergo continual and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions. At Cors Caron, the Afon Teifi flows through an area of fine-grained lake sediments and provides an exceptional opportunity for studying fluvial transport processes dominated by suspended sediment movement. It provides a marked contrast with the upstream and downstream reaches where coarse bed-load transport is dominant, which is more typical of upland rivers in mid-Wales.</p> <p>Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris</p>

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	<p>to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitat for breeding and resting sites. It is important that appropriate amounts of tree cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. The mobility of the Teifi has resulted in the formation of significant areas of off-channel habitat in the form of ox-bows, wet woodlands, willow scrub etc. These are predominantly away from the main channel, and form important areas for otter to rest-up in or support breeding sites. In the few urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p> <p>Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions; therefore these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, to migrate and disperse through the landscape. Connectivity should be maintained, or restored where necessary, as a means to ensure access for the features to sufficient habitat within the SAC. Where the Teifi flows through Cors Caron, a 1.5 km reach in the centre of the bog was artificially straightened at the end of the 19th century. This has had the effect of reducing the naturalness and habitat</p>

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	<p>diversity of the river and its connectivity with the surrounding fen and mire habitats of Cors Caron SAC. The previous meandering channel still exists in the form of cut off meanders, and restoration of this section to its previous course would enhance the river ecosystem structure and function, and its connectivity with the raised bog system.</p> <p>External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>. <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Brook lamprey <i>Lampetra planeri</i>. • River lamprey <i>Lampetra fluviatilis</i>. • Atlantic salmon <i>Salmo salar</i>. • Bullhead <i>Cottus gobio</i>. • Otter <i>Lutra lutra</i>. • Floating water-plantain <i>Luronium natans</i>. <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i>.
<p>Conservation Objectives</p>	<p>Vision for the site: The Afon Teifi/River Teifi SAC will be maintained or, where necessary, restored to high ecological status, including its largely unmodified and undisturbed physical character, so that all of its special features are able to sustain themselves in the long-term as part of a naturally functioning ecosystem. Allowing the natural</p>

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	<p>processes of erosion and deposition to operate without undue interference and maintaining or restoring connectivity maintains the physical river habitat, which forms the foundation for this ecosystem. The quality and quantity of water, including natural flow variability, and the quality of adjacent habitats will be maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future.</p> <p>The aquatic plant communities that characterise parts of the river are not only attractive but also give a good indication of the overall quality of the environment. They will contain the variety and abundance of species expected for this type of river, in conditions of suitably clean water and bed substrate combined with a relatively stable flow regime. Patches of whiteflowered water-crowfoots will continue to be widespread in the main river and in many of the tributaries. In the more shaded reaches mosses and liverworts predominate.</p> <p>Five special fish species will be present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. Bullhead and brook lamprey complete their entire life cycles within the river. Migratory species such as the Atlantic salmon, sea and river lamprey, which swim up river to spawn and go through their juvenile stages in the river, will be able to complete their migrations and life cycles unhindered by artificial barriers such as weirs, pollution, or depleted flows.</p> <p>The abundance of prey and widespread availability of undisturbed resting and breeding sites will allow a large otter population to thrive. They will continue to be found along the entire length of the river and its main tributaries.</p> <p>There will be healthy populations of floating water-plantain in the Teifi Pools and in the river around Tregaron. The Teifi Pools will continue to contain their current range of distinctive aquatic plants that are characteristic of these clear-water upland lakes.</p> <p>The presence of the Afon Teifi/River Teifi SAC and its special wildlife will continue to enhance the economic and social values of the area by providing a high quality environment for ecotourism, outdoor activities and peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water will be recognised and promoted through appropriate land management. The river will remain a focus for education to promote increased understanding of its biodiversity and the essential life support functions of its ecosystems.</p>

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	<p>Conservation Objective for the Watercourse</p> <ul style="list-style-type: none"> • The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary. • The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity & quality, physical habitat, community composition & structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process. • Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC. • All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change. • Flows, water quality, substrate quality, and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. • The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided. • River habitat SSSI features should be in favourable condition. • Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, e.g. weirs, bridge sills, acoustic barriers. • Natural factors such as waterfalls, which may limit the natural range of a species feature, or dispersal between naturally isolated populations, should not be modified. • Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the

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	<p>extent that passage upstream to spawning sites is hindered.</p> <ul style="list-style-type: none"> • Flow objectives for assessment points in the Teifi Catchment Abstraction Management Strategy (CAMS) as they relate to the Afon Teifi SAC will be agreed between EA and NRW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document. • Levels of nutrients, in particular phosphate, will be agreed between EA and NRW for each Water Framework Directive water body in the Afon Teifi SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document. • Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and NRW for each Water Framework Directive water body in the Afon Teifi SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of this document. • Levels of suspended solids will be agreed between EA and NRW for each Water Framework Directive water body in the Afon Teifi SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. • Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects. <p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The area covered by the feature within its natural range in the SAC should be stable or increasing. • The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when

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	<p>other typical species may be defined as appropriate.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The <i>Littorelletea uniflorae</i> aquatic upland lake community will be present in all five of the Teifi Pools (Llyn Hir, Llyn Teifi, Llyn Egnant, Llyn y Gorlan and Llyn Bach), and will be self-maintaining on a long-term basis. • A fully developed <i>Littorelletea</i> community will be present in Llyn Hir, including all of the component species typical of the SAC feature, as represented in the Afon Teifi SAC. • The typical species are defined with reference to the species composition of the JNCC standing water type for the SAC feature, unless differing from this type due to natural variability when other typical species may be defined as appropriate. • For each of Llyn Teifi, Llyn Egnant, Llyn y Gorlan and Llyn Bach, the extent and species composition of the <i>Littorelletea</i> community will be stable or increasing in range. There will be no deterioration in the conservation status of the feature as represented in these lakes. <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Brook lamprey <i>Lampetra planeri</i>. • River lamprey <i>Lampetra fluviatilis</i>. • Atlantic salmon <i>Salmo salar</i>. • Bullhead <i>Cottus gobio</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of the feature in the SAC is stable or increasing over the long term. • The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream

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	<p>migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of that there is, and will continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Otter <i>Lutra lutra</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour. • The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Teifi SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed. • The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers. <p>Annex II habitats that are a primary reason for selection for this site:</p>

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	<ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The floating water-plantain populations will be viable throughout their current distribution in the SAC (maintaining themselves on a long-term basis). Each floating water-plantain population must be able to complete sexual and/or vegetative reproduction successfully. Potential for genetic exchange between floating water-plantain populations, in and/or outside the SAC, must be evident in the long-term. Dispersal of floating water-plantain must be unhindered. • The SAC will have sufficient suitable habitat to support floating water-plantain populations within their current distribution. There will be no contraction of the current floating water-plantain distribution in the SAC. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. water levels in Teifi Pools, water depth, stability of river flows, stability of bed substrate, ecosystem structure and functions e.g. nutrient levels, and shade. <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of the feature in the SAC is stable or increasing over the long term. • The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of the following.

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	<ul style="list-style-type: none"> • There is, and will continue to be, a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis.
<p>Component SSSIs</p>	<p>Designations covered:</p> <ul style="list-style-type: none"> • Afon Teifi SSSI (the SAC and SSSI boundaries are concurrent). <p>Afon Teifi/River Teifi SAC flows through (dissects) Cors Caron SAC, NNR and SSSI, and Elenydd SSSI. The underpinning SSSI designations do not overlap.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation. <p><u>Water Quality and Hydrological Management</u> Factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, and can produce unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient status, epiphytic algae may suppress the growth of aquatic flowering plants. Favourable management for this feature is therefore largely dependent on ensuring that sufficient depth, velocity and duration of flow and sufficiently low phosphate levels are maintained within the natural range of the vegetation. A favourable flow regime can be defined with reference to naturalised flows (removing the influence of artificial abstractions and discharges from flow records). While more sophisticated analysis of depth and velocity has been carried out locally for the Review of Consents process, a flow level criterion is generally applied to regulate abstractions. Based on current available information, the recent level of flow depletion downstream of abstractions in the Afon Teifi SAC is not considered to be damaging to this feature, either through limiting its range or adversely affecting its community composition.</p> <p><u>Vegetation/Scrub Management</u> The level of shading is a determining factor to the presence of this feature in some reaches, particularly on certain of the tributaries. Very shaded tributaries do not support the macrophyte diversity</p>

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	<p>seen in more open reaches, but these wooded reaches provide good breeding habitat for otters and the uprooting of roots as trees fall within the channel provide clean gravel runs for salmon spawning. On some reaches, some localised and selective coppicing and pollarding of bankside trees may be required, but the requirements of this feature must also be balanced with those of other SAC features such as fish species and otters.</p> <p>Although the catchment has been grazed for centuries, the effects of grazing, particularly by cattle, are worth considering. Cattle grazing can damage water-crowfoot beds, introduce silt (through poaching and localised erosion), and can lead to enrichment or pollution of the river. Conversely, grazing can increase the variety of niches available to plants and animals; reduce the ingress of marginal vegetation into the main channel; and control the development of woody vegetation.</p> <p>Fencing river banks to limit access to the channel will address the negative implications of cattle grazing but, at the same time, is likely to accelerate the development of woody vegetation and rank, bank-top vegetation, with longer-term implications for shading levels. It may also increase the likelihood of invasion by non-native plant species such as Japanese knotweed and Himalayan balsam. Balanced decisions are required relating to the optimal stocking level and grazing duration to minimise the potential for negative effects. Localised water quality issues can have an impact on the feature. There are a number of smaller sewage treatment works within the SAC, which can have a detrimental effect if not operating to a high standard.</p> <p><u>Diffuse and Point Source Pollution Management</u> The conservation objectives require that the area covered by the feature is stable or increasing within its natural range, which is likely to require catchment-wide measures to control diffuse pollution from agriculture, as the principal source of phosphate. In the Afon Teifi catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, separating clean and dirty water in farmyards, and the establishment of fenced buffer zones on river reaches adjacent to intensively managed livestock grazing or arable land. Additional measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be</p>

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	<p>implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC.</p> <p><u>Invasive Species</u> Invasive non-native plants may also have a detrimental impact on this feature, and control programmes for Japanese knotweed and Himalayan balsam should be considered, with the aim of reducing their extent in the SAC.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ▪ Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i> <p><u>Water Abstraction</u> The current operation of Llyn Teifi and Llyn Egnant as reservoirs for public water supply has been investigated in considerable detail as part of the Environment Agency's Review of Consents process, and the impact of abstraction licences on the SAC features have been subjected to Appropriate Assessment (Environment Agency Wales, 2007). The outcome of the assessment with reference to the <i>Littorelletea</i> community was that although a lower abstraction rate from the regulated lakes would be of benefit to this feature, the current abstraction licences do not have a significant negative impact upon the integrity of the feature as a whole within the SAC, in terms of its conservation objectives.</p> <p><u>Species Diversity</u> Recent studies have shown that the <i>Littorelletea</i> community within Llyn Hir is the most diverse within the SAC in terms of the number of species present. The Teifi Pools as a whole contain a high diversity of macrophytes associated with the <i>Littorelletea</i> community, including seven of the eight principal species characteristic of the feature. All surveys have highlighted the consistent absence of water lobelia <i>Lobelia dortmanna</i> and awlwort <i>Subularia aquatica</i>, species that are particularly intolerant of fluctuating water levels, in the regulated Llyn Teifi and Llyn Egnant and the presence of these species in the unregulated Llyn Hir.</p> <p>The conservation objectives require a fully developed <i>Littorelletea</i> community to be maintained in Llyn Hir only; for each of the other lakes, the objective is the maintenance of community species diversity recorded as present between 1997 and 2005. The main concern regarding the two Teifi Pools abstraction licences is the</p>

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	<p>concentration of high species diversity within only one of the lakes. In the event of a pollution incident within Llyn Hir, a potentially irreplaceable element of the community could be permanently lost from the SAC; hence the requirement to maintain the existing condition of the <i>Littorelletea</i> in the remaining water bodies, allowing the possibility of species recolonisation.</p> <p><u>Water Abstraction</u> Seasonal fluctuation in water levels in the regulated lakes is amplified by abstraction, resulting in prolonged exposure of the lake margins, particularly in years of low rainfall (such as 1976 or 1995). Unfortunately there is no data available on the impact of a dry year upon the existing <i>Littorelletea</i> community within Llyn Teifi and Llyn Egnant; however it is safe to assume that some populations of individual <i>Littorelletea</i> community species within the lakes will be negatively impacted in years of extreme draw-down. It is also evident that the current <i>Littorelletea</i> community within Llyn Teifi and Llyn Egnant has been able to recover from such extreme draw-down events in the past.</p> <p>Both Llyn Egnant and Llyn Teifi are exposed, wind-stressed sites, which may further restrict the growth and distribution of a number of macrophyte species in the littoral zone (Burgess et al., 2006). Although wind stress reflects habitat quality and not condition, it could be an important factor if exacerbated by draw-down, for example, by making isoetids vulnerable to uprooting by wind.</p> <p><u>Water Quality</u> EA water quality monitoring (2004 data, quoted in Burgess et al.) has indicated elevated phosphate levels in Llyn Teifi and Llyn Egnant, but only a marginal increase in Llyn Hir. Significantly elevated phosphate levels may have a negative impact on the <i>Littorelletea</i> feature, and contribute to the absence of some macrophyte species, particularly those that are sensitive to nutrient enrichment; for example, this may have contributed to the absence of water lobelia from Llyn Egnant (Burgess et al.). Possible reasons for these elevated nutrient levels include enrichment from livestock dung (sheep) and sediment inputs from stock-mediated soil erosion exacerbated by sheep trampling around the shores. Significant livestock reduction measures have recently been implemented in the Teifi Pools catchment under the auspices of the Tir Gofal agri-environment scheme, and these will contribute to reducing nutrient enrichment from these sources, as well as reducing the impact of grazing and trampling of exposed littoral zones. Nutrient-rich droppings from the Canada geese that have recently colonised the Teifi Pools may also have a negative impact, and culling of this</p>

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	<p>outlying population of an alien species should be considered.</p> <p>Llyn Hir is known to have been limed by Dŵr Cymru Welsh Water in 1985, prior to the SSSI and SAC designation, but there is no record of its impact on the aquatic plant community. Liming may have a negative impact on the <i>Littorelletea</i> feature, which is characteristic of low alkalinity levels, and there is therefore a presumption against the repetition of this treatment.</p> <p><u>Invasive Species</u> There is a risk that the introduction of invasive non-native plants, such as Australian swamp stonecrop <i>Crassula helmsii</i>, could also have a detrimental impact on this feature. A significant source of such introductions could be via the boots, clothing or equipment of anglers visiting the Teifi Pools, and angling clubs should be encouraged to follow best practice guidelines for cleansing / decontaminating clothing and equipment before travelling between angling waters.</p> <p>Climate change may pose a threat to the Teifi Pools through accelerated erosion of peat within the catchments, changes to temperature and rainfall regimes, subsequent increases in sedimentation and in turn, changes in macrophyte composition and structure. Conversely, reductions in sulphur deposition and consequent increases in lake pH, ANC (acid neutralising capacity) and DOC (dissolved organic carbon) may lead to increased diversity in lake macrophyte species assemblages (Burgess et al. 2006).</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Brook lamprey <i>Lampetra planeri</i>. • River lamprey <i>Lampetra fluviatilis</i>. <p><u>Sediment Loads and Hydrological Management</u> The extent and quality of suitable habitat for brook and river lamprey must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p>Entrainment in water abstractions directly impacts on population</p>

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	<p>dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed.</p> <p><u>Migration Barriers</u> The impacts of barriers to migration and flow depletion are highlighted in the assessment of conservation status for this feature. The most significant potential obstruction to migration of lamprey is the Cenarth Falls (unit 2). Although sea lamprey are known to get past them, no transforming <i>Lampetra</i> spp. were found above the falls in the 2004 study, so it is not known whether they present an obstruction to the smaller river lamprey. The falls are of a size that they may present a significant barrier to lamprey movement at certain flows. In addition to Cenarth Falls, four small weirs exist on the Ceri that may prevent access to the upper parts of this tributary for migratory lamprey. There is also another group of weirs fairly low down in the Clettwr sub-catchment, which may prevent access to the majority of this tributary. The impact of artificial barriers should be assessed on a case-by-case basis. Physical modification of these barriers is required where depth/velocity/duration of flows is unsuitable to allow passage.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. <p><u>Water Quality</u> The Atlantic salmon is the focus for much of the management activity carried out on the Teifi. The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is a high priority. Measures to address these problems include the establishment of buffer zones on reaches adjacent to intensively managed livestock grazing or arable land. Tree management, especially coppicing and pollarding to increase light levels to the channel, is also carried out. In-stream liming, using limestone sand, has been trialled in the acidified Berwyn tributary. In recent years, much of this work has been supported or directly undertaken by Environment Agency Wales under their 'Sustainable Fisheries' programme. Other work has included reduction in exploitation pressure through the introduction of 'catch and release' angling (both mandatory, through EA byelaws, and voluntary, encouraged by the local angling clubs).</p> <p><u>Sediment Loads</u> Elevated levels of fines (particles <0.83mm) within spawning</p>

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	<p>substrates can interfere with egg and fry survival. Clean substrate free from excessive siltation should predominate at suitable spawning sites. Spawning habitat is defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256 mm) but with the majority being <150 mm. Water depth during the spawning and incubation periods should be 15-75 cm. Fry habitat is indicated by water of <20 cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40 cm deep and similar substrate. Holding areas are defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, and provides cover for fish and a source of food for invertebrates.</p> <p><u>Pollution</u> In the Teifi catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.</p> <p>Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on invertebrate populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations.</p>

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	<p>Measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC.</p> <p>Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering, or likely to impact upon the site should be monitored, reviewed and altered if necessary.</p> <p><u>Vegetation</u> Overhanging trees provide valuable shade and food sources, whilst tree root systems provide important cover and flow refuges for juveniles.</p> <p><u>Migration Barriers</u> In all river types, artificial barriers should be made passable. On the Teifi artificial barriers are not considered to be a major issue, but local problems exist. The impact of existing barriers should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented.</p> <p>Development activities that may cause long-term or temporary physical, acoustic, chemical and sediment barrier effects will need to be addressed in the assessment of specific plans and projects. Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Intake screens must meet statutory requirements under the Salmon & Freshwater Fisheries Act.</p> <p><u>Competition and Species Management</u> A small-scale salmon rearing and stocking programme has recently been commenced on the lower Teifi by a local angling association, using brood-stock taken from the river. The management objectives for SAC salmon populations are to attain naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It</p>

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	<p>carries various ecological risks, including the loss of natural spawning from brood-stock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. There should therefore be a presumption against salmon stocking in the Afon Teifi SAC.</p> <p>The presence of artificially high densities of other fish species can create unacceptably high levels of predatory and competitive pressure on juvenile salmon and the aim should be to minimise these risks in considering any proposals for stocking. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p>Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries. Net Limitation Orders are used to control the estuarine fishery. Exploitation of salmon by rod fisheries is regulated by EA licensing and byelaws controlling the fishing season and allowable methods.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Bullhead <i>Cottus gobio</i>. <p><u>Migration Barriers</u> Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences. New in-stream structures should be avoided, whilst the impact of existing artificial structures needs to be evaluated.</p> <p><u>Sediment Load</u> The extent and quality of suitable bullhead habitat must be maintained. Elevated levels of fines can interfere with egg and fry survival. Spawning habitat is defined as unsilted coarse (gravel/pebble/ cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles/cobbles are therefore important.</p> <p><u>Vegetation and Scrub Management</u> The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be</p>

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	<p>limited to no more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants. Slack-water areas provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.</p> <p>Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence.</p> <p>Maintenance of intermittent tree cover in conjunction with retention of woody debris helps to ensure that habitat conditions are suitable. Some reaches may naturally have lower tree cover.</p> <p><u>Competition</u> The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of fish should be avoided in the SAC. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <p>Bullheads are relatively sedentary and interactions between populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact. There should be no stocking/transfers of bullhead unless agreed to be in the best interests of the population.</p> <p>In general, management for other SAC features is expected to result in favourable habitat for bullhead, through improvements in water quality and flow regime and maintenance of suitable physical habitat.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Otter <i>Lutra lutra</i>. <p><u>Habitat Extent</u></p>

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	<p>Although recent monitoring suggests that the otter population on the Teifi may well be at the carrying capacity for the catchment, it is possible that, if all the breeding sites achieve optimal habitat conditions and fish and amphibian stocks are secured, the catchment may then support further breeding animals. However, the amount of compression of home ranges that otters will accept cannot as yet be determined.</p> <p>Although it is not possible to conclude whether the overall number of potential breeding sites in the catchment is high or low (in relation to the total length of watercourse), there does appear to be a marked difference in the number and distribution of sites in the two halves of the catchment. In particular, an assessment of otter breeding habitat has indicated that there may be a shortage of suitable breeding sites in the upper half of the catchment, which may affect the long-term viability of the population. This could be addressed by habitat enhancement, including stock exclusion from suitable woodlands near to the river, coppicing discrete areas close to the bank edge to promote scrub growth, and the construction of log-pile otter holts.</p> <p>Food availability is an important factor. Fish biomass should stay within expected natural fluctuations. A potential problem appears to be the decline in eel populations, and similar concerns are apparent with respect to amphibian numbers on a UK scale. Recent survey work on the upper reaches of the river has suggested a possible decline in otter use of these stretches, and this may in turn be linked to reduced fish populations, as a knock-on effect of invertebrate depletion due to sheep dip pollution.</p> <p><u>Land Management</u> Management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter population of a size determined by natural prey availability and associated territorial behaviour. The involvement of river users and land managers will be important in improving potential breeding habitat near to the river. Agri-environment schemes and the Better Woodlands for Wales scheme provide possible mechanisms for maintaining suitable sites, such as lightly grazed woodlands, areas of dense scrub, and tussocky fens with purple moor-grass.</p> <p><u>Migration Barriers</u> Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for</p>

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	<p>otter road deaths, such features may be retrofitted.</p> <p><u>Pollution & Contamination</u> Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p> <p>Annex II habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p><u>Hydrological Management</u> The principal factors influencing the river populations of this feature are broadly similar to those affecting the <i>Ranunculus</i> vegetation (Feature 1). These include flow, substrate quality and water quality. Favourable management for this feature is largely dependent on ensuring that sufficient depth, velocity and duration of flow and sufficiently low phosphate levels are maintained within the natural range of the feature. A favourable flow regime can be defined with reference to naturalised flows (removing the influence of artificial abstractions and discharges from flow records). While more sophisticated analysis of depth and velocity has been carried out locally for the Review of Consents process, a flow level criterion is generally applied to regulate abstractions. Based on current available information, the current abstraction regime in the Afon Teifi SAC is not considered to be damaging to this feature.</p> <p><u>Water Quality and Diffuse Pollution</u> The maintenance of sufficient suitable habitat for the feature in terms of water quality is likely to require catchment-wide measures to control diffuse pollution from agriculture, as the principal source of phosphate. In the Afon Teifi catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, separating clean and dirty water in farmyards, and the establishment of fenced buffer zones on river reaches adjacent to intensively managed livestock grazing or arable land. Additional measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation</p>

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	<p>objectives for the SAC.</p> <p>NRW water quality monitoring (2004 data, quoted in Burgess et al., 2006) has indicated higher than expected phosphate levels in the three main pools, although only marginally so in Llyn Hir. Elevated phosphate levels may in theory have a negative impact on the feature by encouraging the growth of more vigorous competitive plant species, but in the Teifi Pools this appears unlikely to occur due since few other species can persist at the depth favoured by the floating water-plantain. Possible reasons for elevated nutrient levels include enrichment from livestock dung (sheep) and sediment inputs from stock-mediated soil erosion exacerbated by sheep trampling around the shores. Significant livestock reduction measures have recently been implemented in the Teifi Pools catchment under the auspices of the Tir Gofal agri-environment scheme, and these will contribute to reducing nutrient enrichment from these sources.</p> <p><u>Nutrient Management</u> Llyn Hir is known to have been limed by Dŵr Cymru Welsh Water in 1985, but there is no recorded indication of a negative impact on the aquatic flora. Liming of upland catchments has not been shown to affect floating water-plantain, and given the range of pH data and substrate affinities recorded, it appears unlikely that it will have any significant effect.</p> <p><u>Species Stability and Management</u> While acknowledging the lack of available information on the management of upland lakes for floating water-plantain, the LIFE report on the ecology of the species (Lansdown & Wade, 2003), quoting Welsh data, suggests that upland lake populations are amongst the most stable, and that management is unlikely to be needed unless there is a change in the water chemistry or processes suppressing succession.</p> <p>Monitoring has shown there to be healthy populations of floating water plantain in all three of the principal Teifi Pools: Llyn Teifi, Llyn Egnant and Llyn Hir. The species grows most abundantly at 1-2.5m depth, and relies predominantly on vegetative reproduction for maintenance and dispersal of the population, although it is known to flower periodically during dry summers. Llyn Teifi and Llyn Egnant are artificially regulated as reservoirs for public water supply, operated by Dŵr Cymru Welsh Water since the late 1950s. The impact of the current operation of these reservoirs has been investigated as part of the Environment Agency's Review of Consents process (Natural Resources Wales, 2007), which</p>

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	<p>concluded that the floating water-plantain is remarkably tolerant of the fluctuating water levels that result from the abstraction regime, and that there is no negative impact on the feature.</p> <p>Annual flowering populations of floating water plantain are often associated with the draw-down zones of permanent water bodies such as Llyn Teifi and Llyn Egnant, probably formed by plantlets which break off from stolons on deeper plants and are washed to the margins of the lakes, where they root and form flowering stands (Lansdown and Wade). Southey & Broughton noted particularly strong colonies upon the thick, silty margins of Llyn Teifi. Seasonal fluctuations in water levels in the regulated lakes are amplified by abstraction, resulting in prolonged exposure of the lake margins, particularly in years of low rainfall (such as 1976 or 1995). Draw-down events are likely to stimulate flowering of the deep water populations of floating water plantain, leading to the production of viable seed. The Teifi Pools has been described as one of the centres for genetic diversity of floating water plantain populations (Lansdown and Wade), and the abstraction regime of the regulated lakes may contribute to this element by encouraging more frequent flowering events.</p> <p><u>Invasive Species and Competition</u> There is a risk that the introduction of invasive non-native plants, such as Australian swamp stonecrop <i>Crassula helmsii</i>, could also have a detrimental impact on this feature. A significant source of such introductions could be via the boots, clothing or equipment of anglers visiting the Teifi Pools, and angling clubs should be encouraged to follow best practice guidelines for cleansing / decontaminating clothing and equipment before travelling between angling waters.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i>. <p><u>Migration Barriers</u> The impacts of barriers to migration and flow depletion are highlighted in the assessment of conservation status for this feature. The most significant potential obstruction to migration of lamprey is the Cenarth Falls (Unit 2). Although sea lamprey are known to get past them, as noted above, the falls are of a size that they may present a significant barrier to lamprey movement at certain flows. In addition to Cenarth Falls, four small weirs exist on the Ceri that may prevent access to the upper parts of this tributary for migratory lamprey. There is also another group of weirs fairly</p>

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	<p>low down in the Clettwr sub-catchment, which may prevent access to the majority of this tributary. The impact of artificial barriers should be assessed on a case-by-case basis. Physical modification of these barriers is required where depth/velocity/duration of flows is unsuitable to allow passage.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed.</p> <p><u>Sediment Loads and Hydrological Management</u> The extent and quality of suitable sea lamprey habitat must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</p> <ul style="list-style-type: none"> • Distribution within catchment. <ul style="list-style-type: none"> ○ Distribution within site Units 2-6. • Typical species (Units 2-6) <ul style="list-style-type: none"> ○ Site-specific definitions for reference Healthy <i>Ranunculon</i> vegetation type for sites 2-6. Refer to page 18 & 19 from the abovementioned document. • Native species (Units 2-6). <ul style="list-style-type: none"> ○ Cover of indicators of eutrophication maintained below threshold over the medium to long term. Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. and <i>Vaucheria</i> spp.) should not have a cover value of greater than 10% in 3 consecutive years in any three representative sample stretches of suitable habitat. • Alien / introduced species (Units 2-6). <ul style="list-style-type: none"> ○ No impact on native biota from alien or introduced species. Non-native species such as <i>Elodea</i> spp. should not be dominant in more than 20% (maximum of 1 in 5) of 10m sample stretches in any one representative sample 100m length of suitable

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	<p>habitat.</p> <p>Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i></p> <ul style="list-style-type: none"> • Age/size structure of ammocoete population (Units 1-6). <ul style="list-style-type: none"> ○ Samples of < 50 Ammocoetes contain at least 2 size classes. ○ Samples of > 50 Ammocoetes contain at least 3 size classes. <p>This gives an indication of recruitment to the population over the several years preceding the survey. Failure of one or more years recruitment may be due to either short or long term impacts or natural factors such as natural flow variability, therefore would trigger further investigation of the cause rather than leading automatically to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution of ammocoetes within catchment (Units 1-6). <ul style="list-style-type: none"> ○ Present at not less that 2/3 of sites surveyed within natural range. <p>The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit except Unit 7 (the Teifi Pools). Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> ○ No reduction in distribution of ammocoetes. <p>Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit or sub-unit/tributary, and will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Ammocoete density. <ul style="list-style-type: none"> ○ Optimal habitat: >10m² overall catchment mean: >5m². <p>Optimal habitat comprises beds of stable fine sediment or sand >15cm deep, low water velocity and the presence of organic detritus, as well as, in the Teifi, shallower sediment, often patchy and interspersed among coarser substrate.</p> <p>Sea lamprey <i>Petromyzon marinus</i></p> <ul style="list-style-type: none"> • Distribution within catchment (Units 1-2). <ul style="list-style-type: none"> ○ Suitable habitat adjacent to or downstream of suitable spawning sites should contain <i>Petromyzon</i> ammocoetes.

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	<ul style="list-style-type: none"> ○ Spawning adults to be reported from Units 1 - 2 in at least 5 years out of 6. <ul style="list-style-type: none"> • Ammocoete density (Units 1-2) <ul style="list-style-type: none"> ○ Ammocoetes should be present in at least four sampling sites each not less than 5km apart. <p>This standard CSM attribute establishes a minimum occupied spawning range, within any sampling period, of 15km.</p> <p>Atlantic salmon <i>Salmo salar</i></p> <ul style="list-style-type: none"> • Adult run size (Units 1-6). <ul style="list-style-type: none"> ○ Conservation Limit complied with at least four years in five. <p>The Conservation Limit for adult run size has been exceeded in nine out of the past ten years, but for juvenile population densities, around 50% of the surveys carried out between 1995-2005 produced densities at a level to cause concern (categories D-F) with little improvement observed in recent years. In the recent surveys, there are still many headwater streams that show salmon densities of grade D or below.</p> <ul style="list-style-type: none"> • Juvenile densities (Units 2-6). <ul style="list-style-type: none"> ○ Expected densities for each sample site using HABSCORE. <p>The estimate of adult numbers is converted into an estimate of numbers of eggs deposited which is compared against an Egg Deposition Target (EDT), calculated by considering the area of suitable spawning habitat within the catchment. The equivalent adult run to achieve the EDT is described in terms of a Conservation Limit, which must be exceeded 4 years in 5 for the Management Target to be considered attained. Electro-fishing for juveniles is either quantitative or semi-quantitative, and estimated juvenile densities are classified in one of six categories A to F. The monitoring guidance produced by the LIFE in UK Rivers project recommends that ideally juvenile densities should be compared to predicted densities for the sample reach using the HABSCORE model. These targets are calculated and monitored by the Environment Agency as part of the Salmon Action Plan for the Teifi.</p> <ul style="list-style-type: none"> • Biological quality (Units 1-6). <ul style="list-style-type: none"> ○ Biological GQA class A. <p>This is the class required in the CSM guidance for Atlantic salmon, the most sensitive feature.</p>

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<ul style="list-style-type: none"> • Chemical quality (Units 1-6). Specified limits: <ul style="list-style-type: none"> ○ Dissolved Oxygen (% sat) 10%ile – 80. ○ Biological Oxygen Demand (mg/l) 90%ile – 2.5. ○ Total Ammonia (mg N/l) 90%ile – 0.25. ○ Un-ionised Ammonia (mg N/l) 95%ile – 0.021. ○ pH (lower limit as 5%ile, upper limit as 95%ile) – 6.0-9.0. ○ Hardness (mg/l CaCO₃) Mean – ≤ 10; >10 and ≤50; >50 and ≤ 100; >100. ○ Dissolved Copper (µg/l) 95%ile – 5; 22; 40; 112. ○ Total Zinc (µg/l) 95%ile – 30; 200; 300; 500. • Flow (Units 1-6). <ul style="list-style-type: none"> ○ Targets are set in relation to river/reach type(s) (below) 	<p>Table 1 HDERF1 - River flow thresholds for SAC/SSSI rivers</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="text-align: left;">EW band (sensitivity)</th> <th colspan="3">Maximum % reduction from daily naturalised flow</th> </tr> <tr> <th>>Qn50</th> <th>Qn50-95</th> <th><Qn95</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Very High</td> <td>10</td> <td>10</td> <td>1-5</td> </tr> <tr> <td style="text-align: left;">High</td> <td>15</td> <td>10</td> <td>5-10</td> </tr> </tbody> </table> <p>Bullhead <i>Cottus gobio</i></p> <ul style="list-style-type: none"> • Population densities (Units 2-6). <ul style="list-style-type: none"> ○ No less than 0.2m² in sampled reaches. <p>CSM guidance states that densities should be no less than 0.2 m⁻² in upland rivers (source altitude >100m) and 0.5 m⁻² in lowland rivers (source altitude ≤100m). A significant reduction in densities may also lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution (Units 2-6). <ul style="list-style-type: none"> ○ Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current. <p>Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an</p>	EW band (sensitivity)	Maximum % reduction from daily naturalised flow			>Qn50	Qn50-95	<Qn95	Very High	10	10	1-5	High	15	10	5-10
EW band (sensitivity)	Maximum % reduction from daily naturalised flow															
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High	15	10	5-10													

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	<p>unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Reproduction / age structure (Units 2-6). <ul style="list-style-type: none"> ○ Young-of-year fish should occur at densities at least equal to adults. <p>This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.</p> <p>Otter <i>Lutra lutra</i></p> <ul style="list-style-type: none"> • Distribution (all Units). <ul style="list-style-type: none"> ○ Otter signs present at 75% of Otter Survey of Wales sites. <p>The Otter Survey of Wales undertaken in 2002 surveyed 111 reference sites in the Teifi catchment, of which 97% were positive. This continued an upward trend in signs from 38% in 1977-78, 40% in 1984-85, and 59% in 1991. The next full Otter Survey of Wales is planned in 2009, but NRW is also currently considering setting up a monitoring programme of OSW survey sites using a network of volunteers.</p> <ul style="list-style-type: none"> • Breeding activity (all Units). <ul style="list-style-type: none"> ○ 2 reports (within the catchment) of cub/family sightings, or 2 reports of cub, lactating or pregnant female road casualties at least 1 year in 3. <p>Evidence that otter breeding has taken place within the catchment is usually derived from three sources: otter road mortalities where pregnant/lactating females, and/or cubs are involved, sighting of cubs (usually together with the female); and cubs found abandoned (either separated from the family group or orphaned as a result of the death of the mother). Based on current information, 7 centres of breeding activity have been estimated within the SAC.</p> <ul style="list-style-type: none"> • Actual and potential breeding sites (all Units). <ul style="list-style-type: none"> ○ No decline in number and quality of mapped breeding sites in the Teifi catchment. <p>In the Teifi catchment, 47 actual or potential breeding sites have been identified, distributed throughout the catchment on the main river and tributaries.</p> <p>Floating water-plantain <i>Luronium natans</i></p> <ul style="list-style-type: none"> • Distribution of floating water-plantain in the main river

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	<p>(Units 4-5).</p> <ul style="list-style-type: none"> ○ Present at 90% of upstream (principal) monitoring sites for river populations one year in six. Present at 70% of downstream (marginal) monitoring sites for river populations one year in six (sites to be determined). (NRW Monitoring Report No. 98/2/7, 1998). <p>The 90% and 70% figures for river populations are based on evidence that riverine floating water-plantain populations can become extinct due to the less-constant character of river environments compared with those in lakes. Downstream populations have a potential for recolonisation from the upstream locations.</p> <ul style="list-style-type: none"> • Distribution of floating water-plantain in the Teifi pools (Unit 7). <ul style="list-style-type: none"> ○ Live vegetative material present in each of Llyn Teifi, Llyn Egnant, Llyn Hir and Llyn y Gorlan. (NRW Environmental Monitoring Report No. 13, 2004). <p>Floating water-plantain is also present in Llyn Bach but this very small water body is not considered critical to monitor at present, as there is no obvious threat to this population.</p> <ul style="list-style-type: none"> • Presence of floating flowers in the Teifi pools (Unit 7). <ul style="list-style-type: none"> ○ Present in at least one of Llyn Teifi, Llyn Egnant, Llyn Hir, Llyn y Gorlan and Llyn Bach, (or in any part of these) one year in 6. (NRW Environmental Monitoring Report No. 13, 2004). <p>This indicator will show that lake populations have the potential for seed dispersal and genetic exchange. It is important that there is evidence of sexual reproduction, especially in the long term. There is no requirement for floating water-plantain to flower in the river, although it is known that it does so occasionally due to the coincidence of suitable conditions for flowering and dispersal.</p> <ul style="list-style-type: none"> • Native species (Unit 7). <ul style="list-style-type: none"> ○ Cover of indicators of eutrophication maintained below threshold over the medium to long term. <p>Epiphytic filamentous green algae indicative of eutrophication should have a cover value of not greater than 50% on the surface of each plant for the first 9 out of any 10 aquatic macrophytes examined, in 3 consecutive years, in any of the pools.</p>

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	<ul style="list-style-type: none"> • Alien / introduced species (Unit 7). <ul style="list-style-type: none"> ○ No impact on native biota from alien or introduced species. <p>The presence of non-native invasive plant species, including but not limited to <i>Crassula helmsii</i>, will not be tolerated in any of the Teifi Pools.</p> <p>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></p> <ul style="list-style-type: none"> • Macrophyte community composition: Llyn Hir (Unit 7). <ul style="list-style-type: none"> ○ All of the following characteristic species should be present in Llyn Hir: <i>Lobelia dortmanna</i>, <i>Littorella uniflora</i>, <i>Isoetes</i> spp.*, <i>Subularia aquatica</i>, <i>Sparganium angustifolium</i>, <i>Luronium natans</i>, <i>Carex rostrata</i>. *Both <i>Isoetes lacustris</i> and <i>I. echinospora</i> are recorded in the Teifi Pools. <p><i>Utricularia minor</i> is also a key species of the community, but is not considered appropriate for effective monitoring as it is easily overlooked.</p> <ul style="list-style-type: none"> • Macrophyte community composition: Llyn Teifi, Llyn Egnant, Llyn y Gorlan and Llyn Bach (Unit 7). <ul style="list-style-type: none"> ○ For each of Llyn Teifi, Llyn Egnant, Llyn y Gorlan and Llyn Bach those of the characteristic species listed above, recorded as present between 1997 and October 2005, should be present. • Native species (Unit 7). <ul style="list-style-type: none"> ○ Cover of indicators of eutrophication maintained below threshold over the medium to long term. <p>Epiphytic filamentous green algae indicative of eutrophication should have a cover value of not greater than 50% on the surface of each plant for the first 9 out of any 10 aquatic macrophytes examined, in 3 consecutive years, in any of the pools.</p> <ul style="list-style-type: none"> • Alien / introduced species (Unit 7). <ul style="list-style-type: none"> ○ No impact on native biota from alien or introduced species. <p>The presence of non-native invasive plant species, including but not limited to <i>Crassula helmsii</i>, will not be tolerated in any of the Teifi Pools.</p>

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	<p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Afon Teifi/River Teifi SAC (2008) available at:</i> http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=3c827c66-806e-46ad-ba01-859713c29bd2&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ▪ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation: Favourable ▪ Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>: Favourable • Brook lamprey <i>Lampetra planeri</i>: Unfavourable: unclassified • River lamprey <i>Lampetra fluviatilis</i>: Unfavourable: unclassified • Atlantic salmon <i>Salmo salar</i>: Unfavourable: unclassified • Bullhead <i>Cottus gobio</i>: Unfavourable: unclassified • Otter <i>Lutra lutra</i>: Favourable • Floating water-plantain <i>Luronium natans</i>: Favourable • Sea lamprey <i>Petromyzon marinus</i>: Unfavourable: unclassified
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Invasive Species</u> Stands of <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation feature are known to be widespread in the Afon Teifi SAC including many of the tributaries. However, further information on its natural range, distribution and variation is desirable. Sympathetic management will be promoted wherever the feature is present. Species indicative of unfavourable condition for this feature e.g. filamentous algae associated with eutrophication and invasive non-native species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status within the SAC.</p> <p><u>Water Quality and Nutrient Enrichment</u> Adverse factors may include elevated nutrient levels, shading or altered flow and/or sediment regimes. It is possible that reaches with slightly elevated nutrient levels and/or regulated flows may have a higher cover of the feature than under natural conditions.</p>

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	<p>Stands of this upland lake plant community, the <i>Littorelletea uniflorae</i> and/or the <i>Isoëto-Nanojuncetea</i> are present in each of the Teifi Pools. Adverse factors may include elevated nutrient levels, artificial regulation of water levels ('draw-down') in the reservoirs at Llyn Teifi and Llyn Egnant, and poaching of exposed lake shores by livestock during periods of low water levels. Species indicative of unfavourable condition for this feature e.g. filamentous algae associated with eutrophication, invasive nonnative species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status within the SAC.</p> <p>Adverse factors on Floating water-plantain populations may include elevated nutrient levels, artificial regulation of water levels ('draw-down') in the reservoirs at Llyn Teifi and Llyn Egnant, altered river flow and/or sediment regimes, and shading. Species indicative of unfavourable condition for this feature e.g. filamentous algae associated with eutrophication, invasive nonnative species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status within the SAC.</p> <p><u>Habitat Barriers</u> It is considered necessary to maintain a fully developed <i>Littorelletea</i> community in Llyn Hir only. The development of the community in Llyn Bach and Llyn y Gorlan is restricted by the small size of these lakes. The development of the community in Llyn Egnant and Llyn Teifi is restricted by the current management of these two lakes as reservoirs, since several of the key component species of the <i>Littorelletea</i> community are unable to cope with the effects of frequent draw-down. These latter four lakes, in their current condition, contribute to maintaining the feature as a whole in favourable condition, but it is not necessary for them to support a fully developed <i>Littorelletea</i> community</p> <p><u>Competition and Stocking</u> Fish stocking can adversely affect population dynamics through competition, predation, introduction of disease and alteration of population genetics.</p> <p><u>Water Abstraction & Channel Morphology</u> Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. In general, management for one fish feature is likely to be sympathetic for the other features present in the river, provided that the components of favourable conservation status for the watercourse (key environmental factors above) are secured. The characteristic channel morphology provides the diversity of water depths, current</p>

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	<p>velocities and substrate types necessary to fulfil the habitat requirements of the features. The close proximity of different habitats facilitates movement of fish to new preferred habitats with age.</p> <p><u>Afforestation</u> Upland coniferous forestry plantations in parts of the upper catchment, including the Groes, Berwyn and Brefi catchments, adversely affect the run-off and sediment characteristics and water quality of the river.</p> <p><u>Pollution</u> In a few locations there are also problems with toxic run-off from abandoned metal mines. Measures should be taken to restore the hydrological characteristics of headwater areas including wetland functions.</p> <p><u>Construction, Development & Migration Barriers</u> Salmon migration can be affected by acoustic barriers and by high sediment loads, which can originate from a number of sources including construction works. While the breeding population of otter on the Teifi is not currently considered to be limited by the availability of suitable breeding sites, there is some uncertainty over the number of breeding territories which the SAC is capable of supporting given near-natural levels of prey abundance. The decline in eel populations may be having an adverse effect on the population of otters on the Teifi. Road and bridge improvement schemes within the catchment should take appropriate measures towards achievement of this objective.</p> <p><u>Disturbance</u> Floating water-plantain populations are known to be present in the main river reaches through and downstream of Cors Caron, and in each of the Teifi Pools. Vegetative reproduction is believed to be the main means of regeneration and dispersal for these populations, but they are known to flower periodically in the Teifi Pools during dry summers. Thus, disturbance during the summer months could adversely affect the regeneration of the populations. Sexual reproduction is important, especially in the long-term, as this provides an alternative means of dispersal and genetic exchange over short and long distances.</p> <p><u>Atmospheric Deposition</u> Potential increased emissions in traffic, employment, dust, etc.</p>

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<p>Landowner/ Management Responsibility</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary.</p> <p>There are 7 Management Units within the River Teifi SAC designation with unit 5 under ownership of the NRW.</p> <table border="1"> <thead> <tr> <th>Unit number</th> <th>SAC</th> <th>SSSI</th> <th>CCW owned</th> <th>Surroundings</th> </tr> </thead> <tbody> <tr> <td colspan="5">Afon Teifi SSSI</td> </tr> <tr> <td>1</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>Cors Caron</td> </tr> <tr> <td rowspan="2">6</td> <td>6.1</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>6.2</td> <td>✓</td> <td>✓</td> <td>Elenydd-M</td> </tr> <tr> <td>7</td> <td>✓</td> <td>✓</td> <td></td> <td>Elenydd-M</td> </tr> </tbody> </table>	Unit number	SAC	SSSI	CCW owned	Surroundings	Afon Teifi SSSI					1	✓	✓			2	✓	✓			3	✓	✓			4	✓	✓			5	✓	✓	✓	Cors Caron	6	6.1	✓	✓		6.2	✓	✓	Elenydd-M	7	✓	✓		Elenydd-M
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<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>																																																	

<p>Site Name: Cwm Doethie - Mynydd Mallaen Location Grid Ref: SN747458 JNCC Site Code: UK0030128 Size 4122.29 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Cwm Doethie – Mynydd Mallaen is within the Elenydd – Mallaen SAC.</p> <p>The Elenydd – Mallaen area occupies the southern section of the Cambrian Mountains in central Wales, stretching from the upper Cothi and Tywi valleys north-west of Llandovery to the Ystwyth, Elan and Wye valleys in the north. These hills are built of rocks of Silurian and Ordovician age and the landforms are typical of the 'slate uplands' of south-central Wales, with plateaux separated by steep-sided valleys.</p> <p>Elenydd is located in the centre of this area. It is one of the most important areas of hill land in Wales for nature conservation and is of outstanding interest for its range of breeding birds. Much of the hill vegetation is also of special interest. Elenydd is important in Mid Wales for its nutrient-poor upland lakes. The area supports a wide variety of uncommon plants and animals.</p> <p>Cwm Doethie – Mynydd Mallaen, consisting largely of steep-sided valleys and upland tracts, is located in the southern part of the Cambrian Mountains. It is of outstanding interest for its heath and woodland habitats and wildlife and, in particular, its birdlife.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <ul style="list-style-type: none"> • European dry heaths.
<p>Conservation Objectives</p>	<p>Vision for the site: For each habitat, or species group of special interest, its natural range and areas it covers within that range are stable or increasing, and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and, the conservation status of its typical species is favourable.</p> <p>For each species of particular interest, the population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the</p>

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	<p>natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Old sessile oak woodlands remain a significant and conspicuous feature of the upland valley sides within the plan area. Those in the Elan and Claerwen valleys and Rhayader area, the Dinas and Gwenffrwd area of the upper Tywi valley and the Cothi valley to the north of Mynydd Mallaen are particularly well developed and extensive. • The boundary between the woodland and adjacent upland habitat is often a flexible one where trees regenerate on to open ground. At many locations oak woodland forms patches in ‘ffridd’ areas where there is less grazing pressure on the upland fringe. • The oak woodland has of a variety of different structures and its character varies from place to place, ranging from long standing closed canopy areas to largely open wood pasture. • The dominant trees are sessile oaks, but in places birch is more conspicuous. Rowans and other trees occur as a minor component while at the foot of slopes where the oak woodland grades into wet woodland, there are some alders and willows. Non-native trees such as beech and sycamore will be present only in small numbers are generally scarce. • Under-storey shrubs are generally quite sparse, but scattered groups of hazel or holly will be found in some woods. • Ground cover varies widely. Parts will be bracken covered, others grassy, others again have a wider range of flowering plants and ferns and are often carpeted with bluebells in spring. On thin soils in shaded moist situations there are luxuriant carpets of mosses and liverworts, with or without under-shrubs like heather and bilberry. • The larger trees support a variety of lichens on their trunks and branches. • In each woodland block, trees in most age classes are present and veteran trees are prominent in some areas,

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	<p>particularly where there is wood pasture.</p> <ul style="list-style-type: none"> • In all areas except wood pasture, there is evidence of actual regeneration in the form of seedlings and saplings or potential for regeneration, while in some wood pasture areas the planting and protecting of young trees, especially oak, may be appropriate. • Dead wood is well distributed and sometimes abundant, both lying on the woodland floor and occurring as standing dead trees or branches of trees. • The majority of the oak woodland has a closed canopy, but there are some clearings and much larger areas that are effectively wood pasture. These conditions should be sympathetic to the important populations of mosses and liverworts on the one hand and lichens on the other. • The oak woods support a characteristic assemblage of birds, such as wood warbler, pied flycatcher and redstart. • The pattern and distribution of grazed and un-grazed woods may change over time as different conservation needs arise. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The extent, quality and diversity of heath vegetation within the constituent sites is maintained and, where possible, degraded heath is restored to good condition. • The main heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath. • Sunny slopes in certain areas support vegetation that includes bell heather and western gorse and steep north and east facing slopes have a rich variety of mosses and liverworts beneath the dwarf shrub canopy, including bog mosses in some areas. • Populations of uncommon plants, such as lesser twayblade, are stable or increasing. • The larger heathland areas provide suitable habitat for breeding birds, including red grouse and merlin. • All factors affecting the achievement of these conditions are under control.

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<p>Component SSSIs</p>	<p>The Elenydd-Mallean area has been divided into 10 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land ownership.</p> <p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on land ownership encompassing seventeen SSSI designations:</p> <ul style="list-style-type: none"> ▪ Elenydd. ▪ Cwm Doethie – Mynydd Mallaen. ▪ Marcheini Uplands, Gilfach Farm & Gamallt. ▪ Carn Gafallt. ▪ Llynoedd Ieuan. ▪ Cwm Gwynllyn. ▪ Coedydd Glannau a Cwm Coel. ▪ Coed Yr Allt-Goch. ▪ Cerrig Gwalch. ▪ Caban Lakeside Woodlands. ▪ Mwyngloddfa Cwmystwyth. ▪ Caeau Cnwch a Ty'n-Y-Graig. ▪ Caeau Troed-Rhiw-Drain. ▪ Gweunydd Ty'n-Y-Llidiart. ▪ Rhos Yr Hafod. ▪ Rhosydd Llanwrthwl. ▪ Vicarage Meadows. <p>As aforementioned, Cwm Doethie – Mynydd Mallaen is also recognised as a SSSI.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Old sessile oak woods with Ilex and Blechnum in the British Isles. <p><u>Grazing</u> Low levels of sheep grazing can be beneficial to the mosses, liverworts and lichens in the oak woodland. Different grazing regimes are required in different types of oak woodland. The more open 'park-like' areas require regular grazing during the growing season. The main oak woodland blocks may need periodic grazing</p>

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	<p>to maintain a fairly open ground layer but would benefit from stock exclusion in the short-term to allow the woodland to regenerate, develop an understorey where possible and build up the levels of dead wood. In the longer term a continuous, very low stocking density may be more appropriate in some areas.</p> <p><u>Woodland Management</u> Woodland should be encouraged to develop a diverse structure, with mature and over-mature trees and sufficient natural regeneration of native trees and shrubs. As far as possible natural processes will be allowed to operate, with any active management limited to that required for the control of non-native species (see below) and for safety reasons along the footpaths. The regeneration of oak and ash in particular requires plenty of light to encourage the growth of any seedlings into viable saplings. Natural instability on the steeper slopes, cliffs and scree may create large canopy gaps on a fairly regular basis but, elsewhere, gaps arising from tree death will be rare in the short to medium term and they may be too small to permit the establishment of young trees. In this case, the enlargement of natural gaps and the creation of new gaps by selective felling might be considered in the longer term.</p> <p>Very old trees are in short supply. The majority of trees in many of the plan units are of middle years and have yet to develop the characteristic holes, crevices and dead wood of veteran trees. Every effort should be made to extend the life of existing veteran trees for as long as possible. Judicious tree surgery can lighten large limbs without harming the lower plant interest and reduce the risk of collapse of the trunk or wind throw of the entire tree. Competing woody species and climbers can be removed by cutting. Dead and decaying wood should normally be retained in the woods, though some of this is likely to fall to the bottom of the steeper slopes. Wherever possible, standing dead trees should be allowed to fall naturally. Dead wood is important for its associated fauna and flora and is also essential to nutrient recycling and restoring soil nutrients. Dead wood continues to support lower plants and once the bark falls off, standing dead trees can support specialised lichen species. Movement and cutting/tidying of dead wood should be avoided unless essential for public and livestock safety. Any woodland management work should be undertaken between August and January so as not to disturb breeding birds and all trees providing important nesting sites should be retained.</p> <p>Many woodland mosses, liverworts and lichens need high humidity levels. Humidity may be reduced by excessive opening of the canopy, or loss of adjacent woodland cover. Any proposal to fell</p>

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	<p>and replant within, or adjacent to, areas that are important for lower plants, should be assessed for its potential impact on the mosses, liverworts and lichens. Where felling and replanting is proposed, a “continuous-cover” system should be used to avoid excessive opening of the tree canopy. This could take the form of phased removal of non-native trees and restocking by natural regeneration.</p> <p><u>Control of Invasive Non-Native Trees and Shrubs</u> Removal of beech and conifers may be agreed following assessment of their wildlife interest. There may be areas where it would be desirable to retain these trees in the canopy in the short term in order to maintain humidity for the lower plants (see above).</p> <p>In the vicinity of the former Cwm Elan House and the Hafod Estate area, the large beech trees are a feature of the historic landscape and they also represent a large potential dead wood habitat of the future, so management should aim to control their spread into other areas. All sycamores should be removed from the ash woodland but mature trees supporting good lichen communities should be retained elsewhere, provided that all saplings and young trees are removed. All rhododendron should be cleared from the woodland and any re-growth spot-treated with herbicide. Work should be carried out outside the bird breeding season.</p> <p><u>Disturbance</u> Some woodland breeding birds are particularly sensitive to disturbance during the nesting season. Public access to areas used by these species should be restricted between February and July.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European Dry Heaths. <p><u>Grazing</u> Heavy grazing, particularly in autumn and winter, is damaging to the dwarf shrubs and should be avoided. A suitable mixed grazing regime should be established/maintained across the un-fenced parts of the sites.</p> <p><u>Burning and Cutting</u> Burning can be a useful management tool for maintaining varied structure within the mature dry heathland areas on relatively level ground and for providing habitat for breeding grouse, provided that it forms part of an approved cycle of management. It is important to ensure that such management does not damage the woodland, rock, scree or ffridd areas or encourage the spread of bracken.</p>

<p>Site Name: Cwm Doethie - Mynydd Mallaen Location Grid Ref: SN747458 JNCC Site Code: UK0030128 Size 4122.29 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>Burning in combination with intense grazing can also result in the loss of those shrub species that give this habitat its characteristic appearance.</p> <p>Wet heath and other wetland areas, steep slopes and rocky areas should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses, clubmosses and ground nesting birds. Cutting is a possible alternative to burning for heathland management in the drier areas, where vehicle access is possible, and can also be usefully employed to create firebreaks. If cutting is carried out, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Care must be taken to ensure that machinery does not cause damage to fragile peat soils. In damper areas, where heather is layering, burning and cutting are not needed.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low and heathland areas are particularly sensitive to nutrient inputs. Consequently, no fertilisers should be applied in the open hill areas. Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding, where necessary, should be confined to less sensitive upland vegetation or agriculturally improved areas. Care should be taken to avoid run-off into more sensitive areas.</p> <p><u>Atmospheric Pollution/Acidification</u> Several widespread ongoing human-induced processes are changing the environmental and ecological conditions and are causing concern in upland areas in Britain. These include acidification, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. Dwarf shrubs, mosses, liverworts and lichens are particularly vulnerable to pollution from atmospheric sources.</p> <p>Much of this atmospheric pollution comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial processes. If particularly damaging, current point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. However, it will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution.</p>

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	<p><u>Access & Recreational Use</u> Unauthorised vehicle use is a threat to the moorland areas, which are easily accessible from designated By-ways. Bog and heath vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p> <p>Some By-ways, such as sections of the Monks Trod, have become impassable to vehicles encouraging motorcycles to deviate onto sensitive bog areas. This causes considerable damage and disturbance. If a durable surface cannot be installed and maintained on these routes, then motor vehicles should be restricted or diverted away from sensitive areas. Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage use by off-road vehicles away from legally designated routes.</p> <p>Although the hill land within the site is subject to rights of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to bird life. However, the impacts of this use need to be monitored and any significant damage or disturbance addressed by appropriate access restrictions if necessary.</p> <p>Some moorland areas within Elenydd SSSI are also used for military training and occasionally for other organized events and activities, such as orienteering and paragliding. Such use is entirely at the discretion of the landowners and occupiers, who should ensure there is no damage or disturbance to the features of interest. Generally, off-road vehicle use should be avoided, as should sensitive bird areas during the breeding season.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>European dry heaths</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – N/A, constrained by site topography and hydrology. ○ Lower limit – No measurable loss of extent (as measured in 2006). • Distribution. <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Occurs in all units where listed as KH or Sym below.

Constituent SSSI	SAC/SPA Features (see 3.1 above)							
	1	2	3	4	5	6	7	8
Elenydd	KH	KH	KH	Sym	KH	KH	KS	K
Cwm Doethie – Mynydd Mallaen	Sym	KH	KH	x	Sym	x	x	K
Marcheini Uplands, Gilfach Farm & Gamallt	(KH)	(KH)	(KH)	Sym	x	x	x	Sy
Cam Gafallt	Sym	KH	KH	(KH)	x	x	x	Sy
Llynoedd Ieuan	(KH)	Sym		x	x	(KH)	x	Sy
Cwm Gwynllyn	x	Sym	KH	x	x	(KH)	(KS)	Sy
Coedydd Glannau a Cwm Coel	x	x	KH	Sym	x	x	x	Sy
Coed yr Allt-goch	x	x	KH	Sym	x	x	x	Sy
Cerrig Gwalch	x	Sym	KH	KH	x	x	x	Sy
Caban Lakeside Woodlands	x	x	KH	x	x	x	x	
Mwyngloddfa Cwmystwyth	x	x	x	x	KH	x	x	Sy
Caeau Cnwch a Ty-n-y-graig	x	x	x	x	x	x	x	Sy
Caeau Troed-rhiw-drain	x	x	x	x	x	x	x	Sy
Gweunydd Ty'n-y-lldiart	x	x	x	x	x	x	x	Sy
Rhos yr Hafod	x	x	x	x	x	x	x	Sy
Rhosydd Llanwrthwl	x	x	x	x	x	x	x	Sy
Vicarage Meadows	x	x	x	x	x	x	x	Sy

KH - a 'Key Habitat', i.e. the habitat that is the main driver of management and focus of monitoring effort, perhaps because of the dependence of a key species (see KS below).

KS – a 'Key Species', often driving both the selection and management of a Key Habitat.

Sym - habitats and species that are of importance but are not the main drivers of management or focus of monitoring. These features will benefit from management for the key feature(s). These may be classed as 'Sym' features because:

- they are present in the unit but may be of less conservation importance than the key feature; and/or
- they are present in the unit but in small areas/numbers, with the bulk of the feature elsewhere; and/or
- their requirements are broader than and compatible with the management needs of the key feature(s), e.g. a mobile species that uses large parts of the site and surrounding areas.

- Habitat Quality.
 - Upper limit – N/A.
 - Lower limit – 90% of vegetation within defined area of each site unit where dry heath is a key habitat (see above) should conform to the definition of good quality blanket bog given below.

Definition of good quality dry heath: At least 50% of vegetation

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	<p>cover made up of indicator species (see list below). At least 50% of vegetation cover comprising dwarf shrubs. At least two types of dwarf shrub and one species of moss, liverwort or non-crustose lichen present (excluding hair-cap mosses and swan-neck mosses). AND: Less than 50% cover of gorse. Less than 1% cover of non-native plants and/or agricultural weeds. Less than 10% Bracken cover. Less than 20% Tree and scrub cover. AND: Less than two thirds of young pioneer plants collectively showing signs of browsing.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – No evidence of significant burning (patches larger than 0.5ha) in any parts of any units where a burning programme has not been agreed. AND: In areas subject to a burning plan, no more than 33% of the total heathland area is burnt in 5 years. AND: No evidence of burning in sensitive areas (see below). ○ Lower limit – N/A. <p>Areas sensitive to damage by fire – Exposed summits; areas with thin soil (less than 5cm deep); slopes greater than 25% and gully sides; areas with abundant bog-moss, liverworts or lichens; areas with existing small-scale structural variation due to natural re-generation (layering); pools, patches of bog peat hagsgs and eroded areas; areas adjacent to streams (5-10m buffer zone).</p> <ul style="list-style-type: none"> • Erosion/Bare Ground <ul style="list-style-type: none"> ○ Upper Limit – 10% bare ground in heathland areas in units where heathland is a key habitat. ○ Lower limit – N/A. • Air quality <ul style="list-style-type: none"> ○ Upper limit – No critical loads for acidic and nitrogen deposition are exceeded at 2 out of 3 Environment Agency monitoring stations in more than one year out of 5 ○ Lower limit – None. <p>Old sessile oak woods with Ilex and Blechnum in the British Isles</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Upper limit – None, except 0.1% loss of dry heathland areas to woodland (based on 2006 aerial photographs). ○ Lower limit – The present extent of oak woodland as mapped (extent shown on 2006 aerial photographs -

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	<p>including temporary glades).</p> <ul style="list-style-type: none"> • Canopy Cover <ul style="list-style-type: none"> ○ Upper limit – 75% canopy cover in key wood pasture areas (see maps below) OR: 95% canopy cover in key woodland areas where a closed canopy is not essential (see maps below) OR: 100% canopy cover in key woodland areas with well-developed moss and liverwort carpets and/or shade demanding lichens. ○ Lower limit – Presence of mature and/or veteran trees in key wood pasture areas OR: 75% canopy cover in key woodland areas where a closed canopy is not essential OR: 90% canopy cover in key woodland areas with well-developed moss and liverwort carpets and/or shade demanding lichens. AND: There should be a varying pattern of canopy breaks over time within all of the key woodland areas. • Regeneration <ul style="list-style-type: none"> ○ Upper limit – None in ‘closed canopy’ woodland OR: 15% ground cover of ‘scrubby growth’ in wood pasture areas. ○ Lower limit – In ‘closed canopy’ areas only, the presence of viable saplings of native species at least 1.5m high within 10 – 15 years of a gap appearing. The definition of a canopy gap is one with a diameter equal to, or more than average height of standing trees). • Woodland Structure <ul style="list-style-type: none"> ○ Upper limit – N/A. ○ Lower limit – Presence of trees and shrubs across the full range age classes in the key oak woodland areas, including saplings, young trees, mature and over mature trees AND: No reduction in the overall number of veteran trees in the key wood pasture areas (see maps below) AND: Presence of veteran trees in all woods in 100 years time, 75% of woods in 50 years time. • Tree and Shrub Composition <ul style="list-style-type: none"> ○ Upper limit – No rhododendron or thickets of other non-native invasive shrubs, such as beech and sycamore, are present in the understorey.

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	<ul style="list-style-type: none"> ○ Lower limit – 95% of tree and shrub cover is composed of locally native species, such as oak, birch, rowan, holly, hazel, hawthorn, alder and ash. AND: 50% of the canopy trees are oak. ● Dead Wood <ul style="list-style-type: none"> ○ Upper limit – None. ○ Lower limit – Presence of standing and fallen deadwood with a minimum diameter of 20cm and minimum length of 2m. ● Quality Indicators <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 50% ground cover of bryophytes in key woodland areas with well-developed moss and liverwort carpets (see maps in Annex 4). ● Grazing Pressure <ul style="list-style-type: none"> ○ Upper limit – 0.4 livestock Units (LSU)/ha/year in key wood pasture areas (see maps in annex 4) AND: 0.05 LSU/ha/year in other key oak woodland areas. ○ Lower limit – 0.2 LSU/ha/year in key wood pasture areas AND: Sufficient to suppress the growth of bramble and ivy in key woodland areas with well-developed moss and liverwort carpets and/or shade demanding lichens. ● Woodland Management <ul style="list-style-type: none"> ○ Upper limit – 10% of canopy gaps created artificially AND: 20% of areas of regeneration achieved by planting. <p>Refer to Core Management Plan (including conservation objectives) incorporating Elenydd-Mallaen Special Protection Area, Elenydd Special Area for Conservation, Coetiroedd Cwm Elan and Cwm Doethie Special areas for Conservation (2008) (minor amendment 2013) for further information at: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cors-fochno-to-cwm-sac-list/idoc.ashx?docid=452b5711-ee14-470e-af92-0dd3e322a6c4&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● European dry heaths: Unfavourable (2004) ● Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles: Unfavourable (2006)

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<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing</u> Continuous grazing is likely to prevent tree regeneration in the long term and may damage the field and shrub layers, where these elements are present. Heavy stocking could also damage moss and liverwort carpets and cause soil erosion on the steeper slopes. Heavy grazing, particularly in autumn and winter, is damaging to the dwarf shrubs and should be avoided. A suitable mixed grazing regime should be established / maintained across the un-fenced parts of the sites to maintain European dry heath.</p> <p><u>Woodland Management</u> Humidity may be reduced by excessive opening of the canopy, or loss of adjacent woodland cover. Any proposal to fell and replant within, or adjacent to, areas that are important for lower plants, should be assessed for its potential impact on the mosses, liverworts and lichens. Where felling and replanting is proposed, a “continuous-cover” system should be used to avoid excessive opening of the tree canopy. This could take the form of phased removal of non-native trees and restocking by natural regeneration.</p> <p><u>Control of Invasive Non-native Trees and Shrubs</u> Removal of beech and conifers may be agreed following assessment of their wildlife interest. There may be areas where it would be desirable to retain these trees in the canopy in the short term in order to maintain humidity for the lower plants (see above). Beech is a particular concern as it can regenerate vigorously under an oak canopy, and when mature can suppress and alter the ground flora. Sycamore has potential to invade areas where the soil is deeper and less acidic but large trees can support uncommon lichens. Rhododendron is highly invasive and represents a serious threat to the woodland in the absence of grazing.</p> <p>In the vicinity of the former Cwm Elan House and the Hafod Estate area, the large beech trees are a feature of the historic landscape and they also represent a large potential dead wood habitat of the future, so management should aim to control their spread into other areas. All sycamores should be removed from the ash woodland but mature trees supporting good lichen communities should be retained elsewhere, provided that all saplings and young trees are removed. All rhododendron should be cleared from the woodland and any re-growth spot-treated with herbicide. Work should be carried out outside the bird breeding season.</p>

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	<p><u>Disturbance</u> Some woodland breeding birds are particularly sensitive to disturbance during the nesting season. Public access to areas used by these species should be restricted between February and July.</p> <p><u>Burning and Cutting</u> Burning can be a useful management tool for maintaining varied structure within the mature dry heathland areas on relatively level ground and for providing habitat for breeding grouse, provided that it forms part of an approved cycle of management. It is important to ensure that such management does not damage the woodland, rock, scree or ffridd areas or encourage the spread of bracken. Burning in combination with intense grazing can also result in the loss of those shrub species that give this habitat its characteristic appearance.</p> <p>Wet heath and other wetland areas, steep slopes and rocky areas should not normally be burnt, as burning is likely to damage important plant and animal species, especially bog mosses, clubmosses and ground nesting birds. Cutting is a possible alternative to burning for heathland management in the drier areas, where vehicle access is possible, and can also be usefully employed to create firebreaks. If cutting is carried out, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Care must be taken to ensure that machinery does not cause damage to fragile peat soils. In damper areas, where heather is layering, burning and cutting are not needed.</p> <p><u>Soil Fertility</u> Soil fertility at this site is naturally low and heathland areas are particularly sensitive to nutrient inputs. Consequently, no fertilisers should be applied in the open hill areas.</p> <p>Supplementary stock feeding can lead to localised damage of the sward and cause poaching and gradual nutrient enrichment. Feeding, where necessary, should be confined to less sensitive upland vegetation or agriculturally improved areas. Care should be taken to avoid run-off into more sensitive areas.</p> <p><u>Atmospheric Pollution/Acidification</u> Several widespread ongoing human-induced processes are changing the environmental and ecological conditions and are causing concern in upland areas in Britain. These include acidification, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a</p>

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	<p>combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. Dwarf shrubs, mosses, liverworts and lichens are particularly vulnerable to pollution from atmospheric sources.</p> <p>Much of this atmospheric pollution comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial processes. If particularly damaging, current point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. However, it will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution.</p> <p><u>Access & Recreational Use</u> Unauthorised vehicle use is a threat to the moorland areas, which are easily accessible from designated by-ways. Bog and heath vegetation is easily damaged and may take a long time to recover. Ground nesting birds may be disturbed during the breeding season.</p> <p>Some By-ways, such as sections of the Monks Trod, have become impassable to vehicles encouraging motorcycles to deviate onto sensitive bog areas. This causes considerable damage and disturbance. If a durable surface cannot be installed and maintained on these routes, then motor vehicles should be restricted or diverted away from sensitive areas. Owners and occupiers should co-operate with the police and other statutory bodies to undertake enforcement action where possible and discourage use by off-road vehicles away from legally designated routes.</p> <p>Although the hill land within the site is subject to rights of public access on foot, such use does not appear to be so intensive as to cause habitat damage or significant disturbance to bird life. However, the impacts of this use need to be monitored and any significant damage or disturbance addressed by appropriate access restrictions if necessary.</p> <p>Some moorland areas within Elenydd SSSI are also used for military training and occasionally for other organized events and activities, such as orienteering and paragliding. Such use is entirely at the discretion of the landowners and occupiers, who should ensure there is no damage or disturbance to the features of interest. Generally, off-road vehicle use should be avoided, as should sensitive bird areas during the breeding season.</p>

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<p>Landowner/ Management Responsibility</p>	<p>Main land uses in the Elenydd – Mallaen area, are agriculture and commercial forestry. Much of the land forms the catchment area for Llyn Brienne, Teifi Pools and the Elan Valley Reservoirs. The area is also used for military training and is important for tourism and outdoor recreation.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Carmarthenshire’s Local Development Plan (2006-2021) Deposit Draft, March 2011 http://www.carmarthenshire.gov.uk/English/environment/planning/Planning%20Policy%20and%20Development%20Plans/Local%20Development%20Plan/Documents/HRA%20Report%20Vol%201.pdf</p> <p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Afon Tywi/ River Tywi Location Grid Ref: SN687263 JNCC Site Code: UK0013010 Size: 363.45 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Afon Tywi rises in the Cambrian Mountains and flows south for some 10km before entering Llyn Brianne reservoir. The reservoir was constructed in the early 1970's to regulate water flows in the Tywi, enabling abstraction for public supply at Nantgaredig. From Llyn Brianne the Tywi falls steeply through mountain valleys for a further 20km before reaching the upper boundary of the SAC at Llandovery Road Bridge. The river then flows in a broadly south-westerly direction to Llandeilo, and then westerly through Carmarthen to outfall into Carmarthen Bay at Llansteffan. The Afon Tywi SAC boundary terminates in the tidal reaches just south of Carmarthen, where it enters the Carmarthen Bay & Estuaries SAC. The freshwater reaches of the Tywi are some 110km long, with just short of 80km designated as SAC. Within the SAC its course is more characteristic of a mature river, falling just 65m between Llandovery and the sea. The valley, formed by the movement of glaciers during the last ice age, has a classic U-shape, steep sided, with a wide, flat bottom. Its underlying geology of alluvium, glacial sands and gravels has resulted in an actively eroding river meandering across its wide floodplain, with generally sparse tree cover along the banks. This has led to the formation of extensive shingle shoals, ox-bow lakes and former river terraces. A number of significant tributaries flow into the designated reach, including the Llandovery Bran, Afon Dulais, Sawdde, Cennen, Cothi and Gwili.</p> <p>The majority of the catchment is rural, urbanised areas are restricted to Llandovery, Llandeilo and Carmarthen. Land use is greatly influenced by geology and topography. In the mountainous upper catchment forestry and sheep farming is dominant, whilst dairy and livestock farming takes place in the middle and lower reaches. A limited amount of arable farming occurs in the middle and lower reaches, including maize for ensiling, and this has the potential to increase sediment loads in the river from field run-off over the winter period.</p> <p>There has been a major change from hay to silage production and increased grass production as well as an increase in the use of artificial fertilizers.</p> <p>The line of the A40 trunk road and B4300 mirror the course of the Tywi on either side of the valley, coming in close proximity to the river in a number of places. The Heart of Wales railway line from Llanelli to Shrewsbury crosses the river at Llandeilo, Llangadog and Llanwrda, with significant lengths of track adjacent to the river. The ecological structure and functions of the site are dependent on hydrological and</p>

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	<p>geomorphological processes (often referred to as hydromorphological processes), as well as the quality and connectivity of riparian habitats. The more mobile species, such as migratory fish and otters, may also be affected by factors operating outside the site.</p> <p>Hydrological processes, in particular river flow and water chemistry, determine a range of habitat factors of importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high ‘spate’ flows and base-flows is essential. Reductions in flow may reduce the ability of the adults of migratory fish to reach spawning sites. The flow regime should be flows as near to natural as constraints will allow in order to support the functioning of the river ecosystem. The solid geology of the upper reaches and tributaries result in catchments which respond quickly to rainfall. The area has an extremely high annual average rainfall with variations both spatially and seasonally. Annual average rainfall is highest in the Black Mountains and the Cambrian Mountains, at 2,420mm and 2,008mm respectively.</p> <p>Rainfall decreases down the valley sides and into the bottoms, with lowest rainfall occurring in the coastal areas. The topography of the area is such that catchments respond quickly to rainfall events, with rapid changes in river levels along their lengths. Base flows in the Tywi are enhanced by releases from Llyn Brianne, though di-urnal variations occur below the abstraction at Nantgaredig, pumping being mainly at night and over the weekends. This notwithstanding, the catchment is protected from low summer and drought flows.</p> <p>Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream create the physical structure of the river habitats. For the greater part, the river meanders over a flat valley floor, re-working previously deposited river sediments and unconsolidated drift materials of sands, tills and gravels deposited during and after the last ice age. These deposits are frequently exposed in small river cliffs, displaying evidence of the historical development of the river basin. Though rock sections are uncommon, the orientation of the river course indicates that it is controlled by features in the underlying solid geology such as faults or folds in the rocks of the valley floor.</p> <p>The Tywi is the most mobile of rivers, meandering across the floodplain in its middle and lower reaches. Active erosion and deposition takes place from Llandovery all the way to Carmarthen, with gravel movement, pool filling, bank erosion and siltation occurring throughout.</p>

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	<p>Large floods are responsible for larger-scale changes in channel character, while periods with higher frequencies of moderate floods are responsible for maintaining instability and large-scale movement of gravel bars and banks. The sensitivity of the river to change varies along its length, both in terms of the sequence of floods and human interventions. In addition, increases in extreme events as a result of climate change have implications for enhanced geomorphic activity.</p> <p>These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions. Although gravel availability along the Tywi has reduced, there are many private gravel extraction sites, with commercial extraction taking place at Llwynjack below Llandovery. It is not known how much the extractions and the Llyn Brianne dam have contributed to the reduction in gravel availability. Other human interventions which have impacted on the geomorphology of the river include flood banks, river stabilisation, bank protection and construction of the railway embankment, which acts as a barrier to channel migration.</p> <p>Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitat for breeding and resting sites. It is important that</p>

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	<p>appropriate amounts of tree cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved for example, through managing grazing levels, selective coppicing of riparian trees and restoring adjacent wetlands. The mobility of the Tywi has resulted in the formation of significant areas of off-channel habitat in the form of ox-bows, wet woodlands, willow scrub etc. These are predominantly away from the main channel, and form important areas for otter to rest-up in or support breeding sites. In the urban sections the focus may be on maintaining the river as a communication corridor but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.</p> <p>Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions, therefore these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species to migrate and disperse through the landscape. Connectivity should be maintained, or restored where necessary, as a means to ensure access for the features to sufficient habitat within the SAC.</p> <p>External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Twaite shad (<i>Alosa fallax</i>). • European otter (<i>Lutra lutra</i>).

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	<p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site selection:</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). • Sea lamprey (<i>Petromyzon marinus</i>). • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). • Bullhead (<i>Cottus Gobio</i>).
<p>Conservation Objectives</p>	<p>Vision for the site: Our vision for the Afon Tywi SAC is to maintain or, where necessary, restore the river to high ecological status, including its largely unmodified and undisturbed physical character, so that all of its special features will be able to sustain themselves in the long-term as part of a naturally functioning ecosystem. Allowing the natural processes of erosion and deposition to operate without undue interference and maintaining or restoring connectivity will maintain the physical river habitat, which forms the foundation for this ecosystem. The quality and quantity of water, including natural flow variability, and the quality of adjacent habitats will be maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future. In places such as urban environments where natural processes are likely to cause significant damage to the public interest, artificial control measures are likely to be required.</p> <p>The special fish species found in the river, both residents such as the bullhead and brook lamprey, and migratory species such as shad, river & sea lamprey, will be present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. The migratory fish will be able to complete their migrations and life cycles largely unhindered by artificial barriers such as weirs, pollution, or depleted flows.</p> <p>The abundance of prey and widespread availability of undisturbed resting and breeding sites will allow a large otter population to thrive. They will continue to be found along the entire length of the river and its main tributaries.</p> <p>The presence of the Afon Tywi SAC and its special wildlife will enhance the economic and social values of the area by providing a high quality environment for ecotourism, outdoor activities and peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water will be recognised and</p>

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	<p>promoted through appropriate land management. The river will continue to be a focus for education to promote increased understanding of its biodiversity and the essential life support functions of its ecosystems.</p> <p>Conservation Objective for the watercourse</p> <ul style="list-style-type: none"> • The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary. • The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity & quality, physical habitat, community composition & structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3. • Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC. • All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change. • Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. • The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided. • River habitat SSSI features should be in favourable condition. • Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, e.g. weirs, bridge sills, acoustic barriers. • Natural factors such as waterfalls, which may limit the natural range of a species feature, or dispersal between naturally

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	<p>isolated populations, should not be modified.</p> <ul style="list-style-type: none"> • Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered. • Flow objectives for assessment points in the Tywi, Taf & Gwendraeths Catchment Abstraction Management Strategy (CAMS) as they relate to the Tywi SAC will be agreed between EA and NRW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process. • Levels of nutrients, in particular phosphate, will be agreed between EA and NRW for each Water Framework Directive water body in the Tywi SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document. • Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and NRW for each Water Framework Directive water body in the Tywi SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 3 of this document. • Levels of suspended solids will be agreed between EA and NRW for each Water Framework Directive water body in the Tywi SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. • Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Twaite shad (<i>Alosa fallax</i>). <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site selection:</p> <ul style="list-style-type: none"> • Allis shad (<i>Alosa alosa</i>). • Sea lamprey (<i>Petromyzon marinus</i>). • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). • Bullhead (<i>Cottus Gobio</i>).

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The conservation objective for the water course as defined in above must be met. • The population of the feature in the SAC is stable or increasing over the long term. • The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply (as described in sections 2.2 and 5). Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of 4.2.4 • There is, and will probably continue to be, a sufficiently large habitat to maintain the feature’s population in the SAC on a long-term basis. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European otter (<i>Lutra lutra</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour. • The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Tywi SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on

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	<p>prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.</p> <ul style="list-style-type: none"> • The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.
<p>Component SSSIs</p>	<p>The plan area has been divided into 7 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on the following:</p> <ul style="list-style-type: none"> • SAC/SSSI boundary. • Artificial barriers, where they significantly affect one or more of the features' ranges. • Major impacts, in particular major water abstractions. • Natural hydromorphology, where there are significant differences in management issues/key features between reaches. • Estuaries: the reach below the tidal limit is treated as a separate unit. • The units include one or more of EA's River Basin Management Plan water bodies; as far as is practicable, unit boundaries coincide with these water body boundaries.
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>The Atlantic salmon and sea trout are the focus for much of the management activity carried out on the Tywi catchment. Their relatively demanding water quality and spawning substrate quality requirements mean that reduction in diffuse pollution and siltation impacts is a high priority for the catchment. Despite the fact that salmon are not an SAC feature on the Tywi, actions undertaken for the benefit of salmonids will in the main be beneficial to the SAC fish species and otter. Measures to address these problems include the establishment of buffer zones on reaches adjacent to intensively managed livestock grazing or arable land. Tree management, especially coppicing and pollarding to</p>

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	<p>increase light levels to the channel, is also often carried out. The EAW's Sustainable Fisheries Project has carried out much of this work in recent years.</p> <p>In the Tywi catchment, the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter.</p> <p>Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, has a devastating impact on crayfish populations and can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations.</p> <p><u>Reduce Pollution</u> Measures to control diffuse pollution in the water environment, including 'Catchment Sensitive Farming', may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC.</p> <p>Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering or likely to impact upon the site should be</p>

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	<p>monitored, reviewed and altered if necessary.</p> <p><u>Manage Vegetation around the River</u> Overhanging trees provide valuable shade and food sources, whilst tree root systems provide important cover and flow refuges for juveniles. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Twait shad (<i>Alosa fallax</i>). • Allis shad (<i>Alosa alosa</i>). <p><u>Consideration into Effect of Physical Barriers</u> Artificial physical barriers are probably the single most important factor in the decline of shad in Europe. Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of shad. Both species (but particularly allis shad) can make migrations of hundreds of kilometres from the estuary to spawning grounds in the absence of artificial barriers. Existing fish passes designed for salmon are often not effective for shad. Any new provisions need to take their requirements into account. The impact of existing barriers in the Tywi should be assessed on a case-by-case basis.</p> <p>Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Llangadog Creamery weir is considered to be the most significant barrier to fish migration in the Tywi. Consideration is being given to reduce or remove the effect of this barrier. An assessment of options will be carried out in conjunction with the other relevant competent authorities.</p> <p><u>Knowledge on Effect of Preferred Temperature</u> Llyn Brienne is a deep reservoir that exhibits thermal stratification in the spring/summer. Releases of water from the reservoir are results in cold water being released into the Tywi. This results in reduced temperature conditions in the main river Tywi at certain times of year.</p> <p>Allis and twait shad are temperature dependent in critical phases of their life history. Both species are anadromous, migrating from the sea into rivers as adults to spawn. The timing of adult migrations appears to be primarily dependent upon temperature, with migration triggered at</p>

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	<p>estuarine water temperatures of 11-12°C and secondarily by river flow and tides. Peak migration activity occurs at water temperatures of 11-14°C, usually between April and June. Spawning varies regionally, but typically takes place in water temperatures of above 15°C between May and July. Eggs are sensitive to water temperatures below 16-18°C. Water temperatures of above 18°C throughout June and July are therefore considered ideal for successful shad egg incubation. Temperature is also believed to be important in triggering migration of shad larvae towards the estuary, with most juvenile thought to migrate from the River Wye into the Severn estuary once water temperatures fall below 19°C.</p> <p><u>Drivers to Combat Pollution</u> An embargo on works between May and late July operates within the catchment. Diffuse inputs from agricultural sources are the main cause of nutrient enrichment. The Water Framework Directive will provide a driver to tackle diffuse inputs. Catchment sensitive farming initiatives, Tir Gofal and the EA's Sustainable Fisheries Project are encouraging the use of buffer strips to reduce these impacts and protect the Shad eggs and juveniles.</p> <p>The extent and quality of suitable shad habitat must be maintained. Spawning habitat is defined as stable, clean gravel/pebble-dominated (approximately 70%) substrate without an armoured layer and with <10% fines in the top 30 cm. Water depth during the spawning and incubation periods should be 50-75 cm. Holding areas are defined as pools of at least 200 cm depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence. Anglers occasionally fish for shad, and they are sometimes taken in quite large numbers. Further research is necessary to define sustainable levels of angling. If this shows there is cause for concern a temporary cessation of fishing activity in the vicinity of known spawning grounds during the spawning period should be considered, particularly where shad are known to be taken regularly. Exploitation of shad is currently unregulated and controls are being considered through the review of freshwater fisheries legislation.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European otter (<i>Lutra lutra</i>). <p>A survey undertaken in 2004 identified 101 breeding sites within the Tywi catchment, based on the European Commission's Life Nature Programme methodology. Of these 14 were in use, with a further 87</p>

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	<p>having potential. The report suggested the catchment should be capable of supporting at least 22 breeding pairs, based on one breeding female per 20km stretch of river. It is possible that, if all the breeding sites achieve optimal habitat conditions and fish and amphibian stocks are secured, the catchment may then support further breeding animals. However, the amount of compression of home ranges that otters will accept cannot as yet be determined.</p> <p><u>Manage Suitable Sites</u> Management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter population of a size determined by natural prey availability and associated territorial behaviour. The involvement of river users and land managers will be important in improving potential breeding habitat near to the river. Agri-environment schemes and the Better Woodlands for Wales scheme provide possible mechanisms for maintaining suitable sites, such as lightly grazed woodlands, areas of dense scrub, and tussocky fens with purple moor-grass. The low lying nature of the floodplain render large areas unsuitable as breeding sites, and it is likely that the tributaries and marginal areas away from the designated boundaries provide the major potential e.g. relict channels, scrub and woodland.</p> <p><u>Improvement in Safety</u> A number of particular threats to the otter have been identified on the catchment, not least the number of road mortalities that have occurred. There is also considerable room to improve the bankside habitat along the main length of the Tywi and some of the tributaries. This presents difficulties on the main river, as its mobile nature and flood magnitude create problems with fencing to exclude stock. Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.</p> <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site selection:</p> <ul style="list-style-type: none"> • Sea lamprey. <p><u>Consideration into Effect of Physical Barriers</u> The impacts of barriers to migration and flow depletion are highlighted in the assessment of conservation status for this feature. The impact of barriers should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of</p>

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	<p>flows is unsuitable to allow passage. Llangadog creamery weir is considered to be the most significant barrier to fish migration on the Tywi. An assessment of options to reduce or remove the impact of this barrier will be carried out in conjunction with the other relevant competent authorities.</p> <p><u>Knowledge on Effect of Flow Depletion</u> The impact of flow depletion downstream of major abstractions was assessed in the Review of Consents process. The outputs of the hydraulic model suggest that changes to water depth and water velocities occurring as a result of the abstraction at Capel Dewi are unlikely to impact upon: the ability of adult lamprey to migrate through the lower reaches of the river; spawning habitat downstream of Capel Dewi; or juvenile habitat downstream of the abstraction.</p> <p><u>Further Assessments</u> There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream. Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed. The screening arrangements at the DCWW intakes at Manorafon and Capel Dewi are currently being assessed as part of the Habitats Directive review of consents process.</p> <p>The extent and quality of suitable sea lamprey habitat must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Nursery habitat consists of open-structured, aerated, silty and sandy substrates between 2 and 40cm depth generally in shallow (<0.5m) slack-water channel margins.</p> <p>Annex I habitats and Annex II species present as qualifying features, but not primary reasons for site selection:</p> <ul style="list-style-type: none"> • Brook lamprey (<i>Lampetra planeri</i>). • River Lamprey (<i>Lampetra fluviatilis</i>). <p>The extent and quality of suitable habitat for brook and river lamprey must be maintained. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg survival. Spawning habitat consists of well-oxygenated gravel/pebble substrate of >10cm depth in</p>

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	<p>lead to constraints on genetic interactions that may have adverse consequences. New instream structures should be avoided, whilst the impact of existing artificial structures needs to be evaluated.</p> <p>The extent and quality of suitable bullhead habitat must be maintained. Elevated levels of fines can interfere with egg and fry survival. Spawning habitat is defined as unsilted coarse (gravel/pebble/cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles/cobbles are therefore important.</p> <p><u>Safeguarding Vegetation and Habitat</u> The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be limited to no more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants. Slack-water areas provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth. Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach. Woody debris removal should be minimised, and restricted to essential activities such as flood defence.</p> <p>Maintenance of intermittent tree cover in conjunction with retention of woody debris helps to ensure that habitat conditions are suitable. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches.</p> <p><u>Restriction on Non-Native Fish</u> Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. Non-native crayfish should be absent from the SAC. The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of fish should be avoided in the SAC.</p> <p><u>Control Fish Numbers and Introduction</u></p>

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	<p>Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges. Bullheads are relatively sedentary and interactions between populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact. There should be no stocking/transfers of bullhead unless agreed to be in the best interests of the population.</p> <p>In general, management for other SAC features is expected to result in favourable habitat for bullhead, through improvements in water quality and flow regime and maintenance of suitable physical habitat.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Twaite shad <i>Alosa fallax</i> Allis shad <i>Alosa alosa</i></p> <ul style="list-style-type: none"> • Adult run size (Units 5-6). <ul style="list-style-type: none"> ○ No decline in the annual run size greater than would be expected from variations in natural mortality alone. <p>Adult run size should comply with an agreed target for the river. The EAW operate an acoustic and video fish counter at Ty Castell flow gauging station immediately upstream of the Capel Dewi WTW intake. The use of hydroacoustic counters for estimating run size is currently being investigated by the EAW.</p> <ul style="list-style-type: none"> • Spawning distribution (Units 1-6). <ul style="list-style-type: none"> ○ No decline in spawning distribution. <p>Spawning distribution is assessed by kick sampling for eggs and/or observations of spawning adults. A representative sample of sites within units 5 to 6 will be monitored at 3 yearly intervals. Absence from sites within reaches 5 to 6 in 2 consecutive surveys will result in an unfavourable condition assessment</p> <ul style="list-style-type: none"> • Biological quality (Units 1-6). <ul style="list-style-type: none"> ○ Biological GQA class B (see below). • Chemical quality (Units 1-6). Specified limits (RE1): <ul style="list-style-type: none"> ○ Dissolved Oxygen (% sat) 10%ile – 80.

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	<p>period</p> <p>Sea lamprey <i>Petromyzon marinus</i></p> <ul style="list-style-type: none"> • Distribution within catchment (Units 1-6). <ul style="list-style-type: none"> ○ Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon</i> ammocoetes. <p>This attribute provides evidence of successful spawning and distribution trends, and will be applied to spawning sites known to have been utilised within the previous 10 years, and historical sites considered still to have suitable habitat. Spawning locations may move within and between sites due to natural processes and new sites may be discovered over time. Silt beds downstream of all sites identified will be sampled for presence or absence of ammocoetes. Where apparently suitable habitat at any site is unoccupied feature condition will be considered unfavourable. Monitoring undertaken by APEM in 2004 failed to yield any sea lamprey ammocoetes or transformers despite reports of adult fish spawning in the system.</p> <ul style="list-style-type: none"> • Ammocoete density (Units 3-4). <ul style="list-style-type: none"> ○ Ammocoetes should be present in at least four sampling sites each not less than 5km apart. <p>This standard CSM attribute establishes a minimum occupied spawning range, within any sampling period, of 15km. In the Tywi, spawning sites within units 3 to 4 will be assessed against this attribute.</p> <ul style="list-style-type: none"> • Spawning Activity (Units 1-6). <ul style="list-style-type: none"> ○ No reduction in extent of spawning activity year on year. <p>Direct observation or red counts Sea lamprey ammocoetes are typically much less numerous than river / brook lamprey ammocoetes, so this may be the only cost-effective means of determining that a healthy spawning population is present. Sea lampreys spawn in June – August (depending on the river) and are usually easily observed at traditional spawning sites during these months.</p> <ul style="list-style-type: none"> • Biological quality (Units 1-6). <ul style="list-style-type: none"> ○ Biological GQA class A. <p>All classified reaches within the site that contain, or should contain sea lamprey under conditions of high environmental quality should comply with the targets given.</p>

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	<p>Consents process</p> <p>Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i></p> <ul style="list-style-type: none"> • Age/size structure of ammocoete population (Units 1-6). <ul style="list-style-type: none"> ○ Samples < 50 ammocoetes ~ 2 size classes. ○ Samples > 50 ammocoetes ~ at least 3 size classes. <p>This gives an indication of recruitment to the population over the several years preceding the survey. Failure of one or more years recruitment may be due to either short or long term impacts or natural factors such as natural flow variability, therefore would trigger further investigation of the cause rather than leading automatically to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> ○ Present at not less than 2/3 of sites surveyed within natural range <p>The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit i.e. all except unit 7. Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> ○ No reduction in distribution of ammocoetes. <p>Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit, and will lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Ammocoete density (Units 1-6). <ul style="list-style-type: none"> ○ Optimal habitat: >10m². Overall catchment mean: >5m². <p>Optimal habitat comprises beds of stable fine sediment or sand >15cm deep, low water velocity and the presence of organic detritus.</p> <ul style="list-style-type: none"> • Biological quality (Units 1-6). <ul style="list-style-type: none"> ○ Biological GQA class B. <p>All classified reaches within the site that contain, or should contain lamprey under conditions of high environmental quality should comply with the targets given.</p> <ul style="list-style-type: none"> • Chemical quality (Units 1-6). Specified limits (RE1):

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	<p>lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution (Units 1-6). <ul style="list-style-type: none"> ○ Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current. <p>Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Reproduction / age structure (Units 1-6). <ul style="list-style-type: none"> ○ Young-of-year fish should occur at densities at least equal to adults. <p>This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Biological quality (Units 1-6). <ul style="list-style-type: none"> ○ Biological GQA class B. <p>All classified reaches within the site that contain, or should contain bullhead under conditions of high environmental quality should comply with the targets given.</p> <ul style="list-style-type: none"> • Chemical quality (Units 1-6). Specified limits (RE1): <ul style="list-style-type: none"> ○ Dissolved Oxygen (% sat) 10%ile – 80. ○ Biological Oxygen Demand (mg/l) 90%ile – 2.5. ○ Total Ammonia (mg N/l) 90%ile – 0.25. ○ Un-ionised Ammonia (mg N/l) 95%ile – 0.021. ○ pH (lower limit as 5%ile, upper limit as 95%ile) – 6.0-9.0. ○ Hardness (mg/l CaCO₃) Mean – ≤ 10; >10 and ≤50; >50 and ≤ 100; >100. ○ Dissolved Copper (µg/l) 95%ile – 5; 22; 40; 112. ○ Total Zinc (µg/l) 95%ile – 30; 200; 300; 500. • Flow (all Units). <ul style="list-style-type: none"> ○ Targets are set in relation to river/reach type(s) (below)

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	<p>Table 1 HDERF1 - River flow thresholds for SAC/SSSI rivers</p> <table border="1"> <thead> <tr> <th rowspan="2">EW band (sensitivity)</th> <th colspan="3">Maximum % reduction from daily naturalised flow</th> </tr> <tr> <th>>Qn50</th> <th>Qn50-95</th> <th><Qn95</th> </tr> </thead> <tbody> <tr> <td>Very High</td> <td>10</td> <td>10</td> <td>1-5</td> </tr> <tr> <td>High</td> <td>15</td> <td>10</td> <td>5-10</td> </tr> </tbody> </table> <p>Targets equate to those levels agreed and used in the Review of Consents</p> <ul style="list-style-type: none"> • Temperature (all Units). <ul style="list-style-type: none"> ○ Targets are set in relation to river/reach type(s). <p>Targets equate to those levels agreed and used in the Review of Consents.</p> <p>Otter <i>Lutra lutra</i></p> <ul style="list-style-type: none"> • Distribution (all Units). <ul style="list-style-type: none"> ○ Otter signs present at 70% of Otter Survey of Wales sites (NRW, 20053). <p>The Otter Survey of Wales undertaken in 2002 surveyed 86 reference sites in the Tywi catchment, of which 77% were positive. This continued an upward trend in signs from 14% in 1977; 68% in 1984; 69% in 1991. The next survey is planned in 2009, but NRW are currently considering a rolling programme of sub-catchment survey every 2 years using Otter Survey of Wales full survey sites. The 3 subcatchments² identified in Morgan (2005) would therefore be surveyed once in every six years.</p> <ul style="list-style-type: none"> • Breeding activity (all Units). <ul style="list-style-type: none"> ○ 2 reports of cub/family sightings, or 2 reports of cub, lactating or pregnant female road casualties at least 1 year in 3. <p>Based on current information 5 centres of breeding activity have been estimated within the SAC. These sit with a reach of 67km and therefore exceed the estimate of 1 breeding female per 20km. However each of these centres includes the confluence of at least 1 major tributary, whose contribution is not take into account.</p>	EW band (sensitivity)	Maximum % reduction from daily naturalised flow			>Qn50	Qn50-95	<Qn95	Very High	10	10	1-5	High	15	10	5-10
EW band (sensitivity)	Maximum % reduction from daily naturalised flow															
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	<ul style="list-style-type: none"> • Actual and potential breeding sites (all Units) <ul style="list-style-type: none"> ○ No decline in number and quality of mapped breeding sites in subcatchments. <p>In the Tywi catchment, 101 actual or potential breeding sites have been identified, distributed throughout the catchment on the main river and tributaries.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Afon Tywi/River Tywi SAC (2008)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/idoc.ashx?docid=3c827c66-806e-46ad-ba01-859713c29bd2&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Twait shad (<i>Alosa fallax</i>) and Allis shad (<i>Alosa alosa</i>) Unfavourable: Unclassified • European otter (<i>Lutra lutra</i>): Favourable • Sea lamprey (<i>Petromyzon marinus</i>): Unfavourable: Unclassified • Brook lamprey (<i>Lampetra planeri</i>) and River Lamprey (<i>Lampetra fluviatilis</i>): Unfavourable: Unclassified • Bullhead (<i>Cottus Gobio</i>) Unfavourable: Unclassified
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>All features for which the site is designated are directly or indirectly vulnerable to deterioration in water quality: direct and diffuse pollution, particularly nutrient run-off from agricultural land; and eutrophication and increased siltation. Afforestation in the upper catchment contributes to low pH that can affect features further downstream. They are also affected by flow conditions and extremes of water temperature. This is a regulated river, with abstraction from the river for drinking water and industry. Anadromous fish are vulnerable to barriers to migration, such as weirs. All fish are vulnerable to inappropriate fishing activities and the introduction of non-indigenous species. The Tywi is one of only four rivers in England and Wales in which spawning stocks of twait shad are known to occur. Shad are particularly vulnerable to many of these issues.</p> <p>Suitable in-stream and riparian habitat is required for all features. Gravel extraction, intensive agricultural land-use, engineering works, invasive plant species and the loss of alder tree-cover through disease can lead to degradation of habitat and water quality. All features can be</p>

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	<p>affected by disturbance relating to recreation and amenity access. In addition, otters require suitable terrestrial habitats to provide cover and adequate populations of prey species. These issues are being addressed by a variety of statutory bodies that are in a position to overcome these threats through regulatory powers and partnerships with landowners, industry and other interested parties.</p> <p>NRW encourage owners and occupiers to carry out positive habitat management through agreements and agri-environment schemes. A SSSI Site Management Plan and a Conservation Strategy has been produced by NRW and a Site Issue Briefing has been produced by NRW. NRW is investigating the effects of abstractions and discharges under the review of consents process under the Habitats Regulations and the river is included in their Asset Management Planning Process.</p> <p><u>Effect of River Abstraction</u> The impact of flow depletion downstream of major abstractions was assessed in the Review of Consents process. The outputs of the hydraulic model suggest that changes to water depth and water velocities occurring as a result of the abstraction at Capel Dewi are unlikely to impact upon: the ability of adult shad to migrate through the lower reaches of the river; spawning habitat downstream of Capel Dewi; or juvenile habitat downstream of the abstraction. However the diurnal operation of the pumps does expose marginal habitat and therefore has the potential to strand juveniles or expose sediments supporting juvenile habitat. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p><u>Impact of Introducing Stored (different temperature) Water</u> The impact of lowered temperatures from the hypolimnial release at Llyn Brianne on the Tywi also has the potential to impact upon lamprey. The anadromous sea lamprey are temperature dependent at critical freshwater life stages. Migration of sea lamprey into estuaries usually occurs from April onwards at temperatures of between 10-18°C, and spawning occurs when water temperatures increase above a threshold of 15°C, usually between May and June. The critical spawning temperature range for sea lamprey is considered to be 11-25°C, and eggs require temperatures of 15-25°C to hatch.</p> <p><u>Fishing</u> Commercial fishermen also take shad as a by-catch. Changes in fishing methods need to be promoted to minimize captures, while both anglers and trawler men should be encouraged to return alive any</p>

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	<p>individuals caught.</p> <p><u>Non-Native Species</u> Artificially enhanced densities of other fish may introduce unacceptable competition or predation pressure and the aim should be to minimise these risks in considering any proposals for stocking.</p> <p><u>Food Availability</u> Food availability is an important factor. Fish biomass should stay within expected natural fluctuations. A potential problem appears to be the decline in eel populations, and similar concerns are apparent with respect to amphibian numbers on a UK scale.</p> <p><u>Pollution</u> Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century. There should be no increase in pollutants potentially toxic to otters.</p>
<p>Landowner/ Management Responsibility</p>	<ul style="list-style-type: none"> • Sea lamprey, brook lamprey and bullhead are recorded throughout the SAC. • Twaite shad are recorded only infrequently in Units 1 & 2, as their distribution is constrained by flow and temperature barriers. • The distribution of river lamprey is unknown. Single records exist for units • Management for twaite shad and sea lamprey is expected to also be sympathetic for river/brook lamprey (spawning habitat) and bullhead. • Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units. • The status of allis shad is uncertain on the Afon Tywi (River Tywi) SSSI. It is assumed to be present in the same units as twaite shad.
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Carmarthenshire’s Local Development Plan (2006-2021) Deposit Draft (March 2011) available at: http://www.carmarthenshire.gov.uk/English/environment/planning/Planning%20Policy%20and%20Development%20Plans/Local%20Development%20Plan/Documents/HRA%20Report%20Vol%201.pdf</p>

<p>Site Name: Afon Eden – Cors Goch Trawsfynydd Location Grid Ref: SH720271 JNCC Site Code: UK0030075 Size: 284.29 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Afon Eden/River Eden is a relatively unmodified river, mainly upland in character, of approximately 10km length. The watershed begins just south of Llyn Trawsfynydd, within an area of gently sloping and poorly drained land. The upper section of the catchment is slow-flowing with a number of deep pools along its length. In the lower two-thirds of the catchment the river flows more steeply into a narrow rocky gorge, with an adjacent area of forestry plantation, known as Coed y Brenin. The Afon Eden joins with the Afon Mawddach, just above the village of Ganllwyd, but the SAC boundary continues downstream to the tidal limit of the Mawddach at Llanelltyd. The Afon Eden is fed by a number of base-poor upland streams, which flow from the eastern flanks of the Rhinog mountains. The Ardudwy leat takes the most acidic waters from the eastern tributaries to Llyn Trawsfynydd. This water is used to maximise the water available for HEP generation by the Maentwrog Power Station.</p> <p>The area receives high average rainfall, which has contributed to the development of raised bogs, blanket bog, and transition mires and quaking bogs. Two areas of raised bog occur at the top end of the catchment, close to the watershed, where they were once part of a much larger extent of bog, much of which is now flooded by Llyn Trawsfynydd. Transition mires and quaking bogs occur in waterlogged situations where they receive nutrients from the surrounding catchment as well as from rainfall. They are located within the wetlands surrounding the areas of raised bog.</p> <p>The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), the quality of riparian habitats and connectivity of habitats. Animals that are highly mobile such as migratory fish and otters are also affected by factors operating outside the site.</p> <p>The river contains the last known population of freshwater pearl mussels surviving in Wales; they are almost entirely confined to one section of the river. Historically the mussels were more widespread in the catchment. The mussels rely on salmonid parr hosting, for a short period of time, the glochidial larvae of the mussels on their gills, so the success of migratory and spawning fish in the catchment is crucial to their long term survival. Atlantic salmon is also an important fish species that breeds in the Mawddach catchment. In the slow moving</p>

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	<p>waters just upstream from Pont y Grible is a population of floating water plantain.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. • Freshwater pearl mussel <i>Margaritifera margaritifera</i>. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Active raised bog. <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. • Otter <i>Lutra lutra</i>.
<p>Conservation Objectives</p>	<p>Our vision for the Afon Eden – Cors Goch Trawsfynydd SAC is to maintain, or where necessary restore, the raised bogs, their associated areas of blanket bog, and the river to good condition so that all of its typical and uncommon species (listed below) are able to sustain themselves in the long-term as part of a naturally functioning ecosystem.</p> <p>To conserve the physical river by maintaining or restoring the ecological connectivity of riparian habitats and by allowing the natural processes of erosion and deposition to operate without undue interference. The quality and quantity of water, including natural flow variability, and the quality of adjacent habitats, are maintained or restored to a level necessary to maintain in favourable condition for the foreseeable future all the freshwater species listed below. Floating water-plantain populations are able to maintain themselves on a long term basis throughout their current distribution in the river and each population is able to successfully complete sexual and /or vegetative reproduction. The river provides sufficient habitat to support existing populations within their current distribution and also allows for future expansion and dispersal.</p> <p>Atlantic salmon migrate into the catchment to spawn and go through their juvenile stages in the river and are present in numbers that reflect a healthy and sustainable population supported by well distributed</p>

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	<p>good-quality habitat. These migratory fish are able to complete their migrations and life cycles largely unhindered by artificial barriers such as pollution, or depleted flows.</p> <p>The freshwater pearl mussel population is maintained throughout its distribution in the river corridor. Within the river there is a sufficient supply of clean water, host salmon and suitable habitat to support a long term, self-sustaining population.</p> <p>The otter population thrives on the abundance of prey species and the widespread availability of undisturbed resting and breeding sites that are found along the river and its main tributaries.</p> <p>The hydrology of the two raised bogs and their associated areas of blanket bog are intact and as a result there is active accumulation of <i>Sphagnum</i> moss peat. The bogs' surface is a mosaic of hummocks and wetter hollows with little encroachment of scrub and where purple moor-grass occurs it is a typical and desirable species of localised dominance of a wetland or lagg/fen vegetation community.</p> <p>All factors affecting the achievement of favourable condition shall be under control. The presence of the Afon Eden – Cors Goch Trawsfynydd SAC and its special wildlife enhances the economic and social value of the area, by providing a high quality environment for peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water are recognised and promoted through appropriate land management.</p> <p>Vision for water courses</p> <p>The ecological status of the water course is a major determinant in the capacity for the habitats in the SAC to support each feature at near-natural population levels, as determined by natural ecological and hydromorphological processes and characteristics. Flow regime, water quality, quantity and physical habitat should be maintained or restored as far as possible to a near-natural state in order to support the coherence of the ecosystem structure and function. Favourable conservation status (FCS) is determined in part by the capacity of the water course to support the species for which it is considered special, so the relevant SAC features must be in FCS for the water course feature to be in FCS.</p> <p>FCS can be maintained or restored to favourable conservation status when all the following conditions for the water course are satisfied:</p>

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	<ul style="list-style-type: none"> • Water flows and water quantity shall be sufficient to support the SAC features. This shall include: <ul style="list-style-type: none"> • During the migration periods of each migratory fish species that their passage upstream to spawning sites is not hindered by abstraction discharges, engineering or gravel extraction activities or other impacts. • Water quantity and flows at pearl mussel beds, fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. • Water quality shall be sufficient to support the SAC features. This shall include: <ul style="list-style-type: none"> • Levels of nutrients, in particular orthophosphate, will be agreed between EA and NRW for the Water Framework Directive water body in the Afon Eden – Cors Goch Trawsfynydd SAC, and measures taken to maintain nutrients below these levels. • Levels of suspended solids will be agreed between EA and NRW for the Water Framework Directive water body in the Afon Eden – Cors Goch Trawsfynydd SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. • The physical habitat and substrate quantity shall be maintained. All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat except where natural processes cause them to change. Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. leats, bridge sills etc. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>The vision for this feature is for it to be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The <i>L. natans</i> populations will be viable throughout their current

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	<p>extent in the Afon Eden & will be able to maintain themselves on a long-term basis. There will be no contraction of the current <i>L. natans</i> distribution in the Afon Eden and each <i>L. natans</i> population must be able to disperse and complete sexual and/or vegetative reproduction successfully.</p> <ul style="list-style-type: none"> • The river will have sufficient habitat to support existing <i>L. natans</i> populations within their current distribution and future expansion. • All factors affecting the achievement of these conditions are under control. <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Freshwater pearl mussel <i>Margaritifera margaritifera</i>. <p>The vision for this feature is for it to be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The freshwater pearl mussel population must be viable throughout its distribution in the river and maintaining itself on a long-term basis. • There will be no contraction of the number, age range, distribution or size of mussel beds found within the population. • Within the distribution of these beds there will be sufficient habitat to support a viable populations. • The transference of pearl mussel glochidia (larvae) is facilitated by an abundant and selfsustaining Atlantic salmon population. • All factors affecting the achievement of these conditions are under control. <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. <p>The vision for this feature is for it to be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The Atlantic salmon population must be viable throughout its distribution in the river and maintaining itself on a long-term basis. • There will be no contraction of the number or age range of the salmon population. • There will be sufficient habitat to support a viable population. • All factors affecting the achievement of these conditions are

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	<p>under control.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Otter <i>Lutra lutra</i>. <p>The vision for this feature is for it be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour. • The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. A number of potential and breeding sites have been identified (Lyles, 2006) in the upper reaches of the Afon Eden. The size of breeding territories may vary depending on prey abundance. • The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site is subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance are managed. Survey information shows that otters are widely distributed in the Mawddach catchment. • The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers. • All factors affecting the achievement of these conditions are under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Active raised bog. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied for both raised bogs management units:</p>

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	<ul style="list-style-type: none"> • The location and distribution of the raised bogs and associated rands and fen lags will increase at the expense of less desirable vegetation communities. • The extent of the raised bogs and associated rands, fen lags and blanket bog (including those areas that are considered unfavourable or currently degraded) will be at least 157 ha. This area estimate is based on the extent of the management units within which the peat ‘domes’ are situated. • The raised bogs will exhibit a near-natural zonation from the purely ombrogenous (rain fed) bog crowns, through sloping rand and wet lagg zones to adjacent blanket bog. • The abundance and distribution of uncommon plants is maintained or increased. • The typical species of the vegetation communities comprising the active raised bog SAC feature are frequent. • The hydrological integrity of each bog will be restored and maintained and the development of scrub and encroachment of <i>Molinia caerulea</i> will be managed. The structure of the bogs are maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. • Invasive non-native species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spirea</i>) are not present within the SAC boundary. • Each active raised bog management unit is free from all trees. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 6 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on habitat and survey units within the Afon Eden – Cors Goch Trawsfynydd and Meirionnydd oak wood and bat sites SAC boundary that are underpinned by the Afon Eden – Cors Goch Trawsfynydd SSSI.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site</p>	<p>Favourable conservation status will be achieved by:</p> <ul style="list-style-type: none"> • Reducing the levels of river bank erosion and increasing the density of bank side vegetation.

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<p>integrity)</p>	<ul style="list-style-type: none"> • Removal of artificial features affecting the natural flow regime. • Reducing the level of nutrients, in particular orthophosphates, entering the open water courses including reducing fertiliser application and adhering to the 10m “ no application zone” around ditches and streams in the catchment. • Run-off from municipal waste management in the catchment not being allowed to adversely impact on water quality. • Trunk road management between Coed y Brenin and Bronaber sympathetic to protecting water quality. • Existing drainage ditches being left unmaintained or lightly cleaned on rotation i.e. either deepened or widened and leaving at least 50% vegetated. Not digging new drainage systems in the catchment and by leaving headwaters unmanaged. • Ensuring grazing levels in the catchment sympathetic to maintaining water quality. Restoring improved pastures to semi-improved or semi-improved to unimproved with corresponding reductions in livestock and reduction or cessation of fertiliser input. • Sympathetically siting agricultural activities in the catchment e.g. grazing sites for overwintered stock, gates, supplementary feeding, stock crossing, gates and vehicle turning points which are situated away from open water courses. • All forestry related operations in the catchment adhering to the most recently published best practice guidelines at all times and implementing additional measures where necessary to protect water quality. • Sympathetically locating water borne recreational activities and operating them at a sensitive scale. • Retaining the presumption against dredging and gravel abstraction. • Leaving coarse woody debris (CWD) in-situ. • Reviewing consents for STW in the catchment. • Identifying and treating releases of toxic waters from old mine sites. • Adhering to DEFRA good practice guidelines for protecting water quality and controlling soil erosion in the catchment. • Monitoring and controlling invasive alien plant species and adhering to EA good practice guidelines for using herbicides near open water courses to protect water quality. • Ensuring sheep dip and other agri-veterinary products (e.g. Ivermectin) are used in accordance with good practice guidelines.

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	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>In addition to meeting all the management requirements for the factors affecting the water quantity for the watercourse feature (listed above), favourable conservation status will be maintained by:</p> <ul style="list-style-type: none"> • Retaining a presumption against dredging and gravel abstraction. • Trying to limit the number of canoes launching upstream of the <i>Luronium</i> beds and timing paddling to coincide with high water flows. • Freshwater pearl mussel <i>Margaritifera margaritifera</i>. <p>In addition to meeting all the management requirements for all the factors affecting the water course and Atlantic salmon features (listed respectively above and below), favourable conservation status will be achieved by the following measures:</p> <ul style="list-style-type: none"> • Trying to limit the number of boats launching upstream of the pearl mussel beds and timing paddling to coincide with high water flows. • Increasing the capacity for juvenile salmonid host fish in the catchment. • Preventing / reducing potential for illegal pearl fishing by not publicising the location of the pearl mussel beds. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Active raised bog. <p>The main factors affecting the raised bog on this site are drainage, grazing, past burning and peat cutting.</p> <p><u>Drainage</u></p> <p>In the past, the peatland at Cors Goch has been subjected to drainage works in an attempt to improve the land for agriculture. The current landowners maintain most of the larger drains. The main ditch system in the northern dome is currently maintained by Magnox Electric plc. as an overspill system for Llyn Trawsfynydd dam. The northern raised bog has a drain approximately 3m wide cutting through its western margin. The southern bog also has had several drains cut into it. A ditch up to a metre wide in places runs along the southern and western margins of</p>

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	<p>the south dome and smaller mostly in-filled ditches also exist cutting across into the dome.</p> <p>1. No new drainage ditches should be cut. Seek to infill or block existing ditches to create pools wherever possible.</p> <p><u>Grazing</u> Grazing can be very significant on this habitat particularly where it has been affected by artificial drainage, as is the case here. Artificially drained bog will tend to have a taller vegetation height and more woody ericaeous growth, such as tall heather and scrub on the dome, and very vigorous <i>Molinia</i> in the lagg/fen, as this species is favoured by a good through flow of drainage water. It is easy then for the bog to become under-grazed. Restoring a more stagnant, high water table will naturally help to lessen <i>Molinia</i> dominance, as will grazing and trampled by cattle or ponies. Grazing by sheep will lead to unwanted changes in species composition, through selective grazing out of species like the regionally rare bog rosemary and heather and in increased <i>Molinia</i> dominance. Some short vegetation and small patches of exposed peat through poaching can increase the biodiversity providing habitat for species such as mosses and sundews to colonise. Bare peat should not however be extensive or eroding. Patterns of grazing are also important. Summer cattle and/or horse grazing will have the most benefit to the SAC feature. Supplementary feeding means that stock congregate in one area to feed and dung leading to peat erosion and local nutrient enrichment which allows competitive ruderal weed plant species to establish to the detriment of bog species. Supplementary feeding tends to result in over grazing as more stock are held on the land for longer than it can naturally sustain. No supplementary feeding should be consented on the raised bog with the exception of mineral licks, which can help stock graze rank areas of vegetation. To help attain favourable conservation status the grazing regimes would need to be adjusted.</p> <p>2. Cattle/pony (not sheep) grazing regimes should be reinstated and bridges installed to facilitate stock movement. Stock may be encouraged to graze rank areas by mowing paths and by the placement of mineral licks. The erection of temporary/permanent fencing may also be appropriate.</p> <p><u>Burning</u> Burning causes a decrease in the cover of fire sensitive species such as the <i>Sphagnum</i> mosses and may lead to an increase in those</p>

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	<p>species such as purple moor grass <i>Molinia caerulea</i> which regenerate rapidly after fire. It has been the practice of the landowners to manage the raised bogs by burning in the past and it is likely that this (together with drainage and grazing) has had an effect on the cover of <i>Sphagnum</i>, the occurrence of bare peat and the cover of ericaceous species. The southern dome is believed to be recovering from a large fire which occurred some time ago. In 2002, moss cover was considered to be more sparsely distributed than is typical of such habitat probably as a result of past burning, a low water table and competition from other plant species.</p> <p>3. No burning should be consented.</p> <p><u>Peat Cutting</u> Evidence of old peat cuttings are still visible on the surface of both domes. The cuttings to the east of the southern dome have developed into valuable habitat.</p> <p>4. A presumption against peat cutting should be maintained.</p> <p><u>Ardudwy Leat</u> This leat transports water out of the Eden sub-catchment and into Llyn Trawsfynydd before it is used by Magnox Electric to run a hydropower scheme at Maentwrog. It is likely that it affects the water table level in the blanket bog that surrounds the southern raised dome but its impact is currently unknown. Research is required into the impact of leat on the local hydrology.</p> <p>5. Operation of leat should not be changed without appropriate assessment.</p> <p><u>Old Municipal Dump at SH702346</u> Rubble and other material was dumped here sometime in the first half of the twentieth century and it has created a raised area that stands proud of the surrounding land. It is presumed that the rubble was dumped on top of the northern raised bog. Research is required to assess the potential for bog restoration and extension of area by removing the rubble.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>.

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	<p>In addition to managing the factors affecting the water course feature (listed above) favourable conservation status will be achieved by the following measures:</p> <ul style="list-style-type: none"> • Timing the launching of canoes to coincide with high flows. • Promoting awareness of the impact of over fishing pools during periods of low flows. • A presumption against stocking non-native fish and using live bait. • Checking hatchery reared salmonids for disease prior to release. • Removing the fish trap at Pont Dolgefeiliu. • Enforcement of fishery byelaws to reduce poaching. • Recreational fishing strategy that is sensitive to the requirement to restore a near to natural salmonid population in the Mawddach catchment. • Reviewing the Salmon Action Plan for the Mawddach in light of new research on conservation compliance limits. • Otter <i>Lutra lutra</i>. <p>Management should aim to manage the factors affecting the water courses and take additional action:</p> <ul style="list-style-type: none"> • Refer to actions listed for water courses. • Retain and develop habitat suitable for breeding sites. • Retain a healthy food chain and supply within the whole catchment and improve the quality/quantity of the fish population. • Maintain existing good quality bankside vegetation for breeding otters including dense scrub, bramble, blackthorn & gorse, reed beds, deciduous woodland with an understorey and wetlands within the boundary of the SAC. • Ensure infrastructure for recreational activities are sympathetically located and this activity takes place at an appropriate scale. • Reduce the mink population by implementing control measures. <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Freshwater pearl mussel <i>Margaritifera margaritifera</i></p> <ul style="list-style-type: none"> • Population distribution. <ul style="list-style-type: none"> ○ Lower limit – The distribution of mussels must not

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	<p>contract from its 2003 range.</p> <ul style="list-style-type: none"> • Population density and age structure. <ul style="list-style-type: none"> ○ Upper limit: None set. ○ Lower limit: Adult mussels are present for each delineated section of river (705 adults in total – 2003 survey results). ○ Lower limit: Report of one juvenile mussel of <65mm length during a site visit. • Water quantity (flow). Of the naturalised daily flow throughout the year the following should apply: <ul style="list-style-type: none"> ○ Upper limit – Flow should not be more than 110%. ○ Lower limit – Flow should be at least 90%. <p>River flow affects a range of habitat factors of critical importance to pearl mussels, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance both of occasional flushing flows and base flows, based on natural hydrological processes, is vital.</p> <ul style="list-style-type: none"> • Water Quality. Water quality shall be sufficient to support the SAC features. This shall include: <ul style="list-style-type: none"> ○ Levels of nutrients, in particular orthophosphate, will be agreed by NRW for the Water Framework Directive water body in the Afon Eden – Cors Goch Trawsfynydd SAC, and measures taken to maintain nutrients below these levels. ○ Levels of suspended solids will be agreed by NRW for the Water Framework Directive water body in the Afon Eden – Cors Goch Trawsfynydd SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. • Habitat extent including river morphology. <ul style="list-style-type: none"> ○ Lower limit – Map of current river morphology. <p>Maintain the characteristic physical features of the river channel, banks and riparian zone.</p>

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	<ul style="list-style-type: none"> • Habitat Quality inc. River Substrate. <ul style="list-style-type: none"> ○ Lower limit – Recovery target value: <1% silt and fine sands in top 30 cm of substrates hosting juvenile and adult mussels. ○ Monitoring targets – In the core transects, the following number of sample points will be classed as suitable habitat: (A) 8/10, (B) 7/9, (C) 25/30, (D) 6/8, (E) 10/14, (F) 15/18, (G) 20/26, (H) 12/17, (I) 7/9, (J) 7/9, (K) 8/11. ○ Limit – River bank shading should not exceed 60% adjacent to the mussel beds. <p>Clean coarse sands & gravels provide suitable habitat for pearl mussels. River banks should not be heavily shaded but some shading provides shade, keeping water temperatures optimal for the species and reducing growths of filamentous algae. Elevated levels of silt and fine sand can clog substrates used by juvenile mussels and can impair adult feeding/respiration. Riverside vegetation, especially mature willow trees, provide shading which helps keep the mussels cool during hot summers.</p> <ul style="list-style-type: none"> • Host Fish Population. <ul style="list-style-type: none"> ○ An abundant supply of juvenile salmonids (0+ and 1+ year classes) is vital to the survival of the larval stage. <p>Physical and chemical conditions need to be suitable for the well being of all life stages of salmonids, including free access up the river and conditions in the estuary and lower river where the juveniles of migratory salmonids are present. Release of parr & smolt by the EA from the smolt release pond at Bronaber means that fish of this age may migrate to sea before attached larval mussel has completed its glochidial stage.</p> <ul style="list-style-type: none"> • Fisheries & Species Promotion. <ul style="list-style-type: none"> ○ Assessment of plans and projects. ○ Insufficient data available on fish take. ○ Insufficient data available on impact of release of hatchery bred fish on native population. ○ Insufficient data on mink population in catchment. <p>Net limitation orders are in place on the Mawddach. Rod licences are issued by NRW. Over-fishing during low flows Salmon become concentrated in pools during low flows and are vulnerable to over</p>

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	<p>fishing. Over fishing of adult salmon at sea. This practise was recently out-lawed but it will continue to have an effect on salmon numbers in the short term future. Stocking of non-native fish. Smolt releases from holding pond at Bronaber for sea trout & salmon. Competition with and predation of wild fish populations, introduction of disease, genetic alterations, impact on wider food chain. Alteration to the natural age structure through fishery release strategy. Shift in population structure from fry to parr stages.</p> <ul style="list-style-type: none"> • Operation of Fish Trap. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Fish trap at Pont Dolgefeiliau is not currently in operation. If it were to be used it would create a barrier to fish migration.</p> <ul style="list-style-type: none"> • Gravel Abstraction. <ul style="list-style-type: none"> ○ Presumption against gravel abstraction. • Invasive Alien Species <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Japanese knotweed is found growing next to the watercourses and is usually controlled via herbicides. Herbicided handled inappropriately may enter the water course and poison fish and invertebrates.</p> <ul style="list-style-type: none"> • Coarse Woody Debris (CWD). <ul style="list-style-type: none"> ○ Presumption against CWD removal from the watercourse except on grounds of health and safety. Assessment of plans and projects. <p>It is natural to find CWD in water courses and it assists with maintaining good water quality and can provide refuge areas for young fish.</p> <ul style="list-style-type: none"> • Illegal Fish Poaching. <ul style="list-style-type: none"> ○ Insufficient data. <p>Removal of Salmonids.</p> <ul style="list-style-type: none"> • Illegal Fish Poaching. <ul style="list-style-type: none"> ○ Any evidence of pearl fishing must be pursued as a Wildlife crime. <p>The level, if any, of freshwater pearl mussel poaching is not known.</p>

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	<p>Pearl fishers remove the pearl from the adult mussel inevitably killing it. The price of pearl mussels has declined during the last decade due to imports of cultivated ones from China & this may reduce the demand for wild ones.</p> <ul style="list-style-type: none"> • Diffuse and Point Source Pollution. <ul style="list-style-type: none"> ○ Bronaber works is operating under discharge levels set in the 1950s which will be reviewed under RoC. ○ Maesgwm centre is likely to be redeveloped and this could provide an opportunity to upgrade the facility. ○ The new works (2005) at Pont Dolgefeilau has a relatively novel peat based filter which should conform to modern water quality discharge standards. <p>In addition to individual domestic septic tanks in the catchment there are three sewerage treatment works (STW) Bronaber STW operated by Dŵr Cymru, Coed y Brenin visitor centre STW at Maesgwm (SH715273) operated by Forestry Commission (FC), and Coed y Brenin visitor centre STW at Pont Dolgefeilau (SH721268) operated by FC.</p> <ul style="list-style-type: none"> • Agricultural Operations <ul style="list-style-type: none"> ○ Presumption against new drainage ditches. Light rotational cleaning of existing ditches only. ○ Appropriate grazing. ○ Soil degradation occurs around stock feeding points and they should be located away from open watercourses. ○ Presumption against any new land cultivation. ○ No fertiliser and/or lime application within defined location specific buffer areas. ○ Persistent, non-water soluble agriveterinary treatments have the most impact. <p>Different agricultural operations in the catchment present different risk factors for the feature; High risk operations leading to increased soil erosion, sediment supply and run-off rates include:</p> <ul style="list-style-type: none"> - Cleaning and creating new drainage ditches. - Inappropriate high grazing levels. - Inappropriately sited supplementary feeding points. - Land cultivation e.g. ploughing. - Fertiliser and lime application. - Pesticide application including sheep dipping and certain worming treatments.

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	<ul style="list-style-type: none"> • Forestry Operations <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Forestry operations in the catchment present different risk factors for the feature; The most high-risk operation is clear felling with timber transportation and conifer afforestation presenting a impact medium risk.</p> <ul style="list-style-type: none"> • Trunk Road Management & other Urban Land Use. <ul style="list-style-type: none"> ○ Review. <p>Road drainage Increase in sediment and decrease in water quality to channel may be due to trunk road management between Coed y Brenin and Bronaber. Run-off from management of RTA by emergency services and fuel, milk or chemical spillages could affect water quality.</p> <ul style="list-style-type: none"> - Surface water abstraction for domestic/ industrial /agricultural use. <p>Reduction of flows especially during the summer months.</p> <ul style="list-style-type: none"> - Tips/dumps <p>The disused WWII army camp at Bronaber is the site of several licensed and unlicensed tips. There is the potential for materials and pollutants to enter a tributary of the Eden above the FWPM beds.</p> <ul style="list-style-type: none"> • River engineering <ul style="list-style-type: none"> ○ Review ○ Assessment of plans and projects ○ Presumption against dredging ○ Presumption against in –channel works. <ul style="list-style-type: none"> - Arduwy leat - Cessation of the leat would increase the levels of acidic waters from the western tributaries entering the Eden. This leat abstracts water from the catchment and low flows affect water quality also overtopping of the leat during high flows leads to acidic waters entering the Eden. Annual cleaning of the weirs and screens leads to gravels being dumped in the tributaries in one large load. This creates an artificial “pulse” of sands, gravels and sediments entering the water body. - Small-scale hydro-power schemes in the catchment would change channel morphology and flow regimes.

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	<ul style="list-style-type: none"> - Dredging would stir up river bed sediments. - In-channel works, including flood defence works, leading to increase in sediment load, chemical pollution. <ul style="list-style-type: none"> • Recreation. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <ul style="list-style-type: none"> - Water base recreation can lead to disturbance and / or damage to channel banks and beds and cause an increase in sediment supply. - Walking & cycling can lead to footpath erosion and cause an increase in sediment supply <ul style="list-style-type: none"> • Mining. <ul style="list-style-type: none"> ○ Unknown levels – the release of toxic substances including acidic water could be a significant factor. <p>Release of toxic substances can have a direct & cumulative impact on both fish and invertebrates.</p> <ul style="list-style-type: none"> • Deposition atmospheric pollution. <ul style="list-style-type: none"> ○ U.K. monitoring programme. <p>Deposition of oxides of nitrogen & sulphur. Acidification of river water. Deposition of nitrogen & ammonia. Eutrophication.</p> <ul style="list-style-type: none"> • Climate change. <ul style="list-style-type: none"> ○ U.K. monitoring programme. <p>Water temperature is the trigger for adult mussels to release their glochidial larvae. Data from the Mawddach pearl mussel hatchery project suggests that the larvae are being released earlier in the season and in some years this may not coincide with the presence of migratory salmonids.</p> <p>Change in rainfall patterns and transpiration rates. Upward trend in average ambient water temperature.</p> <ul style="list-style-type: none"> - Warmer, drier summers Increased stream temperatures, reduced summer flows, increase in algal blooms and increase in potential for woodland / moorland fires. - Increased frequency of high intensity rainfall. More erosive

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	<p>runoff and thus increased sedimentation. More flashy flow regimes and flood souring of river bed.</p> <p>Atlantic salmon <i>Salmo salar</i></p> <ul style="list-style-type: none"> • Population Distribution. <ul style="list-style-type: none"> ○ Unknown. • Population size & range; Adult run <ul style="list-style-type: none"> ○ Unknown. <p>CSM guidance states: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component. As there is no fish counter in the Eden so adult run size is calculated using rod catch data for the Mawddach catchment. Further details can be found in the EA Mawddach Salmon Action Plan 1999.</p> <ul style="list-style-type: none"> • Population size & range: Juvenile densities. <ul style="list-style-type: none"> ○ Unknown. <p>CSM guidance states: These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality. Expected densities for each sample site using HABSCORE. Assessed using electro fishing data.</p> <ul style="list-style-type: none"> • Water quantity. <ul style="list-style-type: none"> ○ No information provided. <p>Monitoring is responsibility of NRW.</p> <ul style="list-style-type: none"> • Hydromorphology Flow regime, water quality. <ul style="list-style-type: none"> ○ Data for the Mawddach that may be possible to use for this. <p>Draft targets are set in relation to river/reach type(s).</p> <ul style="list-style-type: none"> • Habitat extent including river morphology. <ul style="list-style-type: none"> ○ Unknown. • Habitat quality inc. river substrate. <ul style="list-style-type: none"> ○ Unknown. <p>Clean coarse sands & gravels provide suitable habitat for salmonid redds. Riverbanks should not be heavily shaded but some shading provides shade, keeping water temperatures optimal for the species</p>

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	<p>and reducing growths of filamentous algae. Elevated levels of silt and fine sand can impair adult respiration.</p> <ul style="list-style-type: none"> • Recreation. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Water based recreation can lead to disturbance and / or damage to channel banks and beds and cause an increase in sediment supply. Canoeists may also trample and damage salmon spawning grounds. Walking & cycling can lead to footpath erosion and cause an increase in sediment supply.</p> <ul style="list-style-type: none"> • Fisheries & Species Promotion. <ul style="list-style-type: none"> ○ Assessment of plans and projects. ○ Insufficient data available on fish take. ○ Insufficient data available on impact of release of hatchery bred fish on native population. ○ Insufficient data on mink population in catchment. <p>Net limitation orders are in place on the Mawddach. Rod licences are issued by NRW.</p> <ul style="list-style-type: none"> - Over-fishing during low flows Salmon become concentrated in pools during low flows and are vulnerable to over fishing. - Over fishing of adult salmon at sea. <p>This practise was recently out-lawed but it will continue to have an effect on salmon numbers in the short term future.</p> <ul style="list-style-type: none"> - Stocking of non-native fish. Smolt releases from holding pond at Bronaber for sea trout & salmon. <p>Competition with and predation of wild fish populations, introduction of disease, genetic alterations, impact on wider food chain.</p> <ul style="list-style-type: none"> - Alteration to the natural age structure through fishery release strategy. Shift in population structure from fry to parr stages. - Introduction of infectious diseases. Reduction in salmonids population. - Introduction of mink and displacement of otter <p>Predation on salmon stocks by both otter & mink. Mink are more generalist predators and tend to get pushed upstream by otters into the headwaters of a catchment where they impact upon the native aquatic</p>

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	<p>fauna including salmonids.</p> <ul style="list-style-type: none"> • Operation of Fish Trap. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Fish trap at Pont Dolgefeiliau is not currently in operation. If it were to be used it would create a barrier to fish migration.</p> <ul style="list-style-type: none"> • Gravel Abstraction. <ul style="list-style-type: none"> ○ Presumption against Gravel Abstraction. <p>Loss of Salmon Spawning Grounds.</p> <ul style="list-style-type: none"> • Invasive Alien Species. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Japanese knotweed is found growing next to the watercourses and is usually controlled via herbicides. Herbicides handled inappropriately may enter the water course and poison fish and invertebrates.</p> <ul style="list-style-type: none"> • Coarse woody debris (CWD). <ul style="list-style-type: none"> ○ Presumption against CWD removal from the watercourse except on grounds of health and safety. Assessment of plans and projects. <p>It is natural to find CWD in water courses and it assists with maintaining good water quality and can provide refuge areas for young fish.</p> <ul style="list-style-type: none"> • Illegal Fish Poaching. <ul style="list-style-type: none"> ○ Unknown <p>Removal of Salmonids</p> <ul style="list-style-type: none"> • Diffuse and Point Source Pollution. <ul style="list-style-type: none"> ○ Bronaber works is operating under discharge levels set in the 1950s which will be reviewed under RoC. ○ Maesgwm centre is likely to be redeveloped and this could provide an opportunity to upgrade the facility. ○ The new works (2005) at Pont Dolgefeiliau has a relatively novel peat based filter which should conform to modern water quality discharge standards. <p>In addition to individual domestic septic tanks in the catchment there</p>

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	<p>are three sewerage treatment works (STW), Bronaber STW operated by Dŵr Cymru, Coed y Brenin visitor centre STW at Maesgwm (SH715273) operated by Forestry Commission (FC) and Coed y Brenin visitor centre STW at Pont Dolgefeilau (SH721268) operated by FC.</p> <ul style="list-style-type: none"> • Agricultural Operations. <ul style="list-style-type: none"> ○ Presumption against new drainage ditches. Light rotational cleaning of existing ditches only. ○ Appropriate grazing. ○ Soil degradation occurs around stock feeding points and they should be located away from open watercourses. ○ Presumption against any new land cultivation. ○ No fertiliser and/or lime application within defined location specific buffer areas. ○ Persistent, non-water soluble agriveterinary treatments have the most impact. <p>Different agricultural operations in the catchment present different risk factors for the feature; High risk operations leading to increased soil erosion, sediment supply and run-off rates include:</p> <ul style="list-style-type: none"> - Cleaning and creating new drainage ditches. - Inappropriate high grazing levels. - Inappropriately sited supplementary feeding points. - Land cultivation e.g. ploughing. - Fertiliser and lime application. - Pesticide application including sheep dipping and certain worming treatments. <ul style="list-style-type: none"> • Forestry Operations. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Forestry operations in the catchment present different risk factors for the feature; The most high-risk operation is clear felling with timber transportation and conifer afforestation presenting a impact medium risk.</p> <ul style="list-style-type: none"> • Trunk Road Management & other Urban Land Use. <ul style="list-style-type: none"> ○ Unknown. <p>Road drainage Increase in sediment and decrease in water quality to channel may be due to trunk road management between Coed y Brenin and Bronaber. Run-off from management of RTA by emergency</p>

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	<p>services and fuel, milk or chemical spillages could affect water quality.</p> <ul style="list-style-type: none"> - Surface water abstraction for domestic/ industrial /agricultural use. <p>Reduction of flows especially during the summer months.</p> <ul style="list-style-type: none"> - Tips/dumps <p>The disused WWII army camp at Bronaber is the site of several licensed and unlicensed tips. There is the potential for materials and pollutants to enter a tributary of the Eden above the FWPM beds.</p> <ul style="list-style-type: none"> • River Engineering. <ul style="list-style-type: none"> ○ Assessment of plans and projects. ○ Presumption against dredging. ○ Presumption against in –channel works. - Ardudwy leat - Cessation of the leat would increase the levels of acidic waters from the western tributaries entering the Eden. This leat abstracts water from the catchment and low flows affect water quality also overtopping of the leat during high flows leads to acidic waters entering the Eden. Annual cleaning of the weirs and screens leads to gravels being dumped in the tributaries in one large load. This creates an artificial “pulse” of sands, gravels and sediments entering the water body. - Small-scale hydro-power schemes in the catchment would change channel morphology and flow regimes. - Dredging would stir up river bed sediments. - In-channel works, including flood defence works, leading to increase in sediment load, chemical pollution. • Mining. <ul style="list-style-type: none"> ○ Unknown levels – the release of toxic substances including acidic water could be a significant factor. <p>Release of toxic substances can have a direct & cumulative impact on both fish and invertebrates.</p> <ul style="list-style-type: none"> • Deposition atmospheric pollution <ul style="list-style-type: none"> ○ U.K. monitoring programme

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	<ul style="list-style-type: none"> • Climate change <ul style="list-style-type: none"> ○ U.K. monitoring programme. <p>Water temperature is the trigger for adult mussels to release their glochidial larvae. Data from the Mawddach pearl mussel hatchery project suggests that the larvae are being released earlier in the season and in some years this may not coincide with the presence of migratory salmonids.</p> <p>Change in rainfall patterns and transpiration rates. Upward trend in average ambient water temperature.</p> <ul style="list-style-type: none"> - Warmer, drier summers increased stream temperatures, reduced summer flows, increase in algal blooms and increase in potential for woodland / moorland fires. - Increased frequency of high intensity rainfall. More erosive runoff and thus increased sedimentation. More flashy flow regimes and flood souring of river bed. <ul style="list-style-type: none"> • Marine by-catch. <ul style="list-style-type: none"> ○ 5% by-catch has been assessed as having no significant impact. <p>A working group from the EA has identified that approximately 5% of the post-smolt and adult salmon are caught in pelagic trawl nets.</p> <p>Otter <i>Lutra lutra</i></p> <ul style="list-style-type: none"> • Population distribution. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – MawddachSub-catchment: Afon Eden Otter signs found at 4 of the 6 OSW sites (66%). <p>Although Performance Indicators are given it is difficult to assess the condition of the otter population distribution feature because of the relatively small size of the SAC areas compared to the typical home range size of otters. As otters are mobile animals occupying very large home ranges, the condition of the otter feature should be considered at the landscape level.</p> <ul style="list-style-type: none"> • Breeding Activity. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Breeding Centre: There should be no deterioration in, or loss of, bank side habitats within the

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	<p>assumed breeding centre.</p> <p>Breeding Centres are used to provide an estimate of the number of females breeding in the system. They can only be a “best guess” but are based on our present knowledge of the size of otter home ranges, the juxtaposition of potential breeding sites, and records of breeding activity for the catchment.</p> <ul style="list-style-type: none"> • Actual & Potential Breeding Sites. <ul style="list-style-type: none"> ○ Upper limit – Potential Breeding Sites: There should be no decline in the extent or quality of the 4 mapped potential breeding sites (Eden sub-catchment) on the Eden. Liles (2003) Bryn Re & Gallt Cefn Deuddwr. ○ Lower limit – None set. <p>Within the home range of a single female there may be two or more potential breeding sites. When this is the case, the female may use a different breeding site each year (Liles, 2003). Birth takes place in a Natal Den, either above ground in a small patch of cover (i.e.1m x 1m) such as scrub or a pile of timber, or below ground, for example in a tree root system or a pile of boulders. Females often use a different natal den site each year (Liles, 2003).</p> <p>Although targets are set for the number of Potential Breeding sites within the SAC areas and wider subcatchments, the quality, habitat type, and location of sites is also important. Priority should be given to retaining existing sites. If the number or quality of sites does decline, alternative breeding sites can be created at nearby Habitat Improvement Sites.</p> <ul style="list-style-type: none"> • Water quantity. <ul style="list-style-type: none"> ○ No information provided. <p>Monitoring is responsibility of NRW.</p> <ul style="list-style-type: none"> • Hydromorphology Flow regime, water quality. <ul style="list-style-type: none"> ○ Draft targets are set in relation to river/reach type(s). • Food Availability & Riparian Habitat. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Fish & amphibian biomass should stay within expected fluctuations.

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	<p>The availability of food within the catchment is likely to be a major factor influencing both the distribution and breeding success of otters. Whilst the estuary is likely to support a range of fish species (particularly marine species), fish distribution on the rest of the system is patchy and, in places, very limited. The best parts of the Mawddach catchment for fish populations are the upper Eden (upriver from forestry areas) and the Wnion, where salmonid distribution and spawning is considered to be fair to good. Amphibians appear to be well distributed throughout the catchment. On the Eden, ditches and streams within the extensive areas of marshy grassland in the upper reaches are likely to support good populations of breeding amphibians.</p> <ul style="list-style-type: none"> • Operation of Fish Trap. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Fish trap at Pont Dolgefeiliau is not currently in operation. If it were to be used it would create a barrier to fish migration.</p> <ul style="list-style-type: none"> • Gravel Abstraction. <ul style="list-style-type: none"> ○ Presumption against gravel abstraction. <p>Loss of Salmon Spawning Grounds.</p> <ul style="list-style-type: none"> • Invasive Alien Species. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Japanese knotweed is found growing next to the watercourses and is usually controlled via herbicides. Herbicided handled inappropriately may enter the water course and poison fish and invertebrates.</p> <ul style="list-style-type: none"> • Coarse Woody Debris (CWD). <ul style="list-style-type: none"> ○ Presumption against CWD removal from the watercourse except on grounds of health and safety. Assessment of plans and projects. <p>It is natural to find CWD in water courses and it assists with maintaining good water quality and can provide refuge areas for young fish. Where CWD has accumulated alongside the riverbank it can create suitable sites for laying up couches and natal dens.</p> <ul style="list-style-type: none"> • Illegal Fish Poaching. <ul style="list-style-type: none"> ○ Unknown.

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	<p>Removal of salmonids.</p> <ul style="list-style-type: none"> • Diffuse and Point Source Pollution. <ul style="list-style-type: none"> ○ Bronaber works is operating under discharge levels set in the 1950s which will be reviewed under RoC. ○ Maesgwm centre is likely to be redeveloped and this could provide an opportunity to upgrade the facility. ○ The new works (2005) at Pont Dolgefeilau has a relatively novel peat based filter which should conform to modern water quality discharge standards. <p>In addition to individual domestic septic tanks in the catchment there are three sewerage treatment works (STW); Bronaber STW operated by Dŵr Cymru, Coed y Brenin visitor centre STW at Maesgwm (SH715273) operated by NRW and Coed y Brenin visitor centre STW at Pont Dolgefeilau (SH721268) operated by NRW.</p> <ul style="list-style-type: none"> • Agricultural Operations. <ul style="list-style-type: none"> ○ Presumption against new drainage ditches. Light rotational cleaning of existing ditches only. ○ Appropriate grazing. ○ Soil degradation occurs around stock feeding points and they should be located away from open watercourses. ○ Presumption against any new land cultivation. ○ No fertiliser and/or lime application within defined location specific buffer areas. ○ Persistent, non-water soluble agriveterinary treatments have the most impact. <p>Different agricultural operations in the catchment present different risk factors for the feature; High risk operations leading to increased soil erosion, sediment supply and run-off rates include:</p> <ul style="list-style-type: none"> - Cleaning and creating new drainage ditches. - Inappropriate high grazing levels. - Inappropriately sited supplementary feeding points. - Land cultivation e.g. ploughing. - Fertiliser and lime application. - Pesticide application including sheep dipping and certain worming treatments. <ul style="list-style-type: none"> • Forestry Operations. <ul style="list-style-type: none"> ○ Assessment of plans and projects.

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	<p>Forestry operations in the catchment present different risk factors for the feature; The most high-risk operation is clear felling with timber transportation and conifer afforestation presenting a impact medium risk.</p> <ul style="list-style-type: none"> • River Engineering. <ul style="list-style-type: none"> ○ Assessment of plans and projects. ○ Presumption against dredging. ○ Presumption against in –channel works. - Ardudwy leat - Cessation of the leat would increase the levels of acidic waters from the western tributaries entering the Eden. This leat abstracts water from the catchment and low flows affect water quality also overtopping of the leat during high flows leads to acidic waters entering the Eden. Annual cleaning of the weirs and screens leads to gravels being dumped in the tributaries in one large load. This creates an artificial “pulse” of sands, gravels and sediments entering the water body. - Small-scale hydro-power schemes in the catchment would change channel morphology and flow regimes. - Dredging would stir up river bed sediments. - In-channel works, including flood defence works, leading to increase in sediment load, chemical pollution. • Recreation. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>Breeding otters can be sensitive to disturbance by humans and dogs so recreational areas should be sited at a distance from suitable breeding habitat and known breeding dens.</p> <p>Water based recreation can lead to disturbance and / or damage to channel banks and beds and cause an increase in sediment supply. Canoeists may also trample and damage salmon spawning grounds. Walking & cycling can lead to footpath erosion and cause an increase in sediment supply.</p> <ul style="list-style-type: none"> • Mining. <ul style="list-style-type: none"> ○ Unknown levels – the release of toxic substances including acidic water could be a significant factor.

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	<p>This factor can have an indirect impact on otter by affecting the food chain. Release of toxic substances can have a direct & cumulative impact on both fish and invertebrates</p> <ul style="list-style-type: none"> • Deposition Atmospheric Pollution. <ul style="list-style-type: none"> ○ U.K. monitoring programme. <p>Eutrophication and acidification can have an indirect impact on otter by affecting the food chain. Deposition of oxides of nitrogen & sulphur. Acidification of river water. Deposition of nitrogen & ammonia. Eutrophication.</p> <ul style="list-style-type: none"> • Climate change <ul style="list-style-type: none"> ○ U.K. monitoring programme. <p>Change in rainfall patterns and increased flooding could affect the otter breeding cycle and success rates if natal dens are flooded and feeding patterns disrupted. Water temperature is the trigger for adult mussels to release their glochidial larvae. Data from the Mawddach pearl mussel hatchery project suggests that the larvae are being released earlier in the season and in some years this may not coincide with the presence of migratory salmonids.</p> <p>Change in rainfall patterns and transpiration rates. Upward trend in average ambient water temperature.</p> <ul style="list-style-type: none"> - Warmer, drier summers increased stream temperatures, reduced summer flows, increase in algal blooms and increase in potential for woodland / moorland fires. - Increased frequency of high intensity rainfall. More erosive runoff and thus increased sedimentation. More flashy flow regimes and flood souring of river bed. <p>Active raised bogs</p> <ul style="list-style-type: none"> • Location and Distribution of Raised Bog. <ul style="list-style-type: none"> ○ Upper limit – None, naturally limited by geology, topography and rainfall. ○ Lower limit – The current location and distribution within the SAC must be maintained. The current location and distribution within the SAC must be maintained.

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	<ul style="list-style-type: none"> • Extent of Raised Bog. <ul style="list-style-type: none"> ○ Upper limit – None, naturally limited by geology, topography and rainfall. ○ Lower limit – The current extent within the SAC must be maintained. Two management units for each dome have been drawn up based upon SAC, habitat and land management boundaries. • Uncommon plant species. <p>The abundance and distribution of uncommon plants is maintained or increased (refer to table below).</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Table 1: Uncommon plants of the raised bog feature</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Species</th> <th style="text-align: left;">Status</th> <th style="text-align: left;">Notes</th> </tr> </thead> <tbody> <tr> <td><i>Andromeda polyfolia</i></td> <td>Regionally Rare</td> <td>M18</td> </tr> <tr> <td><i>Sphagnum magellanicum</i></td> <td>Locally uncommon-indicator of good quality raised bog</td> <td>M18, M17</td> </tr> </tbody> </table> </div> <ul style="list-style-type: none"> • Typical species <ul style="list-style-type: none"> ○ As a guide to frequency refer to published NVC tables. <p>The typical species of the vegetation communities comprising the active raised bog SAC feature are frequent (refer to table below).</p>	Species	Status	Notes	<i>Andromeda polyfolia</i>	Regionally Rare	M18	<i>Sphagnum magellanicum</i>	Locally uncommon-indicator of good quality raised bog	M18, M17
Species	Status	Notes								
<i>Andromeda polyfolia</i>	Regionally Rare	M18								
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Table 2. Typical species of the active raised bog feature

NVC Vegetation community	Typical Species-constants and/or desirable*
Bog	
M17 <i>Trichophorum cespitosum</i>- <i>Eriophorum vaginatum</i> blanket mire. Characteristically frequent <i>Eriophorum vaginatum</i> , <i>Scirpus cespitosus</i> and <i>Molinia caerulea</i> .	<i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Molinia caerulea</i> <i>Narthecium ossifragum</i> <i>Potentilla erecta</i> <i>Scirpus cespitosus</i> <i>Sphagnum capillifolium</i> <i>Sphagnum papillosum</i>
M18 <i>Erica tetralix</i>- <i>Sphagnum papillosum</i> raised and blanket mire Particularly good quality blanket bog tending towards raised bog dominated by <i>Sphagna</i> . <i>Sphagnum papillosum</i> frequent (V-IV). <i>Sphagnum magellanicum</i> present often just few clumps.	<i>Calluna vulgaris</i> <i>Erica tetralix</i> <i>Eriophorum angustifolium</i> <i>Eriophorum vaginatum</i> <i>Sphagnum capillifolium</i> <i>Sphagnum papillosum</i> <i>Vaccinium oxycoccus</i> * <i>Sphagnum magellanicum</i> *
Associated mire and lag fen	
M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire	<i>Molinia caerulea</i> <i>Potentilla erecta</i>
M6 <i>Carex echinata</i> – <i>Sphagnum recurvum</i>/ <i>auriculatum</i> mire	<i>Carex echinata</i> <i>Sphagnum recurvum / auriculatum</i> <i>Polytrichum commune</i> <i>Agrostis canina</i> <i>Potentilla erecta</i> <i>Viola palustris</i>

- Structure.
 - Hummock/hollow microtopography will occupy the crown of both raised bogs.

The structure of the raised bogs is maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface.

- Hydrological Integrity.
 - Map current functioning drains and any other features

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	<p>contributing to the drying of the bogs and record bog surface topography-old peat cutting etc.</p> <p>Artificial drainage ditches or moor grips are not present as functioning drains. Ditches should be in filled or blocked to create pools.</p> <ul style="list-style-type: none"> • Invasive Non-Native Species. <ul style="list-style-type: none"> ○ None within the SAC and preferably within a species-specific buffer around the SAC which may be the catchment. <p>Rhododendron and Japanese knotweed are examples of the type of plant species that can colonise wetter habitats. No invasive non-native species have been recorded at Cors Goch.</p> <ul style="list-style-type: none"> • Tree Cover. <ul style="list-style-type: none"> ○ When in favourable condition, raised bog and its associated rand, fen lagg and blanket bog is tree less. <p>Raised bogs in Wales has been naturally tree-less for a long time. Trees are present occasionally where this habitat is in mosaic on drier areas such as acid grassland or out crops of rock away from grazing stock... Invasive tree species such as birch & willow should not be allowed to mature.</p> <ul style="list-style-type: none"> • Grazing and Supplementary Feeding. <ul style="list-style-type: none"> ○ No winter grazing or supplementary feeding on the raised bog. <p>Pony or cattle grazing between May and September/October at a rate of 0.3LSU/year on <i>Molinia</i> dominated bog and 0.05LSU on raised peat/non <i>Molinia</i> bog . Supplementary feeding means that stock congregate in one area to feed and dung leading to peat erosion and local nutrient enrichment which allows competitive ruderal weed plant species to establish to the detriment of bog species</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ No burning. <p>Raised bog should not be burnt, as burning damages important plant and animal species, especially bog mosses and invertebrates and interferes with the natural development of this vegetation. Past burning practice is likely to be at least partly responsible for the relative rarity of</p>

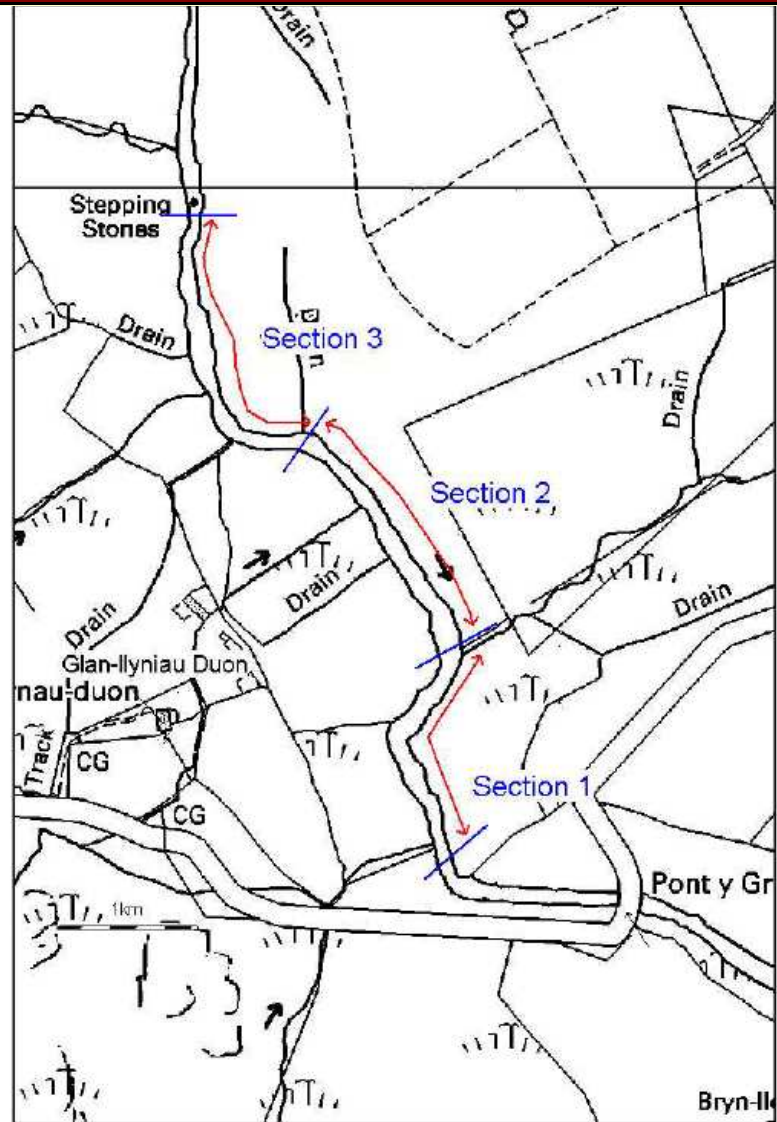
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	<p>burningsensitive species. Burning, in combination with intense grazing, is also responsible for damage to the raised bogs. Burns scorch and kill bog mosses such as <i>Sphagnum magillanicum</i> and <i>S.papillosum</i> and other lower plants, removing the heather/ericaceous layer, to reveal the blanket of <i>Eriophorum vaginatum</i> underneath. The cotton grass recovers well from fire, benefits from the ‘fertiliser’ input of ash, and has then a competitive advantage over other plants which can only recolonise slowly. Thus the NVC M18 bog community associated with intact mires in good condition is converted to the degraded NVC M20 and becomes unfavourable.</p> <ul style="list-style-type: none"> • Drainage. <ul style="list-style-type: none"> ○ No new drainage ditches. We should also seek to infill/block existing ditches wherever possible. <p>The wetland habitats and features are profoundly influenced by alterations to the natural drainage regime of the site. Raised bog is a nutrient-poor, rain fed system, which arises in areas with a wet, cool climate and a suitable topography (completely flat broad valley floor) with little or no water flowing in from surrounding land. Artificial drains cause the bog to dry out and to deteriorate adjacent to the drains. The drains may bring nutrients to the system and the vegetation changes because the bog is no longer only receiving nutrients from the rain. Also, if the drying peat surface becomes exposed, it then oxidises which releases nutrients into the system, and dissolved carbon into water courses which ultimately feed into the Afon Eden. This results in similar changes to the sensitive vegetation as well as increased peat erosion. For these reasons, it is important that there should be no new drainage ditches dug in this habitat, and wherever possible old drainage ditches should be blocked or encouraged to infill. This habitat forms a natural sponge which, provided it is not ditched, helps to reduce floods lower down the river system in rainy times while providing plenty of water during summer droughts.</p> <ul style="list-style-type: none"> • Ardudwy Leat. <ul style="list-style-type: none"> ○ Operation of leat should not be changed without consulting NRW and conducting an appropriate assessment. <p>This leat transports water out of the Eden sub-catchment and into Llyn Trawsfynydd before it is used by Magnox Electric to run a hydropower scheme at Maentwrog. It is likely that it affects the water table level in the blanket bog that surrounds the southern raised dome but its impact</p>

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	<p>is currently unknown. Research is required into the impact of leat on the local hydrology.</p> <ul style="list-style-type: none"> • Invasive Non-Native Species. <ul style="list-style-type: none"> ○ None within the SAC and preferably within a species-specific buffer around the SAC which may be the catchment. <p>Invasive non-native species are aliens within the natural raised and blanket bog communities. Their invasive nature means they threaten the integrity of the habitat by competition, shading and often drying of the blanket bog by transpiration.</p> <ul style="list-style-type: none"> • Peat Extraction. <ul style="list-style-type: none"> ○ Peat cutting should not be allowed to resume. <p>In the past local people dug peat for fuel and the remains of old peat cuttings can still be seen today.</p> <ul style="list-style-type: none"> • Dumped Material. <ul style="list-style-type: none"> ○ Consider restoration to regain bog area. <p>There are dumps including an old municipal dump at SH702346 which has rubble and other material and has created a raised area that stands proud of the surrounding land. It is presumed that the rubble was dumped on top of part of the northern raised bog.</p> <ul style="list-style-type: none"> • Nitrogen Deposition. <ul style="list-style-type: none"> ○ Upper limit – 10 kg N/ha/yr. ○ Lower limit – None set. <p>This air borne pollution leads to enrichment of vegetation and soils, and favours species such as <i>Molinia</i> at the expense of species associated with intact mires. Atmospheric N deposition at the site (estimated at 13.6kg N/ha/yr – source www.apis.ac.uk currently exceeds the estimated critical load for this habitat (5-10 kg N/ha/year). Reductions in atmospheric N deposition require policy implementation at a UK level, as well as local development control to place a limit on local pointsource emissions.</p> <ul style="list-style-type: none"> • Climate change. <ul style="list-style-type: none"> ○ U.K. monitoring of climate change.

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	<p>Peat bogs have an important mitigation role to play in managing the adverse impacts of climate change by acting as flood reservoirs and carbon sinks. Peat bogs are also highly sensitive to the predicted effects of climate change, namely increased winter rainfall and increasing incidence of summer droughts. Hydrological restoration is urgently needed to help ‘climate-proof’ the Cors Goch bogs.</p> <p>Floating water-plantain <i>Luronium natans</i></p> <ul style="list-style-type: none"> • Species extent and abundance. <ul style="list-style-type: none"> ○ Lower limit – <i>Luronium natans</i> will be present within each of Sections 1-3 along the Afon Eden (Map below showing <i>Luronium natans</i> monitoring sections on the Afon Eden). <p>Presence of <i>Luronium natans</i> recorded as plants that are attached to substrate. Detached fragments (unless obviously detached during monitoring) will not be counted.</p>

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Cors Goch Trawsfynydd
Location Grid Ref:
SH720271
JNCC Site Code:
UK0030075 **Size:** 284.29
ha
Designation: SAC

Habitats Regulations Assessment: Data Proforma



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- Sufficient Habitat.
 - Sufficient good quality habitat should exist to support the expansion of existing populations. Extent of good quality habitat should not be reduced.

Submerged populations of *L. natans* require substrates comprising of mud or stable fine gravel or silt in depths of clear water up to 3m.

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	<ul style="list-style-type: none"> • Water Quantity. <ul style="list-style-type: none"> ○ Unknown. • Hydromorphology Flow Regime, Water Quality. • Dredging <ul style="list-style-type: none"> ○ No dredging likely to affect <i>L.natans</i> should occur at Pont y Gribble or other sections of the Eden where suitable habitat is found. <p>Dredging could directly damage <i>L.natans</i> beds.</p> <ul style="list-style-type: none"> • Gravel Abstraction. <ul style="list-style-type: none"> ○ Presumption against gravel abstraction. <p>Loss of source material for river gravel beds. Physical removal of potential habitat.</p> <ul style="list-style-type: none"> • Recreation. <ul style="list-style-type: none"> ○ No canoeing during periods of low flows and no up-stream access points in the vicinity of Pont y Gribble. <p>Canoeing during periods of low flows & trampling of the riverbed could damage submerged populations.</p> <ul style="list-style-type: none"> • Competition from other aquatic plant species. <ul style="list-style-type: none"> ○ Unknown. <p><i>L. natans</i> cannot compete with other aquatic plant species including algae.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Afon Eden – Cors Goch Trawsfynydd SAC (2008)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to-brecon-sac-list/idoc.ashx?docid=ef6a34c8-5b00-4c19-9d12-435687e876a6&version=-1)</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>: Favourable • Freshwater pearl mussel <i>Margaritifera margaritifera</i>: Unfavourable

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	<ul style="list-style-type: none"> • Active raised bog: Unfavourable • Atlantic salmon <i>Salmo salar</i>: Unfavourable • Otter <i>Lutra lutra</i>: Unfavourable • Otter distribution – Unfavourable Actual / potential breeding sites – Favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Water Pollution</u> The pearl mussel and salmonids are particularly vulnerable to water pollution e.g. sheep-dip, nitrate input, sediment input, and inappropriate river management. Any inputs to the river which affect water chemistry need to be controlled, and river management must take account of the needs of the features.</p> <p><u>Recreation and Leisure</u> Boats and canoes launching upstream can affect the Floating water-plantain and Pearl mussel beds if not regulated.</p> <p><u>Natural Processes</u> The high rainfall and acidic geology/pedology renders this area vulnerable to acidification.</p> <p><u>Old Municipal Dump at SH702346</u> Rubble and other material was dumped here sometime in the first half of the twentieth century and it has created a raised area that stands proud of the surrounding land. It is presumed that the rubble was dumped on top of the northern raised bog. Research is required to assess the potential for bog restoration and extension of area by removing the rubble</p>
<p>Landowner/ Management Responsibility</p>	<p>Unknown.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Gwynedd Council’s Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

<p>Site Name: Johnstown Newt Sites Location Grid Ref: SJ310466 JNCC Site Code: UK0030173 Size: 69.61 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The site is located in the environs of the village of Johnstown, south west of Wrexham, at an altitude of 130m above mean sea level. It is of special interest for its population of the great crested newt <i>Triturus cristatus</i>. This species has suffered a marked decline throughout Great Britain and Continental Europe as a result of habitat loss. Great Britain is considered to support one of the strongholds for this species in Western Europe.</p> <p>The Bettisfield Formation feldspathic sandstone and coal measures underlie the site and a number of capped mine shafts are present within the boundaries of the site. Where present, natural soils are of over-consolidated till (boulder clay) origin. The majority of the water bodies originated following the cessation of mineral extractive industries including coal mining and quarrying for clay and associated industrial developments. Certain ponds, particularly at Hafod, were specifically created for amphibian conservation purposes.</p> <p>Surrounding areas of land support a mosaic of scrub and planted trees, grassland, and tall ruderal vegetation. These form important foraging and over wintering areas for adult and juvenile amphibians.</p>
<p>Qualifying Features</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Great crested newt <i>Triturus cristatus</i>.
<p>Conservation Objectives</p>	<p>The site supports a breeding population of over 300 adult great crested newts as identified by torch surveys in the spring. The population of newts is stable or increasing, with at least 30 display/breeding ponds present across the site. Native macrophyte plants cover many of the ponds, but at least 40% of the surface remains as open water.</p> <p>Fish are absent from all breeding/display ponds which support great crested newts, and wildfowl are only seen in small numbers. No non-native aquatic species will be present in any of the ponds.</p> <p>Tall vegetation surrounds the ponds, but it does not lead to excessive shading of the water body. The current vegetation, together with fallen trees, and large stones provides refuge areas for the newts during the day as well as suitable foraging areas, and hibernation places for amphibians. Great crested newts disperse between the ponds using a network of corridors, formed by hedgerows and rough grasslands, together with habitats, such as ponds or scrub that function as</p>

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	<p>stepping-stones.</p> <p>Between sites, new surface water management systems will be amphibian friendly and will therefore not hinder newt dispersal.</p> <p>Ponds exhibiting a range off seral conditions will occur throughout the site. Recreational activities will be sympathetic to newt conservation and consequently, individuals will no longer be able to utilize the site for off roading or fishing purposes.</p> <p>All section of the local community will be aware of the ecological value of the site and of the implications caused by the introduction or transference of fish between ponds.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Great crested newt <i>Triturus cristatus</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • No less than 300 great crested newts will be present on the site. • At least 30 display/breeding ponds will be found throughout the entire site. • Great crested newt larvae will be found in 7 or more of the breeding ponds. • Half of the display/breeding ponds on the site will have a water depth of 10cm or more during the summer months. • Native macrophytes will cover at least half of the pond surface yet some of the water surface will still remain open. • Aquatic marginal vegetation will be present around the ponds. • Breeding/display ponds will not be heavily shaded by surrounding vegetation. • Algal blooms and surface sheens will be absent from display/breeding ponds. • Fish will not be present in breeding/display ponds which support great crested newts. • Only small numbers of water and wildfowl will be seen on the ponds. • The terrestrial habitat surrounding breeding ponds will comprise of refuge areas for newts, foraging areas, areas of hibernacula and corridors which will aid the dispersal of great crested newts. • Off site habitats that function as stepping stone or corridors located between SAC compartments will be maintained for migration, dispersal, foraging and genetic exchange purposes.

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	<ul style="list-style-type: none"> • Off-site features that impact on successful dispersal, such as roadside gully-pots, will not be subject to future construction. • Non-native aquatic species will not be present. • Amphibian chytridiomycosis will not be present. • All factors affecting the achievement of the foregoing conditions are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 17 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on tenure and section 15 agreement areas.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Great crested newt <i>Triturus cristatus</i>. <p>Great crested newts are found in low numbers and great crested newt larvae are only found in a small number of ponds. The principle reasons for this are, the presence of fish in breeding ponds, pond pollution, and <i>Crassula helmsii</i> covering large areas of the pond surfaces.</p> <p>The great crested newt is dependent on a mosaic of terrestrial and aquatic habitats for breeding, shelter and hibernation. Each of these is discussed in further detail below. The provision of log and rubble piles within terrestrial habitats will provide suitable areas for shelter, protection and hibernation.</p> <p><u>Pond Management</u> Excessive growth of aquatic and emergent plants, accumulation of decaying vegetation and silt and scrub encroachment can lead to the gradual loss of open water areas that are important to breeding newts. This is likely to be an ongoing problem. Periodic weed and silt removal will be required to maintain sufficient open water in all water bodies but this must be undertaken very carefully under licence at the correct time of the year to avoid disturbance to breeding newts and/or preventing damage to breeding sites/resting places. Native vegetation and silt should be left on the sides of the pool prior to disposal to allow amphibians and other aquatic creatures to return to the water.</p> <p>Alternative methods must be employed if non-native plant species are present. Bio-security techniques must be employed to minimize risks associated with the accidental spread of non-natives.</p>

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	<p>Pond construction and maintenance will need to be required for the purposes of ensuring seral diversity within the overall site. Additional ponds will therefore continue to be created within the SAC to increase the extent of aquatic habitat available to great crested newts, and thus increase the range and extent of suitable breeding habitats. Whenever appropriate further ponds should be created off-site for the purposes of creating “stepping stones” between SAC compartments. This action will contribute to the delivery of actions associated with maintaining the conservation status of the species.</p> <p><u>Water Quality</u> There is some concern about pollutants, such as oil from off-road vehicles entering the water bodies in management units 4, 5 and 6. Vegetation will act as a buffer to diffuse pollution entering ponds and consequently stands of emergent vegetation should be encouraged. Possible mitigation of impacts might be achieved by preventing the use of motorbikes in close proximity to the ponds. However water pollution is not considered to be a significant factor affecting the presence of great crested newts on this site.</p> <p><u>Woodland, Scrub and Hedgerow Management</u> As far as possible, natural ecological processes should be allowed to operate within the wooded areas. These will, in time, create natural clearings, enable the promotion of tree and shrub regeneration, and ideally allow the steady accumulation of both standing and fallen deadwood, which are essential elements in a natural system. Any active management should aim to complement natural processes, to enhance the various vegetation communities now present, and to promote a greater diversity of woodland structures by encouraging a mixed-age distribution of trees and the wider development of a shrub and ground layer. Care should be taken during such work to avoid disturbance to the newts or their places of shelter.</p> <p>Owing to a substantial area of the overall site being managed as a community woodland and amenity public open space, it is expected that a high degree of public usage will prevail within this area. As a result dangerous trees, hanging branches and standing dead timber, that are likely to be regarded as a safety hazard, may need to be cut down and retained on site. Fallen and cut timber must be allowed to accumulate on site and retained for the purposes of providing shelter, hibernation sites and foraging habitat for newts. Hedgerows should be managed by trimming and periodic layering. They should be protected from grazing livestock and their bases left undisturbed to protect the newts.</p>

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	<p><u>Grassland Management</u> Open habitats such as grassland are important feeding areas but the sward should be long enough to provide cover for the newts and their prey. Areas of grass should be left uncut over the summer months to create rank grassland communities that provide both cover for newts dispersing from breeding and natal ponds and as foraging habitats. Consequently, extensive grazing or cutting is not strictly necessary as the newts can thrive in rank grassland and scrub. However, grassland management regimes should lead to the creation of a mosaic of grassland habitats. Frequent cutting for amenity purposes will only be permitted within 1m of statutory and permitted footpaths.</p> <p><u>Other Factors to be Considered:</u></p> <p><u>Invasive Plants</u> Non-natives water plants such as <i>Crassula helmsii</i> can reproduce very rapidly and lead to a reduction in the open water habitat available for newts. At present (2007) <i>Crassula helmsii</i> has been removed from a number of ponds, however it is still problematic in management Units 3, 7, 13 and 12. Greater control will be required to prevent the spread of this plant on this site by the effective implementation of bio-security techniques.</p> <p><u>Predators</u> Amphibian breeding ponds should ideally contain no predatory fish, as fish will predate newt larvae. Fish have been removed from some ponds using the technique of electro-fishing, netting and pumping. However the presence of fish is still a problem in management Units 3, 7, 12 and 13. Without further removal of fish from ponds in the SAC great crested newt recruitment will decline. Members of the public also need to be discouraged from translocating fish between ponds for recreational fishing purposes. To facilitate effective fish control, the use of piscicides must be considered. Water/wildfowl, although not currently a significant problem, have the potential to predate newt eggs/larvae if numbers are allowed to increase. Consequently land managers must be advised to actively discourage the feeding or introduction of waterfowl. If numbers increase, water/wildfowl numbers will need to be controlled.</p> <p><u>Obstructions to Movement</u> Hedgerows and other linear landscape features must be present to enable the migration and dispersal of individuals, and facilitate genetic exchange between neighbouring newt populations. These features should not be removed or altered so as to restrict newt access. These may be on or off-site. Off-site, newts can become trapped in roadside</p>

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	<p>gully-pots during migration to and from breeding ponds. Once trapped, it is unlikely that animals will be able to escape. Where gully-pots are present, measures should be undertaken to reduce the likelihood of newts becoming trapped and to rescue those that do. In the medium to long term, alternative surface water management systems, that do not include gully-pots, should be installed. Other potential barriers to newts, such as new roads, paths, walls and high kerbs should not be installed without providing adequate crossing points.</p> <p><u>Development</u> The SAC lies within and at the edge of both residential and industrial areas of Johnstown. Consequently, owing to its location, pressure from development is likely to occur in the future. There is insufficient information on the nature and scale of future development and consequently potential impacts cannot be effectively assessed. However, appropriate scheme design and implementation will ensure that both direct and indirect impacts are either avoided or considerably minimized. This effectively prevents impacts on either the integrity and/or the feature of the SAC.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Great crested newt <i>Triturus cristatus</i></p> <ul style="list-style-type: none"> • Extent and distribution of adult great crested newts <i>Triturus cristatus</i> in breeding ponds. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 50 individuals MU 2; 25 individuals MU 3; 50 individuals MU 4; 30 individuals MU 7; 10 individuals MU 9; 10 individuals MU 10; 20 individuals MU 11; 30 individuals MU 12; 75 individuals MU 13, for at least four years in a six year reporting cycle. Total = 300. <p>Night counts of adults during the breeding season. Based on the number of great crested newts required to maintain a viable population - knowledge provided by staff with experience of the site. [Monitoring should take place each year to allow for any climatic variation between years.</p> <ul style="list-style-type: none"> • Evidence of breeding success. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 1 or more breeding ponds with evidence of recruitment per each of the following Management Units 7, 9, 10, 11, 12. <p>Based on the number of breeding ponds showing recruitment which are</p>

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	<p>required to maintain a viable population - knowledge provided by staff with experience of the site.</p> <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 5 breeding ponds with evidence of recruitment per each of the following Management Units MU 2, 3, 4, 13. <p>A breeding pond is defined as a pond in which <i>T. cristatus</i> is/ or is likely to conduct egg laying, and successful metamorphosis once in every 4 years.</p> <ul style="list-style-type: none"> ● Extent of breeding/display ponds. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 4 breeding/display ponds across MU 7, 9, 10, 11, 12. <p>Based on the number of breeding and display ponds required to maintain a viable population and to clarify the situation for legal purposes – knowledge provided by staff with experience of the site.</p> <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 11 breeding/display ponds across MU 2, 3, 4, 13. <p>A breeding pond is defined as a pond in which <i>T. cristatus</i> is/ or is likely to conduct egg laying, and successful metamorphosis once in every 4 years.</p> <ul style="list-style-type: none"> ○ Target total No. = 30 display/breeding ponds. <p>A display pond is defined as a pond in which adults and sub-adults occur between March and May.</p> <ul style="list-style-type: none"> ● Macrophyte Plant cover. <ul style="list-style-type: none"> ○ Upper limit – 60 % of display/breeding ponds will have 75% native macrophyte cover across. ○ Lower limit – 60 % of display/breeding ponds will have 50% native macrophyte cover across. <p>Based on the amount of plant material required for egg laying and the area of open water required for displaying - knowledge provided by staff with experience of the site.</p> <ul style="list-style-type: none"> ● Water Depth.

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	<ul style="list-style-type: none"> ○ Upper limit – Water depth 10m between July and September in 50 % of display/breeding ponds. ○ Lower limit – Water depth > 10 cm between July and September in 50 % of display/breeding ponds MU: 2, 3, 4, 7, 9, 10, 11, 12, 13. <p>Based on the standard CSM parameters for this feature. Influenced by siltation and build-up of decaying vegetation.</p> <ul style="list-style-type: none"> ● Presence of Pollution. <ul style="list-style-type: none"> ○ Upper limit – No surface sheens and algae blooms on display/breeding ponds. ○ Lower limit – Not required. MU: 2, 3, 4, 7, 9, 10, 11, 12, 13. <p>Based on the water conditions that are appropriate for successful breeding - knowledge provided by staff with experience of the site.</p> <ul style="list-style-type: none"> ● Extent of shading. <ul style="list-style-type: none"> ○ Upper limit – 20 % shading on the southern margin or 60 % of the total pond margin shaded on 50 % of breeding/display ponds. ○ Lower limit – Not required. MU: 2, 3, 4, 7, 9, 10, 11, 12, 13. <p>Based on the water conditions that are appropriate for successful breeding - knowledge provided by staff with experience of the site. Pond shading: % estimated for any tree/shrub cover greater than 1m, for trees and shrubs up to 5m from a pond. Shading estimated for trees/shrubs casting shadow over a pond between 10am and 4pm.</p> <ul style="list-style-type: none"> ● Extent and Quality of Terrestrial Habitat. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Terrestrial “newt” habitat with a 250m radius from a breeding/display pond in MU 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 16, must have all and MU 8, 13, 15 and 17 must have at least one of the following characteristics: 1) Refuge areas, i.e. shady areas within the rough/tussocky grassland; scrub, fallen deadwood; underground crevices, tree root systems, mammal burrows, rubble piles, and/or old walls. 2) Foraging areas, i.e. grasslands and woodlands. 3) Potential hibernacula, i.e. log piles or piles of rubble. ● Dispersal Routes.

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	<ul style="list-style-type: none"> ○ Upper limit – No increase (or change in position) of barriers, such as roads and hedges. ○ Lower limit – There should be no significant loss, or fragmentation, of hedgerows and other dispersal corridors. <p>Existing dispersal corridors should be maintained and no new obstructions created. Assessed visually. Baseline from 2006 aerial photographs.</p> <ul style="list-style-type: none"> ● Presence of Water and Wildfowl. <ul style="list-style-type: none"> ○ Upper limit – 3 pairs of water and wildfowl per hectare of open water between April and September in MU 2, 3, 4, 7, 9, 10, 11, 12, 13. ○ Lower limit – Not required. ● Presence of Fish. <ul style="list-style-type: none"> ○ Upper limit – No fish species (including sticklebacks) present in any ponds. ○ Lower limit – Not required. <p>Based on knowledge from staff with experience of the site that the presence of fish will be detrimental to the great crested newt population.</p> <ul style="list-style-type: none"> ● Presence of non-native aquatic plant species, especially <i>Crassula helmsii</i>. <ul style="list-style-type: none"> ○ Upper limit – No non-native aquatic plant species present in any ponds. ○ Lower limit – Not required. <p>Based on knowledge from staff with experience of the site.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Johnstown Newt Sites SAC, EU SAC Code UK0030173 (2008) available at:</i> http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/idoc.ashx?docid=64181da1-4774-4293-b029-07e586a5cc08&version=-1)</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● Great crested newt <i>Triturus cristatus</i>: Unfavourable, declining

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<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Development, Public Access, Fly-Tipping and Pollution.</u> The important great crested newt populations are dependent on the preservation of suitable aquatic and terrestrial habitat. These are vulnerable to destruction and inappropriate management. Situated in the urban fringe, these post-industrial sites are subject to threat from unregulated public access, fly-tipping and pollution. They are also subject to pressures for development. Management agreements and acquisition by public bodies has secured appropriate management of some areas. Close liaison with planning authorities and the provision of site wardening are controlling many of the pressures. Habitat management is underway on areas owned by the local authority to secure optimum habitat conditions.</p> <p><u>Pollution</u> There is some concern about pollutants, such as oil from off-road vehicles entering the water bodies in management Units 4, 5 and 6.</p> <p><u>Non-Native Species</u> Non-natives water plants such as <i>Crassula helmsii</i> can reproduce very rapidly and lead to a reduction in the open water habitat available for newts. At present (2007) <i>Crassula helmsii</i> has been removed from a number of ponds, however it is still problematic in management Units 3, 7, 13 and 12.</p> <p><u>Predatory Fish</u> The presence of fish is still a problem in management Units 3, 7, 12 and 13. Without further removal of fish from ponds in the SAC great crested newt recruitment will decline. Members of the public also need to be discouraged from translocating fish between ponds for recreational fishing purposes.</p> <p><u>Recreation and Leisure</u> The site is used heavily for recreational purposes as it is close to the communities of Johnstown and Rhosllanannerchrugog. Management unit 3 is managed as a Country Park and Units 12, 7 and 8 are managed as a community nature park. The use of off road motorbikes needs to be discouraged as the oil pollutes the pond water and tyres cause compaction and erosion of terrestrial newt habitats. Recreational fishing within the site will not be permitted. Teenagers are known to be moving fish between ponds, and some parts of the site are being used for off road motor sport.</p>
<p>Landowner/ Management Responsibility</p>	<p>Owner/occupier objectives – The site has 10 owners with varying interests in the site including quarrying, landfill, housing and</p>

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	<p>development, conservation of protected species and habitats and recreation.</p> <p>Recreational use – The site is close to the communities of Johnstown and Rhosllanerchrugog and is used regularly for recreational purposes. Management unit 3, 7, 8 and 12 are within the country park.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>

<p>Site Name: Migneint-Arenig-Dduallt Location Grid Ref: SH816440 JNCC Site Code: UK0030205 Size: 19968.23 ha Designation: SPA & SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Migneint-Arenig-Dduallt is a large upland site that stretches between Ysbyty Ifan and Penmachno in the north down to Rhydymain in the south, and from Trawsfynydd in the west to just east of Llyn Celyn. It ranges in altitude from 300 m to 712 m. The northern section encompasses a high peatland plateau centred on Migneint and extending to Tomen y Mur in the west and Cwm Hesygn in the east, with higher points such as Arenig Fach around the rim. The southern section, south of the Afon Lliw, also comprises a high plateau surrounded by higher ground and dominated by Dduallt mountain. The central section, lies south of Cwm Prysor and Llyn Celyn and includes Moel Llyfnant and Moel y Slates as well as the Arenig Fawr mountain ridge which is the highest part of the whole site. The SAC habitats are blanket bog, dry heath, wet heath, lakes and woodland.</p> <p>The site is also SPA for its breeding populations of hen harrier <i>Circus cyaneus</i>, merlin, <i>Falco columbarius</i> and peregrine, <i>Falco peregrinus</i>.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Blanket bog. • European dry heaths. <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Northern Atlantic wet heaths with <i>Erica tetralix</i>. • Natural dystrophic lakes and ponds. • Lakes (Oligotrophic to mesotrophic) standing waters • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p>SPA Features:</p> <ul style="list-style-type: none"> • Hen harrier <i>Circus cyaneus</i>. • Peregrine <i>Falco peregrinus</i>. • Merlin <i>Falco columbarius</i>.
<p>Conservation Objectives</p>	<p>Our vision for the Migneint-Arenig-Dduallt SAC is to maintain, or where necessary restore the SAC feature habitats of this upland site comprising blanket bog, dry heath, wet heath, woodland and lakes, to good condition so that all of its typical and uncommon species are able to sustain themselves in the long-term as part of a naturally functioning ecosystem. Our vision is also to maintain and manage the recovery of</p>

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	<p>the SPA bird features, hen harrier, merlin and peregrine so that their populations are sustainable and viable in the long term. Management of the SPA features is intrinsically linked to management of the habitat supporting them.</p> <p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Blanket bog. <p>The vision for this priority blanket bog SAC feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The total extent of the blanket bog area, including those areas that are considered unfavourable or currently degraded is maintained at the area present when designated, some 8100 ha in total. Vegetation mapped as NVC M20, currently approx. 1700ha, is always considered to be unfavourable. The area of the blanket bog feature is expanding into areas of heavily modified bog currently occupied by wet heath or acid grassland. • The location and distribution of the blanket bog is increasing at the expense of less desirable vegetation communities. • The degraded areas and currently unfavourable blanket bog are managed under a restoration programme so that the area and distribution of favourable blanket bog is increasing. • The typical species of the vegetation communities comprising the blanket bog SAC feature are frequent. • The abundance and distribution of uncommon plants is maintained or increased. Refer to Table 1. • The structure of the blanket bog is maintained and restored to include bog pools, depressions, hummocks and hollows as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. Peat erosion should be under control, and limited to apparently long-established plateau erosion systems. • Invasive non-native species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spiraea</i>) are not present within the SAC and a species specific buffer area. • The blanket bog is free from all trees. • All factors affecting the achievement of these conditions are under control. • European dry heaths. • Northern Atlantic wet heaths with <i>Erica tetralix</i>.

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	<p>The vision for the heath land SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The total extent of the dry heath area, including those areas that are ‘degraded’ (approx 2600ha) shall at least be maintained as present when designated. The degraded areas and currently unfavourable dry heath should be managed under a restoration programme. The area of dry heath should increase at the expense of less desirable vegetation communities such as acid grassland. The total extent of the wet heath area, including those areas that are ‘degraded’ (approx 400 ha) shall at least be maintained as present when designated. The area of wet heath should increase in overall at the expense of less desirable vegetation communities. Some areas of wet heath which are degraded blanket bog may be restored to that priority habitat provided that there is a net gain of wet heath within the SAC. • The distribution of the dry and wet heath will preferably be increasing as it is restored in additional areas. • The typical species of the vegetation communities comprising the dry heath and wet heath will be frequent and abundant. • The abundance and distribution of uncommon plants will be maintained or increased. • The structure of the heath should be maintained and restored, to show natural regeneration by layering and seeding, and to ensure that the component vegetation communities are naturally diverse (refer also to 3 and 4 above). In practise some stands will benefit from being taller with very mature heather (eg NVC H 21) and others including wet heath from having a medium to short structure, less than 30cms height. Signs of overgrazing, including ‘suppressed’, ‘topiary’ or ‘drumstick’ growth habits will not be apparent. • Invasive non-native species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spiraea</i>) will not be present. • The surface of the heath will be generally free from trees and at most have only a few individuals at a density of no more than 2 per hectare. Exceptions to this rule are transition zones from woodland to heath land where trees may be denser grading to open heath. Limits for woodland transition zones should be set on a unit or sub-unit basis. • All factors affecting the achievement of these conditions are under control.

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	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Natural dystrophic lakes and ponds. • Lakes (Oligotrophic to mesotrophic) standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>. <p>Migneint-Arenig-Dduallt has 22 lakes of more than 0.5ha in area, and many smaller pools. Although these nominally consist of two distinct types (clear-water and peaty), in practice the water bodies on the site span the full range from very clear lakes such as Llyn Arenig Fawr, to typical peaty lakes such as Llyn y Dywarchen. Climate change and recovery from acidification is expected to lead to increased peat staining of many of these water bodies, but it is essential that this situation is not exacerbated by inappropriate land management.</p> <p>The vision for the oligotrophic to mesotrophic (clear-water) and dystrophic (peaty) lakes SAC features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The total extent of the clear-water and peaty lakes shall be maintained. The lake condition is intrinsically linked to the condition of the catchment therefore the catchments should be maintained in at least their current condition (including vegetation cover, drainage and appropriate management ie not over grazing and burning). • The typical species, as listed following, of the vegetation communities comprising the Clearwater lakes SAC feature will be common. The vegetation community is characterised by amphibious short perennial vegetation, with shoreweed <i>Littorella uniflora</i> being considered as the defining component. This species often occurs in association with water lobelia <i>Lobelia dortmanna</i>, bog pondweed <i>Potamogeton polygonifolius</i>, quillwort <i>Isoetes lacustris</i>, bulbous rush <i>Juncus bulbosus</i>, alternate water milfoil <i>Myriophyllum alterniflorum</i> and floating water bur-reed <i>Sparganium angustifolium</i>. On Migneint-Arenig-Dduallt all the above species are present, together with yellow water-lily <i>Nuphar lutea</i>, white water-lily <i>Nymphaea alba</i>, smooth stonewort <i>Nitella flexilis</i>, lesser bladderwort <i>Utricularia minor</i> and the nationally scarce slender stonewort <i>Nitella gracilis</i>. In the case of peaty lakes, these water bodies are very acidic and poor in plant nutrients. Their water has a high humic acid content and is usually stained dark brown through exposure to peat. Most examples are small (less than 5 ha in extent),

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	<p>shallow, and contain a limited range of flora and fauna, with the principal aquatic plants being <i>Sphagnum</i>, floating bur-reed and water lilies. The pools are naturally species-poor and a littoral zone is often absent. Fringing vegetation is that characteristic of the habitat in which the pools occur.</p> <ul style="list-style-type: none"> • All factors affecting the achievement of these conditions are under control. • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p>The vision for the Woodland SAC feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The total extent of the woodland area, including woodland canopy and scrub, woodland glades and associated dry heath, bracken and grassland shall be maintained as indicated on the map in the annex, of 67 ha plus additional areas of c.13ha (not mapped) giving a total of approx.80 ha. Broadleaved woodland and scrub currently covers about 0.4% of the site (and bracken over 2% (c. 450 ha). • The location of the woodland SAC feature will be as shown on Maps in annex 1. Woodlands include. Coed Dol- Fudr(SH 831318), Coed Gordderw (SH838336), Coed Maen y Menyn (SH848354) and Coed Boch-y-Rhaeadr (SH 843398). • The tree canopy percentage cover within the woodland area (see maps 1 - 4) shall be no less than 85% (excepting natural catastrophic events). • The canopy and shrub layer comprises locally native species, as indicated in Table 2, typical of this upland woodland which is less oak and more birch dominated than more lowland examples of this SAC feature. • There shall be sufficient natural regeneration of locally native trees and shrubs to maintain the woodland canopy and shrub layer, by filling gaps and allowing the recruitment of young trees, and encouraging a varied age structure. • The typical ground layer species of the woodland SAC feature will be common, see Table 3. It is important for most of the woodland SAC that the vegetation does not becomes rank and overgrown with a height above 40cm and/or dominated by species such as bramble, ivy and young holly. Limits may be set on a unit or compartment basis. Typical lower plants including oceanic species (refer to Table 2 below for an indicative list where known records are ticked) should continue to be abundant and/or maintained.

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	<ul style="list-style-type: none"> • The abundance and distribution of uncommon mosses, liverworts, lichens and ferns, will be maintained or increased. • There will be a defined number of mature trees per hectare within the existing tree canopy on a unit basis. This will need to be defined by diameter for the upland situation where comparable trees at lower altitude are of c60cm diameter plus for oak and ash and/or with signs of decay, holes etc. • Dead wood will be present and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). Volumes of deadwood are currently at relatively low levels because the woodlands, in general, have an even-age structure and lack mature trees. Some lower plants are dead wood specialists but these woodlands tend to lack the rare dead wood invertebrate assemblage found in other parts of the UK. • Invasive non-native species such as rhododendron, Japanese knotweed and Himalayan balsam will not be present. • All factors affecting the achievement of these conditions are under control. <p>SPA Features:</p> <p>Hen harrier <i>Circus cyaneus</i>. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population is at least 8 breeding pairs (SPA form 2003 10-12 pairs) and preferably increasing. (2007 –11 pairs). • Hen Harrier nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats. • Hen Harrier breeding success is at least one young fledged per nest. • There is sufficient nesting and roosting tall heather habitat to support the population in the longterm. • There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low. • All factors affecting the achievement of these conditions are under control.

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	<p>Peregrine <i>Falco peregrinus</i>. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9% GB) and preferably increasing. • Peregrine nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate nest sites. • Peregrine breeding success is at least one young fledged per nest when sample population monitoring is carried out. • There are sufficient cliff and crag with ledges suitable for nesting usually known traditional nest sites to support the population in the long-term. • There is a sufficient hunting habitat and prey. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if peregrine productivity is low. • All factors affecting the achievement of these conditions are under control <p>Merlin <i>Falco columbarius</i>. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9% GB) and preferably increasing. • Merlin nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats. • Merlin breeding success is at least one young fledged per nest when sample monitoring is carried out. • There is sufficient nesting and roosting tall heather, individual trees often with crows' nests and forestry edge habitat to support the population in the long-term. • There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds (commonly meadow pipit and skylark) and large insects to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low. • All factors affecting the achievement of these conditions are under control.

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<p>Component SSSIs</p>	<p>The site has been divided into 119 units defined by stock proof fences as much of the site is grazed as open 'shared' mountain and/or as registered common land. This 'unitisation' may help practical communication about features, objectives, and management with owners and occupiers and targeted management to be achieved where agreed and appropriate. There are no NNR ownership units.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Blanket bog. <p>The following is a brief summary of the key management requirements of, grazing, drainage, burning and tree encroachment, which need to be tackled, to restore the feature to favourable condition.</p> <p><u>Grazing</u> Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year. (0.33 ewes). Ponies or cattle have advantages over sheep due to their tendency to graze coarser grass and rush vegetation without adversely affecting heather/ericaceous cover. Sheep will graze heather intensively in the late summer through to the winter if they are able. As sheep are currently overwhelmingly the favoured agricultural livestock it is difficult to get appropriate grazing regimes with cattle or ponies other than when opportunities arise where landowners are willing or a public body such as FC own land. Sheep grazing can work well when they are stocked at low density and away wintered.</p> <p>Review grazing regimes on a unit basis and identify those areas where grazing is not appropriate for restoring/maintaining blanket bog in good condition and action restoration grazing management where possible.</p> <p><u>Drainage</u> Drainage is a highly significant factor, which adversely affects blanket bog but is difficult to manage. There is little doubt that artificial drainage including moor grips has restricted the extent of blanket bog and affected the quality. The best quality bog, is very waterlogged with bog pools and the heather growth is naturally stunted forming a low mattress of layering stems. Where drainage takes effect the heather can be taller and leggier. When the effect of drainage is severe, as can be seen by forestry drains, blanket bog is converted to wet heath having lost the hare's tail cotton grass and hence can be further degraded.</p>

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	<p>Review and continue the mapping of current drainage ditches and classify according to need to block or whether likely to infill naturally over time and identify those areas where artificial drainage is obviously adversely effecting blanket bog and action restoration ditch blocking management where possible.</p> <p>Continue to liase with LIFE project staff and learn from and influence actions resulting from this project directly on FC land but also through the training and interpretation elements across the whole SAC (eg showing farmers ditch blocking).</p> <p>Liase with and encourage the development of the National Trust initiative for ditch blocking through agreement with their tenants initially on a pilot area in unit (compartment 82b-Llyn Serw).</p> <p><u>Burning</u> Continue to pursue policy of no burning through the SSSI consenting process (suggesting alternative measures if possible such as limited cutting and grazing), maintain vigilance, record and map fires when they occur and pursue enforcements where practical to do so.</p> <p><u>Tree Encroachment/Growth</u> Continue to encourage the total removal of trees from blanket bog through the consenting process and input into funded projects. Resolve perceived conflicts with black grouse management where they occur (refer to page 10).</p> <ul style="list-style-type: none"> • European dry heaths. • Northern Atlantic wet heaths with <i>Erica tetralix</i>. <p><u>Burning</u> Burning has been used as cheap and easy way of managing heath land for centuries; to control coarse and sometimes impenetrable (to man, dog and stock) vegetation and to provide new vegetation growth for livestock or for game birds management. Indeed many assume that heath land and grouse moorland management are one and the same thing. Such areas have been managed by man over centuries to produce an unnatural dominance of heather and the rather species-poor (frequently burnt) vegetation that we have all become accustomed to. Heather is a native plant, which naturally regenerates by collapsing outwards (when mature) and regenerating from the centre. Heather in damp habitats continuously layers to form a 'mattress' of stems. Heather does not have to be burnt to survive and all heaths do not</p>

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	<p>have to be managed as grouse moors, with a patchwork of different age structure, to benefit game birds. It may appear that heath regenerates well after fire but in truth it is the constant species particularly shrubs such as <i>Calluna</i>, <i>Vaccinium</i> and <i>Ulex</i> which thrive on burning, if not overgrazed. Uncommon species including bog mosses and liverworts, and communities like NVC H 21, only survive in tiny areas, which have escaped burning for a long period.</p> <p>Continue to pursue policy of caution regarding burning through the SSSI consenting process and ensure there is a clear written objective for the burning -suggesting alternative measures if possible such as cutting and grazing. Limit to appropriate areas of dry heath (usually NVC H12), at a small scale, well-controlled and following good practise and codes. Hence burning of some stands of dry heath may be consented on a case-by-case basis. Wet heath should not be burnt. Heath on steep rocky slopes with thin soils or heath with abundant lower plants (NVC H 21) or uncommon species such as lesser twayblade orchids (see table 2) should not be burnt. Montane heath should not be burnt</p> <p><u>Conifers</u> Forestry plantations border parts of the site and some areas of (usually failed) conifers with heath are included within the SAC boundary. There is also seeding from plantation areas and previously felled areas where conifers have been left, onto adjacent heath. Continue to encourage conifer removal from heath through the SSSI consenting process, projects and forest re-design.</p> <p><u>Grazing and Stock Management</u> Grazing is required to maintain heaths in favourable condition but heathland has become degraded through a combination of over grazing and burning. In some cases restoration may require the complete removal of stock for a limited time. Traditional shepherding may also be required to ensure that the grazing intensity is more evenly spread across the area. Montane heath currently covers only 0.5 ha of the site and we would aim to maintain or increase this area although it will be constrained somewhat by ecological requirements of exposure and altitude.</p> <p>Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes) for dry heath, and 0.3LSU/ha/yr (cattle/ponies) for wet heath with frequent/dominant purple moor grass. Measures should be initiated to establish appropriate grazing where these features are unfavourable because of</p>

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	<p>current or past grazing regimes.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Natural dystrophic lakes and ponds. • Lakes (Oligotrophic to mesotrophic) standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>. <p>Regular macrophyte / water quality surveys.</p> <p><u>Pollution and Climatic Change</u> There are a number of natural or human-induced processes taking place which are changing the environmental/ecological conditions and causing some concern in relation to Migneint-Arenig-Dduallt and other upland areas in Britain. These include acidification of lakes and soils, due to atmospheric pollution; nutrient enrichment (especially increased nitrogen and phosphorus) in lakes and soils through a combination of atmospheric pollution, excessive sheep-dunging/urination and other inputs from diffuse sources; and the possible effects of climate change on fragile upland ecosystems. Mosses and liverworts are particularly vulnerable to pollution from atmospheric sources. Stock reductions should help reduce the nitrogen input, but it will obviously also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution. Further monitoring and research studies in the uplands are needed to determine precise processes and effects before it is known what restoration management might be possible.</p> <ul style="list-style-type: none"> • Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. <p><u>Mature-Veteran Trees</u> This lack of mature-veteran trees results from past management and should resolve itself over time provided no plans or projects are approved which indirectly result in felling mature trees such as power lines, development and recreational access.</p> <p><u>Dead Wood</u> This lack of dead wood including standing dead wood results from past management and should resolve itself over time provided no plans or projects are approved which result in the removal of significant amounts of dead wood including development and recreational access.</p>

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	<p><u>Grazing</u> Controlled light grazing at no more than 0.05LSU/Ha over the summer months; assuming that sufficient regeneration of young saplings is present.</p> <p>SPA Features:</p> <ul style="list-style-type: none"> • Hen harrier <i>Circus cyaneus</i>. <p><u>Persecution</u> There have been recorded incidents of persecution including young shot in a nest and in 1987 chicks were taken from a nest, as well as adult birds having been shot. There must continue to be vigilance during the breeding season, enforcement action if appropriate, monitoring of the attributes and interpretation of trends.</p> <p><u>Burning</u> Uncontrolled fires have been a problem within Migneint-Arenig-Dduallt SPA in the past, including fires where the cause is unknown and where planned fires have become uncontrollable. There was a particularly severe fire in March 2003 when 872 ha were burnt, which destroyed a traditional hen harrier nest site. Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate.</p> <p><u>Grazing</u> Overgrazing and undergrazing including not having sufficient cattle/pony grazing regimes may be an issue in terms of optimal foraging and prey availability. Establish precisely where these birds are hunting during breeding season so management can be targeted.</p> <p>Further survey/research outside the remit of this plan More information is required on:</p> <ul style="list-style-type: none"> • Wintering/non-breeding areas, both roost and winter-feeding locations need to be further identified and appropriate management. • Peregrine <i>Falco peregrinus</i> <p>There have been several recorded instances within the SPA where chicks or eggs have been stolen; the last known case was in 1997. Four of the 12 known traditional nest sites have had recorded persecution events take place since 1991. With this past history and no prosecutions having taken place this would seem a possibly factor to at</p>

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	<p>least partially account for the unfavourable condition and status. There is however no recent evidence.</p> <p>There must continue to be vigilance during the breeding season, enforcement action if appropriate, monitoring of the attributes and interpretation of trends.</p> <p><u>Disturbance</u> This may be a significant factor. Survey and review activities and recreational use (including climbing) around traditional nest sites during the breeding season.</p> <ul style="list-style-type: none"> • Merlin <i>Faclo columbarius</i> <p><u>Burning</u> Uncontrolled fires have been a problem on the Migneint-Arenig-Dduallt SPA in the past, including fires where the cause is unknown and where planned fires have become uncontrollable. There was a particularly severe fire in March 2003 when 872 ha were burnt, which destroyed or affected three traditional merlin nest sites.</p> <p>Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate.</p> <p><u>Grazing</u> Overgrazing and undergrazing including not having sufficient cattle/pony grazing regimes may be an issue in terms of optimal foraging and prey availability. Establish precisely where these birds are hunting during breeding season so management can be targeted.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Blanket bog</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Lower limit – c.8100 ha ie current area. Land must be checked for this feature before any assessment takes place. No blanket bog area can be lost. ○ Upper limit – None, naturally limited by geology, topography and rainfall. <p>Lower limit is based on current extent which must be maintained. The full extent is difficult to measure precisely as although there are extensive homogenous stands this feature also commonly occurs in</p>

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<p>mosaic with other habitats. The area given can only be regarded as approximate and best represented in map form – see below. The area of core blanket bog communities should be increasing through restoration management.</p> <ul style="list-style-type: none"> • Location and Distribution. <ul style="list-style-type: none"> ○ The current location and distribution within the SAC must be maintained. • Degraded and Currently Unfavourable Areas. <ul style="list-style-type: none"> ○ Upper Limit – 1700 ha (of degraded bog). <p>Upper limit is based on known areas of NVC M20 and other areas of degraded blanket bog such as NVC U6 and M15 on deep peat. Ideally all degraded blanket bog should be restored.</p> <ul style="list-style-type: none"> • Typical Species. <ul style="list-style-type: none"> ○ Typical species will be frequent and form the main dominants. Refer to table 2 below. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Table 2: Uncommon plants of the heath features</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Species</th> <th style="text-align: left;">Status</th> <th style="text-align: left;">Notes-guide to presence in NVC communities</th> </tr> </thead> <tbody> <tr> <td><i>Antennaria dioica</i></td> <td>Regionally Rare</td> <td>H10</td> </tr> <tr> <td><i>Carex bigelowii</i></td> <td>Regionally Rare</td> <td>H18, H21, Montane heath U10</td> </tr> <tr> <td><i>Listera cordata</i></td> <td>Locally uncommon</td> <td>H12, H21</td> </tr> <tr> <td><i>Salix herbacea</i></td> <td>Regionally Rare</td> <td>Montane heath U10</td> </tr> </tbody> </table> </div> <ul style="list-style-type: none"> • Uncommon Plants. <ul style="list-style-type: none"> ○ Lower Limit – current locations, abundance and vigour of plants. <p>Current populations of uncommon plants will flourish and expand where possible.</p> <ul style="list-style-type: none"> • Bog Surface Structure. <ul style="list-style-type: none"> ○ Limit – To be defined as a pragmatic proportion of the current mapped drains including those which will infill and revegetate naturally over time. <p>The structure of the blanket bog is maintained and restored where appropriate to include bog pools, depressions, hummocks and hollows</p>	Species	Status	Notes-guide to presence in NVC communities	<i>Antennaria dioica</i>	Regionally Rare	H10	<i>Carex bigelowii</i>	Regionally Rare	H18, H21, Montane heath U10	<i>Listera cordata</i>	Locally uncommon	H12, H21	<i>Salix herbacea</i>	Regionally Rare	Montane heath U10	
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	<p>as a natural feature of the bog surface. Artificial drainage ditches or moor grips are not present as functioning drains. Ditches should be in filled or blocked to create pools. There should be no significant peat erosion.</p> <ul style="list-style-type: none"> • Invasive Non-Native Species. <ul style="list-style-type: none"> ○ The target should be none present within SAC and ‘buffer’ surrounding land to be determined on a species-specific basis. <p>Invasive non-native species are aliens within the natural blanket bog communities. Their invasive nature means they threaten the integrity of the habitat by competition, shading and often drying of the blanket bog by transpiration. Invasive species can have a significant impact on extent, location and distribution of blanket bog unless control takes place.</p> <ul style="list-style-type: none"> • Tree Cover. <ul style="list-style-type: none"> ○ Blanket bog in favourable condition is tree-less. Target – reducing the current tree cover as part of restoration to favourable condition. <p>Blanket bog in Wales has been naturally tree-less for a long time. Trees are present occasionally where this habitat is in mosaic on drier areas such as heath and acid grassland or crags away from grazing stock. Blanket bog that has been drained, and planted with conifers and is then cleared or fails is particularly prone to tree regeneration.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Favourable management is light summer grazing by sheep, cattle and /or ponies. This will often be at a rate of 0.05 LSU/ha/year (0.33 ewes) but could well be more depending on the land. Ponies or cattle have advantages over sheep due to their tendency to graze coarser grass and rush vegetation without adversely affecting heather/ericaceous cover. Sheep will graze heather intensively in the autumn/winter. <p>Blanket bogs are likely to have always been grazed to some extent, by a variety of herbivores. In an unmodified blanket bog, species composition is regulated by the rain water input and a naturally high water table. Without interference and within high rainfall areas the surface of the bog grows upwards, forming hummocks and hollows in the wettest areas as peat continually forms. This natural blanket bog</p>

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	<p>has a low fairly constant vegetation height with a mattress of layered heather and other woody shrubs over a lower layer of <i>Eriophorum vaginatum</i>. If, as is often the case, the bog is modified, for example by gripping (drainage), burning or heavy grazing, the 'natural' system becomes unbalanced. Hence drained and/ or burnt blanket bog tends to have a greater dominance of heather which can become leggy. This can lead to perceived problems of stock access, and calls for further burning or draining to remedy this; resulting in a downward spiral. Mowing can be a short-term solution but in the longer term it is likely to lead to a decrease in ericoid cover. In the short term, it may be possible to achieve widespread stock dispersal by mowing non blanket bog vegetation areas/paths and to restore the naturally high water table by infilling and/or blocking drains. Overgrazing, often with burning, will degrade blanket bog from the better communities to NVC M20 and then to acid /marshy grassland unless restoration measures are put in place.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ No burning. <p>Blanket bog should not be burnt, as burning damages important plant and animal species, especially bog mosses and invertebrates and interferes with the natural development of this vegetation. Past burning practice is likely to be at least partly responsible for the relative rarity of burning-sensitive species. Burning, in combination with intense grazing, is also responsible for damage and loss of areas of good quality blanket bog in the site. Burns scorch and kill bog mosses such as <i>Sphagnum magellanicum</i> and <i>S.papillosum</i> and other lower plants, removing the heather/ericaceous layer, to reveal the blanket of <i>Eriophorum vaginatum</i> underneath. The cotton grass recovers well from fire, benefits from the 'fertiliser' input of ash, and then has a competitive advantage over other plants which can only recolonise slowly. Thus a NVC M19 or 18 bog is converted to the degraded NVC M20 and becomes unfavourable. There are occasional incidences of flash burns that pass quickly through the bog and burn the heather with little damage to the underlying vegetation, but these tend to occur more through luck rather than judgement, and thus burning is best avoided.</p> <ul style="list-style-type: none"> • Drainage Ditches /Moor Grips. <ul style="list-style-type: none"> ○ No new drainage ditches. We should also seek to infill/block existing ditches wherever possible and to have targets for restoration. <p>The wetland habitats and features are profoundly influenced by alterations to the natural drainage regime of the site. Blanket bog is a nutrient-poor system, which arises in areas with a wet, cool climate and</p>

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	<p>a suitable topography (level or gently sloping ground) with little or no water flowing in from surrounding land. Artificial drains cause the bog to dry out and to deteriorate adjacent to the drains. The drains may bring nutrients to the system and the vegetation changes because the bog is no longer only receiving nutrients from the rain. Also, if the drying peat surface becomes exposed, it then oxidises which releases nutrients into the system, dissolved organic carbon into water courses, and carbon dioxide into the atmosphere. This results in similar changes to the sensitive vegetation as well as increased peat erosion. For these reasons, it is important that there should be no new drainage ditches dug in this habitat, and wherever possible old drainage ditches should be blocked or encouraged to infill. This habitat forms a natural sponge which, provided it is not ditched, helps to reduce floods lower down the river system in rainy times while providing plenty of water during summer droughts.</p> <ul style="list-style-type: none"> • Recreation and Access. <ul style="list-style-type: none"> ○ No visible erosion or compaction of blanket bog and no infrastructure on this priority habitat. <p>The site is designated as access land, although most recreational use is believed to be focused on the existing PROW network. Access can cause erosion and compaction and lead to pressure for infra-structure which can damage or destroy parts of the blanket bog if sited on it.</p> <ul style="list-style-type: none"> • Off-Road Vehicle Use. <ul style="list-style-type: none"> ○ Maintain vigilance, record and report any illegal offroad use seen. No new routes on or very near blanket bog. <p>Off road vehicles have caused damage on the site in the past. Although this has not been widespread, the site is vulnerable to significant damage should off-roading become a problem, and it is therefore discouraged. Off road vehicles can cause erosion and compaction and lead to pressure for new routes which can damage or destroy parts of the blanket bog if sited on it or immediately adjacent.</p> <ul style="list-style-type: none"> • Afforestation/Conifer Encroachment. <ul style="list-style-type: none"> ○ The blanket bog should be treeless. No new afforestation or tree planting on blanket bog. (Trees may be acceptable on neighbouring habitats as adjacent stands or mosaic provided seeding in to the blanket bog is not a problem and other interest has been considered).

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	<p>The presence of trees/conifers on blanket bog immediately places the conservation status of the bog as 'unfavourable'. Afforestation with the accompanying ditching and track construction has damaged blanket bog in the past and continues to cause degradation. The drains continue to function, causing drying of the bog and direct damage/loss of blanket bog vegetation to ditch and spoil. Conifer/trees adjacent and on the blanket bog provide a seedsource for further encroachment, as well as continuing to dry the bog through transpiration. There will be a presumption against afforestation and other tree planting on the mire vegetation. We hope to encourage and implement further rehabilitation of afforested areas of bog by removing trees, blocking ditches and reintroducing light grazing.</p> <ul style="list-style-type: none"> • Mineral Exploration. <ul style="list-style-type: none"> ○ Quarrying on any significant scale is unlikely to be acceptable because of effects on blanket bog or other interest. <p>Current quarries (numerous quarries and levels including Foel Gron, Drum, Arenig, Maen grugog, Braich Ddu, Nant Drewi and immediately adjacent and surrounded by the SAC/SPA Croesyddwyafon) are not worked at present and have had some degree of landscaping. Planning permission is still extant at some locations within the SAC/SPA. As Migneint-Arenig-Dduallt lies within Snowdonia National Park, mineral exploration is less likely to gain approval because of the potential effects on the landscape, apart from likely concerns regarding the Natura 2000 site.</p> <ul style="list-style-type: none"> • Peat Erosion. <ul style="list-style-type: none"> ○ Peat erosion, ie visible bare peat, should not increase in area above the current 2008. Any significant area of visible erosion would mean the blanket bog was unfavourable in that unit. <p>Early human activities and climatic change are now believed to have initiated much of this erosion, and some areas of eroded bog may be of considerable antiquity. Precise reasons for the continuing process are uncertain, but current grazing and trampling by stock are significant contributory factors. There is significant erosion of peat taking place on some areas of blanket bog, such as south-west and north-east of Llyn Conwy. Stock reductions may not provide satisfactory conditions for recovery within a reasonable time, in which case carefully sited, fenced enclosures and possibly sluice-boarding may be needed to allow vegetation recovery and stabilisation of bare peat. This was achieved</p>

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	<p>very effectively in Cwm Idwal NNR, over a period of just a few years. Peat erosion on this site also has implications for Llyn Tegid Ramsar site as Migneint –Arenig-Dduallt forms a substantial part of its catchment. Peat erosion occurring on common land can be difficult to resolve.</p> <ul style="list-style-type: none"> • Atmospheric Deposition & Liming. <ul style="list-style-type: none"> ○ N deposition – the UK Government target should be to ensure less than 10 kg N/ha/yr. Policy implementation at a UK level is achieving reductions in atmospheric deposition; this work needs to be continued, and any potential point source emissions carefully screened and controlled. <p>Atmospheric deposition is a key factor for this ombrogenous ('rainfed') habitat. According to the Air Pollution Information Service (www.apis.ac.uk), current levels of nitrogen deposition estimated at 22.1 kg N/ha/yr are towards the upper end of the estimated critical load for this habitat (5-10 kg N/ha/year); this is likely to enhance the vulnerability of bog-mosses to competition from graminoids, and also increase the susceptibility of heather in particular to a range of factors, including leaf beetle damage. Catchment liming is harmful to oligotrophic Sphagna and will not be consented on areas of blanket bog.</p> <ul style="list-style-type: none"> • Climate Change. <ul style="list-style-type: none"> ○ The natural physical parameters provide a useful guide to potential areas for the successful restoration of degraded heaths. <p>Blanket bog will be vulnerable to the anticipated scenario of increased winter-time rainfall and more severe and prolonged summer drought. Practical measures which can be employed to reduce the impacts of climate change include hydrological repair (primarily ditch blocking), conifer removal, and prevention of burning.</p> <p>European dry heaths. Northern Atlantic wet heaths with <i>Erica tetralix</i>.</p> <ul style="list-style-type: none"> • Extent of heath. <ul style="list-style-type: none"> ○ Upper limit – None, as defined by geology, soils and topography and provided expansion is at the expense of less desirable vegetation such as acid grassland. Aim to increase especially localised communities such as montane heath.

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	<ul style="list-style-type: none"> ○ Lower limit – maintain current extent including montane heath currently only 0.5 ha (Arenig fach). <p>Lower limit is based on current extent of dry and wet heath estimated 15% cover (3000 ha) to an area of approx. 25% (5000 ha). Of which montane heath is only 0.5 ha. Dry heath currently covers nearly 13% of the site (2600 ha), and wet heath covers nearly 2% (400 ha) of the site.</p> <ul style="list-style-type: none"> • Distribution of Heath. • May be possible to increase distribution of montane heath on to Arenig Fawr. • Typical Species. <ul style="list-style-type: none"> ○ Refer to site quadrat data and <i>Rodwell (1991)</i>. <p>Species listed in the table below will be frequent and abundant.</p>

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<p>• Uncommon Plants. ○ Upper Limit – none set. ○ Lower Limit – as recorded at time of SSSI designation.</p> <p>Current populations of uncommon plants will flourish and expand where possible.</p> <p>• Heath Land Structure. ○ Set limits relevant to particular location/stand in context</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d3d3d3;">NVC Vegetation community</th> <th style="background-color: #d3d3d3;">Typical Species-constants</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="background-color: #d3d3d3;">Dry Heath</td> </tr> <tr> <td style="background-color: #d3d3d3;">H8 <i>Calluna vulgaris-Ulex gallii</i> heath Very localised heath community –small areas</td> <td style="background-color: #d3d3d3;">Constants: <i>Calluna vulgaris</i> <i>Ulex gallii</i> <i>Erica cinerea</i></td> </tr> <tr> <td style="background-color: #d3d3d3;">H9 <i>Calluna vulgaris- Deschampsia flexuosa</i> heath Very localised heath community –small areas</td> <td style="background-color: #d3d3d3;">Constants: <i>Calluna vulgaris</i> <i>Deschampsia flexuosa</i></td> </tr> <tr> <td style="background-color: #d3d3d3;">H10 <i>Calluna vulagirs – Erica cinerea</i> heath Very localised heath community –small areas</td> <td style="background-color: #d3d3d3;">Constants: <i>Calluna vulgaris</i> <i>Erica cinerea</i> <i>Potentilla erecta</i></td> </tr> <tr> <td style="background-color: #d3d3d3;">H12 <i>Calluna vulgaris – Vaccinium myrtillus</i> heath Most widespread community covering greatest area.</td> <td style="background-color: #d3d3d3;">Constants: <i>Calluna vulgaris</i> <i>Deschampsia flexuosa</i> <i>Vaccinium myrtillus</i> <i>Dicranum scoparium</i> <i>Hypnum jutlandicum</i> <i>Pleurozium schreberi</i></td> </tr> <tr> <td style="background-color: #d3d3d3;">H18 <i>Vaccinium myrtillus – Deschampsia flexuosa</i> heath <i>V. myrtillus</i> most frequent and generally most abundant ericoid, with <i>Calluna vulgaris</i> inconspicuous- a variety of moss-rich and grassy sub-shrub vegetation. 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	<p>of whole site.</p> <p>The heath surface should be regenerating and characteristic of the vegetation community and generally at a height where there is the most plant diversity.</p> <ul style="list-style-type: none"> • Non-Native Species. <ul style="list-style-type: none"> ○ Acceptable limit – None present within SAC. ○ Target – None present within species-specific buffer zones around SAC. <p>Non-native species especially invasive species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spirea</i>) should not be present.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Favourable management is often summer grazing by sheep, cattle and /or ponies at a rate of 0.225 LSU/ha/year (1.4 ewes) for dry heath, and 0.3LSU/ha/yr (cattle/ponies) for wet heath with frequent/dominant purple moor grass. <p>Heaths are likely to have always been grazed to some extent, by a variety of herbivores. In an unmodified heathland, species composition is regulated by soil composition, water levels, altitude and aspect, as well as factors such as grazing. Where grazing is too high, or where heavy grazing immediately follows an incident such as a burn, the species composition can become heavily modified and at worse can be replaced by acid grassland. Signs of overgrazing include 'suppressed', 'topiary' or 'drumstick' growth habits of heather.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Burning should have clearly stated objectives and be limited to: appropriate areas of dry heath (usually NVC H12), at a small scale, well controlled and following good practice and codes. Hence burning of some stands of dry heath may be consented on a case-by-case basis. ○ Wet heath should not be burnt. ○ Heath on steep rocky slopes with thin soils or heath with abundant lower plants (NVC H 21) or uncommon species such as lesser twayblade orchids (see table below) should not be burnt. ○ Montane heath should not be burnt.

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<p>Uncommon plants of the heath features.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="text-align: left;">Species</th> <th style="text-align: left;">Status</th> <th style="text-align: left;">Notes-guide to presence in NVC communities</th> </tr> </thead> <tbody> <tr> <td><i>Antennaria dioica</i></td> <td>Regionally Rare</td> <td>H10</td> </tr> <tr> <td><i>Carex bigelowii</i></td> <td>Regionally Rare</td> <td>H18, H21, Montane heath U10</td> </tr> <tr> <td><i>Listera cordata</i></td> <td>Locally uncommon</td> <td>H12,H21</td> </tr> <tr> <td><i>Salix herbacea</i></td> <td>Regionally Rare</td> <td>Montane heath U10</td> </tr> </tbody> </table> <p>Burning can be damaging to some types of dry heath and should not be permitted in these areas. Past burning of dry heath, combined with intense grazing has resulted in the loss of areas of dry heath to acid grassland dominated by <i>Festuca/Agrostis</i> or <i>Nardus</i>. Overfrequent burning should be avoided by agreeing a minimum rotation length. In certain situations, controlled burning of specific patches may also be a useful management tool to encourage sheep to cover an area more evenly. Within species-poor stands of often NVC H12 burning can be benign provided it is not followed by locally intense grazing as stock concentrate on recently burnt areas. The extent of Montane heath (0.5ha), found at Arenig Fach, is largely limited by altitude, exposure and other climatic factors, but is also very vulnerable to over grazing, trampling and burning.</p> <ul style="list-style-type: none"> • Mowing <ul style="list-style-type: none"> ○ Cutting limited to appropriate areas of heath, at a small scale, and agreed on a case-by-case basis. <p>Cutting can be a viable alternative to burning and offers a controlled, safe way to manage heather without the associated risks of fires. Machinery can sometimes access areas where burning would not be appropriate, although heather may be slower to regenerate, and build up of brash can also retard regrowth on occasions.</p> <ul style="list-style-type: none"> • Afforestation/conifer encroachment <ul style="list-style-type: none"> ○ No planting of conifers or other trees on heath. A programme of removing trees and restoring heath habitat should be actioned. <p>The presence of conifers (and other invasive non-native species) on heaths immediately places the conservation status of the heath as 'unfavourable'. Conifers/trees shade out the heath vegetation and acidify the groundwater. Associated activities such as heavy plant</p>	Species	Status	Notes-guide to presence in NVC communities	<i>Antennaria dioica</i>	Regionally Rare	H10	<i>Carex bigelowii</i>	Regionally Rare	H18, H21, Montane heath U10	<i>Listera cordata</i>	Locally uncommon	H12,H21	<i>Salix herbacea</i>	Regionally Rare	Montane heath U10	
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	<p>access, planting, fertiliser input, construction and maintenance of access tracks, and drainage works lead to further damage of the heath. The trees also provide seed-source of future conifers to encroach further out onto the heath.</p> <ul style="list-style-type: none"> • Drainage Ditches/Moor Grips. <ul style="list-style-type: none"> ○ No new drainage ditches or drainage work affecting heath land. <p>Drainage works are carried out to dry the land out but this is not desirable where it leads to drying of the peat soils supporting heath, especially wet or humid 'dry' heath (NVC H21). Changes in soil chemistry, erosion and the changes to the vegetation structure covered in grazing above.</p> <ul style="list-style-type: none"> • Bracken. <ul style="list-style-type: none"> ○ Defined limits for bracken and bracken encroachment bordering heath. The CSM limit is less than 10% however this level is high for most stands of heath and too low for heath grading into scrub/woodland. <p>Bracken is a natural component of the moorland edge communities. However, where bracken is encroaching at the expense of dry heath, some form of control may be required.</p> <ul style="list-style-type: none"> • Development. <ul style="list-style-type: none"> ○ Assessment of plans and projects. <p>This factor covers any form of development including construction and maintenance of tracks, erection of infrastructure, masts, towers or turbines as well as quarrying. Current planning policy is not to approve large-scale wind turbine development within Snowdonia National Park.</p> <ul style="list-style-type: none"> • Recreation and Access. <ul style="list-style-type: none"> ○ The site is designated as access land, although most recreational use is believed to be focused on the existing PROW network. Certain areas such as the summit of Arenig Fawr, one of the most visited parts of the site, are particularly vulnerable. Trampling by people, combined with the effects of high stocking levels. Erosion may be caused or made worse by visitors and this is of concern, particularly if access pressure increases. • Off-Road Vehicle Use.

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	<ul style="list-style-type: none"> ○ Maintain vigilance, record and report any illegal off-road use seen. <p>Off- road vehicles have caused damage on the site in the past. Although this has not been widespread, the heath land is vulnerable to significant damage should off-roading become a problem.</p> <ul style="list-style-type: none"> ● Non-Native Species. <ul style="list-style-type: none"> ○ No conifers, rhododendron, Japanese knotweed, Himalayan balsam or bridewort (<i>Spiraea</i>). Keep records of other species such as Canada geese now breeding in the lakes and consider research to check if the impact is benign. <p>Non-native species especially invasive species such as conifers, rhododendron, Japanese knotweed, Himalayan balsam and bridewort (<i>Spiraea</i>) should not be present. Some non-native species are relatively benign and may be tolerated particularly when it is not practical to control such as Canada geese.</p> <ul style="list-style-type: none"> ● Agricultural Improvement. <ul style="list-style-type: none"> ○ No further agricultural improvement or management resulting in adverse impact on heaths. ○ There should be a presumption against ploughing, fertilising and/or re-seeding any of the semi-natural habitats on this site. ○ Opportunities should be sought to restore agriculturally improved land including acid grassland to heath. <p>Adjacent areas have certainly been burnt, drained, ploughed and reseeded in the past, or simply converted within the site from heath land to grassland by a pattern of burning and grazing over the years. Application of fertiliser causes a loss or reduction in many species typical of semi-natural habitats as they are no longer able to compete, while ploughing and reseeded causes direct destruction of the habitats</p> <ul style="list-style-type: none"> ● Physical Environment. <ul style="list-style-type: none"> ○ The natural physical parameters provide a useful guide to potential areas for the successful restoration of degraded heaths. <p>The geology, geomorphology, topography, hydrology and soils all have the ability to dictate or limit what habitats occur on the Migneint-Arenig Dduallt.</p>

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	<ul style="list-style-type: none"> • Climate Change. <ul style="list-style-type: none"> ○ U.K monitoring and Policy. <p>Climate change has the potential to affect the integrity of the site. Some species may die out and others may colonise as their ranges contract or expand.</p> <p>Lakes (Oligotrophic to mesotrophic) standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></p> <p>Natural dystrophic lakes and ponds</p> <ul style="list-style-type: none"> • Extent of All Lakes. <ul style="list-style-type: none"> ○ Upper limit – none, as defined by geology and topography. ○ Lower limit – current. <p>Lower limit is based on current extent.</p> <ul style="list-style-type: none"> • Location of Clearwater and Peaty Lakes. <ul style="list-style-type: none"> ○ Unknown. • Typical Species. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – Characteristic species will be at least Frequent in each of the clear-water lakes, except where natural conditions are limiting (e.g. deep peat). No loss of species compared to 2004 baseline. <p>Clear-water lakes: Characteristic species are <i>Littorella uniflora</i>; <i>Lobelia dortmanna</i>; <i>Isoetes</i> spp.</p> <ul style="list-style-type: none"> • Uncommon Plants. <ul style="list-style-type: none"> - <i>Luronium natans</i>; - <i>Nitella gracilis</i> <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – current. <p><i>Luronium natans</i> was not recorded in Llyn Hiraethlyn in the last survey but this species is easily missed. Current populations of uncommon plants will flourish and expand where possible. <i>Luronium natans</i> is present in Llyn Hiraethlyn (Unit 59) and Llyn y Garn. <i>Nitella gracilis</i> is present in Llyn Conglog-Mawr (Unit 15)</p>

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	<ul style="list-style-type: none"> • Invasive Species. <ul style="list-style-type: none"> ○ Lower Limit – none present. <p>Invasive species are undesirable and can out compete native species. Considered further in factors.</p> <ul style="list-style-type: none"> • Water Quality. <ul style="list-style-type: none"> (All lakes) Acid Neutralising Capacity (ANC). <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – <20 microequivalents / litre during any sampling event. (Clear-water lakes only). <ul style="list-style-type: none"> Total Phosphate (TP). <ul style="list-style-type: none"> ○ Upper limit – Annual Mean <10 microgrammes / litre. ○ Lower limit – None set. (Clear-water lakes). <ul style="list-style-type: none"> Maximum depth of plant colonization. <ul style="list-style-type: none"> ○ Upper Limit – None set. ○ Lower Limit – No deterioration from current. (Peaty lakes). <ul style="list-style-type: none"> Secchi disk depth. <ul style="list-style-type: none"> ○ Upper Limit – 1m Secchi disk depth. ○ Lower Limit – None set. <p>Water quality needs to be sufficient to support a healthy lake ecosystem. Nutrients, acidity and water transparency are particularly critical for this. In dystrophic lakes, nutrient dynamics are relatively poorly understood. For this reason no nutrient targets have been set. However, nutrient levels still require surveillance as part of the routine monitoring programme. The ecosystem of clear-water lakes depends upon light penetrating the water column. Although this can be measured using a Secchi disc, a more reliable indicator of long-term conditions is given by the maximum depth at which submerged plants will grow. Peaty lakes are characterised by heavily peat-stained water with poor light penetration. Deviation from these conditions is likely to indicate problems such as acidification. Since few plants grow in these lakes, a Secchi disc is the most appropriate measuring device.</p> <ul style="list-style-type: none"> • Catchment Management. <ul style="list-style-type: none"> ○ No new drainage ditches. ○ Should also seek to block existing ditches wherever possible. ○ No further agricultural Improvement. ○ Assessment of plans and projects.

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	<p>Drainage/moor grips can lead to drying of the adjacent peat, changes in soil chemistry, erosion, release of dissolved organic carbon, changes to the vegetation structure and increased sedimentation. Enrichment and other pollution draining into the lakes from the catchment is also undesirable. Areas of the site have certainly been burnt, drained, ploughed and reseeded in the past, or simply converted from heathland to grassland by a pattern of burning and grazing over the years. This can result in increased eutrophication of watercourses.</p> <ul style="list-style-type: none"> • Recreation and Access inc, Fishing and Watersports. <ul style="list-style-type: none"> ○ The dominance of peaty soils and preponderance of lime-sensitive species makes liming inappropriate across much of the site. Liming or other interference with water quality should be thoroughly scientifically justified. Assessment of plans and projects. <p>Many lakes on the site are also used for fishing by a variety of clubs. In the past, lime has been applied to Llynnau Gamallt in order to reduce the acidity for fishery purposes.</p> <ul style="list-style-type: none"> • Off-Road Vehicle Use. <ul style="list-style-type: none"> ○ Maintain vigilance, record and report any illegal off-road use seen. Although this has not been widespread, the site is vulnerable to significant damage should offroading become a problem, and it is therefore discouraged by signage. <p>Off road vehicles have caused damage on the SAC (including close to Llyn Dubach y Bont) in the past, and can cause pollution and siltation in the lake catchments.</p> <ul style="list-style-type: none"> • Alien Species. <ul style="list-style-type: none"> ○ Surveillance. <p>Species of water weed such as Canadian pondweed and birds e.g Canada geese may be an issue in the future.</p> <ul style="list-style-type: none"> • Climate Change. <ul style="list-style-type: none"> ○ U.K monitoring programme. <p>Climate change has the potential to effect the integrity of the site. Some species may die out and others may colonise as their ranges contract or expand. These changes are beyond the scope of this document.</p>

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	<p>Old sessile oak woods with Ilex and Blechnum in the British Isles.</p> <ul style="list-style-type: none"> • Extent of broad-leaved woodland and associated habitats. <ul style="list-style-type: none"> ○ Upper limit – Some increases in woodland habitat would be desirable, provided that this is generally at the expense of acid grassland and bracken rather than priority habitats or species. ○ Lower limit – 67 ha as mapped with an additional c 13ha within the SAC. <p>Lower limit is based on current extent of SAC woodland. Management should aim to encourage the development of a more natural, gradual transition from moorland to woodland, with a scattering of trees in some heath areas and in the bracken areas. Target areas are likely to include bracken-covered areas including ffridd and steep, rocky slopes and crags, where there is natural tree regeneration already.</p> <ul style="list-style-type: none"> • Location of Woodland. <ul style="list-style-type: none"> ○ Unknown. • Tree Canopy Cover. <ul style="list-style-type: none"> ○ Upper Limit – Tree canopy 90% of woodland area. ○ Lower Limit – Tree canopy may be less than this if this is of benefit to defined interest such as lichens. It may be less after a natural catastrophic event. <p>The tree canopy percentage cover within should be about 85% of the woodland area. If there is a natural catastrophic event assessment should be made to see if follow up management is required.</p> <ul style="list-style-type: none"> • Canopy and Shrub Layer. <ul style="list-style-type: none"> ○ Some non-native species may be tolerated where they support important species such as lichens and are not highly invasive. Phased removal of non-natives is often appropriate with long-term management to control regrowth/reinvasion. <p>The canopy and shrub layer comprises locally native species.</p> <ul style="list-style-type: none"> • Native Tree and Shrub Regeneration. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – regeneration visible with limits set on a unit basis.

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	<p>Natural regeneration of locally native trees which will often be less in the upland situation than lowland. Acceptable regeneration may vary considerably compartment to compartment depending on ecological assessment</p> <ul style="list-style-type: none"> • Ground Layer. <ul style="list-style-type: none"> ○ The ground layer in these upland woods tends to comprise lower plants and ferns and to be less productive in terms of bramble etc. compared with lowland NVC W11. Woodlands should not be overgrown and as a general guide difficult to walk through because of rank vegetation. <p>The ground layer should be characteristic of the vegetation subcommunity and at a height where there is the most plant diversity for which that location is special or has been designated. These woodlands have a varied structure from gentle fringed slopes to cliffs, massive rocks and moss covered boulder-strewn floors. Typical lower plants including oceanic species (refer to table in the Annex for an indicative list) should continue to be abundant and/or maintained.</p> <ul style="list-style-type: none"> • Uncommon Mosses, Liverworts, Lichens and Slime Moulds. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – The current abundance and distribution should be maintained or preferably increased. <p>Current populations of uncommon mosses, liverworts, lichens and ferns will flourish and expand where possible. Nationally scarce <i>Jamesoniella autumnalis</i> (liverwort) and <i>Plagiothecium laetum</i> (moss) are recorded here.</p> <ul style="list-style-type: none"> • Mature / Veteran trees. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – this is set at a level appropriate to each unit, which is usually above the current number. Achievement of this limit is dependant on time passing and lack of disturbance/destruction of mature and maturing trees so they may be allowed to grow into veterans. <p>There will be a scattering of mature and eventually veteran trees where they are not likely to be affected by health and safety considerations of paths, tracks and power lines.</p>

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	<ul style="list-style-type: none"> • Dead Wood. <ul style="list-style-type: none"> ○ Upper Limit – Not required. ○ Lower Limit – Dead wood will be present and consist of a mixture of fallen trees (minimum 1 per hectare), broken branches, dead branches on live trees, and standing dead trees (minimum 1 per hectare). <p>Dead wood which is important for its associated plants and animals supporting specialised mosses, liverworts, lichens and invertebrates should be present. Tree surgery and timber movement should only usually happen for public or stock safety reasons. Away from public access, standing dead trees will be allowed to decay and fall naturally</p> • Grazing. <ul style="list-style-type: none"> ○ Favourable management is often light summer grazing by sheep, cattle and /or ponies at a rate of 0.05 LSU/ha/year. <p>A light level of grazing helps to maintain the moss, liverwort and lichen interest of the woods. Ideally the grazing level should be low enough to allow some natural regeneration. Too heavy grazing can result in no regeneration, excessive trampling, poaching and loss or disturbance of the ground flora and soils. Suitable stocking rates will need to be assessed relating to the current condition of the woodland.</p> • Non-Native Species. <ul style="list-style-type: none"> ○ Non-native species should be absent unless individual trees are known to be important for maintaining humidity or for defined wildlife interest and there are mechanisms in place to ensure no seeding or encroachment. Coed Gordderw for example has non-native Scots pine which supports lichen interest. Exceptionally individual trees may be retained for landscape reasons provided there is no adverse impact on nature conservation. <p>These include species such as beech, larch, spruce, pine and other conifers, sycamore, (rhododendron, Japanese knotweed, Himalayan balsam, and sweet chestnut). Rhododendron is not recorded from this site or known to occur nearby but it is important to maintain vigilance. This non-native shrub should not be tolerated within the SSSI as it often grows to the exclusion of all else, forming a dense canopy, which casts a dense shade.</p> • Humidity.

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	<ul style="list-style-type: none"> ○ Tree felling leading to large gaps in the gorge canopy should not take place and there should be no significant reduction in the river's flow rate due to abstraction or flow diversion. <p>The assemblage of bryophytes includes many that are dependent upon the maintenance of high levels of humidity. It is the existence of a full canopy cover of trees that maximises the area influenced by the river's humidity. The same tree canopy also filters out the direct sunlight, which some species cannot tolerate. A diverse age structure amongst the trees is therefore essential to the continued recruitment of trees into the canopy following wind blow or death in mature trees above the river.</p> <ul style="list-style-type: none"> ● Hydro-Electric Power. <ul style="list-style-type: none"> ○ Plan or project should be assessed. <p>Hydroelectric power schemes can reduce humidity and include other structures such as pipes, which will may adversely affect the woodland habitat.</p> <ul style="list-style-type: none"> ● Woodland Management. <ul style="list-style-type: none"> ○ Plan or project should be assessed. <p>This may include tree surgery and scrub clearance, can be beneficial if carried out appropriately. It could however cause damage if for example important trees are felled or if mosses, other plants and/or wildlife are damaged or disturbed as a result.</p> <ul style="list-style-type: none"> ● Adventure Gorge Walking & White Water Canoeing/Rafting. <ul style="list-style-type: none"> ○ Plan or project should be assessed. Mitigation must be enforceable. <p>Adventure gorge walking and other such activities are becoming more common in North Wales. Many of the scarce moss and liverwort species grow on rocks and crags in the most humid areas within the gorge, often on accessible ground. They may be at risk of physical damage from increased access by people engaging in these pastimes.</p> <ul style="list-style-type: none"> ● Civil Engineering Operations. <ul style="list-style-type: none"> ○ Plan or project should be assessed. <p>Civil engineering operations including bridge, track and road construction can have an adverse impact on the woodland habitat.</p>

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	<p>SPA Features: Hen harrier <i>Circus cyaneus</i></p> <ul style="list-style-type: none"> • Breeding population size. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – 8 pairs. <p>Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. (2007 –11 pairs). CSM considers a 25% decline in breeding pairs from the 10-12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition this means it could be 8 pairs.</p> <ul style="list-style-type: none"> • Hen Harrier Breeding Distribution. <ul style="list-style-type: none"> ○ Unknown. <p>It is important for the range within the site to be maintained.</p> <ul style="list-style-type: none"> • Breeding Success. <ul style="list-style-type: none"> ○ Lower limit – An average of 1 fledged per territorial pair. <p>Successful nests are those which fledge at least 1 young per season. Nests can fail for a number of reasons including infertile eggs and chick starvation.</p> <ul style="list-style-type: none"> • Extent of Available Nesting Habitat. <p>Ground layer sward height.</p> <ul style="list-style-type: none"> ○ Upper limit – 100cm. ○ Lower limit – Maintain patches of heather at least 40cm deep on flat or gently sloping ground. <p>Maintain suitable areas of tall maturerank heather across the site. Hen harriers often, but not exclusively, nest on flat patches on south facing slopes in sheltered locations.</p> <ul style="list-style-type: none"> • Extent of available hunting habitat and prey items. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 1:3 ratio of nesting to foraging habitat in mosaic throughout breeding area. • Burning and Mowing or Topping Vegetation. <ul style="list-style-type: none"> ○ Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as

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	<p>appropriate and care taken not to provide inadvertently good fox routes to nests.</p> <p>Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1st October to 15th April – Uplands). Burning can also adversely affect hunting habitat.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of hen harrier and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure <p>This factor is highly significant in management of the nesting, roosting and hunting habitat.</p> <ul style="list-style-type: none"> • Persecution. <ul style="list-style-type: none"> ○ Enforcement as and when appropriate. <p>No persecution of hen harriers which are listed W&C Act schedule 1 species should take place.</p> <ul style="list-style-type: none"> • Predation. <ul style="list-style-type: none"> ○ Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place. <p>Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to hen harrier, which are ground nesting birds. Records show that fox predation can be very significant in some years.</p> <ul style="list-style-type: none"> • Disease. <ul style="list-style-type: none"> ○ Assessment of plans and projects if consulted on land adjacent and education/information from initiatives, projects and newsletters. <p>Release of captive bred game birds adjacent to site may introduce diseases such as. Avian Cholera/ Bird Flu.</p> <ul style="list-style-type: none"> • Weather.

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	<ul style="list-style-type: none"> ○ It is important to be mindful of this factor when interpreting data and trends. <p>Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks</p> <ul style="list-style-type: none"> • Development. <ul style="list-style-type: none"> ○ Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent. <p>Upland sites are frequently targeted for windfarm development which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.</p> <ul style="list-style-type: none"> • Disturbance. <ul style="list-style-type: none"> ○ Disturbance during the breeding season (guide: 1st April – 15th August) from about 500m distance can have a major impact. This factor is not measured at present, as the only way would be to have camera on every territory and nest. Numbers of successful pairs is an indication as are trends including numbers not increasing when the habitat is not at carrying capacity. <p>Disturbance by people stopping close by nests and more directly by dogs and vehicles can significantly affect breeding success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming.</p> <p>Merlin <i>Falco columbarius</i></p> <ul style="list-style-type: none"> • Breeding Population Size. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – 7 pairs. <p>Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. CSM considers a 25% decline in breeding pairs from the 9-12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition this means it</p>

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	<p>could be 7 pairs.</p> <ul style="list-style-type: none"> • Merlin Breeding Distribution. <ul style="list-style-type: none"> ○ Unknown. <p>It is important for the range within the site to be maintained.</p> <ul style="list-style-type: none"> • Breeding success. <ul style="list-style-type: none"> ○ Lower limit – 1 fledged per territorial pair when samples are monitored. <p>Successful nests are those, which fledge at least 1 young per season.</p> <ul style="list-style-type: none"> • Extent of available nesting habitat. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – extent at notification. <p>Ground layer sward height.</p> <ul style="list-style-type: none"> ○ Upper limit – 70cm. ○ Lower limit – 30cm with individual trees (with old crows nests particularly traditional sites) <ul style="list-style-type: none"> • Extent of available hunting habitat and prey items. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – 1:3 ratio of nesting to foraging habitat in mosaic throughout breeding area. • Burning and mowing or topping vegetation. <ul style="list-style-type: none"> ○ Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. Mowing should be assessed as appropriate. <p>Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1st October to 15th April – Uplands). Burning can also adversely affect hunting habitat.</p> <ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of merlin and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure.

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	<p>This factor is significant in management of the hunting (and nesting) habitat.</p> <ul style="list-style-type: none"> • Persecution. <ul style="list-style-type: none"> ○ Enforcement as and when appropriate. <p>No persecution of hen harriers which are listed W&C Act schedule 1 species should take place.</p> <ul style="list-style-type: none"> • Predation <ul style="list-style-type: none"> ○ Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place. <p>Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to merlin, which are often ground nesting birds.</p> <ul style="list-style-type: none"> • Weather. <ul style="list-style-type: none"> ○ It is important to be mindful of this factor when interpreting data and trends. <p>Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks.</p> <ul style="list-style-type: none"> • Development. <ul style="list-style-type: none"> ○ Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent. <p>Upland sites are frequently targeted for windfarm development which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.</p> <ul style="list-style-type: none"> • Disturbance. <ul style="list-style-type: none"> ○ Disturbance during the breeding season (guide: 1st April

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	<p>– 15th August) from about 500m distance can have a major impact. This factor is not measured at present, as the only way would be to have camera on every territory and nest. If the trend is for numbers of successful pairs to be stable or increasing it is likely that disturbance is low. Conversely low numbers of successful pairs (as indicated by the carrying capacity of the habitat) and downward trends may indicate disturbance. This factor should be investigated if there are no other known factors responsible.</p> <p>Disturbance by people stopping close by nests and more directly by dogs and vehicles can affect breeding success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming.</p> <ul style="list-style-type: none"> • Forestry Management <ul style="list-style-type: none"> ○ Retain traditional nest site trees and likely potential nesting trees (often with crows' nests) both broadleaf and conifer within the forestry edge. <p>Forest edge management and forest redesign are likely to be important to merlin as possibly increasing numbers are tree nesting within and adjacent to the SPA.</p> <p>Peregrine <i>Falco peregrinus</i></p> <ul style="list-style-type: none"> • Breeding population size. <ul style="list-style-type: none"> ○ Upper limit – n/a. ○ Lower limit – 12 pairs. <p>Number of territorial pairs within SPA from a minimum of three counts in each 6-year reporting cycle. CSM considers a 25% decline in breeding pairs from the 12 pairs on the SPA form 2003 to be acceptable for the population to be in favourable condition -this means it could be 9 pairs. There are c.12 known traditional peregrine nest sites within the SPA, which are not all occupied in any one year.</p> <ul style="list-style-type: none"> • Peregrine Breeding Distribution. <ul style="list-style-type: none"> ○ Unknown. <p>It is important for the range within the site to be maintained.</p> <ul style="list-style-type: none"> • Breeding Success.

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	<ul style="list-style-type: none"> ○ Lower limit – 1 fledged per territorial pair when samples are monitored. <p>Successful nests are those, which fledge at least 1 young per season.</p> <ul style="list-style-type: none"> • Extent of available nest sites. <ul style="list-style-type: none"> ○ Lower limit – 12 within SPA boundary. <p>Peregrines breed mainly on undisturbed ledges of cliffs, crags and quarries, both within and adjacent to the SPA. Ledges suitable for nesting are usually already recorded and known as traditional nest sites.</p> <ul style="list-style-type: none"> • Extent of available hunting habitat and prey items. <ul style="list-style-type: none"> ○ This species will hunt across vast areas and is not in any way restricted to the SPA habitats so meaningful limits cannot be set. <p>This attribute is very significant but cannot be easily measured so declines in other attributes may indicate a need for detailed study and research of prey items.</p> <ul style="list-style-type: none"> • Burning Vegetation. <ul style="list-style-type: none"> ○ Assessment through the SSSI consenting process. No burns at traditional nest locations and otherwise following good practise. <p>Burning of potential nesting sites, limits nesting territory. Burning season extends into nesting period (1st October to 15th April – Uplands). Burning can also adversely affect hunting habitat.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ As described in the SAC and SSSI features' parts of this plan. No particular conflicts of management are apparent as the vision for the whole site takes account of merlin and includes the need for acid grassland and flush in mosaic with blanket bog as well as 'short' and 'tall' heath structure. <p>This factor is significant in management of the hunting (and nesting) habitat.</p> <ul style="list-style-type: none"> • Persecution. <ul style="list-style-type: none"> ○ Enforcement as and when appropriate.

<p>Site Name: Migneint-Arenig-Dduallt Location Grid Ref: SH816440 JNCC Site Code: UK0030205 Size: 19968.23 ha Designation: SPA & SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>No persecution of merlin, which is listed W&C Act schedule 1 species, should take place.</p> <ul style="list-style-type: none"> • Predation. <ul style="list-style-type: none"> ○ Populations of legally controllable predator species, such as foxes and carrion crows, should ideally be controlled, so that they do not pose a threat to merlin, which are often ground nesting birds. <p>Not under control under the consenting process as this OLDSI was removed at confirmation of the SSSI. May be influenced by projects and management agreements. Little data available on how much predator control currently takes place.</p> <ul style="list-style-type: none"> • Weather. <ul style="list-style-type: none"> ○ It is important to be mindful of this factor when interpreting data and trends. <p>Adverse weather can affect the breeding success of the females, e.g. very bad winters affecting the breeding condition of the females before they reach their summer territories, or wet/cold weather chilling the eggs/young chicks.</p> <ul style="list-style-type: none"> • Development. <ul style="list-style-type: none"> ○ Assessment of plans and projects within and adjacent to the SPA. Wind farms are not generally proposed within SNP and landscape is an important consideration adjacent. <p>Upland sites are frequently targeted for windfarm development, which may generate increased risk of mortality as a result of birds colliding with turbine blades, and reduce the amount of habitat available for nesting and hunting. Quarrying can be an issue in terms of loss of habitat.</p> <ul style="list-style-type: none"> • Disturbance. <ul style="list-style-type: none"> ○ Disturbance during the breeding season (guide: 1st April – 15th August) from about 500m distance can have a major impact. <p>This factor is not measured at present, as the only way would be to have camera on every territory and nest. If the trend is for numbers of successful pairs to be stable or increasing it is likely that disturbance is</p>

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	<p>low. Conversely low numbers of successful pairs (as indicated by the carrying capacity of the habitat) and downward trends may indicate disturbance. This factor should be investigated if there are no other known factors responsible. Disturbance by people stopping close by nests and more directly by dogs and vehicles can affect breeding success. Pairs can be deterred from nesting, desert the nest completely, eggs chill and young die and/or chicks can starve if adults cannot feed them. Breeding season is likely to be earlier with mild springs and global warming.</p> <ul style="list-style-type: none"> • Disease. <ul style="list-style-type: none"> ○ Assessment of plans and projects if consulted on land adjacent and education/information from initiatives, projects and newsletters. <p>Release of captive bred game birds adjacent to site may introduce diseases such as Avian Cholera/ Bird Flu.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Migneint-Arenig-Dduallt SAC/SPA (2008) available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/halkyn-to-mynydd-sac-list/idoc.ashx?docid=b14ce3f3-3fcf-4e22-8709-4931e73691c7&version=-1</i></p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Blanket bog: Unfavourable • European dry heaths: Unfavourable • Northern Atlantic wet heaths with <i>Erica tetralix</i>: Unfavourable (2005) • Natural dystrophic lakes and ponds: Unfavourable : Unclassified • Lakes (Oligotrophic to mesotrophic) standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>: Unfavourable Recovering <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles: Unfavourable (2008)</p> <p>SPA Features:</p> <ul style="list-style-type: none"> • Hen harrier <i>Circus cyaneus</i>: Favourable • Peregrine <i>Falco peregrinus</i>: Unfavourable • Merlin <i>Falco columbarius</i>: Favourable

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<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Grazing, Burning, Drainage</u> The main threats to the vegetation features of this site are from inappropriate grazing/burning/drainage and consequent degradation of blanket bog and heath. Afforestation of mire and heath has also been a problem in the past. These problems are being addressed through a number of agri-environment scheme agreements (Tir Cymen/Tir Gofal) and several S15 management agreements. A joint RSPB/Forest Enterprise/NRW black grouse project has also helped restore blanket bog and heath in some areas which had previously been planted with conifers.</p> <p>As sheep are currently overwhelmingly the favoured agricultural livestock it is difficult to get appropriate grazing regimes with cattle or ponies other than when opportunities arise where landowners are willing or a public body such as FC own land. Sheep grazing can work well when they are stocked at low density and away wintered.</p> <p>Uncontrolled fires have been a problem within Migneint-Arenig-Dduallt SPA in the past, including fires where the cause is unknown and where planned fires have become uncontrollable. There was a particularly severe fire in March 2003 when 872 ha were burnt, which destroyed a traditional hen harrier nest site.</p> <p>Drainage is a highly significant factor, which adversely affects blanket bog but is difficult to manage. There is little doubt that artificial drainage including moor grips has restricted the extent of blanket bog and affected the quality. The best quality bog is very waterlogged with bog pools and the heather growth is naturally stunted forming a low mattress of layering stems. Where drainage takes effect the heather can be taller and more leggy. When the effect of drainage is severe, as can be seen by forestry drains, blanket bog is converted to wet heath having lost the hare's tail cotton grass and hence can be further degraded.</p> <p><u>Atmospheric Pollution</u> The vegetation and lake features are vulnerable to acidification due to atmospheric pollution, which is compounded by the high rainfall and acidic geology/pedology of the site. Artificial liming of the catchment is an additional threat.</p> <p><u>Quarrying</u> In the past this site has been significantly affected by quarrying, resulting in habitat destruction.</p>

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	<p><u>Persecution</u> There have been recorded incidents of persecution including young shot in a nest and in 1987 chicks were taken from a nest, as well as adult birds having been shot.</p> <p><u>Disturbance</u> This may be a significant factor. Survey and review activities and recreational use (including climbing) around traditional nest sites during the breeding season.</p>
<p>Landowner/ Management Responsibility</p>	<p>No information available.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Gwynedd Council's Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

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<p>Site Description</p>	<p>The source of the River Dee lies within the Snowdonia National Park and its catchment contains a wide spectrum of landscapes from high mountains around Bala, steep-sided wooded valleys, near Llangollen, to the rich agricultural plains of Cheshire and north Shropshire and the vast mudflats of the estuary.</p> <p>The course and topography of the River Dee and its tributaries were strongly influenced and modified during the last Ice Age. The underlying geology of the Dee ranges from impermeable Cambrian and Ordovician shales in the west, through Silurian to Carboniferous Limestone outcrop at Llangollen to Coal Measures and thick boulder clay overlying the Triassic sandstones of the Lower Dee valley.</p> <p>The site extends from the western extremity of Llyn Tegid taking in the entire lake and its banks to its outfall into the River Dee. It then takes in the river and its banks downstream to where it joins the Dee Estuary SSSI. A number of the Dee's tributaries are also included, these being the Ceiriog, Meloch, Tryweryn, and Mynach. In its swifter upper reaches, the Dee flows through the broad valley near Corwen, and the spectacular Vale of Llangollen before entering the Cheshire plain at Erbistock where it meanders northwards through the Cheshire plain to Chester. Below Chester Weir, the river is largely Estuarine in character. However there is a tidal influence as far upstream as Farndon, as high tides regularly exceed the weir's height. In its slower, more mature reaches the river is characteristic of a floodplain river with meanders, oxbows and other river-formed landscape features.</p> <p>Llyn Tegid, the Tryweryn and the Dee form part of the River Dee Regulation System. The flow of water is controlled by NRW, primarily in order to minimise flooding and for the transportation of water to abstraction points down stream. The level of control is such that the Dee itself is said to be the most regulated river in Europe.</p> <p>However, of the water that reaches Chester, only about a third is regulated by NRW (This is based on an average; the proportion varies depending on conditions and operational requirements). Of the tributaries within the SAC and SSSI, the only regulated tributary is the Afon Tryweryn. Parts of the Rivers Dee and Ceiriog lie within both Wales and England. They have therefore been notified as two separate SSSIs – the Afon Dyfrdwy (River Dee) SSSI in Wales and the River</p>

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	<p>Dee (England) SSSI in England. However, the features for which the SSSIs are notified, in particular migratory fish depend upon the whole river ecosystem.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. • Floating water-plantain <i>Luronium natans</i>. <p>Annex II species present as qualifying features, but not primary reasons for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i>. • Brook lamprey <i>Lampetra planeri</i>. • River Lamprey <i>Lampetra fluviatilis</i>. • Bullhead <i>Cottus gobio</i>. • European otter <i>Lutra lutra</i>. <p>Llyn Tegid Ramsar features where features are also a SAC and / or SSSI feature they will share the same conservation objective(s)</p> <ul style="list-style-type: none"> • The lake and aquatic / emergent vegetation. • Lake Fen /swamp inc. wet woodland. • Fish. <i>Coregonus lavaretus</i> Gwyniad. • Invertebrate. <i>Myxas glutinosa</i> Glutinous snail.
<p>Conservation Objectives</p>	<p>Our vision for the River Dee and Bala Lake SAC is that it will be maintained at, or where necessary restored to, high ecological status with all its features at favourable conservation status. Factors under human control that may significantly affect its feature species or populations in or outside of the site will be controlled in such a way that the features will sustain themselves as part of a functioning ecosystem. This will be true both for plants and animals whose life cycles remain entirely within the site's boundaries, and for migratory species that only spend certain stages of their lives in the SAC.</p> <p>Water is clearly fundamental to a riverine SAC. Therefore the quality, quantity and flow variability of water, plus the quality of adjacent habitats, will be maintained or adjusted to a level necessary to maintain the features in favourable condition for the foreseeable future.</p>

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	<p>Natural processes of erosion and deposition will operate without interference. The protected aquatic and emergent plant communities will continue to characterise parts of the river and lake. In addition to enhancing its appearance, such communities provide a good indication of the overall quality of the river and lake environment and provide important habitats for fish and invertebrates.</p> <p>The protected fish species found in this SAC, both those that are resident all year round, such as the bullhead and brook lamprey, and migratory species such as the Atlantic salmon, sea and river lampreys, swim up river to spawn and go through their juvenile stages in the river. These species will be present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. The migratory fish will be able to complete their migrations and life cycles largely unhindered. Either by artificial barriers such as weirs, disturbance and pollution, or by external factors such as being caught in the by-catch of fishing operations at sea.</p> <p>Llyn Tegid is the largest natural lake in Wales. It will have a healthy ecosystem that is not suffering from nutrient enrichment or acidification, and where use as a reservoir does not impinge on its wildlife interest. As a result, it supports flourishing populations of three rare species: gwyniad, glutinous snail, and floating water-plantain.</p> <p>The abundance of prey and widespread availability of undisturbed resting and breeding sites, will allow a large otter population to thrive. Otters will be found throughout the SAC and in adjacent, supporting habitat.</p> <p>Vision For the Water Course The vision for the water course is for it to be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure (It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process). • There will be no deterioration in water quality other than that temporarily generated by natural variations in water flow or by man made variations occurring as a result of operating the River

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	<p>Dee flow control regime within its normal operating parameters.</p> <ul style="list-style-type: none"> • The Dee flow regime should remain within 10% of 'recent actual flow' as described by Bethune (2006). • The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC will be avoided. • Artificial factors impacting on the capability of each feature to occupy the full extent of its potential range should be modified where necessary to allow passage, eg. weirs, bridge sills, or other forms of barrier. • Natural limiting factors such as waterfalls, which may limit the natural range of a feature or its dispersal between naturally isolated populations, should not be modified. • Flow objectives for assessment points in the Dee Catchment Abstraction Management Strategy will be agreed between EA and NRW as necessary. • Levels for nutrients, in particular phosphate, will be agreed between EA and NRW for each Water Framework Directive water body in the River Dee and Bala Lake SAC, and measures taken to maintain nutrients below these levels (It is anticipated that these limits will concur with the standards used by the Review of Consents process). • The levels of water quality parameters, in addition to those deemed to be nutrients and including levels of suspended solids, that may affect the distribution and abundance of SAC features will be agreed by NRW for each Water Framework Directive water body in the River Dee and Bala Lake SAC, and measures taken to maintain them below these levels (It is anticipated that these limits will concur with the standards used by the Review of Consents process). • Potential sources of pollution, nutrient enrichment and/or suspended solids that have not been addressed in the Review of Consents such as, but not confined to, diffuse pollution or disturbance to sediments, will be considered in assessing plans and projects. <p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p>

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	<ul style="list-style-type: none"> • The conservation objective for the water course as defined above must be met. • The extent of this feature within its potential range in this SAC should be stable or increasing. • The extent of the sub-communities that are represented within this feature should be stable or increasing. • The conservation status of the feature's typical species should be favourable. • All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The parameters defined in the vision for the water course as defined above must be met • The SAC feature populations will be stable or increasing over the long term. • The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis. • All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>The conservation objective for the lake water body must be met. The vision for this feature is for it be in favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • There will be no contraction of the current <i>L. natans</i> extent and distribution, and the populations will be viable throughout their current distribution & will be able to maintain themselves on a long-term basis. Each <i>L. natans</i> population must be able to complete sexual and/or vegetative reproduction successfully. • The lake will have sufficient habitat to support existing <i>L. natans</i> populations within their current distribution and for future expansion.

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	<ul style="list-style-type: none"> • All factors affecting the achievement of these conditions are under control. <p>Annex II species present as qualifying features, but not primary reasons for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i> • Brook lamprey <i>Lampetra planeri</i> • River Lamprey <i>Lampetra fluviatilis</i> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The parameters defined in the vision for the water course as defined above must be met • The SAC feature populations will be stable or increasing over the long term. • The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis • All factors affecting the achievement of these conditions are under control. <ul style="list-style-type: none"> • Bullhead <i>Cottus gobio</i> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The parameters defined in the vision for the water course as defined in 4.1 above must be met • The SAC feature populations will be stable or increasing over the long term. • The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis • All factors affecting the achievement of these conditions are under control <ul style="list-style-type: none"> • European otter <i>Lutra lutra</i> <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following</p>

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	<p>conditions are satisfied:</p> <ul style="list-style-type: none"> • The parameters defined in the vision for the water course as defined in 4.1 above must be met. • The SAC otter population is stable or increasing over the long term, both within the SAC and within its catchment. • There will be no loss of otter breeding or resting sites other than by natural means (such as naturally occurring river processes) within the SAC or its catchment. • There number of potential resting sites within the SAC will not be a factor limiting that limits the otter population's size or extent • There should be no reduction of fish biomass within the SAC or its tributaries except for that attributable to natural fluctuations • There should be no loss of amphibian habitat likely to provide a source of prey for members of the SAC otter population. • The potential range of otters in the within the SAC or its catchment is neither being reduced nor is likely to be reduced for the foreseeable future. • All known or potential access or dispersal routes within the catchment for otters that might be considered part of the SAC population should be maintained such that their function is not impaired including the incorporation of measures or features required to avoid disturbance. • Off site habitats likely to function as 'stepping stones' within the catchment for members of the SAC otter population will be maintained for migration, dispersal, foraging and genetic exchange purposes. • All man-made structures within or likely to be used by otters from the SAC population must incorporate effective measures to facilitate the safe movement and dispersal of otters. • All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). <p>Llyn Tegid Ramsar features where features are also a SAC and / or SSSI feature they will share the same conservation objective(s)</p> <ul style="list-style-type: none"> • The lake and aquatic / emergent vegetation. • Lake Fen /swamp inc. wet woodland. • The total extent of the lake area, including lake fen and swamp shall be maintained. This includes some 10 ha of swamp/fen in total; of which at least 6 ha is attributable to NVC S11 <i>Carex vesicaria</i> swamp community.

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	<ul style="list-style-type: none"> • The abundance and distribution of rare aquatic and emergent species will be maintained or increased and continue to be self-sustaining. • The abundance and distribution of typical species of aquatic /emergent species will be common and continue to be self-sustaining. • The fen and swamp layers comprises locally native species, see Tables 2 for the relevant species for each vegetation community. The abundance of typical species of each fen and swamp type will be common. • The abundance and distribution of uncommon / rare plants occurring within each fen and swamp vegetation community will be maintained or increased and continue to be self-sustaining. • Invasive non-native species such as rhododendron, Japanese knotweed, Canadian pondweed and Himalayan balsam will not be present. This condition is considered under “factors”. • Water quality in the lake should be of a standard that will ensure it reaches at Good Ecological Status or better as defined by the Water Framework Directive, and that the River Dee at Llandderfel Bridge reaches its targets of Biological GQA class A and chemical quality standard of RE1. Eutrophication of the lake from diffuse and point source pollution will be under control and incidences of blue/green algal blooms will have stopped. The nutrient levels in the lake will be much lower and similar to the levels inferred from the diatom assemblages for the lake prior to 1925. • All factors affecting the achievement of these conditions are under control. • Fish. <i>Coregonus lavaretus</i> Gwyniad. <p>There are fewer than 10 recorded populations of whitefish in the British Isles and the Llyn Tegid population is the only one in Wales. Dwelling mainly in the deeper and cooler offshore waters this carnivorous fish feeds on microscopic animals floating in the water. Each year, between January and February, it moves into the shallower waters of the lake to spawn in clean gravel beds. Between 2004 and 2007 an attempt was made to establish a ‘refuge’ population at Llyn Arenig Fawr, an upland oligotrophic lake in Migneint-Arenig-Dduallt SAC (Refer to Migneint-Arenig-Dduallt SAC plan). The conservation objective for the lake water body as defined in conservation objective number 9 & 10 must be met. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p>

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	<ul style="list-style-type: none"> • The population of the feature in the SAC is stable or increasing over the long term. • The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. • Suitable habitat is defined in terms of near-natural hydrological regime, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply. • All factors affecting the achievement of these conditions are under control. <ul style="list-style-type: none"> • Invertebrate. <i>Myxas glutinosa</i> Glutinous snail. <p>The conservation objective for the lake water body as defined in conservation objective number 9 & 10 must be met. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • This population will continue to thrive and colonise all suitable areas of habitat in the marginal zone. The species will have been extensively studied and its ecology, especially its response to fluctuating water levels, will be better understood so that its niche requirements can continue to be met. In addition, we will fully understand whether the apparently different mean growth rates in snail populations at different locations around the lake is due to minor habitat variance or to isolated sub-population differences. • Maintenance of the quality and extent of suitable habitat. • All factors affecting the achievement of these conditions are under control.
<p>Component SSSIs</p>	<p>The site has been divided into 19 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management unit divisions have been based on the following:</p> <ul style="list-style-type: none"> • SSSI boundaries. • Tributary confluences. • Natural hydromorphology. • Artificial barriers where they mark a change in river character. • National boundaries. • Unitary Authority Boundaries.

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	<ul style="list-style-type: none"> • The tidal and navigational limit. • The units include one or more of EA’s River Basin Management Plan water bodies; as far as is practicable unit boundaries coincide with these water body boundaries.
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation. <p>As discussed above, it is important that further knowledge of the condition and extent of this feature is acquired in order to better inform decisions about its management. However, as stated by Hatton-Ellis and Grieve (2003) “There remain many gaps in understanding of the reproductive biology of individual species, the identification and distribution of subspecies, and the ecological tolerances of plant assemblages”. So until there is a greater understanding of the requirements of this feature the emphasis will be on promoting and retaining a mosaic of bank-side and emergent vegetation, and of resisting changes to the aquatic environment unless they can be shown as being unlikely to have a significant effect.</p> <p>Annex II species that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i>. <p>Any form of exploitation detrimental to salmon successfully completing their reproductive cycle is difficult to justify until the following criteria have been met: - The salmon population is consistently reaching its targets, there is no salmon stocking, other than compensating for the habitat loss caused by the construction of Llyn Celyn.</p> <ul style="list-style-type: none"> • Floating water-plantain <i>Luronium natans</i>. <p>Physical damage to floating plants and their habitat from motorised craft should continue to be controlled by limiting the number of motorised boats to emergency craft operated by SNPA wardening staff. No lake bottom sediment should be dredged because it could disturb submerged populations and /or destroy suitable substrate for <i>Luronium natans</i> to colonise.</p> <p>The pools at Glanllyn, where <i>Luronium natans</i> has long been recorded, are now dominated by the alien species <i>Elodea canadensis</i> Canadian pondweed. Some control such as light mechanical harvesting should</p>

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	<p>be considered if observation/research elsewhere indicates that this management is likely to be successful.</p> <p>Annex II species present as qualifying features, but not primary reasons for site selection</p> <ul style="list-style-type: none"> • Sea lamprey <i>Petromyzon marinus</i>. • Brook lamprey <i>Lampetra planeri</i>. • River Lamprey <i>Lampetra fluviatilis</i>. <p>Currently, we don't have sufficient information about <i>Petromyzon marinus</i> in the Dee SAC to know the size or dynamics of its population, the amount of habitat available for its spawning and subsequent development, or the other main factors that limit its development. In view of this, the management requirements are:</p> <ul style="list-style-type: none"> • Identification of spawning sites. • Undertake research to try and determine what is required by way of resources for there to be a sustainable population of this species within the Dee catchment. • Identify which resources are limiting the development of the current population. <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Information on likely rates of entrainment of lamprey ammocoetes is required before acceptable levels can be assessed. In addition, screening must be of a standard sufficient to prevent any significant effect on the Lamprey population.</p> <p>Fish stocking can be damaging to ecosystem structure and function through competition, predation and introduction of disease – ensure any fish stocking is very carefully controlled to avoid these problems, and subject to an appropriate assessment.</p> <ul style="list-style-type: none"> • Bullhead <i>Cottus gobio</i>. <p>Improve water quality to required standard.</p> <p>The importance of submerged higher plants to bullhead survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. JNCC's <i>Common Standards Monitoring Guidance for Freshwater fauna</i> (2005) states that "Weed cutting should be limited to no more than half of the channel width in a</p>

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	<p>pattern of cutting creating a mosaic of bare substrate and beds of submerged plants”. However, in view of the lack of clarity as to the importance of such plants to this species, and as much of the aquatic vegetation is a protected feature of this site in its own right, the precautionary principal should apply. Therefore, there should be no cutting of submerged macrophytes.</p> <p>Slack-water areas provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.</p> <ul style="list-style-type: none"> • European otter <i>Lutra lutra</i>. <p>Most of the following requirements are based on the main recommendations of Morgan (2004): Further survey work is needed in order to better estimate the number of otters in the SAC population. Morgan (2004) states that “It is impossible to judge just how many otters are present on the Dee catchment today. DNA analysis of spraints to identify individual animals is probably the only way by which this might be ascertained with some certainty”.</p> <p>Establish a procedure to undertake an appraisal of road kill sites. The objects being to attempt to identify reasons for otters being on the road – at least 14 otters were killed on roads in the Dee catchment in the six years prior to the survey.</p> <p>Undertake further survey work to specifically identify holts and in particular natal holts – Morgan states that such information is particularly sparse but suggest that it is best gathered by dedicated volunteer groups and suggest that a volunteer survey/monitoring group be established in North East Wales.</p> <p>Fencing of river banks with a suitable buffer should be considered a high priority – This will encourage the establishment of areas with a dense understorey of shrub close to the river – a habitat favoured by otters. It will also reduce grazing pressure and disturbance.</p> <p>Actions currently identified: -</p> <p>NRW – Instigate research in order to more accurately determine:</p> <ul style="list-style-type: none"> • the size of the SAC otter population. • the extent of the SAC otter population.

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	<ul style="list-style-type: none"> • its level of breeding success. • its age structure. • the extent of its dispersal and recruitment. • the routes commonly used for its dispersal and recruitment. • whether the availability of potential resting sites is a limiting the population. <p>Llyn Tegid Ramsar features where features are also a SAC and / or SSSI feature they will share the same conservation objective(s)</p> <ul style="list-style-type: none"> • The lake and aquatic / emergent vegetation. <p>To reduce/halt point and diffuse sources of pollution (enrichment) in the catchment.</p> <p>Within the catchment, forestry managers should be encouraged to adhere to guidelines for applying fertilisers and the suggestions for minimising the release of sediment at all stages of forestry practice from ground preparation to harvesting. These sources give rise to the following pollution issues:</p> <ul style="list-style-type: none"> • Nitrate is very soluble and excessive application can lead to fertiliser seeping through to groundwater, or being washed into rivers through drains or subsurface flow. • Phosphorus can also be carried in this way, but more commonly binds tightly to soil and is lost through surface run-off or erosion from ploughed or eroded land. • Agrochemicals such as sheep dip, fungicides and insecticides can be washed into surface or ground waters if not correctly handled and applied. • Microbial pathogens from manure can be washed into surface waters by rain or where livestock have direct access to watercourses. <p>River sediment levels can be increased by soil erosion due to inadequate livestock or soil management and when livestock damage riverbanks or churn up sediment within the riverbed.</p> <p>Efforts have been made to tackle point sources of enrichment such as from sewerage treatment and other discharges within the catchment and more diffuse sources including land run-off. A pilot 'catchment sensitive farming project' for two tributary rivers, the Afon Llafar and the Afon Twrch, was initiated in 2005 with the aim of improving water quality by reducing diffuse pollution from agricultural operations.</p>

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	<p>Landowners joining the scheme are offered a farm audit which highlights opportunities for improving nutrient planning, soil erosion control, loss of soil structure and organic matter, manure management and sheep dipping. The Welsh Assembly Government, through a partnership with NRW and SNPA, is leading the project, with funding by all partners and European Union Objective 1 funds. This pilot project will finish in 2008 and analysis of the success of the scheme is yet to be published but we can be confident that a similar scheme for the whole catchment of Llyn Tegid would greatly improve water quality and reduce eutrophication and the frequency of blue-green algal blooms. In the absence of such a project, then eutrophication can only be addressed by land owners in the catchment joining other voluntary agri-environment schemes such as Tir Gofal. Within the boundary of the SSSI / SAC, operations that may contribute to eutrophication may be mitigated at a very localised level through the consultation for consent process.</p> <ul style="list-style-type: none"> • Lake Fen /swamp inc. wet woodland. <p>Grazing can help prevent sedge swamp communities and other wetland from developing into willow scrub as well as promoting plant diversity in these habitats and grassland. Some plants are however particularly grazing sensitive and will benefit from grazing exclusion or periods without grazing.</p> <p>Marshy grassland, fen and swamp continues to be cattle and sheep grazed at the southern end of the site. The Bala end was horse grazed until the late 1980s-early 1990s after which grazing ceased. Fen/swamp requires grazing of different zones with some areas not grazed and others lightly summer grazed by cattle/ponies. Mowing including topping rushes can be a good way of controlling ranker vegetation growth and increasing diversity. An area of the site at the northern end was managed as meadow in the past and the rushes growing on part of the southern marshy grassland are regularly topped. Mowing or rush topping may however adversely affect the bladder sedge fen if it is too frequent so it is important that this vegetation is monitored.</p> <ul style="list-style-type: none"> • Mowing/topping may continue as appropriate. <p>Scrub control is often needed at Llyn Tegid, particularly at the northern end, as the fluctuating water level, natural changes in the vegetation as well as lack of grazing all tend to result in scrub growth and</p>

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	<p>encroachment onto grassland and drier fen swamp.</p> <ul style="list-style-type: none"> • A programme of scrub control should continue. <p>Water sports and other recreation, including swimming, sailing, canoeing, wind surfing, canoeing and sail boarding, are enjoyed by many visitors to the lake. The use of powerboats at Llyn Tegid is however restricted to rescue craft by SNPA. Water sports have resulted in the development of supporting infrastructure, including boat storage areas, slipways and boathouses and the creation of launching points. Sometimes the creation of launching points involves moving boulders, an operation that may damage the special interest in some locations, so this aspect needs to be carefully assessed before it is consented. Water sports can also result in a demand for dredging (see below), excavating channels and shoreline modifications. It is important that development does not spread further along the foreshore creating extensive areas bare of vegetation and that construction of infrastructure is controlled.</p> <p>Car parking and amenity areas were formalised in 1995-97 and measures were put in place at the Bala end of the lake to control cars driving onto adjacent grassland. Part of northern end of the shore is managed by SNPA as an amenity area and a car park with picnic benches. Such facilities are important in enabling a range of visitors to enjoy the countryside at Llyn Tegid. Appropriate planning of visitor infrastructure including paths can ensure development without significant damage to the wildlife interest.</p> <ul style="list-style-type: none"> • Recreational activity and infrastructure needs to be managed. <p>Dredging took place in Glanllyn Bay in 1951 and in 1984 when part of the lake area (6700 sq m) was deepened to permit launching of canoes from Glanllyn at times of lower lake levels. An estimated 10,000 tons of sediment was removed from the bay and dumped in an offshore area of the lake. There was another proposal to dredge in 1997. There has also been a proposal to reroute the Afon Llafar, so that it would enter the lake to the east of Glanllyn Bay, presumably to try to reduce sedimentation.</p> <p>Dredging releases nutrients from the sediments and can therefore impact negatively on the nutrient levels of the lake and on the water quality. Small-scale excavation of gravel takes place at a number of locations around the lake. Such operations are only acceptable where</p>

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	<p>the impact on the special interest has been fully assessed and is considered not to be significant.</p> <ul style="list-style-type: none"> • There should be a presumption against dredging. <p>Invasive alien plants such as Japanese knotweed, which was mapped in 1990 and has been controlled by SNPA since then, should not be allowed to re-colonise and spread. New Zealand stone crop and other aliens should not be allowed to establish themselves adjacent to or in feeder streams or the lake itself.</p> <ul style="list-style-type: none"> • Control of Japanese knotweed should continue and local agencies should monitor and be notified of the occurrence of any new invasive species. • Fish. <i>Coregonus lavaretus</i> Gwyniad. <p>The management requirements of the lake also apply to the gwyniad (see above).</p> <p>To reduce point and diffuse sources of pollution (enrichment and sediments) in the catchment.</p> <p>During the spawning season, January – end February the lake water levels should be sufficiently high to ensure that gwyniad fish eggs which are laid in the shallows around the edge of the lake are not exposed. There should be a presumption against fish introductions into the lake.</p> <p>There should be a presumption against significant dredging or any in-lake works between the end of October and the end of May.</p> <ul style="list-style-type: none"> • Invertebrate. <i>Myxas glutinosa</i> Glutinous snail. <p>To reduce point and diffuse sources of pollution (enrichment) in the catchment.</p> <p>Sufficient supply of cobbles and boulders in the marginal zone will be maintained by allowing natural processes to deposit and erode the accretion of substrate materials. Substrate materials should not be added or removed from the marginal zone by human activity. Existing habitats should not be allowed to silt over as a result of human induced activity.</p>

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	<p><u>Water Level Fluctuations</u> The winter water level should not be so low as to expose the snail's habitat for very long periods which may lead to animals desiccating.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</p> <ul style="list-style-type: none"> • Distribution within catchment. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. <p>May occur in all site units except 1 and 14. Though surveys have identified this feature at various sample sites, the feature's extent, or the extent of suitable habitat for it, within the protected site has never been mapped (The fluvial audit of the Dee (Hill and Emery, 2004) recorded vegetation cover of the river bed and looked at statistical associations with certain other variables. They did not however identify this SAC feature vegetation community).</p> <ul style="list-style-type: none"> • Typical species. <ul style="list-style-type: none"> ○ Upper limit – Insufficient information. ○ Lower limit – See Table 1a of the current version of JNCC's <i>Common Standards Monitoring Guidance for Rivers</i>. <p>Should conform to Plant community: species composition and abundance targets in Table 1a of the current version of JNCC's <i>Common Standards Monitoring Guidance for Rivers</i> (Current version – March 2005).</p> <ul style="list-style-type: none"> • Plant community reproduction. <ul style="list-style-type: none"> ○ Upper limit – at least 50% of the habitat / macrophyte population should be left uncut for the full duration of the remaining growing season and there should be no further cutting at the same location for at least two further growing seasons. ○ Lower limit – Nil. <p>For this attribute, the 'Targets', 'Method of assessment', and 'Comments' criteria are as those described in Table 1a of the current version of JNCC's <i>Common Standards Monitoring Guidance for Rivers</i></p>

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	<p>(Current version – March 2005), except for the lower limit. In the guidance, the ‘minimum value is defined in terms of the “total habitat / macrophyte population that should be left uncut”. For the Dee percentages of total habitat area or total macrophyte population cannot be expressed because the total area covered by the habitat is not known. Therefore in this SAC, the value expressed applies to a percentage of the width of channel, but only at locations where control measures such as weed cutting are an established practice as agreed by NRW. In all other locations there should be no cutting of feature vegetation.</p> <ul style="list-style-type: none"> • Bank and Riparian Zone Vegetation. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Bank and riparian zone vegetation should form a seminatural mosaic. However, where it forms part of a plant community classified as a qualifying SSSI habitat feature, it should remain within its notified classification. <p>In addition to being integral to SSSI river habitat (plant community) types, it is clear that the various types of seminatural bank and riparian zone vegetation each contribute to the ecological well being of the site and its features in different ways. Examples include: -</p> <ul style="list-style-type: none"> • Fallen leaves - these provide of a source of allochthonous vegetative input to the aquatic food web. • Fallen trees and branches – woody debris in the water provides cover for fish and invertebrates, and may generate eddies that aid their movement within the site. • Fringing and emergent vegetation at the waters edge provides cover for juvenile fish and invertebrates • Dense vegetation on river banks provides a buffer between intensively farmed land and the river • Ground layer, dense scrub and woodland vegetation on river banks provide a range of terrestrial habitat for otter. <p>Conversely, dense woodland excludes light from the river and may limit the extent of this feature. In view of these and other known and unknown associated factors, the “mosaic” objective should ensure that all the wideranging interactions between bank-side vegetation and the in-river ecosystem can continue to take place.</p> <ul style="list-style-type: none"> • Species indicative of eutrophication. <ul style="list-style-type: none"> ○ Upper limit – Cover, The Combined cover values of

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	<p>blanket weed, epiphytic or other algae should not exceed 25%.</p> <ul style="list-style-type: none"> ○ Lower limit – none set. <p>Cover values should not increase significantly from an established baseline. Methods used to establish these values should be as indicated in the current version of JNCC's <i>Common Standards Monitoring Guidance for Rivers</i> (Current version – March 2005), which rely on the method of Holmes (1983) and a standard check-list of macrophyte species. Taxa typically associated with enrichment are considered negative indicators of favourable condition. The species will vary depending on the River Community Type. For most such species, as there has not been an MTR survey on the Dee, a baseline has yet to be established. However, for blanket weed, epiphytic or other algae, the generic CSM value has been used.</p> <ul style="list-style-type: none"> ● Alien / introduced species. <ul style="list-style-type: none"> ○ Upper limit – No impact on native biota from alien or introduced species. ○ Lower limit – None set. <p>In the CSM guidance, the SERCON scoring system for naturalness of aquatic and marginal macrophytes and naturalness of banks and riparian zone, are used to assess this attribute. SERCON protocols have not yet been applied in the Dee SAC, therefore assessment of this attribute relies on locally defined thresholds and expert judgement. Details to be confirmed.</p> <ul style="list-style-type: none"> ● Water quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Chemical GQA Class: A. Biological GQA Class: A. <p>Based on Table 1a of JNCC's <i>Common Standards Monitoring Guidance for Rivers</i> (Current version – March 2005), for the Attributes: "Habitat functioning: water quality (General assessments)" and "Habitat functioning: water quality". NOTE GQA values represent a rolling, monthly three year average. A river section may achieve GQA class A but still be subject to short term drops in water quality. Therefore, in all cases the principal found in Section 4.1, item 2, should be adhered to.</p> <ul style="list-style-type: none"> ● Flow. <ul style="list-style-type: none"> ○ Upper limit – +10% of recent actual flow.

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	<ul style="list-style-type: none"> ○ Lower limit – -10% of recent actual flow. <p>To a large extent, water flow in the Dee and certain of its tributaries, is regulated by the Environment Agency Wales (EAW) under a set of rules called the Dee General Directions, a requirement of the Dee and Clwyd River Authority Act 1973. The Dee was made a SSSI and SAC with these directions in place. Therefore any change to the flow regime would require assessment under Regulation 48 of the Habitats Regulations 1994. The meaning of “recent actual flow” is as described by Bethune (2006).</p> <ul style="list-style-type: none"> • Light levels. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. <p>This factor is partly addressed above in relation to “Bank and riparian zone vegetation” and “Species indicative of eutrophication”. However, light levels reaching this feature vegetation community may be affected by other factors such as buildings, bridges or other structures. The specific ranges and values of light parameters beyond which this feature would be significantly effected is not known and therefore in all cases of doubt, the precautionary principal should apply.</p> <p>Atlantic salmon <i>Salmo salar</i></p> <ul style="list-style-type: none"> • Adult run size. <ul style="list-style-type: none"> ○ Upper limit – None Set. ○ Lower limit – Conservation Limit 5100 spawning adults per year complied with at least four years in five. <p>CSM guidance states: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component. For the river Dee the Conservation Limit (CL) is 5100 spawning adults per year and the Management Limit (ML) is 6300 spawning adults per year (from Davidson (2005) but details also given in Pisces Conservation Ltd, (2007).</p> <ul style="list-style-type: none"> • Juvenile densities. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Expected densities for each sample site using HABSCORE (Cowx and Fraser, 2003). <p>CSM guidance states: These should not differ significantly from those</p>

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	<p>expected for the river type/reach under conditions of high physical and chemical quality. Assessed using electrofishing data.</p> <ul style="list-style-type: none"> • Water quality. <ul style="list-style-type: none"> Assessment of general chemical quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Chemical GQA Class A. Assessment of general Biological quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Biological GQA Class A. Soluble Reactive Phosphorous Class. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Values for individual stretches to be agreed by NRW as part of the Review of consents process. Annual Mean Suspended Solids for nursery grounds. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – <10 mg L. Annual Mean Suspended Solids for migratory passage. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – <25 mg L⁻¹. <p>Based on JNCC's <i>Common Standards Monitoring Guidance for Freshwater Fauna</i>, 2005 NOTE GQA values represent a rolling, monthly three year average. A river section may achieve GQA class A but still be subject to short term drops in water quality. Therefore, in all cases the principal found in Section 4.1, item 2, should be adhered to. Phosphorous levels are not included within the Chemical RE classification but EA has a separate classification system for these using levels from 1 "Very low" to 6 "Excessively High". The targets have been agreed between EA and NRW. Suspended solids limits are those specified in the current version of JNCC's <i>Common Standards Monitoring Guidance for Freshwater Fauna</i> 2005.</p> <ul style="list-style-type: none"> • Flow. <ul style="list-style-type: none"> ○ Upper limit – +10% of recent actual flow. ○ Lower limit – -10% of recent actual flow. <p>To a large extent, water flow in the Dee and certain of its tributaries, is regulated by NRW under a set of rules called the Dee General Directions, a requirement of the Dee and Clwyd River Authority Act 1973. The Dee was made a SSSI and SAC with these directions in place. Therefore any change to the flow regime would require assessment under Regulation 48 of the Habitats Regulations 1994. The</p>

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	<p>meaning of “recent actual flow” is as described by Bethune (2006).</p> <ul style="list-style-type: none"> • River morphology. <ul style="list-style-type: none"> Artificial barriers. <ul style="list-style-type: none"> ○ Upper limit – No artificial barriers preventing significant numbers of adults from reaching existing and historical spawning grounds, and smolts from reaching the sea. ○ Lower limit – Nil. Characteristic physical features. <ul style="list-style-type: none"> ○ Upper limit. ○ Lower limit – Maintain characteristic physical features. <p>“The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of Atlantic salmon. The close proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within an SAC, whilst restoration may be needed in some reaches.” (Extract from the current version of JNCC’s <i>Common Standards Monitoring Guidance for Freshwater Fauna</i>). This offers specific guidance to the habitat requirements of some of this species’ life stages.</p> <ul style="list-style-type: none"> • Compensation stocking of salmon populations by NRW. <ul style="list-style-type: none"> ○ Upper limit – 200,000. ○ Lower limit – None set. <p>Salmon stocking must only occur in order to compensate for the loss of habitat upstream of the Llyn Celyn dam. Stocking beyond the 200,000 target from the existing compensation scheme or any form or enhancement stocking should not occur.</p> <p>Floating water-plantain <i>Luronium natans</i></p> <ul style="list-style-type: none"> • Population extent and abundance. <ul style="list-style-type: none"> ○ Abundant <i>L. natans</i> should be found in at least, the pools at Glanllyn, Dolfawr bay and near the River Dee outfall. <p>Presence of <i>Luronium natans</i> recorded as plants that are attached to substrate. Detached fragments (unless obviously detached during monitoring) will not be counted.</p>

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	<ul style="list-style-type: none"> • Sufficient habitat. <ul style="list-style-type: none"> ○ Sufficient good quality habitat should exist to support the expansion of existing populations. Extent of good quality habitat should not be reduced. <p>Submerged populations of <i>L. natans</i> require substrates comprising of mud or stable fine gravel or silt in depths of clear water up to 3m.</p> <ul style="list-style-type: none"> • Dredging. <ul style="list-style-type: none"> ○ No dredging likely to affect <i>L. natans</i>. should occur at Glanllyn and Dolfawr bays Dredging could directly damage <i>L. natans</i>. • Disturbance by motorised craft. <ul style="list-style-type: none"> ○ Number and usage of motorised craft should not rise from current level of warden's use, emergency craft and as consented for research. Motorised craft could directly damage <i>L. natans</i>. • Water quality. <ul style="list-style-type: none"> ○ No information provided. <p><i>L. natans</i> is recorded elsewhere across a spectrum of nutrient levels including fairly eutrophic canals.</p> <p>Sea lamprey <i>Petromyzon marinus</i> Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i></p> <ul style="list-style-type: none"> • Age structure. <ul style="list-style-type: none"> ○ Upper limit – No information provided. ○ Lower limit – For samples of 50 or less, at least two distinct size classes should normally be present. If more than 50 ammocoetes are collected, at least three size classes should be present. <p>Electrofishing of suitable habitat using quadrats. Suitable habitat includes silt and sand beds in the river, either at the margins or in the main channel. Age structure – Lamprey ammocoetes grow at a reasonably steady rate and distinct size classes are usually apparent. Ammocoetes typically range from 10 – 150 mm, corresponding to up to six year classes. The largest ammocoetes are usually brook lampreys (river lampreys metamorphose at about 100 – 120 mm), while the</p>

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	<p>smallest individuals are likely to be young-of-year sea lampreys, since this species spawns later in the year than <i>Lampetra</i>. The full range of age classes of ammocoete larvae, from 0+ up to metamorphosis should be present. However, sampling error may make these difficult to discern unless large samples are taken.</p> <ul style="list-style-type: none"> • Distribution within catchment. <ul style="list-style-type: none"> ○ Upper limit – no information provided. ○ Lower limit – Lampreys should be present at not less than 2/3 of sites surveyed. As a minimum, there should be no reduction in the distribution of ammocoetes within the catchment. • Ammocoete density. <ul style="list-style-type: none"> ○ Upper limit – <i>Lampetra</i> spp: None set. ○ Lower limit – <i>Lampetra</i> spp: Optimal habitat – >10 m⁻² ; Overall catchment mean – >5m⁻². ○ Upper limit – <i>Petromyzon</i> spp: None set. ○ Lower limit – <i>Petromyzon</i>: Ammocoetes should be present in at least four sampling sites, each not less than 5 km apart. <p><i>Lampetra</i> ammocoetes cannot be distinguished in the field, so it will not normally be possible to set separate targets for <i>L. fluviatilis</i> and <i>L. planeri</i>.</p> <p><i>Petromyzon</i> ammocoetes can be distinguished in the field, but typically occur at very much lower densities than <i>Lampetra</i> – in UK rivers using conventional, shallow water, electrofishing survey methods, approximately 1 ammocoete in 50 is normally <i>Petromyzon</i>. The setting of density targets for this species using such survey methods is therefore impractical.</p> <ul style="list-style-type: none"> • Spawning Activity (<i>Petromyzon</i> only). <ul style="list-style-type: none"> ○ Upper Limit – None set. ○ Lower Limit – No reduction in extent of spawning activity year on year. <p>Direct observation or redd counts - sea lamprey ammocoetes are typically much less numerous than river / brook lamprey ammocoetes, so this may be the only cost-effective means of determining that a healthy spawning population is present. They are usually easily</p>

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	<p>observed at traditional spawning sites (<i>Common Standards Monitoring Guidance for Freshwater fauna</i>, 2005).</p> <ul style="list-style-type: none"> • Flow. <ul style="list-style-type: none"> ○ Upper limit – +10% of recent actual flow. ○ Lower limit – -10% of recent actual flow. <p>To a large extent, water flow in the Dee and certain of its tributaries, is regulated by the Environment Agency Wales (EAW) under a set of rules called the Dee General Directions, a requirement of the Dee and Clwyd River Authority Act 1973. The Dee was made a SSSI and SAC with these directions in place. Therefore any change to the flow regime would require assessment under Regulation 48 of the Habitats Regulations 1994. The meaning of “recent actual flow” is as described by Bethune (2006).</p> <ul style="list-style-type: none"> • Water quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Chemical GQA Class: B. Biological GQA Class: B. <p>Values from JNCC’s <i>Common Standards Monitoring Guidance for Freshwater fauna</i> (2005). NOTE GQA values represent a rolling, monthly three year average. A river section may achieve GQA class A but still be subject to short term drops in water quality. Therefore, in all cases the principal found in Section 4.1, item 2, should be adhered to.</p> <ul style="list-style-type: none"> • Hydromorphology. <ul style="list-style-type: none"> ○ No information provided. • Barriers. <ul style="list-style-type: none"> ○ Upper limit – No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds. ○ Lower limit – None set. <p>Impact of existing structures needs to be evaluated. The impact of barriers should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/ duration of flows is unsuitable to allow passage. The impact of acoustic (ie noise/vibration) and sediment/chemical barriers should also be assessed on a case by case basis. When arising from construction or other development related activities it may be necessary to restrict the</p>

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	<p>timing of such activities.</p> <ul style="list-style-type: none"> • Spawning site availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>The location and extent of the actual and/or potential area of the SAC that is/ could be spawning habitat is currently unknown.</p> <ul style="list-style-type: none"> • Spawning habitat. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – No significant reduction in spawning habitat. <p>Spawning habitat usually consists of well-oxygenated gravel/pebble substrate of >10cm depth in a range of water depths (0.2 to 1.5m). Sea and river lamprey tend to spawn in deeper water than brook lamprey. Elevated levels of fines (particles <0.83mm) can interfere with egg survival.</p> <ul style="list-style-type: none"> • Exploitation. <ul style="list-style-type: none"> ○ Upper limit – Zero exploitation of sea lamprey until further notice. ○ Lower limit – nil. <p>Exploitation can directly impact population dynamics through reduced recruitment and survival rates.</p> <p>Bullhead <i>Cottus gobio</i></p> <ul style="list-style-type: none"> • Population. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Unknown. <p>See sub-attributes in reproduction / age structure (below). Single-pass electrofishing in August / September. Data analysis as in a-c. below. For details see the LIFE in UK Rivers Project protocol.</p> <ul style="list-style-type: none"> • Population densities. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – No less than 0.2 m⁻² in sampled reaches. <p>CSM guidance states that densities should be no less than 0.2 m⁻² in upland rivers (source altitude >100m) and 0.5 m⁻² in lowland rivers</p>

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	<p>(source altitude $\leq 100\text{m}$). A significant reduction in densities may also lead to an unfavourable condition assessment.</p> <ul style="list-style-type: none"> • Distribution. <ul style="list-style-type: none"> ○ Upper limit – no information provided. ○ Lower limit – Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current. <p>In the UK, bullhead are widespread in any flowing water at an altitude of less than 300 m. Well oxygenated water over a gravel / pebble / cobble substrate is preferred (and is essential for successful reproduction). Riffles are a favoured microhabitat. Very sluggish water with a clay / silt substrate or cold, steepgradient upland sections with numerous cascades and boulder / bedrock substrate should be viewed as sub-optimal. Bullheads can occur in very small channels (<1 m wide) where they may be the only fish species present. Bullhead are very poor colonists, to the extent that catchments may contain many individual subpopulations. It is not feasible to assess each of these individually, but it is very important that there is no loss of these populations, and that access routes between them are not impeded.</p> <ul style="list-style-type: none"> • Reproduction / age structure. <ul style="list-style-type: none"> ○ Upper limit – Unknown. ○ Lower limit – Young-of-year fish should occur at densities at least equal to adults. <p>This gives an indication of successful recruitment and a healthy population structure.</p> <ul style="list-style-type: none"> • Water quality. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Chemical GQA Class: B, Biological GQA Class: B. <p>Values from JNCC's <i>Common Standards Monitoring Guidance for Freshwater fauna</i> (2005). NOTE GQA values represent a rolling, monthly, three year average. A river section may achieve GQA class A but still be subject to short term drops in water quality. Therefore, in all cases the principal found in Section 4.1, item 2, should be adhered to.</p> <ul style="list-style-type: none"> • Flow. <ul style="list-style-type: none"> ○ Upper limit – +10% of recent actual flow.

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	<ul style="list-style-type: none"> ○ Lower limit – -10% of recent actual flow. <p>To a large extent, water flow in the Dee and certain of its tributaries, is regulated by the Environment Agency Wales (EAW) under a set of rules called the Dee General Directions, a requirement of the Dee and Clwyd River Authority Act 1973. The Dee was made a SSSI and SAC with these directions in place. Therefore any change to the flow regime would require assessment under Regulation 48 of the Habitats Regulations 1994. The meaning of “recent actual flow” is as described by Bethune (2006).</p> <ul style="list-style-type: none"> ● Barriers. <ul style="list-style-type: none"> ○ Upper limit – No significant artificial barriers to essential fish movement between reaches. ○ Lower limit – None set. <p>Impact of existing structures needs to be evaluated. CSM guidance: Vertical drops of >18- 20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences. New in stream structures should be avoided, whilst the impact of existing structures needs to be evaluated.</p> <ul style="list-style-type: none"> ● Woody debris removal. <ul style="list-style-type: none"> ○ Upper limit – Woody debris removal should be restricted to essential activities such as flood risk management. ○ Lower limit – Nil. <p>Bullheads are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate. Debris dams and woody debris should be retained where characteristic of the river/reach.</p> <ul style="list-style-type: none"> ● Bankside tree cover. <ul style="list-style-type: none"> ○ Upper limit – None set. Any proposed change to bankside tree cover must be considered individually taking into account factors mentioned in the comments column (see left) and any other significant local factors. ○ Lower limit – Nil. <p>Maintenance of intermittent tree cover in conjunction with retention of woody debris ensures that habitat conditions are suitable. Some</p>

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	<p>reaches may naturally have lower tree cover. Cover may also be lower in urban reaches. In reaches without any riparian trees or where bullhead may be more reliant on woody debris, it may be desirable to introduce a limited amount of cover.</p> <ul style="list-style-type: none"> • Non-native crayfish. <ul style="list-style-type: none"> ○ Upper Limit – none set. ○ Lower Limit – Non-native crayfish should be absent. <p>Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator prey interactions.</p> <ul style="list-style-type: none"> • Stocking of other fish. <ul style="list-style-type: none"> ○ Upper limit – Introductions or restocking should not adversely impact populations. ○ Lower limit – Nil. <p>The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges.</p> <ul style="list-style-type: none"> • Stocking transfers. <ul style="list-style-type: none"> ○ Upper limit – Stocking / transfers of bullhead should not adversely impact populations. ○ Lower limit – Nil. <p>Bullheads are relatively sedentary and interactions between populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact.</p> <p>Otter <i>Lutra lutra</i></p> <ul style="list-style-type: none"> • Population size. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>In 2004 Morgan provided an intuitive estimate of the catchment</p>

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	<p>population size of 22 breeding pairs. However, he states that this not accurate as it is based on an assessment of the habitat available. The presence of otters can be determined by carrying out standard sign surveys. The main problem with monitoring otter populations is the lack of a clear relationship between the density of signs and the density of otters. There is currently no way of reliably estimating otter density, although the use of DNA extracted from spraints may provide a solution to this in the future (<i>Common Standards Monitoring Guidance for Mammals</i> (2004)). In view of this, some form of survey or more accurate means of assessment is required.</p> <ul style="list-style-type: none"> • Extent <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Otter signs to be found at 46 of the 59 sites (See comments below for the definition of ‘sites’). <p>More extensive survey work required. The limits expressed here are based on the ‘Sites’, and their numbers, used by the Otter Survey of Wales within the River Dee SSSI’s catchments. 46 of the 59 equates to 78% of sites. However, while these values may be useful for monitoring purposes, it is highly likely that otters range throughout the SAC and beyond. Therefore extensive survey work is required in order to adequately determine the extent, distribution and mobility of the SAC otter population. The use of artificial sprainting sites may be necessary in parts of the SAC, and beyond, where natural sprainting sites appear to be sparse.</p> <ul style="list-style-type: none"> • Breeding success. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>Morgan (2004) identified 77 potential ‘Otter Sites’. Of these he could confirm only five as being actual breeding sites but no natal holts were actually identified. A number of live sightings were reported but few of these were of cubs and their survivorship is unknown In view of this, clearly further survey or research is required.</p> <ul style="list-style-type: none"> • Age structure. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>In order to properly assess the favourable conservation statues of this feature it would clearly be beneficial to have some understanding of</p>

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	<p>age structure. The only information currently available for this it that of Morgan (2004), based on road deaths and live sightings. However, the numbers involved were very low. Therefore further information is required.</p> <ul style="list-style-type: none"> • Dispersal and recruitment. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>Little is currently known of the extent, rate or direction of dispersal of otters from the SAC population, either within the SAC or in the wider catchment. Similarly, little is known of the of recruitment into the population, either from births within it or from otters dispersing from other populations. Such knowledge would enable assessment of the robustness of the population and its potential ability to recover from losses. It would provide some knowledge of its likely genetic diversity.</p> <ul style="list-style-type: none"> • Good quality vegetation for breeding otters. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – No reduction in the quality of or extent of suitable otter habitat. <p>Good quality vegetation for breeding otters includes dense scrub (e.g. bramble, blackthorn and gorse); reedbeds; deciduous woodland with an under-story; young conifer plantations; <i>Rhododendron</i> thickets; and wetlands (particularly with areas of <i>Molinia caerulea</i>).</p> <ul style="list-style-type: none"> • Potential breeding sites. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – There should be an increase in the number of known potential (in addition to actual) breeding sites on the River Dee from 72 to 76. <p>Lakeside habitat that could provide potential breeding sites for otter should be retained at current levels. Though clearly the presence of sites where otters can breed is a critical factor for any population, the <i>Common Standards Monitoring Guidance for Mammals</i> (2004), specifically excludes breeding sites as a factor or attribute for assessing conservation status of otter. It does so because “It would also be extremely difficult to decide on a reasonable target and a means of measuring the attribute.” However, as the survey of Morgan (2004) collected such data, the number of potential breeding sites has been included here as a factor.</p>

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	<ul style="list-style-type: none"> • Potential resting sites. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Insufficient information. <p>Otters use a range of types of resting or laying up sites, and these may vary in type or location depending on conditions and availability. Surveys within the Dee SAC have found many potential sites but there are sections where few have been found. Where these coincide with sections of the site where little otter activity has been detected, research should be undertaken to determine whether the presence of resting sites is a limiting factor. If it is, measures should be undertaken to increase the number of potential resting sites. In addition, where potential resting sites are few, otters may travel further to find them. This may lead to a greater risk of death due to anthropogenic mortality, particularly where road crossing may occur</p> <ul style="list-style-type: none"> • Food availability. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – Fish biomass stays within expected natural fluctuations. There should be no loss of amphibian habitat likely to be used by otters from the SAC population. <p>More specific limits to be devised. Otters depend on food that comes from a range of aquatic environments, such as streams, marshes, ponds and backwaters. Their diet may, among other things, include fish, amphibians and crustaceans Eels are thought to be particularly favoured though at times prey, such as frogs, can assume a greater importance than that of fish. Data should be sought on fish stocks from EAW. Specific assessment limits have yet to be devised.</p> <ul style="list-style-type: none"> • Dispersal and access routes. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – No loss or impairment of any such routes. <p>More specific limits to be devised. Little is currently known of dispersal or access routes used by otters from the SAC population, either within the SAC or in the wider catchment. However, such routes are essential for the dynamics of a healthy population. Therefore further information is required.</p> <ul style="list-style-type: none"> • Anthropogenic mortality.

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	<ul style="list-style-type: none"> ○ Upper limit – No increase in numbers of recorded Road Deaths. Analysis of road death locations should be used to try and identify reasons for such mortality. ○ Lower limit – Nil. <p>Road deaths have been noted as a primary threat to the otters conservation status across Wales, and if the numbers reported by Morgan (2004) are compared to his estimate of population size, clearly of such deaths are a significant factor affecting the population of this SAC.</p> <ul style="list-style-type: none"> ● Disturbance. <ul style="list-style-type: none"> ○ Upper limit – No significant increased disturbance to otters. ○ Lower limit – Nil. <p>Otters are sensitive to human disturbance and especially to sudden changes in activity. They are particularly sensitive to disturbance by dogs. The female otter is particularly sensitive to disturbance when she has cubs</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Iver Dee and Bala Lake/Afon Dyfrdwy a llyn Tegid SAC (2008) available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/river-to-usk-sac-list/idoc.ashx?docid=601bc11b-69fc-4418-9235-5cb2fdcfed9c&version=-1</i></p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> ● Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation: Unfavourable unclassified ● Atlantic salmon <i>Salmo salar</i>: Unfavourable ● Floating water-plantain <i>Luronium natans</i>: Favourable Un-classified ● Sea lamprey <i>Petromyzon marinus</i>: Unfavourable un-classified ● Brook lamprey <i>Lampetra planeri</i>: Unfavourable un-classified ● River Lamprey <i>Lampetra fluviatilis</i>: Unfavourable un-classified ● Bullhead <i>Cottus gobio</i>: Unfavourable un-classified ● European otter <i>Lutra lutra</i>: Favourable: Un-classified <p>Llyn Tegid Ramsar features where features are also a SAC and / or SSSI feature they will share the same conservation objective(s):</p>

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	<ul style="list-style-type: none"> • The lake and aquatic / emergent vegetation: Unfavourable • A survey of the aquatic / emergent vegetation should be carried out. • Lake Fen /swamp inc. wet woodland: Unfavourable • Fish. <i>Coregonus lavaretus</i> Gwyniad: Unfavourable • Invertebrate. <i>Myxas glutinosa</i> Glutinous snail: Favourable
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Water Extraction and Pollution</u> Parts of the River Dee and Bala Lake SAC are failing their water quality targets consequently, the site and its features are threatened by practices which have an adverse effect on the quality, quantity and pattern of water flows. In particular the following may threaten riverine ecosystems: inappropriate flow regulation; excessive abstraction (for industry, agriculture and domestic purposes); threats to water quality from direct and diffuse pollution; eutrophication and siltation.</p> <p><u>Development, Agricultural Processes and Invasive Species</u> Degradation of riparian habitats due to engineering works, agricultural practices and invasive plant species may also have an adverse effect. The Atlantic salmon population is threatened by excessive exploitation by high sea, estuarine and recreational fisheries. Introduction of non-indigenous species could also threaten both fish and plant species.</p> <p><u>Fish Stocking</u> Fish stocking can be damaging to ecosystem structure and function through competition, predation and introduction of disease – ensure any fish stocking is very carefully controlled to avoid these problems, and subject to an appropriate assessment.</p> <p><u>Safety</u> At least 14 otters were killed on roads in the Dee catchment in the six years prior to the survey.</p> <p><u>Scrub Encroachment</u> Scrub control is often needed at Llyn Tegid, particularly at the northern end, as the fluctuating water level, natural changes in the vegetation as well as lack of grazing all tend to result in scrub growth and encroachment onto grassland and drier fen swamp.</p> <p><u>Recreation and Leisure</u> Water sports have resulted in the development of supporting infrastructure, including boat storage areas, slipways and boathouses</p>

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	<p>and the creation of launching points. Water sports can also result in a demand for dredging (see below), excavating channels and shoreline modifications. It is important that development does not spread further along the foreshore creating extensive areas bare of vegetation and that construction of infrastructure is controlled.</p> <p><u>Dredging</u> Dredging releases nutrients from the sediments and can therefore impact negatively on the nutrient levels of the lake and on the water quality.</p>
<p>Landowner/ Management Responsibility</p>	<p>No information available</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Denbighshire's Local Development Plan (2006 – 2021) May 2011 available at: http://denbighddms.wisshost.net/webfiles/Submission/CD%203/Local%20Development%20Plan%20docs%20DLDP/DLDP007%20Habitats%20Regulations%20Appraisal%20(Mai%20202011).pdf</p> <p>HRA Screening of Shropshire's Core strategy (2006-2026) Stage 2 of Report, February 2010 available at: http://www.shropshire.gov.uk/planning-policy/habitat-regulation-assessment/</p> <p>HRA Screening of Gwynedd Council's Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

<p>Site Name: Cernydd Carmel Location Grid Ref: SN592161 JNCC Site Code: UK0030070 Size: 361.14 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Cernydd Carmel is situated immediately South of the village of Carmel in south Carmarthenshire. A diverse range of habitats is represented, including woodland, grasslandheathland and bog. Of particular interest is the seasonal lake – or turlough – situated next to the small hamlet of Pantllyn at the eastern end of the site.</p> <p>The distribution of habitats is, to a large extent, determined by the underlying geology. Much of the site is located on a thin band of Carboniferous Limestone, which is overlain to the souby acidic Millstone Grit; linear bands of softer shales also occur within the Millstone Grit strata.</p> <p>Pant-y-llyn turlough is an unusual seasonal lake with no natural inlet or outflow streams. It is fed entirely by groundwater from the underlying limestone aquifer, with its water level determined by seasonal variation in the groundwater table. The turlough fills to a depth of approximately 3 metres during the autumn-spring period and empties in summer. Discharge and recharge seemingly occurs through a swallow hole at the northern end of the basin, although other sinks and springs could also be involved. Pant-y-llyn turlough is thought to be the only known example of its kind in mainland Britain and is recognised as the SAC Anhabitat type ‘Turloughs’.</p> <p>Ash woodland occurs extensively at Cernydd Carmel, generally occupying the many limestone knolls at the site. This woodland corresponds to the Annex I habitat ‘<i>Tilio-Acerion</i> forests of slopes, screes and ravines’. It typically occurs as a patchwork of small woods with areas of grassland between, giving the landscape a distinctive mosaic pattern. Most of the grassland at Carmel is agriculturally improved, but stands of semi-natural neutral grassland occur in the Pwll E drychiad holding.</p> <p>Both dry and wet heath occurs on the acidic Millstone Grit ridge.</p> <p>The bands of softer shale within the Millstone Grit have given rise to linear depressions supporting mire vegetation. These stands are recognised as the Annex I habitat ‘Active Raised bogs’.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Turloughs.

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	<p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. • Northern Atlantic wet heaths with Erica tetralix. • European dry heaths. • Active raised bogs.
<p>Conservation Objectives</p>	<p>Vision for the site:</p> <p>Cernydd Carmel SAC will support a wide range of habitats, including woodland, heathland, raised bog and grassland, as well as the seasonal lake – or turlough- at the eastern end of the site.</p> <p>The turlough will continue to fill and empty on a seasonal basis, with the basin typically filling with water during autumn and winter, and drying out in the summer. It will be fed by clean, unpolluted water filtering in from the limestone aquifer below. Any scrub encroachment in the turlough basin will be controlled, allowing its specialist flora and fauna to thrive.</p> <p>The ash woodland will remain as a distinct patchwork of wooded blocks, occupying the many limestone knolls at the site. It will form a characteristic element of the historic woodland-grassland landscape pattern at Carmel. The woodland canopy will be largely dominated by ash, over a rich under-storey of young trees and shrubs including hazel, hawthorn, spindle and buckthorn. The ground flora will include a rich mixture of woodland herbs including bluebell, dog's mercury, wood anemone, wild garlic and hart's tongue fern, as well as rarities such as lily of the valley, mezereone and herb paris.</p> <p>Heathland will be prevalent on the Southern millstone grit ridge. Stands of dry heath will occupy the more freely draining parts of the ridge, with wet heath on the damper soils. The heathland should be lightly grazed by cattle and ponies, to encourage a high cover of heather and other dwarf shrubs, whilst preventing encroachment by scrub or bracken.</p> <p>Raised bog vegetation will occupy the series of peaty depressions within the Millstone Grit ridge. The natural hydrology of these bogs will be unaffected by artificial drainage or other modifying factors. The mire surfaces should display a natural 'hummock and hollow' topography and support a specialist bog flora including hare's-tail cotton grass, deergrass, cross leaved heath and bog mosses.</p>

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	<p>Species-rich neutral grassland should cover most of the freely draining land at Pwll Edrychiad. This vegetation will include a range of meadow flowers including common knapweed, bird's-foot-trefoil, red clover and whorled caraway; there should also be a large population of greater butterfly-orchid in most years. Stands of previously improved grassland elsewhere at the site (notably in the NNR units) will support more species-rich vegetation, a consequence of grassland restoration management.</p> <p>Marshy grassland will cover the damper soils at Pwll Edrychiad and other wet parts of the site. These areas will support a typical range of wetland plants including purple moor grass, sharp flowered rush, carnation sedge, tormentil and devil's bit scabious.</p> <p>Finally the important geological exposures at Carmel should remain visible and available for continued study.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Turloughs. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The turlough will fill and empty according to natural seasonal fluctuations in the underlying aquifer. It will typically fill with water in the autumn-spring period and empty during the summer. • A natural pattern of vegetation zones will be apparent during the dry phase of the turlough • The following vegetation zones, together with typical associated species, will be present: hydrophytic bryophyte zone; <i>Equisetum fluviatile</i> zone; <i>Carex vesicaria</i> zone; <i>Phalaris arundinacea</i> zone; <i>Salix cinerea-Galium palustre</i> woodland zone. • Alien plant species such as <i>Crassula helmsii</i>, <i>Hydrocotyle ranunculoides</i>, <i>Myriophyllum aquaticum</i> and <i>Azolla filiculoides</i> will be absent. • All factors affecting the achievement of the above conditions, including water quality, water levels and scrub development, will be under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection:</p>

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	<ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Tilio-Acerion woodland will occupy approximately 44 ha of Cernydd Carmel SAC. • The Tilio-Acerion woodland will occur as a patchwork of small woods with areas of grassland between, forming a characteristic element of the historic landscape pattern of Cernydd Carmel. The distribution of woods will mirror the pattern of woodland mapped in 1994. • Within the high forest areas, between 10 and 25% of the woodland will comprise open glades or canopy gaps, although the location of glades/canopy gaps may vary over time. • Trees and shrubs of a wide range of ages and sizes should be present, including functionally mature canopy trees, young trees and an active shrub layer. • Regeneration of locally native trees/shrubs will be plentiful. • Locally uncommon species will continue to be present. • Dense bramble will be largely absent. • Within the high forest areas, dead wood will be present in the form of standing and fallen trunks/limbs. • All factors affecting the achievement of the above conditions, including grazing and browsing, will be under control. <ul style="list-style-type: none"> • Northern Atlantic wet heaths with Erica tetralix. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Northern Atlantic wet heath will occupy at least 6 ha of Cernydd Carmel SAC. • The wet heath will have a high cover (>25%) of dwarf shrubs including heather, cross leaved heath and bilberry. • Typical associates will include western gorse Ulex gallii and Molinia caerulea, but not at high cover. • Bog mosses Sphagnum spp. Will be prominent in the sward. • Scrub and bracken will be largely absent. • All factors affecting the achievement of these conditions, including grazing and scrub/bracken encroachment, are under control.

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	<ul style="list-style-type: none"> • European dry heaths. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • European dry heath will occupy at least 19 ha of Cernydd Carmel SAC. • The dry heath will be dominated by varying mixtures of heather <i>Calluna vulgaris</i>, bilberry <i>Vaccinium myrtillus</i> and western gorse <i>Ulex gallii</i>, although <i>U. gallii</i> itself should not exceed 50% cover. • Scrub, bracken, bramble, thistles, tall rushes, large docks and nettles will be largely absent. • Bare ground will not exceed 10% cover. • All factors affecting the achievement of these conditions, including grazing and scrub/bracken encroachment, are under control. <ul style="list-style-type: none"> • Active raised bogs. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Active raised bog will cover at least 13 ha of Cernydd Carmel SAC. • At least five raised bog peatland units will be present, occupying a series of peaty depressions within the Millstone Grit ridge. • The mires will support a specialist bog flora including heather, cross-leaved heath, deergrass, hare’s-tail cotton grass, bog asphodel and round leaved sundew. • Bog mosses <i>Sphagnum</i> spp. will be abundant, while purple moor grass <i>Molinia caerulea</i> and other grasses will be scarce. • The mire surfaces will display a characteristic hummock and hollow topography, with lawns of <i>Sphagnum</i> moss dominating the wet hollows. • Scrub and bracken will be largely absent. • All factors affecting the achievement of these conditions, including grazing and scrub/bracken encroachment, are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations</p>

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	<p>where necessary. In this plan the management units have been based mainly on tenure, but also with reference to features and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Turloughs. <p>Protection of the turlough’s hydrological regime is fundamental to the long term conservation of the feature. Any alterations to the cyclical fluctuations of the groundwater table could have a detrimental impact on the ecological and hydrological integrity of the turlough. Potential threats to its hydrology could arise through the construction of artificial drainage channels or culverts at the edge of the turlough itself, or through any lowering of the water table in the underlying aquifer by means of water abstraction or quarrying activities. The last two activities have the potential to impact upon the turlough if carried out anywhere within the catchment of the aquifer, not just the immediate environs. Any future proposals that could affect the hydrology of the turlough will therefore need to be carefully assessed and regulated.</p> <p>The other main factor which could affect the conservation status of the turlough is water quality. Increased nutrient levels in particular could have a detrimental effect on its characteristic flora and fauna. Again this factor needs to be considered on a catchment scale and not the immediate environs. Agriculture is the most likely source of any eutrophication in the aquifer. Low intensity farming should therefore be encouraged throughout the aquifer’s catchment. This should be achieved through direct management of farmland within the NNR units, continued uptake of agri-environment agreements and other statutory mechanism. Good agricultural practices should also be followed through appropriate regulatory means.</p> <p>Occasional scrub control should be carried out in the turlough basin as required.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> • Tilio-Acerion forests of slopes, screes and ravines. <p><u>Distribution and Extent</u> To maintain the current extent of <i>Tilio-Acerion</i> woodland, no management as such is required, other than to ensure that none of the</p>

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	<p>woodland is felled. However, excessive spread of scrub around the edges of individual woodland blocks should be controlled as required, to maintain the historic woodland-grassland landscape pattern. Such management is ongoing, notably in the Grasslands Trust NNR.</p> <p><u>Woodland Structure</u> The current unfavourable condition assessment is largely a reflection of the relatively young structure of the <i>Tilio-Acerion</i> woodland. Although Carmel is regarded as an ancient woodland site (Lister & Whitbread, 1988), the woods have been regularly harvested for timber in the past. Hence structural elements such as mature and over-mature trees, canopy gaps and deadwood are under-represented at the site. However, as the woodland develops as high forest, these features should become more prevalent through natural dynamic processes. It is anticipated that the desired structural criteria for high forest could probably be achieved over time through a simple minimum-intervention regime, with management largely limited to light thinning of young canopy trees around older specimen oaks, to prolong their longevity.</p> <p>The current structural criteria in the <i>Tilio-Acerion</i> conservation objective largely relate to a desired state for high forest. Obviously these criteria are not compatible with the structural composition of coppice woodland, so the conservation objective will need to be revised to take account of future coppice management, once a coppice plan has been agreed. It is likely that certain woodland units will be earmarked for the reintroduction of coppicing, while other units will be allowed to develop high forest. The current structural criteria can then be applied solely to the high forest areas, with new structural criteria developed specifically for the coppice plots. Various management recommendations – including proposed locations for reintroduction of coppicing – have been put forward by Peterken (1999); it is likely that these proposals will form the basis for future coppice management at Carmel.</p> <p><u>Woodland Species Composition</u> The characteristic species composition of the Carmel <i>Tilio-Acerion</i> is one of its key attributes. In particular, the conservation of its species-rich ground flora and associated uncommon species should be a fundamental consideration in the planning of any woodland management at the site. During the 2007 monitoring, the ground flora was found to meet the required criteria in the great majority of woodland units, suggesting that the current stage of woodland development (i.e high forest) allows a species-rich ground flora to persist.</p>

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	<p>Despite the high frequency of key woodland herbs, dense bramble was a concern at a number of sample points. It should be noted that bramble has responded vigorously to increased light levels following the recent (2001/02) thinning and coppicing of the woodland around Glangwenlais Quarry, with a corresponding decline in typical woodland herbs. This bramble infestation might be an early transitional phase in the coppice cycle, or it could be a consequence of complete stock exclusion in the Glangwenlais Quarry unit. Coppicing combined with light grazing may result in a less vigorous growth of bramble, allowing the typical ash woodland herbs to flourish under coppice conditions. However, in view of the current bramble dominance at Glangwenlais, it is advised that no further coppicing is undertaken in any ungrazed woods at Carmel, at least not until the effects on the Glangwenlais ground flora are examined throughout the current coppice cycle. Further consideration is given to the effects of grazing below.</p> <p><u>Non-Native Species</u> Beech and sycamore are treated as non-native species at Cernydd Carmel and their spread is viewed as undesirable. These species should be controlled within the <i>Tilio-Acerion</i> as required, to maintain the native species composition of the canopy and shrub layers. It should be noted there has been considerable regeneration of sycamore in the Glangwenlais Quarry 2001/02 coppice plots. It is therefore likely that additional sycamore control will be necessary in any stands where future coppice management is undertaken.</p> <p><u>Grazing</u> Although certain woodland blocks are ungrazed, notably the Glangwenlais Quarry unit, the majority of woods at Cernydd Carmel are open to livestock. Indeed Rackham (1992) considers that most woods have not excluded stock for at least 100 years, if they ever did so. Nonetheless most of the <i>Tilio-Acerion</i> woodland appears to be only lightly grazed. Cattle and ponies are the predominant grazers in the area, and the rocky limestone floor in most woods seems to provide a natural deterrent to <i>regular</i> incursions by livestock. Certainly the rich ground flora and abundant regeneration in most woods suggests that the current grazing regime does not have a detrimental effect on the characteristic species composition of the <i>Tilio-Acerion</i> woodland. Indeed it may be beneficial in suppressing bramble growth and maintaining species-richness.</p> <p>It is therefore proposed that light grazing by cattle and ponies should continue in most of the <i>Tilio-Acerion</i> units at Carmel. As stated above, this grazing may be especially beneficial in any areas where coppicing</p>

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	<p>is reinstated, as light grazing can inhibit bramble response in such situations. The introduction of sheep grazing, however, should be discouraged. It is likely that sheep would find the rocky woodland terrain less of an obstacle, and could have a potentially damaging effect on ground flora species and regeneration.</p> <ul style="list-style-type: none"> • Northern Atlantic wet heaths with <i>Erica tetralix</i>. <p>An appropriate grazing regime is necessary to deliver favourable conservation status for the Northern Atlantic wet heath feature. Shortage of grazing can result in a high cover of <i>Molinia</i>, together with encroachment by scrub and bracken.</p> <p>The high cover of <i>Molinia</i> in the Carmel wet heath vegetation is the principal reason for its current unfavourable condition. Insufficient grazing, at least in certain stands, is considered to be the main causal factor. To address this issue, a suitable grazing regime should be implemented across the site. Most of the wet heath stands are grazed by ponies or cattle, which are the preferred grazers for this type of habitat. Grazing by sheep should be discouraged due to their selective grazing habits.</p> <p>Within the grazed units, slightly higher stocking rates should therefore be considered, although grazing should not be increased to a level where the cover of dwarf shrubs is reduced. Furthermore grazing outside of the spring and summer period should be avoided, as grazing during the winter months can result in the preferential grazing of ericoids in the absence of other palatable vegetation. A few of the wet heath stands are currently ungrazed. Introduction of grazing to these stands should be encouraged, to reduce the rank growth of <i>Molinia</i> and prevent any future scrub or bracken development.</p> <ul style="list-style-type: none"> • European dry heaths. <p>To achieve favourable conservation status for the European dry heath feature, an appropriate grazing regime is required, both in terms of stocking rates and grazing times. Overgrazing will result in a reduced cover of dwarf shrubs; lack of grazing will lead to scrub and bracken encroachment, together with rank, leggy heather growth. Pony or cattle grazing is preferential to sheep, due to the selective grazing habits of sheep.</p> <p>The monitoring carried out in 2008 showed that some of the grazed dry heath stands are exhibiting localised signs of overgrazing (e.g. units 5</p>

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	<p>and 11). Reduced stocking levels in these units should enable recovery of the sward and a shift towards favourable condition. Again winter grazing should be discouraged to avoid preferential grazing of ericoids.</p> <p>Reintroduction of grazing to the currently unmanaged dry heath areas is necessary to prevent further scrub and bracken encroachment, which has been identified as a problem in certain stands. Scrub and bracken control should be carried out where required.</p> <ul style="list-style-type: none"> • Active raised bogs. <p>High <i>Molinia</i> cover and a shortage of <i>Sphagna</i> in raised bogs is often attributable to surface or peripheral drainage. However, the lack of any obvious drainage affecting the Carmel mires suggests another factor could be involved.</p> <p>Lack of grazing in most of the raised bog stands could be resulting in a dominance of <i>Molinia</i>, which in turn is suppressing <i>Sphagnum</i> growth. Indeed the one stand that is currently grazed is of markedly better quality than the ungrazed units. Efforts should therefore be made to reintroduce grazing to the currently unmanaged stands. Investigations might also be required to establish whether any hydrological or atmospheric deposition problems are affecting the raised bog vegetation.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Turloughs</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Turlough basin will fill with water during wet phase. <p>This attribute was developed by NRW's SAC monitoring team (Lovering, 2006). The lower limit is based on extent during the wet phase. It assumes that in winter the water level will reach the upper limits of inundation, approx. 3.5 m above the swallow hole to the marginal <i>Salix</i> woodland zone. No upper limit has been set, as the extent is naturally limited by the size of the turlough basin. This attribute can be monitored via simple visual checks of winter water levels.</p> <ul style="list-style-type: none"> • Quality. <ul style="list-style-type: none"> ○ Upper limit: Not required. ○ Lower limit: Each of the following vegetation zones

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	<p>should be present:</p> <ol style="list-style-type: none"> 1. Hydrophytic bryophyte zone – currently occurs in the immediate vicinity of the swallow hole. 2. <i>Equisetum fluviatile</i> zone – currently occurs c. 0.6 m above and to the south of the swallow hole. 3. <i>Carex vesicaria</i> zone – currently dominates most of the turlough basin, c. 1.2-2.2 m above the swallow hole. 4. <i>Phalaris arundinacea</i> zone – currently occupies the northern end of the basin, c. 2.2 m above the swallow hole. 5. <i>Salix cinerea-Galium palustre</i> woodland zone – extends as a narrow zone around the edge of the turlough basin, up to c. 3.5 m above the swallow hole. <ul style="list-style-type: none"> ○ <u>And</u> associated species for each vegetation zone are present. Associated species for each zone include: <ol style="list-style-type: none"> 1. Hydrophytic bryophyte zone – <i>Fontinalis antipyretica</i>, <i>Drepanocladus aduncus</i>. 2. <i>Equisetum fluviatile</i> zone – <i>Galium palustre</i>, <i>Mentha aquatica</i>, <i>Veronica scutellata</i>, <i>Persicaria hydropiper</i>, <i>P. maculosa</i>, <i>Fontinalis antipyretica</i>, <i>Drepanocladus aduncus</i>, <i>Calliergon cordifolium</i>. 3. <i>Carex vesicaria</i> zone – <i>Mentha aquatica</i>, <i>Phalaris arundinacea</i>, <i>Solanum dulcamara</i>, <i>Fontinalis antipyretica</i>, <i>Drepanocladus aduncus</i>, <i>Calliergon cordifolium</i>. 4. <i>Phalaris arundinacea</i> zone – <i>Solanum dulcamara</i>, <i>Galium palustre</i>, <i>Fontinalis antipyretica</i>, <i>Drepanocladus aduncus</i>. 5. <i>Salix cinerea-Galium palustre</i> woodland zone – <i>Mentha aquatica</i>, <i>Solanum dulcamara</i>, <i>Agrostis stolonifera</i>. ○ <u>And</u> alien plant species are absent. Potentially invasive non-native species include <i>Crassula helmsii</i>, <i>Hydrocotyle ranunculoides</i>, <i>Myriophyllum aquaticum</i> and <i>Azolla filiculoides</i>. ● Water Quality factors. Water quality: pH. <ul style="list-style-type: none"> ○ Upper limit – pH 7.1. ○ Lower limit – pH 6.7. <p>Limits are based on pH measurements taken in 1992 (see above). Water sampling should take place during the wet phase, ideally in March to enable monitoring of both dry and wet phases in the same reporting year.</p>

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	<p>Water quality: conductivity.</p> <ul style="list-style-type: none"> ○ Upper limit – 634 μs cm. ○ Lower limit – 275 μs cm. <p>Limits are based on conductivity measurements taken in 1992 (see above). Water sampling should take place during the wet phase, ideally in March to enable monitoring of both dry and wet phases in the same reporting year.</p> <p>Water quality: turbidity.</p> <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Entire bed of turlough should be visible during wet phase. <p>The turlough is fed entirely by groundwater and its waters are normally very clear. Turbidity is most likely to arise from pollution, either via the groundwater or from surface water runoff. Monitoring should take place during the wet phase, and may be undertaken throughout the monitoring cycle.</p> <p>Water quality: water levels.</p> <ul style="list-style-type: none"> ○ Limits relating to water levels in the turlough are addressed in 'Extent' and 'Quality' above. Any concerns highlighted through monitoring of 'Extent' and 'Quality' should trigger investigations into water levels. Simple visual checks of water levels can also be carried out at various stages of the annual fill-drain cycle. <p>The hydrology of the turlough is determined by seasonal fluctuations in the groundwater table of the underlying aquifer. Any alterations to the cyclical fluctuation of water levels could have a detrimental impact on the ecological and hydrological integrity of the turlough.</p> <ul style="list-style-type: none"> ● Scrub encroachment. <ul style="list-style-type: none"> ○ Upper limit – 5% scrub cover. ○ Lower limit – Not required. <p>Development of willow and alder scrub in the turlough basin is a potential threat to the characteristic flora and fauna of the turlough. Scrub encroachment in the turlough basin is unacceptable and an upper limit of 5% scrub cover has been set.</p> <p>Tilio-Acerion forests of slopes, screes and ravines</p>

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	<ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – As mapped in 1994. <p>The <i>Tilio-Acerion</i> feature at Cernydd Carmel is analogous to W8 woodland, the extent of which (43.9 ha) was mapped by Mileto & Castle (1994). The lower limit is based on total extent mapped in 1994. To achieve favourable conservation status, the spatial extent of each individual wood mapped in 1994 must also be maintained. No upper limit has been set as the potential for expansion of <i>Tilio-Acerion</i> woodland is naturally limited by underlying geology and topography. In certain cases expansion of <i>Tilio-Acerion</i> will also be constrained by limits relating to other important features (e.g. neutral grassland) and the need to preserve the characteristic woodland-grassland landscape pattern. Repeat monitoring will be achieved by field-checks of baseline maps of individual woodland stands, reference to aerial photos, or a combination of both.</p> <ul style="list-style-type: none"> • Canopy cover. <ul style="list-style-type: none"> ○ Upper limit – Open glades or canopy gaps will comprise 25% of the woodland area. ○ Lower limit – Open glades or canopy gaps will comprise 10% of the woodland area. <p>This attribute has been developed specifically to cater for the open structure of the <i>Tilio-Acerion</i> woodland at Carmel. A glade or canopy gap is defined as an open area whose distance across is equal to or greater than the height of the tallest adjacent tree, or an area of between 15 and 30 m across:</p> <ul style="list-style-type: none"> • Structure of woodland. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit: Within a 25 m radius of at least 80% of sample points, the following conditions will be met: <p>At least 5 functionally mature canopy-forming trees are present. At least 1 young tree is present. An active shrub layer with at least 5 locally native trees/shrubs of between 1 and 3 m is present.</p> <p>This attribute is based on the standard Common Standards Monitoring (CSM) attribute for this feature, but has been modified according to site-specific requirements. Functionally mature trees are defined as</p>

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	<p>those which show signs of maturity such as holes and hollows, rot columns, dead branches, etc. Relevant species include ash <i>Fraxinus excelsior</i>, oak <i>Quercus</i> spp., goat willow <i>Salix caprea</i>, yew <i>Taxus baccata</i>, rowan <i>Sorbus aucuparia</i>, downy birch <i>Betula pubescens</i>, alder <i>Alnus glutinosa</i> and wych elm <i>Ulmus glabra</i>. Young trees are defined as any tree greater than 3 m in height, with a girth of at least 15 cm at chest height.</p> <ul style="list-style-type: none"> • Tree regeneration. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – within a 25 m radius of at least 80% of sample points, at least 10 saplings of any of the following species will be present: ash <i>Fraxinus excelsior</i>, oak <i>Quercus</i> spp., goat willow <i>Salix caprea</i>, yew <i>Taxus baccata</i>, downy birch <i>Betula pubescens</i> or wych elm <i>Ulmus glabra</i>. <p>This attribute is based on the standard CSM attribute for this feature, but has been modified according to site-specific requirements. A sapling is defined as a young tree between 1 and 2 m in height.</p> <ul style="list-style-type: none"> • Species composition: canopy and shrub layers. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – The canopy and shrub layers will be comprised of locally native species, where: Non-native canopy-forming trees, including beech and sycamore, make up no more than 5% of the canopy. Non-native species, including beech and sycamore, make up no more than 5% of the shrub layer. <p>This attribute is based on the standard CSM attribute for this feature, but has been modified according to site-specific requirements. At Cernydd Carmel the main native canopy species are ash <i>Fraxinus excelsior</i>, oak <i>Quercus</i> spp., goat willow <i>Salix caprea</i>, yew <i>Taxus baccata</i> and wych elm <i>Ulmus glabra</i>. The main native shrub species are hazel <i>Corylus avellana</i>, hawthorn <i>Crataegus monogyna</i>, blackthorn <i>Prunus spinosa</i>, spindle <i>Euonymus europaeus</i>, buckthorn <i>Rhamnus catharticus</i>, holly <i>Ilex aquifolium</i> and rowan <i>Sorbus aucuparia</i></p> <ul style="list-style-type: none"> • Species composition: field and ground layers. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Within a 3 m radius of at least 80% of sample points, the following conditions will be met:

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	<p>At least 5 of the following species are present: <i>Ranunculus ficaria</i>, <i>Circaea lutetiana</i>, <i>Galium odoratum</i>, <i>Allium ursinum</i>, <i>Hyacinthoides non-scripta</i>, <i>Mercurialis perennis</i>, <i>Convallaria majalis</i>, <i>Paris quadrifolia</i>, <i>Lamium galeobdolon</i>, <i>Conopodium majus</i>, <i>Phyllitis scolopendrium</i>, <i>Arum maculatum</i>, <i>Anemone nemorosa</i>, <i>Listera ovata</i>, <i>Sanicula europaea</i>.</p> <p>Dense bramble is absent. Bare ground is absent.</p> <p>This attribute is based on the standard CSM attribute for this feature, but has been modified according to site-specific requirements. Dense bramble is defined as stands of bramble with greater than 50% cover and a radius of 5 m or more. Bare ground is defined as patches greater than 5 x 5 m, where bare ground exceeds 75% cover.</p> <ul style="list-style-type: none"> • Species composition: locally distinctive species. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – <i>Rhamnus catharticus</i>, <i>Euonymus europaeus</i>, <i>Convallaria majalis</i>, <i>Paris quadrifolia</i> and <i>Daphne mezereum</i> will continue to be present at locations recorded in past surveys. <p>This attribute has been developed in recognition of the various uncommon plant species found in the <i>Tilio-Acerion</i> woodland at Carmel.</p> <ul style="list-style-type: none"> • Dead wood [high forest areas only]. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Within a 25 m radius of at least 80% of sample points, at least 2 dead wood trunks/limbs, standing or lying, of >20 cm diameter and at least 3 m long will be present. <p>This attribute is based on the standard CSM attribute for this feature, but has been modified according to site-specific requirements.</p> <ul style="list-style-type: none"> • Grazing <ul style="list-style-type: none"> ○ Limits relating to grazing or browsing impacts are addressed in 'tree regeneration', species composition: field and ground layers', and 'species composition: locally distinctive species' above. Any concerns highlighted through monitoring of these attributes should trigger investigation and/or management control of

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	<p>Grazing.</p> <p>Excessive grazing is a potential threat to the <i>Tilio-Acerion</i> feature, leading to loss or change of ground flora species, reduced regeneration, excessive bare ground or poaching. Light grazing, however, can be beneficial in terms of suppressing bramble dominance, especially in recently coppiced woodland. Excessive grazing is not considered a major issue in the majority of woods at present, as the rocky woodland floor generally deters regular incursions by cattle and ponies. Future grazing by sheep should be discouraged. Similarly browsing (notably by deer) can have a detrimental impact on the shrub layer, but again browsing is not considered a significant issue at present. Deer are not common at Carmel at the current time, although numbers could increase in future.</p> <ul style="list-style-type: none"> • Non-native species. <ul style="list-style-type: none"> ○ Limits relating to non-native species are addressed in 'Species composition: canopy and shrub layers' above. Any concerns highlighted through monitoring of 'Species composition: canopy and shrub layers' should trigger investigation and/or management control of non-native species. <p>Spread of non-native species can fundamentally alter the species composition of the <i>Tilio-Acerion</i> feature. Of particular relevance at Carmel is the presence of sycamore and, to a lesser extent, beech. Although their native status at Carmel can be debated (e.g. Peterken, 1999), any spread of these species is viewed as undesirable. Sycamore in particular can respond vigorously to increased light levels and may require specific control in any coppiced areas.</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i></p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Extent of wet heath and potential wet heath mapped in 2003. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. The lower limit is based on the extent of wet heath (approx. 5 ha) and potential wet heath (approx. 1 ha) mapped in 2003 – refer to map 2 in Crowther & Groome (2004). No upper limit has been set as the potential for expansion of wet heath is generally limited by natural edaphic factors and topography. In certain cases expansion of wet heath may also be constrained by limits relating to</p>

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	<p>other important features (e.g. active raised bog).</p> <ul style="list-style-type: none"> • Quality. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – At least 60% of sample points in plots J-L will be referable to 'good condition wet heath'. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. Minor amendments were made following further monitoring by NRW in 2008 (Wilkinson, 2008). The lower limit requires 60% of sample points in a series of representative plots (plots J-L) to be 'good condition wet heath'. Plots J-L are shown in map 5 in Crowther & Groome (2004). No upper limit is required in this case. Good condition wet heath is defined as vegetation where, within a 1 m radius of any sample point:</p> <ul style="list-style-type: none"> • Dwarf shrub cover is >25%. • <i>Ulex gallii</i> cover is <25%. • <i>Molinia</i> cover is <40%. • <i>Sphagnum</i> cover is >10%. • <3 fronds of bracken are present. • Trees, saplings or scrub (excluding <i>Ulex gallii</i>) is absent. <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Limits relating to the effects of grazing are addressed in 'Quality' above. Any concerns highlighted through monitoring of 'Quality' should trigger investigation and/or management control of Grazing. <p>An appropriate grazing regime is necessary to maintain wet heath vegetation in good condition. Under-grazing can lead to a rank growth of <i>Molinia</i> and encroachment of scrub and bracken. Conversely over-grazing can lead to loss of ericoids, poaching and damage to <i>Sphagnum</i> carpets.</p> <ul style="list-style-type: none"> • Scrub/bracken encroachment. <ul style="list-style-type: none"> ○ Limits relating to spread of scrub and bracken are addressed in 'Quality' above. Any concerns highlighted through monitoring of 'Quality' should trigger investigation and/or management control of 'scrub/bracken encroachment', with cross-reference to 'Grazing'. <p>Although encroachment of scrub and bracken is essentially a consequence of under-grazing (see 'Grazing' above), it is treated as a</p>

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	<p>separate factor here due to the distinct management techniques involved in the control of scrub and bracken.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – No burning will be tolerated in the wet heath areas. <p>Burning is not considered an appropriate management tool for wet heath as it can damage <i>Sphagnum</i> mats and peat soils.</p> <p>European dry heaths</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Extent of dry heath and potential dry heath mapped in 2003. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. The lower limit is based on the extent of dry heath (approx. 16.5 ha) and potential dry heath (approx. 2.5 ha) mapped in 2003 – refer to map 2 in Crowther & Groome (2004). No upper limit has been set as the potential for expansion of dry heath is generally limited by natural edaphic factors and topography.</p> <ul style="list-style-type: none"> • Quality. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – At least 70% of sample points in plots E-I will be referable to 'good condition dry heath'. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. The lower limit requires 70% of sample points in a series of representative plots (plots E-I) to be 'good condition dry heath'. Plots E-I are shown in map 5 in Crowther & Groome (2004). No upper limit is required in this case. Good condition dry heath is defined as vegetation where, within a 1 m radius of any sample point:</p> <ul style="list-style-type: none"> • Dwarf shrub (ericoids + <i>Ulex gallii</i>) cover is >75%. • <i>Ulex gallii</i> cover is <50%. • At least 2 of the ericaceous species <i>Erica cinerea</i>, <i>Calluna</i> and <i>Vaccinium</i> spp. are present, with a combined cover of >25%. • <3 fronds of bracken are present. • Bare ground cover is <10%. • Trees, scrub, bramble, thistles, tall <i>Juncii</i>, large docks or nettle are absent.

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	<ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Limits relating to the effects of grazing are addressed in 'Quality' above. Any concerns highlighted through monitoring of 'Quality' should trigger investigation and/or management control of Grazing. <p>An appropriate grazing regime is necessary to maintain dry heath vegetation in good condition. Under-grazing can lead to a tall, even-aged sward of mature and over-mature <i>Calluna</i>, or dense <i>Ulex gallii</i>. Lack of grazing will also result in scrub and bracken encroachment. Conversely over-grazing can lead to loss of ericoids, increased grass cover or excessive bare ground.</p> <ul style="list-style-type: none"> • Scrub/bracken encroachment. <ul style="list-style-type: none"> ○ Limits relating to spread of scrub and bracken are addressed in 'Quality' above. Any concerns highlighted through monitoring of 'Quality' should trigger investigation and/or management control of 'scrub/bracken encroachment', with cross-reference to 'Grazing'. <p>Although encroachment of scrub and bracken is essentially a consequence of under-grazing (see 'Grazing' above), it is treated as a separate factor here due to the distinct management techniques involved in the control of scrub and bracken.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – No burning should take place without prior consideration and approval. <p>Burning of the dry heath areas may have been historically practised, but it has not been carried out in the recent past. Careful consideration would need to be given to any future proposals for burning of the dry heath.</p> <p>Active raised bogs</p> <ul style="list-style-type: none"> • Extent. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – Extent of raised bog mapped in 2003. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. The lower limit is based on the extent of</p>

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	<p>raised bog (approx. 13 ha) mapped in 2003 – refer to map 2 in Crowther & Groome (2004). No upper limit has been set as the potential for expansion of raised bog is generally limited by natural edaphic factors and topography.</p> <ul style="list-style-type: none"> • Quality. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – At least 60% of sample points in plots A-D will be referable to ‘good condition raised bog’. <p>This attribute was developed by Crowther & Groome (2004), with guidance from NRW staff. Certain inconsistencies in % cover values quoted by Crowther & Groome were also clarified when monitoring was repeated by NRW’s SAC monitoring team in 2008 (Wilkinson, 2008). The lower limit requires 60% of sample points in a series of representative plots (plots A-D) to be ‘good condition raised bog’. Plots A-D are shown in map 5 in Crowther & Groome (2004). No upper limit is required in this case. Good condition raised bog is defined as vegetation where, within a 1 m radius of any sample point:</p> <ul style="list-style-type: none"> • Five or more of the following species are present: <i>Eriophorum vaginatum</i>, <i>E. angustifolium</i>, <i>Calluna vulgaris</i>, <i>Erica tetralix</i>, <i>Scirpus cespitosus</i>, <i>Narthecium ossifragum</i>, <i>Drosera rotundifolia</i>, <i>Rhynchospora alba</i>. • total cover of <i>Sphagna</i> is >20%. • cover of <i>Molinia</i> and other grasses is <10%. • Trees, scrub and bracken are absent. <ul style="list-style-type: none"> • Water levels. <ul style="list-style-type: none"> ○ Limits to be determined following future hydrological investigations. <p>A high and stable water table is fundamental for the long-term conservation of the raised bogs at Cernydd Carmel. In an active, peat-forming system, the water table would normally be at or close to (within 10 cm) the mire surface throughout the year. Recent monitoring work by Crowther & Groome (2004) suggested that the unfavourable condition assessment was principally due to a drying out of the mire surfaces, although no significant evidence of drainage was noted within the individual bogs. Further investigation into the hydrology of the raised bogs is therefore required, to try to establish the cause(s) of the perceived drying out.</p> <ul style="list-style-type: none"> • Water quality. <ul style="list-style-type: none"> ○ Upper limit – surface water pH 4.5.

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	<ul style="list-style-type: none"> ○ Lower limit – surface water pH 2.7. <p>As an ombrotrophic (rain-fed) habitat, raised bogs are characterised by very low nutrient levels in the mire surface. Key species (notably peat-forming <i>Sphagna</i>) are highly susceptible to increases in nutrient levels, either from run-off from surrounding agricultural land or through atmospheric deposition (see Factor F3 below). As an indicator of oligotrophic conditions, pH has been chosen as the main criterion for assessing nutrient levels in the raised bogs at Carmel. Upper and lower limits specified here are based on a range of pH 2.7-4.5, which is typical for active raised bogs.</p> <ul style="list-style-type: none"> • Atmospheric nutrient deposition. <ul style="list-style-type: none"> ○ Upper limit – 10 kg N/ha/yr. ○ Lower limit – Not required. <p>In the absence of any inputs from surrounding land, raised bogs receive all their inorganic nutrients from precipitation or dry deposition. The critical load for raised and blanket bogs is 5-10 kg N/ha/yr. Current N deposition at this site is estimated at 19.2 kg N/ha/yr (source: Air Pollution Information Service, www.apis.ac.uk). Continued N deposition at this rate will encourage a spread of <i>Molinia</i> and a reduction in peat-forming <i>Sphagnum</i> spp. Local air quality should be regulated through rigorous development control measures, as well as wider environmental policies.</p> <ul style="list-style-type: none"> • Scrub. <ul style="list-style-type: none"> ○ Limits relating to scrub are addressed in 'Quality' above. Any concerns highlighted through monitoring of 'Quality' should trigger investigation and/or management of 'Scrub', with cross-reference to 'Water levels'. <p>Intact raised bogs are largely devoid of scrub due to the high surface water table. However, scrub can develop in certain situations, especially where the mire surface is drying out. Scrub encroachment will therefore not be tolerated in the raised bogs at Carmel.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ Grazing limits to be determined following future hydrological/ grazing studies. <p>Grazing is not generally regarded as an essential tool in the conservation of pristine raised bog habitats, but does have a role on impacted sites such as Cernydd Carmel. It is currently practised on</p>

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	<p>some of the raised bogs at Carmel and is presumably a historical activity. Grazing can be useful in suppressing <i>Molinia</i> growth, although potential input of nutrients through dunging should be borne in mind.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – No burning will be tolerated in the raised bog areas. <p>Many specialist bog species are intolerant of burning. Peat is combustible and fire has the potential to destroy a significant proportion of the mire substrate.</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Cernydd Carmel SAC (2011)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cadair-to-coed-y-sac-list/idoc.ashx?docid=255d577f-7f4b-4d0d-879e-03b46f7f5c1a&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Turloughs: Unfavourable: Unclassified • Tilio-Acerion forests of slopes, screes and ravines: Unfavourable: Declining • Northern Atlantic wet heaths with <i>Erica tetralix</i>: Unfavourable: Unchanged • European dry heaths: Unfavourable: Unclassified • Active raised bogs: Unfavourable: Unchanged
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Drainage</u> Any alterations to the cyclical fluctuations of the groundwater table could have a detrimental impact on the ecological and hydrological integrity of the turlough. Potential threats to its hydrology could arise through the construction of artificial drainage channels or culverts at the edge of the turlough itself, or through any lowering of the water table in the underlying aquifer by means of water abstraction or quarrying activities.</p> <p><u>Grazing</u> The monitoring carried out in 2008 showed that some of the grazed dry heath stands are exhibiting localised signs of overgrazing (e.g. units 5 and 11). However Lack of grazing in most of the raised bog stands could be resulting in a dominance of <i>Molinia</i>, which in turn is suppressing</p>

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	<p><i>Sphagnum</i> growth. Indeed the one stand that is currently grazed is of markedly better quality than the ungrazed units. Therefore, efficient grazing management is essential.</p> <p><u>Agricultural Pollution</u> Increased nutrient levels in particular could have a detrimental effect on its characteristic flora and fauna. Again this factor needs to be considered on a catchment scale and not the immediate environs. Agriculture is the most likely source of any eutrophication in the aquifer. Proposals to intensify agricultural practices are being addressed through management agreements and Tir Cymen/Tir Gofal agri-environment schemes.</p>
<p>Landowner/ Management Responsibility</p>	<p>Most of the grassland at Carmel is now grazed by either cattle, ponies or, to a lesser extent, sheep. Much of the agriculture is fairly non-intensive. Indeed the grassland within the NNR parts of the site is managed principally for nature conservation, with the intention of maintaining the existing areas of semi-natural grassland at Pwll Edrychiad and restoring other more improved swards through appropriate grassland restoration methods. A number of private holdings in the Carmel SAC are also managed under agri-environment agreements.</p> <p>It should be clarified here that some of the NNR units are managed by NRW, with other units managed by the Grasslands Trust. A small section of the NNR is also in private ownership but is subject to a Nature Reserve Agreement with NRW. The remainder of the SAC is in multiple private ownership.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Carmarthenshire's Local Development Plan (2006-2021) Deposit Draft, March 2011 available at: http://www.carmarthenshire.gov.uk/English/environment/planning/Planning%20Policy%20and%20Development%20Plans/Local%20Development%20Plan/Documents/HRA%20Report%20Vol%201.pdf</p>

<p>Site Name: Crymlyn Bog / Cors Crymlyn Location Grid Ref: SN708719 JNCC Site Code: UK0012885 Size: 299.45 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Crymlyn Bog is a large lowland fen situated in a glacial depression on the eastern edge of Swansea. In addition to Crymlyn Bog itself, the SAC also includes Pant-y-Sais fen, a smaller (approximately 20 ha) wetland located about 1 km east of the main site.</p> <p>The predominant habitat at Crymlyn Bog and Pant-y-Sais is lowland topogenous fen, which comprises a diverse range of mire, tall-herb fen and swamp communities. Of particular interest are the localised stands of the SAC Annex I habitat types ‘Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>’ and ‘Transition mires and quaking bogs’.</p> <p>Also of interest are the stands of wet woodland at Crymlyn Bog, including the Annex I habitat ‘Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>’ (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>).</p> <p>In addition the SAC supports a suite of uncommon plant species, including a large population of the nationally rare slender cotton-grass <i>Eriophorum gracile</i>.</p> <p>The site is also of importance for its invertebrate fauna. Of particular note is the population of the fen raft spider <i>Dolomedes plantarius</i>, which is known from just two other sites in the UK. The hornet robberfly <i>Asilus crabroniformis</i> also occurs in some of the drier pastures on the western flank of Crymlyn Bog.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>. • Transition mires and quaking bogs. <p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>). <p>Ramsar features (provisional) Note: The Ramsar features for Crymlyn Bog SAC are open to interpretation at present. They will be subject to a ‘quality control’</p>

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	<p>exercise in the near future, to confirm the qualifying features. Hence the following list of Ramsar features is only provisional at present. Conservation objectives for the Ramsar features will be developed once the confirmed list of features has been agreed.</p> <ul style="list-style-type: none"> • Topogenous fen. • Slender cotton-grass. • Peatland invertebrate assemblage. • Plant species assemblage.
<p>Conservation Objectives</p>	<p>Vision for the site: Lowland fen will be the predominant habitat at Crymlyn Bog SAC, covering approximately 80% of Crymlyn Bog itself and about 75% of Pant y Sais fen.</p> <p>A range of fen communities will be represented, including the SAC Annex I habitat types ‘calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>’ and ‘transition mires and quaking bogs’; at least 15 ha of the former habitat and 12 ha of the latter type will be present at Crymlyn Bog.</p> <p>Effective habitat management will be carried out to maintain the lowland fen vegetation (including its component SAC habitats) in favourable condition. This conservation management will be based on techniques such as grazing and vegetation cutting, as requirements dictate. Targeted scrub control will also be undertaken to prevent scrub development in important habitat areas. Wider protection measures will safeguard water levels, water quality and atmospheric pollution impacts at the site.</p> <p>Wet woodland will occupy approximately 10% of Crymlyn Bog, including the SAC Annex I habitat ‘alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>’. This woodland will continue to develop a natural wet woodland species composition and structure, through natural dynamic processes.</p> <p>The fen vegetation at Crymlyn Bog SAC will support a suite of uncommon plant species, including a large and sustainable population of slender cotton-grass <i>Eriophorum gracile</i>.</p> <p>The range of fen and associated open water habitats will also support a suite of uncommon invertebrates. In particular a viable population of the rare fen raft spider <i>Dolomedes plantarius</i> will occupy the various canal and open water habitats at the site. A viable population of the hornet</p>

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	<p>robberfly <i>Asilus crabroniformis</i> will also occur in the drier pastures on the western periphery of Crymlyn Bog.</p> <p>Since the announcement in late 1997 of the closure of the BP Llandarcy Oil Refinery a number of studies have been completed to further assess the site's hydrological characteristics and the influence of historic hydrocarbon contamination. The water-balance of the site is critical to future management and the function of the site's internal waterway (the Glan y Wern Canal) is being considered with a view to its restoration. A comprehensive hydrological study by the Environment Agency and NRW commenced in October 2002.</p> <p>The flora and fauna of the site is susceptible to changes in water quality, influenced by surrounding industrial effluent sources such as oil, pulverised fuel ash and iron-rich mine adit discharge. Monitoring is in place to provide a check on ongoing discharges. The current dominance and ongoing spread of relatively species-poor <i>Phragmites australis</i> reedswamp will require further management at the site.</p> <p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Calcareous fen will occupy at least 15 ha of Crymlyn Bog SAC. • Most of the remainder of the site will comprise related fen vegetation. • The following plant species will be common in the calcareous fen vegetation: <i>Cladium mariscus</i>, <i>Carex elata</i>, <i>Osmunda regalis</i>, <i>Phragmites australis</i>. • Although <i>Cladium mariscus</i> may form dense stands in places, the majority of the calcareous fen at Crymlyn Bog will be the more open, species-rich form, with <i>Cladium</i> typically present at less than 20% cover. • Similarly although <i>Phragmites australis</i> is a frequent constituent of calcareous fen vegetation, this species will not generally exceed 20% cover. • Scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will be largely absent. • All factors affecting the achievement of these conditions will be under control. • Transition mires and quaking bogs.

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	<p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Transition mire vegetation will occupy at least 12 ha of Crymlyn Bog SAC. • Most of the remainder of the site will comprise related fen vegetation. • The transition mire will comprise varying mixtures of the following plant species: <i>Schoenus nigricans</i>, <i>Carex rostrata</i>, <i>C. echinata</i>, <i>C. limosa</i>, <i>Equisetum fluviatile</i>, <i>Eriophorum angustifolium</i>, <i>E. gracile</i>, <i>Menyanthes trifoliata</i>, <i>Sphagnum</i> spp. • Although <i>Phragmites australis</i> and <i>Cladium mariscus</i> may be present, these species will not attain high cover. • Scrub species such as willow <i>Salix</i> and birch <i>Betula</i> will be largely absent. • All factors affecting the achievement of these conditions will be under control. <p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Alluvial forest will occupy at least 27 ha of Crymlyn Bog SAC. • Most of the remainder of the site will comprise fen vegetation. The alluvial forest canopy will be dominated by varying mixtures of alder <i>Alnus glutinosa</i>, willow <i>Salix</i> spp. and birch <i>Betula</i> spp, including over-mature specimens of these species. • Regeneration of <i>Alnus</i>, <i>Salix</i> and <i>Betula</i> will be present either as saplings or as regrowth from the base of trees or fallen stems. • The field layer will be dominated by <i>Carex paniculata</i>, with associates such as <i>Lysimachia vulgaris</i>, <i>Osmunda regalis</i>, <i>Lythrum salicaria</i>, <i>Solanum dulcamara</i>, <i>Iris pseudacorus</i> and <i>Scutellaria galericulata</i>. • Negative species such as <i>Pteridium aquilinum</i> and <i>Urtica dioica</i> will be largely absent. <p>All factors affecting the achievement of these conditions will be under control.</p>

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<p>Component SSSIs</p>	<p>The plan area has been divided into 15 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on tenure, but also with reference to features and land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex I habitats that are a primary reason for selection of this site</p> <ul style="list-style-type: none"> • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>. <p>The calcareous fen feature is located mainly in management unit 8, but also extends into part of unit 10. The calcareous fen is currently (2008) subject to light grazing by cattle belonging to the neighbouring tenant farmer. The cattle wander on and off the bog from the adjoining farmland, as ground conditions on the bog allow. Despite this grazing, the most recent SAC monitoring result suggests the current level of management is insufficient to maintain the calcareous fen feature in favourable condition.</p> <p>To address the decline in condition of the calcareous fen feature, it is recommended that grazing levels should be increased to tackle the overgrown vegetation. If this cannot be achieved, or if increased grazing levels do not bring about a return to favourable condition, other alternative management techniques such as vegetation cutting or burning should be explored.</p> <p>Scrub control is already carried out within the calcareous fen area and there are no current concerns about scrub levels. Scrub control should continue in future to maintain this position. It is worth noting there is potential scope for extending the area of calcareous fen beyond its core distribution. This is likely to be achieved through a combination of vegetation cutting and biomass removal in areas over-run by <i>Phragmites</i> and/or <i>Cladium</i>, coupled with follow-on grazing and wider nutrient reduction measures.</p> <ul style="list-style-type: none"> • Transition mires and quaking bogs. <p>The stands of existing transition mire mapped by Hurford & Perry (2000) are located in units 5 (north of Tir John tip) and 10 (at the head of the Glan y Wern Canal). The areas of former transition mire mapped</p>

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	<p>by Headley (1990) are located along the western edges of units 5 and 10.</p> <p>Pony grazing has recently been introduced to part of unit 5, including the existing stand of transition mire mapped by Hurford & Perry (2000). The former area of transition mire mapped by Headley (1990), identified as Area B in Hurford & Perry (2000), is also located in this grazing parcel. There are plans to further extend the area of pony grazing here.</p> <p>Scrub control is also practised to prevent excessive scrub encroachment. There is scope within unit 5 for the use of ‘cut and collect’ mowing to achieve rapid reductions in standing crop (particularly areas dominated by <i>Phragmites</i>), in conjunction with grazing. This may achieve limited increases in the extent of transition mire. There is also scope for hydrosereal rejuvenation through the creation of shallow scrapes (turf ponds), though work would be required to identify optimal locations.</p> <p>The existing and former stands of transition mire in unit 10 – Areas C and D in Hurford & Perry (2000) – are currently ungrazed. Unfortunately the wet ground condition here makes the introduction of grazing a difficult proposition. Scrub control has been carried out in the existing area of transition mire (Area D).</p> <p>In terms of future management requirements, the current (and proposed expansion of) grazing in unit 5 should be sufficient to maintain/restore the transition mire vegetation here. Should future monitoring highlight continued concerns over the condition of this vegetation, other alternative management techniques such as vegetation cutting or burning should be explored. Scrub control should also continue to prevent excessive scrub development.</p> <p>As stated above, the introduction of grazing to the existing and former transition mire vegetation in unit 10 (Areas C and D) is problematic due to the extremely wet ground conditions there. Alternative management techniques such as vegetation cutting or burning should therefore be considered, coupled with ongoing scrub control. Nutrient enrichment has also been highlighted as a potential reason for the spread of <i>Phragmites australis</i> in Areas C and D; this eutrophication is thought to be linked to elevated nutrient levels entering Crymlyn Bog via Crymlyn Brook and possibly from the vicinity of Upper Glan y Wern Farm (Headley, 2004). Various management options have been proposed to tackle this eutrophication, including reedbed creation (Gilman <i>et al.</i>,</p>

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	<p>2008). A preferred management solution should now be pursued following close scrutiny of the various nutrient reduction options. The sheer size of unit 10 suggests that radical management options such as turf pond creation could be considered. These could be targeted in areas which are likely to have supported transition mire prior to the expansion of tall-reed fen.</p> <p>It should be stated that numerous stands of putative transition mire vegetation have been identified at Crymlyn Bog since Hurford & Perry's (2000) work. It is therefore possible that transition mire is more extensive at Crymlyn Bog than originally thought. Indeed a recent (2005) NVC survey of Pant y Sais (Bosanquet <i>et al.</i>, 2005) mapped several stands of vegetation conforming to transition mire, where none was previously identified by Hurford & Perry (2000). It is therefore recommended that a comprehensive NVC survey of Crymlyn Bog is undertaken, at which point the transition mire conservation objective should be scrutinised and revised as necessary. In the meantime the current extent of transition mire at the site, as recognised by Hurford & Perry (2000), should be viewed with a degree of caution.</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>). <p>Key management requirements for the alluvial forest feature are to maintain the high water table and prevent any increase in nutrient levels. There are no concerns over either of these factors at the current time. Similarly there is no threat from excessive grazing at present, as the wet ground conditions provide a natural deterrent to livestock.</p> <p>A key conservation aim for the alluvial forest feature is for it to develop a natural wet woodland species composition and structure through natural dynamic processes. It is envisaged that this condition will be achieved simply through non-intervention management.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i></p> <ul style="list-style-type: none"> • Extent of calcareous fen. <ul style="list-style-type: none"> ○ Upper limit – None set.

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	<ul style="list-style-type: none"> ○ Lower limit – As mapped in 1998. <p>This attribute was developed by Hurford & Perry (2000). The lower limit is based on extent (approx. 15 ha) mapped in 1998 by Hurford & Perry (2000). No upper limit has been set as any expansion of calcareous fen would be beneficial.</p> <ul style="list-style-type: none"> ● Condition of calcareous fen. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – In Area A (see Hurford & Perry, 2000): >80% of the vegetation is calcareous fen and scrub is absent. And outside Area A: >2 stands of Cladium-dominated vegetation are present. <p>Attributes for the condition of calcareous fen at Crymlyn Bog SAC were developed by Hurford & Perry (2000). The following definitions were given: Note: Monitoring in 2005 highlighted difficulties in identifying <i>Carex elata</i>, especially in separating vegetative <i>C. elata</i> from <i>C. acutiformis</i>. It is recommended that further consideration is given to this issue prior to the next formal monitoring visit.</p> <ul style="list-style-type: none"> ➤ Calcareous fen = vegetation where, within a 2 m radius of any sampling point: <i>Carex elata</i> is present at >20% cover; <i>Cladium mariscus</i> is present at <20% cover. <i>Phragmites australis</i> is present at <20% cover. ➤ Scrub = Any <i>Salix</i>, <i>Betula</i> or <i>Rhododendron</i> tree >1 m tall within a 2 m radius of any sampling point. ➤ Cladium-dominated vegetation = Stands of vegetation >20 x 20 m where <i>Cladium mariscus</i> forms >50% cover. <ul style="list-style-type: none"> ● Water quality factors. <ul style="list-style-type: none"> ○ See below. <p>Good water quality is fundamental to the long-term conservation of the calcareous fen feature. Calcareous fen is dependent on low nutrient levels to maintain its characteristic suite of plant species, and avoid replacement by vegetation typical of more eutrophic conditions (e.g. dense <i>Phragmites australis</i>). Good water quality must therefore be maintained to protect the calcareous fen feature. The following parameters and provisional limits are proposed as key indicators of water quality. The limits are based on recommended maximum levels for Dissolved Available Inorganic Nitrogen (DAIN) and Phosphorus (DAIP). Sampling may be undertaken on any watercourses or discharges entering the site, with sampling frequency determined</p>

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	<p>principally by the potential threat to the calcareous fen feature. A systematic programme of water quality monitoring needs to be developed.</p> <ul style="list-style-type: none"> • Water quality: DAIN. <ul style="list-style-type: none"> ○ Upper limit – 1.5 mg/l DAIN. ○ Lower limit – Not required. • Water quality: DAIP. <ul style="list-style-type: none"> ○ Upper limit – 0.05 mg/l DAIP. ○ Lower limit – Not required. • Atmospheric pollution. <ul style="list-style-type: none"> ○ Upper limit – 20 kg N/ha/yr. ○ Lower limit – Not required. <p>Atmospheric nutrient deposition also contributes to the overall nutrient budget of Crymlyn Bog. This factor is especially relevant given the site's location on the urban edge of Swansea, with major historic and recent industrial development around its margins. The critical load for calcareous fen is 13-20 kg N/ha/yr. Atmospheric deposition should not exceed this threshold, either in isolation or in combination with other nutrient inputs. However, the critical load for N is currently exceeded at the site, chiefly through inflowing streams. Local air quality should be regulated through appropriate statutory and other wider policy measures.</p> <ul style="list-style-type: none"> • Water levels. <ul style="list-style-type: none"> ○ No limits set at present. There are no current concerns over water levels at the site, backed up by ongoing hydrological monitoring carried out by EAW. Future monitoring will determine whether the setting of any limits is required, with cross-reference to monitoring of Attributes 'extent of calcareous fen' and 'condition of calcareous fen' above. <p>A high and stable water table is essential for the long-term conservation of the calcareous fen feature. Water levels should be maintained at or slightly above ground level for much of the year to prevent drying out of the fen habitat.</p> <ul style="list-style-type: none"> • Successional change. <ul style="list-style-type: none"> ○ Limits relating to the effects of successional change are addressed in Attributes 'extent of calcareous fen' and

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	<p>'condition of calcareous fen' above. Any concerns highlighted through monitoring of these attributes should trigger investigations and/or management control of successional change.</p> <p>Fen vegetation will inevitably succeed to scrub and woodland in the absence of management. Prior to this there can be a progression from early successional stages to later fen stages, often reflected in a shift from more species-rich vegetation to rank, impoverished swards. Management such as grazing, vegetation cutting or burning can be employed to stall the successional process and maintain the fen vegetation.</p> <ul style="list-style-type: none"> • Scrub encroachment. <ul style="list-style-type: none"> ○ Limits relating to the spread of scrub are addressed in Attribute 'condition of calcareous fen' above. Any concerns highlighted through monitoring of Attribute 'condition of calcareous fen' should trigger investigations and/or management control of Factor scrub encroachment. <p>Although scrub encroachment is an intrinsic consequence of successional change (see Factor 'successional change'), it is treated as a separate factor here due to the distinct management techniques involved in its control.</p> <ul style="list-style-type: none"> • Alien plant species. <ul style="list-style-type: none"> ○ No limits set as yet, but it is recommended that the calcareous fen condition attribute ('condition of calcareous fen') is amended to include limits for Himalayan balsam, prior to the next formal monitoring visit. <p>Himalayan balsam has recently invaded several areas around the western edge of Crymlyn Bog. This annual plant can be very invasive, often colonising along stream-sides and watercourses by its water-borne seeds. Given its preference for damp substrates, Himalayan balsam is a potentially serious threat to the fen habitats at Crymlyn Bog.</p> <p>Transition mires and quaking bogs.</p> <ul style="list-style-type: none"> • Extent of transition mire. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – As mapped by Headley (1990) – indicated

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	<p>as Areas B, C and D in Hurford & Perry (2000).</p> <p>This attribute was developed by Hurford & Perry (2000). The lower limit is based on extent (approx. 12 ha) mapped in the late 1980s by Headley (1990). Only two small stands (totalling about 1 ha) were mapped by Hurford & Perry (2000), suggesting a marked loss of transition mire during the 1990s. Hurford & Perry considered that the original extent mapped by Headley was a realistic lower limit for this attribute. No upper limit has been set as any expansion of transition mire would be beneficial.</p> <ul style="list-style-type: none"> • Condition of transition mire. <ul style="list-style-type: none"> ○ Upper limit: Not required. ○ Lower limit: In Areas B, C and D: >80% of the vegetation is either transition mire or Sphagnum dominated mire And Salix, Betula or Rhododendron scrub >1 m tall is absent And the density of Cladium mariscus and/or Phragmites australis is <10 green aerial shoots in any 1m radius. <p>Attributes for the condition of transition mire at Crymlyn Bog SAC were developed by Hurford & Perry (2000).</p> <ul style="list-style-type: none"> ➤ Transition mire = vegetation where, within any 1 m radius: Carex rostrata or Schoenus nigricans is present at >30% cover or open water is visible and at least three of Carex echinata, Carex limosa, Carex rostrata, Equisetum fluviatile, Eriophorum angustifolium, Eriophorum gracile and Menyanthes trifoliata are present. ➤ Sphagnum-dominated mire = species-poor vegetation where Sphagnum spp. form >30% cover within any 1 m radius. <ul style="list-style-type: none"> • Water quality factors. <ul style="list-style-type: none"> ○ See below. <p>Good water quality is fundamental to the long-term conservation of the transition mire feature. Transition mire is dependent on low nutrient levels to maintain its characteristic suite of plant species, and avoid replacement by vegetation typical of more eutrophic conditions (e.g. dense <i>Phragmites australis</i>). Good water quality must therefore be maintained to protect the transition mire feature. The following parameters and provisional limits are proposed as key indicators of water quality. The limits are based on recommended maximum levels for Dissolved Available Inorganic Nitrogen (DAIN) and Phosphorus</p>

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	<p>(DAIP). Sampling may be undertaken on any watercourses or discharges entering the site, with sampling frequency determined principally by the potential threat to the transition mire feature. A systematic programme of water quality monitoring needs to be developed.</p> <ul style="list-style-type: none"> • Water quality: DAIN. <ul style="list-style-type: none"> ○ Upper limit – 1.5 mg/l DAIN. ○ Lower limit – Not required. • Water quality: DAIP. <ul style="list-style-type: none"> ○ Upper limit – 0.05 mg/l DAIP. ○ Lower limit – Not required. • Atmospheric pollution. <ul style="list-style-type: none"> ○ Upper limit – 10 kg N/ha/yr. ○ Lower limit – Not required. <p>Atmospheric nutrient deposition also contributes to the overall nutrient budget of Crymlyn Bog. This factor is especially relevant given the site's location on the urban edge of Swansea, with major historic and recent industrial development around its margins. The critical load for transition mire and quaking bog is 5-10 kg N/ha/yr. Atmospheric deposition should not exceed this threshold, either in isolation or in combination with other nutrient inputs. However, the critical load for N is currently exceeded at the site, chiefly through inflowing streams. Local air quality should be regulated through appropriate statutory and other wider policy measures.</p> <ul style="list-style-type: none"> • Water levels. <ul style="list-style-type: none"> ○ No limits set at present. There are no current concerns over water levels at the site, backed up by ongoing hydrological monitoring carried out by EAW. Future monitoring will determine whether the setting of any limits is required, with cross-reference to monitoring of Attributes 'extent of transition mire' and 'condition of transition mire' above. <p>A high water table is essential for the long-term conservation of the transition mire feature. Water levels should be maintained at or slightly above ground level for much of the year to prevent drying out of the fen habitat.</p> <ul style="list-style-type: none"> • Successional change.

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	<ul style="list-style-type: none"> ○ Limits relating to the effects of successional change are addressed in Attributes 'extent of transition mire' and 'condition of transition mire' above. Any concerns highlighted through monitoring of these attributes should trigger investigations and/or management control of Factor 'successional change'. <p>Fen vegetation will inevitably succeed to scrub and woodland in the absence of management. Prior to this there can be a progression from early successional stages to later fen stages, often reflected in a shift from more species-rich vegetation to rank, impoverished swards. Management such as grazing, vegetation cutting or burning can be employed to stall the successional process and maintain the fen vegetation.</p> <ul style="list-style-type: none"> • Scrub encroachment. <ul style="list-style-type: none"> ○ Limits relating to the spread of scrub are addressed in Attribute 'condition of transition mire' above. Any concerns highlighted through monitoring of Attribute 'condition of transition mire' should trigger investigations and/or management control of Factor 'scrub encroachment'. <p>Although scrub encroachment is an intrinsic consequence of successional change (see Factor 'successional change'), it is treated as a separate factor here due to the distinct management techniques involved in its control.</p> <ul style="list-style-type: none"> • Alien plant species. <ul style="list-style-type: none"> ○ No limits set as yet, but it is recommended that the calcareous fen condition attribute ('condition of transition mire') is amended to include limits for Himalayan balsam, prior to the next formal monitoring visit. <p>Himalayan balsam has recently invaded several areas around the western edge of Crymlyn Bog. This annual plant can be very invasive, often colonising along stream-sides and watercourses by its water-borne seeds. Given its preference for damp substrates, Himalayan balsam is a potentially serious threat to the fen habitats at Crymlyn Bog.</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i>, <i>Salicion albae</i>)</p> <ul style="list-style-type: none"> • Extent of alluvial forest.

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	<ul style="list-style-type: none"> ○ Upper limit – As mapped in 2009. ○ Lower limit – As mapped in 2009. <p>This attribute was initially developed by NRW’s SAC monitoring team in 2004 (Wilkinson, 2004a). It was subsequently revised following further monitoring in 2009 (Wilkinson, 2009), when additional areas of alluvial woodland were identified. The lower limit is based on extent (27 ha) mapped in 2009. Similarly the upper limit is based on extent mapped in 2009, as it is considered that any expansion of alluvial woodland into fen vegetation would be undesirable.</p> <ul style="list-style-type: none"> • Condition of alluvial forest. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – At least 75% of alluvial woodland will be in good condition. <p>This attribute was initially developed by NRW’s SAC monitoring team in 2004 (Wilkinson, 2004). It was subsequently revised following further monitoring in 2009 (Wilkinson, 2009).</p> <ul style="list-style-type: none"> ➤ Good condition alluvial woodland = woodland where, within a 15 m radius: 95% or more of the canopy-forming trees are Salix, Alnus or Betula; Viable re-growth is present from the base of trees or fallen stems; At least one over-mature tree is present. ➤ And, within a 5 m radius: Carex paniculata is present in the field layer along with at least two of the following: Lysimachia vulgaris, Osmunda regalis, Lythrum salicaria, Solanum dulcamara, Iris pseudacorus, Scutellaria galericulata, Sparganium erectum; The following species are absent: Pteridium aquilinum, Urtica dioica. <ul style="list-style-type: none"> • Water Quality. <ul style="list-style-type: none"> ○ No limits set at present. There are no current concerns over water quality within the alluvial woodland areas and the adjoining agricultural land is not farmed intensively (Tir Gofal agreement in operation). More detailed consideration is given to water quality limits in 'Calcareous fens with Cladium mariscus and species of the Caricion davallianae' and 'Transition mires and quaking bogs' above. <p>Good water quality is important in maintaining the characteristic species composition of alluvial woodland. Increased nutrient levels would result in an increase in undesirable ground flora species. In the</p>

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	<p>current case, agricultural run-off from adjoining farmland is the main potential source of any eutrophication.</p> <ul style="list-style-type: none"> • Atmospheric Pollution. <ul style="list-style-type: none"> ○ No limits set for alluvial forest feature, but refer to 'Calcareous fens with Cladium mariscus and species of the Caricion davallianae' and 'Transition mires and quaking bogs' above for limits relating to fen features. <p>Atmospheric pollution is a potentially significant source of nutrient inputs to Crymlyn Bog. This factor is especially relevant given the site's location on the urban edge of Swansea, with major historic and recent industrial development around its margins. Local air quality should be regulated through appropriate statutory and other wider policy control measures.</p> <ul style="list-style-type: none"> • Water levels. <ul style="list-style-type: none"> ○ No limits set at present. There are no current concerns over water levels at the site, backed up by ongoing hydrological monitoring carried out by EAW. Future monitoring will determine whether the setting of any limits is required, with cross-reference to monitoring of Attributes 'extent of alluvial forest' and 'condition of alluvial forest' above. <p>A high water table is essential for the long-term conservation of the alluvial forest feature. Water levels should be maintained at or above ground level for much of the year to prevent drying out of the wet woodland habitat.</p> <ul style="list-style-type: none"> • Grazing. <ul style="list-style-type: none"> ○ No limits set at present. Apart from a minor amount of sheep trespass at the very edge of the woodland, there is no grazing of the alluvial forest feature (the wet ground conditions are a natural deterrent to livestock). <p>Heavy grazing of wet woodland can lead to excessive poaching of the ground, with damaging effects on the woodland ground flora.</p> <p>Ramsar features (provisional).</p> <ul style="list-style-type: none"> • Topogenous fen. • Slender cotton-grass. • Peatland invertebrate assemblage. • Plant species assemblage.

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	<p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Crymlyn Bog/Cors Crymlyn SAC (2008)</i> available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/cors-fochno-to-cwm-sac-list/idoc.ashx?docid=01d20149-ecf7-4def-9c4e-0d6908964016&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>: Unfavourable; declining • Transition mires and quaking bogs: Unfavourable • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae): Unfavourable, recovering
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Scrub Encroachment</u> In recent years scrub has encroached at the expense of fen vegetation due to lack of appropriate management. The most recent SAC monitoring result suggests the current level of management is insufficient to maintain the calcareous fen feature in favourable condition.</p>
<p>Landowner/ Management Responsibility</p>	<p>The main current management practices at Crymlyn Bog SAC are grazing and scrub control. However, anecdotal evidence suggests that the site has become wetter in recent times, making extensive grazing of the site less practicable than before.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening for Neath Port Talbot's Local Development Plan (2011-2026) Revised Report, February 2011 available at: http://www.npt.gov.uk/PDF/planning sa scoping report revised feb11 .pdf</p>

<p>Site Name: Pen Lleyn a'r Sarnau / Lleyn Peninsula and the Sarnau Location Grid Ref: SH401130 JNCC Site Code: UK0013117 Size: 146023.48 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Pen Llŷn a'r Sarnau SAC encompasses areas of sea, coast and estuary that support a wide range of different marine habitats and wildlife, some of which are unique in Wales.</p> <p>In places the SAC landward boundary abuts the boundary of SACs encompassing terrestrial / coastal habitats and species and some intertidal areas that are part of the marine SAC have been notified as Sites of Special Scientific Interest (SSSI) (see Appendix 2). The Pen Llŷn a'r Sarnau SAC also overlaps wholly or in part with a number of Special Protection Areas (SPA) classified under the Birds Directive: Glannau Aberdaron ac Ynys Enlli SPA, Mynydd Cilan, Trwyn yr Wylfa ac Ynysoedd Sant Tudwal SPA and Dyfi SPA. The conservation objectives and core management plans for these locations can be found on the NRW website.</p> <p>The Pen Llŷn a'r Sarnau SAC is situated in northwest Wales. The SAC boundary extends from Nefyn on the north coast of Llŷn and includes parts of the seashore and the waters and seabed around the Llŷn Peninsula, in north Cardigan Bay and along the Meirionnydd coast to Clarach in Ceredigion south of the Dyfi estuary, including the Glaslyn/Dwyrhyd, Atro, Mawddach and Dyfi estuaries (Map 1)19. Much of the area of the SAC is subtidal, but there are also extensive intertidal areas. The site covers an area of about 146,023 ha.</p> <p>The boundary of the SAC encompasses the 9 marine habitat features and areas important for the 3 mammal species for which it was selected as an SAC. The features are distributed throughout the SAC with no single feature occupying the entire SAC and with features overlapping in some locations.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. • Estuaries. • Coastal lagoons. • Large shallow inlets and bays. • Reefs. <p>Annex I habitat present as a qualifying feature, but not a primary reason for site selection</p>

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	<ul style="list-style-type: none"> • Mudflats and sandflats not covered by seawater at low tide. • Salicornia and other annuals colonising mud and sand. • Atlantic salt meadows <i>Glauco Puccinellietallia maritima</i>. • Submerged or partially submerged sea caves. <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Bottlenose dolphin. • Otter. • Grey seal.
<p>Conservation Objectives</p>	<p>Vision for the site: NRW's vision for the Pen Llŷn a'r Sarnau SAC is for a high quality marine and coastal environment which is healthy, productive and biologically diverse, supporting resilient marine ecosystems and communities. The special habitat and species features of the SAC will be maintained and, where necessary, restored so that they will be able to sustain themselves in the long-term as part of naturally functioning ecosystems. The diversity of the wildlife habitats and species in the SAC will not be degraded.</p> <p>The varied physical character and processes in different parts of the SAC will operate without any undue interference; this includes the natural processes of tides, waves and currents and the associated processes of sediment erosion and deposition. The quality of water in the SAC will be maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future. The health and quality of the 12 SAC features are inter-related and will also depend on the state of other non SAC feature marine habitats within the site, as well as structural and functional components of the marine ecosystem.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. <p>The <i>subtidal sandbanks</i> for the SAC should continue to comprise mobile or highly mobile sediment habitats and their associated communities. The overall structure, sediment characteristics and biological communities of the Tripods, Bastram Shoal and Devil's Ridge sandbanks will reflect their exposure to the prevailing south-westerly winds and strong tidal flow. The sediment characteristics and biological</p>

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	<p>communities of the Four-fathom bank sandbank will reflect conditions of slightly less exposure to wind and tidal currents. Sediment supply and hydrodynamic processes forming the sandbanks will continue unhindered. The condition of the biological communities within and on the sediment, together with mobile species associated with the sandbanks, will be maintained or improved under appropriate management.</p> <ul style="list-style-type: none"> • Estuaries. <p>Each of the three <i>estuaries</i> of the SAC will continue to be shallow, bar-built drying estuaries supporting a mosaic of habitats and associated wildlife that reflects the transition from the estuarine to terrestrial habitats. The estuaries will support good quality saltmarsh transitions to other habitats such as shingle, sand dune, peat mire, brackish and freshwater marsh, reed swamp, bog and woodland. The sediments of the estuaries will continue to comprise a high proportion of sandy to muddy sediments, and the sediment type and biological communities associated with them will reflect a gradient from more exposed and saline conditions at the mouth of each estuary to more sheltered freshwater-influenced communities in their landward reaches. The structure and characteristics of each estuary will be determined by unhindered geomorphological and biological processes, including sediment transport, erosion and accretion and the influence of flood events and by appropriate management of the surrounding catchments. Artificial constraints on the estuaries form and functioning will be minimised to ensure the long-term presence and viability of estuary habitats; restore floodplain functions and habitats; and improve the ecosystem resilience to climate change. The estuaries will continue to function as fish nursery areas and to support important populations of migratory fish and birds, and other key species such as otter.</p> <ul style="list-style-type: none"> • Coastal Lagoons. <p>The Morfa Gwyllt <i>coastal lagoon</i> will continue to be present in its current location with no loss of extent or reduction in its ability to provide a specialised brackish water lagoon habitat. Specialist lagoon species will continue to be present as viable populations together with a range of other marine species characteristic of the predominantly sediment habitat in the lagoon basin. The negative impact of disturbance to the lagoon from human activities would be expected to be reduced under appropriate management, thereby improving the ability of Morfa Gwyllt to continue to exist and function as a coastal</p>

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	<p>lagoon.</p> <ul style="list-style-type: none"> • Large Shallow Inlets and Bays. <p>The <i>large shallow bay feature</i> (Tremadog Bay) should continue to comprise a variety of high quality sediment and hard substrate habitats and their associated biological communities. The special characteristics of the bay will be maintained, including species rich and species diverse subtidal sediments as the dominant habitat type within the bay. The subtidal sediments should comprise a mosaic of sediment types including extensive areas of muddy gravel, fine and muddy sand and mud. On the shore, the condition of the varied habitat types and their associated communities will be expected to be maintained or improved under appropriate management. The intertidal habitat types present will include muddy and sandy gravel, mixed sediment and boulder shores, bedrock, sand and shingle. The natural biological productivity of the bay and its ability to function as a nursery area for fish and shellfish species will be maintained and safeguarded. The potential for expansion of the biogenic reefs and eelgrass (seagrass) communities that are components of the bay feature should be safeguarded through appropriate management.</p> <ul style="list-style-type: none"> • Reefs. <p>The <i>reefs</i> of the SAC should continue to comprise a large variety of habitats and their associated biological communities both on the shore and underwater. The different components of the reef habitat should continue to be present with no significant loss of extent, and the quality of the wildlife communities they support should be maintained or enhanced; these components comprise reef formed from different types of hard substrate throughout the site (bedrock, boulders, cobbles and mixed ground), biogenic reefs and carbonate reef. The potential for expansion of the biogenic reef communities on the shore and underwater will be safeguarded through appropriate management.</p> <p>Annex I habitat present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Mudflats and sandflats not covered by seawater at low tide. <p>The <i>intertidal mudflats and sandflats</i> feature should continue to comprise an array of sediment habitats and their associated biological communities, ranging from exposed and moderately exposed sands in open coast situations, through exposed to sheltered sands and muds in</p>

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	<p>estuarine conditions. Complete examples of zonation of exposed and moderately exposed sediment communities will continue to be present. The quality of intertidal mudflat and sandflat communities would be expected to be maintained or improved. The potential for expansion of the nationally scarce eelgrass (seagrass) community should be safeguarded through appropriate management. The long-term viability and quality of the intertidal mudflats and sandflats in estuarine conditions may be enhanced by restoration of more naturally functioning estuary systems.</p> <p>The site retains its complete sequences of <i>saltmarsh vegetation</i>, from pioneer vegetation, such as glasswort, through to upper saltmarsh. The variety of communities will continue to be present and their quality will be maintained or improved. The long-term viability and quality of the saltmarsh features will be improved through management of the estuaries that restores more naturally functioning estuary systems.</p> <ul style="list-style-type: none"> • Salicornia and other annuals colonising mud and sand. • Atlantic salt meadows <i>Glauco Puccinellietalia maritimae</i>. • Submerged or partially submerged sea caves. <p>The sea caves feature should continue to comprise intertidal and subtidal caves, clefts, crevices and tunnels in the bedrock substrate within the SAC. The extent of the sea caves and the variety and quality of the biological communities they support will be maintained or improved. Many of the caves (intertidal and subtidal) will continue to support well-developed zonation of sea cave communities. The sea caves of the SAC will continue to provide accessible and high quality breeding places for grey seal.</p> <p>The SAC will continue to provide a productive and supportive marine area for <i>grey seals</i>. The population of grey seals frequenting the SAC will form an important component of a larger southwest UK population of grey seals. Grey seals will continue to be widespread throughout the SAC predominantly in areas of open coast and sea. Grey seals will have access to, and sufficient availability of prey, and they will have widespread availability and access to good quality essential habitats, including areas for hauling out and pupping, that are free from excessive disturbance. The quality and distribution of haul out and breeding sites for grey seals within the site will be maintained or improved through appropriate management.</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection</p>

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	<ul style="list-style-type: none"> • Bottlenose dolphin. <p>The SAC will continue to provide a productive and supportive marine area for <i>bottlenose dolphin</i>. Bottlenose dolphin will continue to be widespread within the waters of the SAC and those frequenting the SAC will reflect a healthy population structure including immature and adult male and female dolphins. The bottlenose dolphins in the SAC will form an important component a larger population of this species present in Cardigan Bay and in the wider sea area around Wales and the north east Atlantic. The animals using the SAC will reflect good physiological health. The bottlenose dolphins will have access to and sufficient availability of prey, and they will have widespread availability and access to good quality essential habitats free from excessive disturbance. The quality and distribution of essential habitats (such as for feeding, calving, resting and travelling) within the site will be maintained or improved through appropriate management.</p> <ul style="list-style-type: none"> • Otter. <p><i>Otters</i> will continue to be widespread throughout the SAC both in areas of open coast and within the estuaries. Otters will have sufficient availability of prey and widespread availability and access to good quality essential habitats including freshwater and undisturbed resting and breeding sites to allow the otter population to thrive. The distribution, breeding centres and actual/potential breeding sites of otters within the site and adjacent catchments will be maintained or improved through appropriate management.</p> <ul style="list-style-type: none"> • Grey Seal. <p>The landscape quality and conservation value of the area will continue to be high. The presence of the Pen Llŷn a'r Sarnau SAC and its special wildlife enhances the economic and social values of the area by providing a high quality environment for fisheries, outdoor activities, ecotourism, scientific and educational study, and peaceful enjoyment by local people and visitors. The positive contribution of the SAC to the natural, social and economic quality of the area will be recognised and promoted through appropriate sea and land management which ensures compatibility between activities and the sustainable use of the site. Local communities will take pride in their surroundings and work actively to make sustainable improvements for future generations.</p>

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<p>Component SSSIs</p>	<p>N/A</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>The area within and around the Pen Llŷn a'r Sarnau SAC is fundamentally rural with very little, if any, heavy industry. The sea and adjacent land is widely used for a variety of commercial and recreational activities with tourism, farming and fishing providing key sources of income to the local economy. The main settlements of the area are concentrated around the coast (e.g. Pwllheli, Porthmadog, Barmouth, Aberdyfi) although the inland towns of Dolgellau and Machynlleth are in close proximity to the upper reaches of the estuaries of the SAC. Although parts of the coast of the SAC are relatively inaccessible due to their topography or restricted land access, many areas within the SAC can be accessed from the main coastal settlements or from small roads, slipways and beaches throughout the site.</p> <p>Many parts of the landward boundary of the SAC remain unmodified but others have been altered and there are extensive stretches of coastal and flood defences in some areas. Along the coast these defences comprise mainly sea walls and rock armour and, within the estuaries, flood defence embankments of one sort or another. Smaller stretches of defence using gabions, rock armour and less organised rock rubble are used to protect some properties. Beach re-charge using coarse sediment dredged from the entrance to Pwllheli harbour is being used in conjunction with rock armour defences to protect part of the coastal frontage near Pwllheli (at Traeth Crugan).</p> <p>In the past extensive modifications have been made to the estuaries which have generally resulted in land take from each estuary. This has usually been due to the construction of embankments, sea defence works and land drainage schemes, with the process of land reclamation starting before the end of the 19th century and continuing up until the 1980's in some areas. Many of the historical impacts were as a result of the large scale construction of structures within and adjacent to the estuaries, such as the Cob at Porthmadog, the railway bridge in the Mawddach and the railway embankment in the Dyfi. Flood embankments have also been constructed to protect agricultural land reclaimed from the estuary.</p> <p>A wide range of recreational activities take place in and around the SAC. Water-based recreation (such as swimming, sailing, power</p>

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	<p>boating (including jet skis), diving and kayaking) is very popular and a very important part of the tourist-based economy of the area. There are various facilities around the site to support this including marinas, harbours, slipways and associated support services. Several national and international boating events (sail and power boats) take place in the SAC every year, many of them using the marina facilities at Pwllheli. There are a number of beaches that are particularly popular with holidaymakers during the summer season and these see visitor numbers peak during the summer months. Equally, there are many smaller quieter areas around the coast that people specifically come to the area to enjoy. Recreational sea angling is popular in the SAC and takes place from the shore and from boats. Some angling charter boats operate within the SAC. Wildlife watching is increasing in popularity and there are boats which operate during the summer months to take people out to some of the more accessible islands and coast to see the wildlife.</p> <p>The area of the SAC is important for commercial fishing, with the main fishing being potting for lobsters and crabs, although potting for prawns and whelks also occurs. Some netting (drift and set gill nets and some tangle netting) occurs in the SAC. Historically very little trawling and dredging has taken place in the SAC, although there is an increased interest in scallop dredging in general and this has resulted in the implementation of a number of closed areas in the SAC through byelaws of the North Western and North Wales Sea Fisheries Committee in order to safeguard the features of the SAC. Whilst there has been interest expressed in possible mariculture activities in an adjacent to the SAC currently the only commercially operating business is a land-based fish farm on the Llŷn using a recirculating water system. There are, however, some small-scale mussel rope culture trials underway in the SAC.</p> <p>Extensive areas of the adjacent coastal land bordering the SAC are farmed and the saltmarsh areas of the estuaries of the SAC (Glaslyn/Dwryd, Mawddach and Dyfi) are grazed, mainly by sheep but also cattle and horses.</p> <p>There have been historical changes in sewage treatment and disposal with a number of improvements over recent years through upgrading of the main sewage treatment plants and installation of small treatment systems for those premises not using the main sewage system (e.g. installation of small individual treatment systems for homes and businesses adjacent to the SAC, e.g. caravan sites). As a result water</p>

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	<p>quality within the SAC should have improved. Diffuse inputs into the SAC, particularly within the estuary catchments, together with discharges via combined sewer outfalls are not well known. With the prospect of increasing rainfall as a result of climate change this input may become a more substantial contribution. Forestry is a significant land use within the catchment area of the Mawddach and Dyfi estuaries, with many of the forests here composed of even-aged stands of predominantly mixed conifer.</p> <p><u>Human Activities</u></p> <p>These conservation objectives recognise and acknowledge that human activity has already modified and continues to modify habitats and species populations in various ways, to varying degrees and at varying spatial and temporal scales, either acutely or chronically. The conservation objectives do not aim to prevent all change to the habitat and species features, or to achieve an indefinable, abstract natural or pristine state, since these would be unrealistic and unattainable aspirations. Rather, they seek to prevent further negative modification of the extent, structure and function of natural habitats and species' populations by human activity and to ensure that degradation and damage to the features that is attributable to human activities or actions is prevented. Consequently, in order to meet the requirements of the Directive and ensure the site makes its appropriate contribution to conservation of biodiversity, the conservation objectives seek to:</p> <ul style="list-style-type: none"> • Encompass inherent dynamism rather than to work against it. • Safeguard features and natural processes from those impacts of human activity that cause damage to the features through the degradation of their range, extent, structure, function or typical species. • Facilitate, where necessary, restoration of features or components of features that are currently damaged or degraded and in unfavourable condition. <p>The term <i>degradation</i> is used to encompass damage or deterioration resulting only from such human activities or actions as have a detrimental effect on the feature. The magnitude of any degradation is dependent on the longevity and scale of the impact and the conservation importance of the species or habitats on which the impact occurs. This is influenced by the type of human action, its nature, location, timing, frequency, duration and intensity and the species or habitats, and their intolerance and recoverability.</p>

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	<p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Reefs. Large shallow inlets and bays. Sandbanks which are slightly covered by sea water all the time. Estuaries. Coastal lagoons. Mudflats and sandflats not covered by seawater at low tide. Atlantic salt meadows <i>Glauco Puccinellietallia maritima</i>. <i>Salicornia</i> and other annuals colonising mud and sand. Submerged or partially submerged sea caves.</p> <p><u>RANGE</u></p> <ul style="list-style-type: none"> • The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. <p>For the reef feature these include:</p> <ul style="list-style-type: none"> ○ Rocky intertidal reefs. ○ Rocky subtidal reefs. ○ Extensive boulder and cobble reefs – the sarnau. ○ Biogenic reefs (horse mussel <i>Modiolus modiolus</i> reef / green crenella <i>Musculus discors</i> reef and Honeycomb worm <i>Sabellaria alveolata</i> reef. ○ Carbonate reef formed by methane gas leaking from the seabed. <p>For the intertidal mudflat and sandflat feature these include:</p> <ul style="list-style-type: none"> ○ <i>Mya arenaria</i> and polychaetes in muddy gravel. ○ Eel grass <i>Zostera marina</i> beds. ○ Muddy gullies in the Mawddach estuary. <p>For the <i>Salicornia</i> feature this includes:</p> <ul style="list-style-type: none"> ○ Communities characterised by the species <i>Sarcocornia perennis</i>. <p>For the intertidal mudflats and sandflats and sandbanks features this requires an overall stability or increase in the amount of the feature, taking into account the areas of long term stability and localised losses and additions arising from environmental processes. For estuaries this includes the stability of sandy sediments in proportion to the muddy sediments.</p>

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	<p><u>Restoration and Recovery</u> – As part of this objective it should be noted that; for the estuaries feature additional land which should form an integral part of the estuarine ecosystem should be restored.</p> <p><u>STRUCTURE AND FUNCTION</u></p> <ul style="list-style-type: none"> • The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. <p>Important elements include:</p> <ul style="list-style-type: none"> ○ Geology. ○ Sedimentology. ○ Geomorphology. ○ Hydrography and meteorology. ○ Water and sediment chemistry. ○ Biological interactions. <p>This includes a need for nutrient levels in the water column and sediments to be:</p> <ul style="list-style-type: none"> ○ At or below existing statutory guideline concentrations. ○ Within ranges that are not potentially detrimental to the long term maintenance of the features species populations, their abundance and range. <p>Contaminant levels in the water column and sediments derived from human activity to be:</p> <ul style="list-style-type: none"> ○ At or below existing statutory guideline concentrations. ○ Below levels that would potentially result in increase in contaminant concentrations within sediments or biota. ○ Below levels potentially detrimental to the long-term maintenance of the features species populations, their abundance or range. <p>For Atlantic saltmeadows this includes the morphology of the saltmarsh creeks and pans</p> <p><u>Restoration and recovery</u> – As part of this objective it should be noted that; for the estuaries feature the structure and functions of the estuaries that have been damaged/degraded by the constraints of artificial structures such as flood banks, are restored.</p> <p><u>TYPICAL SPECIES</u></p> <ul style="list-style-type: none"> • The presence, abundance, condition and diversity of typical species are such that habitat quality is not degraded.

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	<p>Important elements include:</p> <ul style="list-style-type: none"> ○ Species richness. ○ Population structure and dynamics. ○ Physiological health. ○ Reproductive capacity. ○ Recruitment. ○ Mobility. ○ Range. <p>As part of this objective it should be noted that:</p> <ul style="list-style-type: none"> ○ Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term. ○ The management and control of activities or operations likely to adversely affect the habitat feature, is appropriate for maintaining it in favourable condition and is secure in the long term. <p>Restoration and recovery – As part of this objective it should be noted that; for the reefs feature the potential for expansion of the horse mussel <i>Modiolus modiolus</i> community off the north Llŷn coast is not inhibited.</p> <p>Bottlenose dolphin. Otter. Grey seal.</p> <p><u>POPULATIONS</u></p> <ul style="list-style-type: none"> • The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements are population size, structure, production, and condition of the species within the site. <p>As part of this objective it should be noted that:</p> <ul style="list-style-type: none"> ○ for bottlenose dolphin, otter and grey seal; contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression. ○ grey seal populations should not be reduced as a consequence of human activity. <p><u>RANGE</u></p>

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	<ul style="list-style-type: none"> • The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future. <p>As part of this objective it should be noted that for bottlenose dolphin, otter and grey seal:</p> <ul style="list-style-type: none"> ○ Their range within the SAC and adjacent inter-connected areas is not constrained or hindered. ○ There are appropriate and sufficient food resources within the SAC and beyond. <p>The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing.</p> <p><u>SUPPORTING HABITATS AND SPECIES</u></p> <ul style="list-style-type: none"> • The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. <p>Important considerations include:</p> <ul style="list-style-type: none"> ○ Distribution. ○ Extent. ○ Structure. ○ Function and quality of habitat. ○ Prey availability and quality. <p>As part of this objective it should be noted that:</p> <ul style="list-style-type: none"> ○ The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term. ○ The management and control of activities or operations likely to adversely affect the species feature, is appropriate for maintaining it in favourable condition and is secure in the long term. ○ Contamination of potential prey species should be below concentrations potentially harmful to their physiological health. ○ Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour.

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	<ul style="list-style-type: none"> ○ For otter there are sufficient sources within the SAC and beyond of high quality freshwater for drinking and bathing. <p>Restoration and recovery – As part of this objective it should be noted that for the bottlenose dolphin and otter, populations should be increasing.</p> <p>For further information refer to Pen Llyn a'r Sarnau/Llyn Peninsula and the Sarnau European Marine Site comprising: Pen Llyn a'r Sarnau/Llyn Peninsula and the Sarnau Special Area of Conservation Special Area of Conservation (2009) available at: http://www.ccg.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/idoc.ashx?docid=6912ad5e-6ec0-4a0d-bf0b-545f03b33452&version=-1)</p>
<p>SAC Condition Assessment</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time. • Estuaries. • Coastal lagoons. • Large shallow inlets and bays. • Reefs. • Mudflats and sandflats not covered by seawater at low tide. • Salicornia and other annuals colonising mud and sand. • Atlantic salt meadows <i>Glauco Puccinellietallia maritima</i>. • Submerged or partially submerged sea caves. • Bottlenose dolphin. • Otter. • Grey seal. <p><u>For all of the above, the condition is stable or increasing.</u></p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Development and Disturbance</u> Construction, e.g. of slipways, coastal defence and marinas/harbours could cause disturbance to the estuarine, intertidal mudflat and sandflat, and reef habitats and disrupt physical processes essential for maintenance of these habitats. NRW is consulted by the local planning authorities and other statutory bodies over such developments.</p> <p>Certain reef communities are vulnerable to disturbance from specific</p>

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	<p>fishing methods, in particular heavy bottom-fishing gear. NRW will liaise with the relevant Sea Fisheries Committee to identify ways of minimising impact on habitats as well as keeping a watching brief on the levels of such fishing activity. The potential impacts of heavy bottom-fishing gear on the subtidal sandbank and shallow inlet and bay habitats will need to be assessed.</p> <p><u>Major Development Projects and Pollution</u> There is the possibility of future drilling for oil and gas in Cardigan Bay and the Irish Sea as well as the possibility of offshore wind power developments – NRW is advising the Department of Trade and Industry on potential impacts and possible ways of minimising these.</p> <p>Many of the marine wildlife communities in the cSAC are sensitive to oil pollution. The development of oilwells and boat traffic in the Irish Sea present potential pollution sources. NRW is working with the oil companies and with other statutory organisations so that adequate safety measures are in place to try and prevent pollution incidents. Also, NRW is a member of the North Wales Standing Environment Group which is preparing a regional contingency plan to help coordinate response to try and minimise environmental impacts in the event of a pollution incident.</p> <p>Some of the key activities and issues directly or indirectly influenced by human activity that are currently believed to be actual or potential threats to the long term sustainability of the habitats and wildlife of the SAC and which either require better management or further investigation include (not in any particular order):</p> <ul style="list-style-type: none"> • <u>Coastal & Flood Defence</u>: constraint on the functioning of the coastal and estuarine areas from artificial boundaries which affects the extent of habitat (coastal squeeze). Need for strategic plans for vulnerable areas of the coast. • Land use management in the surrounding catchments (including forestry management) and the influence of this on the estuarine and coastal habitats. Need for integrated planning. • <u>Water quality and nutrient enrichment.</u> • <u>Harvesting of marine resources</u> (commercial and non-commercial): need for improved management and regulatory regime to prevent damage to SAC features and support sustainable harvesting regimes. • Mobile fishing gear. • <u>Over grazing</u> in some locations in the estuaries.

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	<ul style="list-style-type: none"> • High speed power craft (including PWCs). • <u>Litter & debris.</u> • <u>Climate change issues</u> (e.g. warming sea water temperature, sea level rise, increase storminess). • <u>Introduction of non-native species.</u> • <u>Marine wildlife watching / Eco tourism.</u> • Scientific research. • Poor public awareness and lack of understanding or interest in the marine environment.
<p>Landowner/ Management Responsibility</p>	<p>No Information available.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Gwynedd Council's Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p> <p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p>

<p>Site Name: Craig yr Aderyn Location Grid Ref: SN708719 JNCC Site Code: UK9020283 Size: 89.43 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The high crag of Craig Yr Aderyn, rising from sea level to over 250 metres is a striking landscape feature on the south side of the Dysynni valley. The site is a Special Protection Area because it is an important breeding and roosting site for chough.</p> <p>Craig yr Aderyn itself forms the core of a large anticline where Ordovician rock comprising the Craig Cau formation outcrops. These predominantly igneous rocks consist of rhyolitic ash-flow tuffs that have in the past been quarried for road stone.</p> <p>The crags used to regularly support over 1% of the British population of breeding chough, with five or six pairs nesting in holes and crevices, making this the densest population of breeding chough in the British Isles (six pairs in 0.5Km). However, in recent years breeding numbers have declined to 3-4 pairs. Craig yr Aderyn is also a roost site for chough throughout the year, with non-breeders in the summer and high numbers outside the breeding season. During the period 1991/92-1995/96 the average maximum count was 56, however since then the number of roosting birds has fallen to an average of 18 during the 1999/00-2004/05 period. It has become clear that the birds using Craig yr Aderyn are part of a metapopulation that spend much of the year in south Meirionydd, with the other principle roosting site being at Tonfannau Quarry, 8 kms away, near Tywyn.</p> <p>In recent years the origin of individuals using Craig yr Aderyn has been established by tracing colour–ringed chicks. The results to date indicate that the birds using this site were born in Ceredigion and Montgomeryshire and have fledged from nests up to 70kms away. There are only a few records of birds from north Gwynedd.</p> <p>Craig yr Aderyn was formerly located on the Dysynni estuary. This was drained in the Eighteenth century and so the rock now overlooks farmland and is 7 kms from the sea. Despite this the Rock supports a breeding colony of cormorants, the only regular inland nesting site in Wales. The colony was first recorded by Edward Llyud in 1695 and was mentioned in Thomas Pennant’s “Tour in Wales “ in 1784. Over 60 pairs of cormorant nest on the crags, which represent about 1% of the GB breeding population. Other breeding species include barn owl, peregrine, redstart, wheatear, linnets and little owl.</p> <p>To the north and east of the crags, there is a large area of unimproved acid grassland mixed with bracken. This is one of the major factors influencing the number of breeding and roosting chough, as they</p>

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	<p>require an unimproved sward, rich in their main food, soil invertebrates and short enough for chough to be able to use their beaks to probe for food. Acidic, dry heathland occurs in the south-eastern part of the site. A small area of base-enriched marshy grassland above Gesail adds to the plant diversity with species such as common butterwort <i>Pinguicula vulgaris</i>, many-stalked spike-rush <i>Eleocharis multicaulis</i> and pale sedge <i>Carex Pallescens</i> and mosses such as <i>Campylium stellatum</i>, <i>Ctenidium molluscum</i> and <i>Fissidens adianthiodes</i>.</p> <p>The north facing cliffs and slopes support a good range of moss and liverwort species. Of particular note are the nationally scarce mosses growing on boulders in the scree; <i>Grimmia decipens</i>, which appears to be decreasing in its national range and <i>Hedwigia integrifolia</i> which occurs here at its southernmost location in Britain. The uncommon liverwort <i>Jubula hutchinsiae</i> has been recorded from streamside rocks. On rocky areas above the main cliff face Wilson's filmy fern <i>Hymenophyllum wilsonii</i> and oak fern <i>Gymnocarpium dryopteris</i> have been recorded.</p>
<p>Qualifying Features</p>	<p>Annex 1 species that are a primary reason for selection of Craig yr Aderyn SPA</p> <ul style="list-style-type: none"> • Chough <i>Pyrhocorax pyrrhocorax</i>.
<p>Conservation Objectives</p>	<p>Vision for the site: Craig yr Aderyn or Birds Rock is an impressive outcrop rising from sea level to over 250 metres on the south side of the Dysynni valley, near Tywyn. Until the Eighteenth century the Dysynni estuary reached up to the foot of the Rock, but this was drained and the sea is now 7 kms away.</p> <p>Craig yr Aderyn is a Special Protection Area because choughs breed and roost here. Choughs are an uncommon species of crow declining in much of Europe. Up to 6 pairs breed and up to 50-60 roosting birds can be present in some months. In recent years numbers have declined, however it is clear that the birds at Craig Yr Aderyn form part of a metapopulation, using a number of sites in the area. Numbers of chough within the metapopulation are thought to be stable or increasing.</p> <p>We want chough to continue to breed and roost at Craig yr Aderyn and for this to happen it is important that there continues to be suitable undisturbed crevices for the choughs to nest in and short grassy vegetation nearby for them to feed on. We would not wish to see</p>

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	<p>bracken encroaching any further, nor sheep numbers declining.</p> <p>Craig Yr Aderyn also has a breeding colony of cormorants which was first recorded by Edward Lluyd in 1695 and was mentioned in Thomas Pennant's "Tours in Wales" in 1784. We want to see 60 to 100 pairs of cormorants nesting over the main rock face and occupying all available ledges.</p> <p>Annex 1 species that are a primary reason for selection of Craig yr Aderyn SPA</p> <ul style="list-style-type: none"> • Chough <i>Pyrrhocorax pyrrhocorax</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The breeding population of Chough is at least 5 pairs. • The winter roosting population should be at least 27 birds. • Sufficient suitable habitat is present to support the populations. • The factors affecting the feature are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 2 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on tenure.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Annex 1 species that are a primary reason for selection of Craig yr Aderyn SPA</p> <ul style="list-style-type: none"> • Chough <i>Pyrrhocorax pyrrhocorax</i>. <p>Sufficient undisturbed breeding, roosting and feeding habitat needs to be available to support the population and allow expansion. Chough require short-grazed grassland, thin soils on rock outcrops and cliffs, open-structure heathland and grazed cloddiau for feeding; these habitats are available in the SPA, but the birds do spend a lot of time foraging on similar habitat outside the SPA boundary. Soil dwelling invertebrates form the principle component of the choughs diet. These invertebrates are most abundant in warm free-draining soils, while choughs require short, open swards to feed efficiently. Coprophagus beetle larvae have been shown to be a very important component of the diet of some chough populations. The agriculture of the area is predominantly pastoral with sheep, beef cattle and widespread silage production. Additional control of bracken and heathland management will increase available habitat.</p>

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	<p>It is also essential that disturbance during the breeding season is kept to a minimum. The most likely cause of disturbance is climbing and hence maintenance of the current voluntary agreement with the British Mountaineering Council prohibiting climbing between April and July is crucial.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Internationally important population (1% or more of the Great Britain population) of breeding and non-breeding season Chough <i>Pyrrhocorax pyrrhocorax</i>.</p> <ul style="list-style-type: none"> • Breeding population. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – To contribute towards maintaining the Chough population in a favourable condition where, in 3 out of 5 consecutive years: The SPA breeding population is at least 5 pairs. <p>Based on performance indicators and targets as set out in the SPA review site account.</p> <ul style="list-style-type: none"> • Breeding productivity. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – To contribute towards the maintenance of the chough population in favourable condition where, during a six year monitoring period: The average number of young fledged per occupied territory will be at least 2. <p>Based on annual productivity surveillance data.</p> <ul style="list-style-type: none"> • Roosting Chough. <ul style="list-style-type: none"> ○ Upper limit – None set. ○ Lower limit – The SPA wintering population (maximum count) is at least 27 birds. <p>Based on performance indicators and targets as set out in the SPA review site account.</p> <ul style="list-style-type: none"> • Foraging habitat condition. <ul style="list-style-type: none"> ○ Upper limit – Grazing levels will not lead to excessive poaching damage. ○ Lower limit – The site will be moderately grazed (0.34

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	<p>LSU/ha, which is the current agreed Tir Gofal grazing level).</p> <p>Acidic grassland requires grazing to prevent the encroachment of scrub, bracken and gorse. Ideally, cattle and ponies are preferable to sheep as they are less- selective grazers. Economic factors could result in a reduction in grazing, making the site unsuitable for chough to feed.</p> <ul style="list-style-type: none"> • Disturbance of Clough. <ul style="list-style-type: none"> ○ Upper limit – no breeding attempts to be know to fail because of impact of human disturbance. ○ Lower limit – None set. <p>Based on surveillance.</p> <ul style="list-style-type: none"> • Burning. <ul style="list-style-type: none"> ○ Upper limit – To maintain open heathland the dwarf-shrub vegetation will be managed by burning or cutting on a 12 year rotation so that $\frac{1}{12}$ of the habitat will be managed each year. ○ Lower limit – A quarter of the heathland vegetation will be in early pioneer stage (0-3 years old) at any time. <p>The western part of the site above Gesail is dominated by western gorse and bracken. Burning is likely to favour bracken and western gorse, so this should not be used as a management tool where these species are likely to invade. Cutting or spraying may be more appropriate in these areas. Some cutting, spraying or burning management is necessary to maintain a diverse age structure and prevent further spread of these species. This should occur as long-term small-patch burning on a 12-year rotation. Burning should not occur unless followed up by grazing.</p> <ul style="list-style-type: none"> • Bracken. <ul style="list-style-type: none"> ○ Upper limit – There should be no more than 5 fronds bracken within a 2m radius in 75% of the habitat. ○ Lower limit – There should no more than 5% of unbroken stands of bracken. <p>Bracken dominates large areas on the western side of the site cliffs and may be spreading into areas of acid grassland. Spraying is probably the most effective to prevent the spread of bracken, however the presence of species of uncommon ferns, means that spraying has to be very carefully targeted.</p>

<p>Site Name: Craig yr Aderyn Location Grid Ref: SN708719 JNCC Site Code: UK9020283 Size: 89.43 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Craig Yr Aderyn (Birds Rock) Spa (2008)</i> available at: http://www.NRW.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/idoc.ashx?docid=f6eee934-a3f0-4fd9-8917-787b9a05f0a7&version=-1</p>
<p>SAC Condition Assessment</p>	<ul style="list-style-type: none"> • Chough <i>Pyrrhocorax pyrrhocorax</i>: Favourable, Maintained.
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Disturbance</u> The crags regularly support over 1% of the British population of breeding chough, and 8% of the British wintering population, as it is also a roost site for this species. It is the site of the only regular in-land breeding colony of cormorant in Wales.</p> <p>Both these species are vulnerable to disturbance as the crags are a well known climbing site. This is being addressed by imposing restrictions on when the activity can take place. The grazing pressure is regulated by a Tir Gofal management agreement at the moment, to produce favourable chough feeding habitat.</p>
<p>Landowner/ Management Responsibility</p>	<p>Management Unit 1 – Mainly common land with several legal interests. Management Unit 2 – Former quarry now owned by SNPA.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Gwynedd Council's Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Screening_Report.pdf</p>

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Dyfi Estuary is located on the west coast of Wales on the boundary between Ceredigion, Gwynedd and Powys. The SPA comprises the estuary, with adjoining saltmarsh, marshy grassland and improved grassland. The estuarine complex is of outstanding physiographic interest. It includes sandbanks, mud-flats, saltmarsh, peatbogs, river channels and creeks, with an extensive sand dune complex across the mouth of the estuary. The estuary itself is a feature of the Penllyn a'r Sarnau marine SAC.</p> <p>The site is of importance as a traditional wintering area for Greenland White-fronted Goose <i>Anser albifrons flavirostris</i> – the most southerly regularly used area for this population in the UK. Until the early 1980s the geese roosted on the estuary and flew inland either to the Cambrian mountains or to the raised bog of Cors Fochno to feed. The geese now use the saltmarsh and grasslands for feeding and roost on the sandbanks and mud-flats.</p> <p>A general decline in Greenland white-front populations is reported due to the birds having a delayed age of first breeding, leading to a reduction of young birds. It appears that something is stopping the birds from achieving breeding condition and therefore very few geese are surviving long enough to breed (Fox A.D. pers.comm. 2008). Interspecific competition with Greater Canada Geese on the breeding grounds in Greenland, and poor weather, has been cited as possible reasons but the influential factors are not fully understood. Worldwide numbers have declined from a high of 35,600 in 99/00 to an estimated 24,895 in 2006 with poor numbers of young recorded in that period. This is reflected in the Dyfi wintering flock, which has contained very few young geese in recent years, and where wintering numbers have declined steadily from 167 in 1998/99 to a maximum of 102 in the last three winters (2005-6 to 2007-8). The decline is also mirrored at other sites such as in SW Scotland and at Wexford.</p> <p>The Dyfi Estuary is the sole remaining wintering site in Wales and the most southerly in the UK. It is both a roosting and feeding area, and is particularly important in the context of maintaining the traditional wintering range within the UK. However, evidence of past range contraction suggests that small isolated populations are particularly vulnerable.</p>
<p>Qualifying Features</p>	<p>SPA Features that are the reason for selection:</p> <ul style="list-style-type: none"> • Greenland White-fronted Goose <i>Anser albifrons flavirostris</i>.

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Conservation Objectives</p>	<p>Vision for the Site The site will continue to provide a safe refuge, with all of the environmental conditions necessary to sustain nationally important numbers of over-wintering Greenland white-fronted geese in the long-term.</p> <p>SPA Features that are the reason for selection:</p> <ul style="list-style-type: none"> • Greenland White-fronted Goose <i>Anser albifrons flavirostris</i>. <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • The Dyfi wintering population attains national importance level (ie.1% of the national (UK) population), annually. • Winter mortality levels are <1% annually. • Juvenile/ sub-adult birds comprise > 5% of the wintering population annually. • All site-specific factors affecting the achievement of these conditions (eg. avoidable disturbance), are under control.
<p>Component SSSIs</p>	<p>The plan area has been divided into 13 management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based mainly on a combination of habitat boundaries and, where appropriate, tenure or land management requirements.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>SPA Features that are the reason for selection:</p> <ul style="list-style-type: none"> • Greenland White-fronted Goose <i>Anser albifrons flavirostris</i>. <p>Information on past changes to the range and distribution of wintering populations indicates that the Dyfi Greenland white-front population is highly vulnerable to further decline and subsequent loss. Data analysis (Fox <i>et al.</i> 1998) indicates that size, number and quality of feeding areas, levels of disturbance, flock size and site latitude are all factors that influence flock status.</p> <p>The Dyfi flock is the only one surviving in mainland UK south of the Scottish border, and is both small, isolated and at the southern edge of its range.</p> <p>Management requirements at Dyfi need to concentrate on:</p> <ul style="list-style-type: none"> • Maintaining the extent and quality of grazing. • Ensuring minimum disturbance of feeding and roosting areas.

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<ul style="list-style-type: none"> • At present there is insufficient control over either of these requirements, even though a greater extent of SPA land is under conservation management than in previous decades. Wildfowling activities whilst having minimal direct impact on the geese are reported to cause disturbance to the birds from adjacent parts of the wildfowling zone (RSPB pers. comm.). <p>The geese also remain vulnerable to shooting and disturbance on private farmland and statutory protection for the species is highly desirable.</p> <ul style="list-style-type: none"> • Information is required on the frequency of disturbance at Dyfi feeding/ roosting sites, and on distances from sources of disturbance. • Further information on grazing behaviour within the site in relation to sward nutrition value and possible competition from greater Canada goose is recommended. • In addition further research is required on the breeding grounds in Greenland to determine more clearly the factors which appear to be delaying breeding activity amongst younger adult birds and depressing population recruitment <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Greenland white-fronted goose <i>Anser albifrons flavirostris</i></p> <ul style="list-style-type: none"> • Population size. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 209 geese (current 1% UK population level). <p>The number of geese in the wintering flock is a key indicator of population health. 1% of the national population is regarded as the level at which 'national importance' threshold is met.</p> <ul style="list-style-type: none"> • Winter survival / mortality rate. <ul style="list-style-type: none"> ○ Upper limit – Not required. ○ Lower limit – 98% winter survival rate. <p>High over-winter survival rates indicate that shooting has not directly affected the population in recent years and that suitable wintering habitat has been adequately available. Indirectly, disturbance may be critical in affecting condition, survival and reproductive capability (see 'disturbance of goose feeding and roosting habitat' below).</p> <ul style="list-style-type: none"> • Proportion of juvenile geese to adults. <ul style="list-style-type: none"> ○ Upper limit – Not required.

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<ul style="list-style-type: none"> ○ Lower limit – flock contains 5% juvenile/sub-adult birds. <p>NB. Whilst management at the wintering site cannot directly influence this attribute, it is considered to be a valuable indicator of the population health. This indicates the level of population recruitment, which is important in maintaining the long-term viability of the goose population.</p> <ul style="list-style-type: none"> • Disturbance of goose feeding and roosting habitat. <ul style="list-style-type: none"> ○ No information provided. <p>The geese are easily disturbed by human activity, even from a considerable distance away. Currently, geese can suffer disturbance from two main sources: i) from land management activities eg farming and utility management; ii) from shooting on land in close proximity to goose feeding/roosting areas. Statutory protection and/or additional management agreements are required. In addition, no disturbance buffer zones should be considered around key feeding/roosting areas.</p> <ul style="list-style-type: none"> • Sward height. All saltmarsh and grassland swards in the SPA: <ul style="list-style-type: none"> ○ Lower limit – Annual summer livestock grazing at moderate intensity. <p>Units 5.2, 8.1 and 8.2:</p> <ul style="list-style-type: none"> ○ Lower limit – Mean sward height of < 15cm in early October. <p>The geese graze on both saltmarsh and improved grasslands where the turf is kept relatively short by livestock grazing over the summer. Key grazing areas utilised consistently in recent years are at Hen Hafod (Unit 5.2) and Penmaen Isaf (Units 8.1 & 8.2).</p> <p>For further information refer to <i>the Core Management Plan (including Core Objectives) for Dyfi Estuary/Aber Dyfi SPA (2008) available at: http://www.NRW.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/idoc.ashx?docid=f1ea292f-ebda-4e6e-8b7c-06fc7bcd98a6&version=-1</i></p>
<p>SAC Condition Assessment</p>	<p>Greenland White-fronted Goose <i>Anser albifrons flavirostris</i>: Declining; Unfavourable</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Disturbance</u> The Dyfi estuary regularly supports over 1% of the GB wintering population of Greenland white-fronted geese, and as the only site in</p>

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>England and Wales, it is the most southerly population in the UK. Disturbance by leisure activities including wildfowling, and also low-flying aircraft, may be significant to feeding and roosting geese. NRW and the RSPB lease the sporting rights over the majority of the site. The sporting rights are let to local wildfowling clubs within the NNR where there is a voluntary ban on shooting the geese. There are also sanctuary areas where no shooting takes place within the eastern half of the estuary. The SPA is warded by NRW and the RSPB and disturbance from leisure activities is monitored.</p> <p><u>Acidification</u> Contained as a vulnerability within River Basin Management Plan: Western Wales River Basin District, 2009. A challenge to preserve and enhance the integrity of the Dyfi Estuary is that of acidification. Acidification of rain and soils, due to atmospheric pollution, and nutrient enrichment (especially increased nitrogen and phosphorus), through a combination of atmospheric pollution, excessive dunging/urination in areas where stock preferentially graze and other inputs from diffuse sources. The majority of atmospheric pollution typically comes from distant, diffuse sources, such as traffic and domestic emissions, but some can be attributed to large point sources, such as major power stations or industrial processes.</p> <p><u>Grazing</u> Appropriate grazing of the saltmarsh and grassland is important to maintain feeding areas.</p> <p><u>Non Native Species</u> There is an increasing resident flock of Canada geese on the estuary of approximately 2,000 birds. The interactions between this species and the Greenland white-fronted geese and the impact on the habitat are unknown.</p>
<p>Landowner/ Management Responsibility</p>	<p>Much of the saltmarsh is now owned and managed by RSPB, who are grazing to maintain relatively short swards suitable for grazing wildfowl. The geese also use areas of farmland where no form of protection exists, and where further disturbance can occur.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of the Ceredigion Local Development Plan (2007-2022) Deposit December 2010 available at: http://www.ceredigion.gov.uk/index.cfm?articleid=17756</p> <p>HRA Screening of Gwynedd Council's Unitary Development Plan (2001-2016) June 2008 available at: http://www.gwynedd.gov.uk/upload/public/attachments/946/HRA_Scree</p>

<p>Site Name: Dyfi Estuary JNCC Site Code: UK9020284 Size: 2056.60 ha Designation: SPA</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p><u>ning_Report.pdf</u></p>

<p>Site Name: Downton Gorge Location Grid Ref: SN708719 JNCC Site Code: UK0012735 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Downton Gorge (69.3ha) is an example of <i>Tilio-Acerion</i> forests in a narrow ravine with a distinctive microclimate and a variety of slopes and aspects. Both small leaved lime <i>Tilia cordata</i> and large-leaved lime <i>T. platyphyllos</i> occur, together with ash <i>Fraxinus excelsior</i> and elm <i>Ulmus spp.</i> The ground flora includes wood fescue <i>Festuca altissima</i> and violet helleborine <i>Epipactis purpurata</i>. The gorge cliffs are rich in ferns, reflecting the humidity of the site, with a wide range of species recorded. The site is potentially vulnerable to the effects of air- and water-borne pollution, particularly in respect of its significant lichenological interest. However these effects are not related to the management of the site.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection for this site:</p> <ul style="list-style-type: none"> • <i>Tilio-Acerion</i> forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes).
<p>Conservation Objectives</p>	<p>Vision for the site: Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features. Subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of qualifying natural habitats and habitats of qualifying species. • The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species. • The supporting processes on which qualifying natural habitats and habitats of qualifying species rely. • The populations of qualifying species. • The distribution of qualifying species within the site. <p>Annex 1 species that are a primary reason for selection.</p> <ul style="list-style-type: none"> • <i>Tilio-Acerion</i> forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes). <p>The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:</p>

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	<ul style="list-style-type: none"> • No loss of ancient semi-natural stands. • At least current area of recent semi-natural stands maintained, although their location may alter. • No loss of ancient woodland. • No reduction in the number of veteran trees.
<p>Component SSSIs</p>	<p>Habitat Types represented (Biodiversity Action Plan categories).</p> <ul style="list-style-type: none"> • Broadleaved, Mixed and Yew woodland – Lowland. <p>Species categories.</p> <ul style="list-style-type: none"> • Lichen assemblage. <p>Geological features (Geological Site Types).</p> <ul style="list-style-type: none"> • Inland Outcrops (EO). • River and Stream sections (EW). • Road, rail and canal cuttings (ER). • Disused quarries and pits (ED). <p>The above species apart from the Broadleaved, Mixed and Yew woodland – Lowland are SSSI designated interest features.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p><u>Synthesised Conditions to Maintain Integrity</u></p> <ul style="list-style-type: none"> • Understorey (2-5m) present over at least 20% of total stand area. • Canopy cover present over 30-90% of stand area. • At least three age classes spread across the average life expectancy of the commonest trees. • Some areas of relatively undisturbed mature/old growth stands or a scatter of large trees allowed to grow to over-maturity/death on site (e.g. a minimum of 10% of the woodland). • A minimum of 3 fallen lying trees >20 cm diameter per ha and 4 trees per ha allowed to die standing. • At least 95% of cover in any one layer of site-native or acceptable naturalised species. • Minimum levels of particular native tree/shrub species (where important and appropriate): No loss of <i>Tilia platyphyllos</i> and <i>T. cordata</i> and <i>Sorbus torminalis</i>. • Death, destruction or replacement of native woodland species through effects of introduced fauna or other external

<p>Site Name: Downton Gorge Location Grid Ref: SN708719 JNCC Site Code: UK0012735 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>unnatural factors not more than 10% by number or area in a five year period.</p> <ul style="list-style-type: none"> • 80% of ground flora cover referable to NVC communities to W10, W8 and transition to alder wood by the river. (See Whild Associates, 1999 for NVC survey). • Distinctive species present eg <i>Festuca altissima</i>, <i>Scrophularia umbrosa</i>, <i>Convallaria majalis</i>, <i>Paris quadrifolia</i> in the ground flora and <i>Sedum forsterianum</i> on rocky slopes (see Whild Associates, 1999). Also <i>Tilia</i> spp and <i>Sorbus torminalis</i> (see above). • 15 species of ferns still present including <i>Gymnocarpium dryopteris</i> (Oak Fern) and Brittle Bladder Fern (<i>Cystopteris fragilis</i>). • Populations of locally notable invertebrate species, eg Coleoptera of dead wood, are important quality indicators but there is insufficient data to be able to set targets (other than targets set for deadwood). • Patches of associated habitats and transitions eg to alder alongside river, species rich rock faces, maintained in extent. • The Lichen flora of mature trees is an important quality indicator, See separate tables. • Signs of seedlings growing through to saplings to young trees at sufficient density to maintain canopy density (or equivalent regrowth from coppice stumps). • No planting, apart from exceptional circumstances to restore conifer plantation to broadleaves. • Sycamore not preventing regeneration of native trees and shrubs. • Himalayan Balsam not able to colonise woodland. • <i>Rhododendron</i> tolerated by the river as Otter cover and under Beech stands as poses no threat to native flora. Elsewhere should be prevented from colonising. <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Having researched the JNCC and Natural England websites', no further information could be found. Therefore the above will be relied upon for further assessment.</p>
<p>SAC Condition Assessment</p>	<p><i>Tilio-Acerion</i> forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes): Unfavourable.</p>

<p>Site Name: Downton Gorge Location Grid Ref: SN708719 JNCC Site Code: UK0012735 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Animal Grazing</u> The main threat to the site at present is increased deer pressure and therefore very little regeneration of the woodland habitat. General woodland management is good and various initiatives are being trialled to reduce deer pressure or exclude deer from various areas of the site.</p> <p><u>Air- and Water- Borne Pollution</u> The site is potentially vulnerable to the effects of air- and water-borne pollution, particularly in respect of its significant lichenological interest. However these effects are not related to the management of the site. Further information is available at: http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0012735.pdf</p> <p><u>Water Quality</u> Natural England recommendation for this vulnerability addition. See appendix [WHATEVER NUMBER the actions list audit trail MIGHT BE assuming it's to be added... my thought would be to have some audit trail to demonstrate a regard to 61(3) & (4) of the HRA regs.</p> <p>From Correspondence with Natural England about Downton Gorge, the following are expressed pressures.</p> <ul style="list-style-type: none"> • Cultivation, including ploughing, rotovating, harrowing, and re-seeding. • The introduction of grazing. • The introduction of stock feeding. • The introduction of mowing. • Application of manure, fertilisers and lime. • Application of pesticides, including herbicides (weedkillers). • Dumping, spreading or discharge of any materials. • Burning. • The release into the site of any wild, feral or domestic animal*, plant or seed. • The killing or removal of any wild animal*, other than pest control. • The destruction, displacement, removal or cutting of any plant or plant remains, including tree, shrub, herb, dead or decaying wood, moss, lichen, fungus, leafmould and turf. • The introduction of tree and/or woodland management+ and changes in tree and/or woodland management. • Drainage (including the use of mole, tile, tunnel or other artificial drains). • Modification of the structure of watercourses (eg, rivers,

<p>Site Name: Downton Gorge Location Grid Ref: SN708719 JNCC Site Code: UK0012735 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>streams, springs, ditches and drains), including their banks and beds, as by re-alignment, re-grading and dredging.</p> <ul style="list-style-type: none"> • Management of aquatic and bank vegetation for drainage purposes. • The changing of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes). • Infilling of ditches and drains. • The introduction of freshwater fishery production and/or management and changes in freshwater fishery production and/or management, including sporting fishing and angling. • Extraction of minerals, including topsoil, subsoil, limestone and spoil. • Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground. • Storage of materials on or against rock outcrops. • Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling. • Modification of natural or man-made features, clearance of boulders, large stones, loose rock, scree or spoil and battering, buttressing, grading or seeding rock-faces, outcrops or cuttings, infilling of pits and quarries. • Use of vehicles or craft likely to damage or disturb features of interest. • Recreational or other activities likely to damage woodland, river and geological features of interest. • Changes in game management and hunting practice. <p>* 'animal' includes any mammal, reptile, amphibian, bird, fish or invertebrate. + including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.</p>
<p>Landowner/ Management Responsibility</p>	<p>No Information available.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Herefordshire's Core Strategy (2011-2031) Revised preferred Option 2011 available at: https://www.herefordshire.gov.uk/planning-and-building-</p>

<p>Site Name: Downton Gorge Location Grid Ref: SN708719 JNCC Site Code: UK0012735 Size: 42.11 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>control/planning-policy/sa-and-hra</p>

<p>Site Name: River Clun Location Grid Ref: SO393754 JNCC Site Code: UK0030250 Size: 14.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The River Clun (14.93ha) drains an area of 272 km² to its confluence with the River Teme at Leintwardine. Downstream of Marlow it is designated as part of the Teme Site of Special Scientific Interest (SSSI) and is protected in its own right as a Special Area of Conservation (SAC). The River Clun supports the freshwater pearl mussel <i>M. margaritifera</i>, which grows to 140mm in length, and burrows into sandy substrates, often between boulders and pebbles, in fast-flowing rivers and streams. It requires cool, well-oxygenated soft water free of pollution or turbidity. The mussel spends its larval, or glochidial, stage attached to the gills of salmonid fishes. The larvae attach themselves during mid to late summer and drop off the following spring to settle in the riverbed gravel where they grow to adulthood.</p>
<p>Qualifying Features</p>	<p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> • Freshwater pearl mussel <i>Margaritifera margaritifera</i>. <p>The Clun is also known to support other key species such as:</p> <ul style="list-style-type: none"> • otter (<i>Lutra lutra</i>). • white-clawed crayfish (<i>Austropotamobius pallipes</i>). • grayling (<i>Thymallus thymallus</i>). • salmon (<i>Salmo salar</i>). • bullhead (<i>Cottus gobio</i>). • brook lamprey (<i>Lampetra planeri</i>). <p>Key habitats include: inland water bodies, (running water), improved grassland and broad-leaved deciduous woodland.</p>
<p>Conservation Objectives</p>	<p>Vision for the Site: To return the River Clun SSSI/SAC to a healthy, resilient and diverse habitat that supports the characteristic species of the river. Importantly, this will reverse the decline of the rare and endangered Pearl mussel population. Delivery of this vision will rely on significant changes to the way both the catchment and river are managed. A successful outcome is only possible if a wide range of stakeholders including landowners and local communities and groups are involved. Key vehicles for delivering change include the Catchment Sensitive Farming Initiative, agri-environmental schemes (in particular Higher Level Stewardship) and physical habitat improvements.</p>

<p>Site Name: River Clun Location Grid Ref: SO393754 JNCC Site Code: UK0030250 Size: 14.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>Conservation Objectives for the River Clun include:</p> <ul style="list-style-type: none"> • Appropriate species composition and abundance. • A healthy reproducing plant community. • A characteristic level of fine sediment for a river such as the Clun. • Predominantly unmodified and characteristic channel form. • Protection of rare species (the Pearl mussel) and distinctive habitat types. • No artificial barriers significantly impairing migratory species. • No impact on native biota from alien introduced species. • A characteristic flow regime. • Near-natural bank and riparian zone structure.
<p>Component SSSIs</p>	<ul style="list-style-type: none"> • River Clun. • River Teme.
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>Conditions needed to support site integrity:</p> <ul style="list-style-type: none"> • Maintenance of good water quality (limit pollution and sedimentation, particularly from agricultural run-off). • Maintenance of salmonid populations. • Maintain riparian vegetation. <p><u>Synthesised Conditions to Maintain Integrity</u> Having researched the JNCC and Natural England websites', no further information could be found. Therefore the above will be relied upon for further assessment.</p>
<p>SAC Condition Assessment</p>	<p>At present the River Clun SSSI is not in a favourable condition. The Pearl mussel population for which it is renowned is in very poor health and persistent decline. Our best estimate is that the population will die out in fewer than 25 years unless measures are put in place to reduce the fine sediment and pollutant load of the river.</p> <p>Further information is available at: http://www.shropshirehillsaonb.co.uk/wp-content/uploads/2012/03/River-Clun-Restoration-Strategy-v3b.pdf</p>

<p>Site Name: River Clun Location Grid Ref: SO393754 JNCC Site Code: UK0030250 Size: 14.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Land Use & Management</u> <i>Margaritifera margaritifera</i> is dependent on low sediment and nitrate levels, fast flows of cool water and clean gravels. It also relies on the presence of trout for part of its breeding cycle. Intensification of agriculture across the catchment is a significant threat to the long-term survival of the isolated population at this site i.e. enhanced sedimentation through poor agricultural practice leading to smothering of adult and juvenile mussels; eutrophication of waters through fertiliser run-off from adjacent land.</p> <p>Drainage ditches have been constructed. Field drains have been laid. Land use has been intensified. The road network has been extended and previously dirt surfaces have been metalled. These factors combine to increase the volume and rate at which water moves across the catchment and through the catchment drainage system. More surface runoff across the catchment generates bigger, more powerful and faster flows in the drainage and river network. Surface runoff entrains sediment and pollutants. More surface runoff carries more sediment and pollutants into the river.</p> <p>The pressure to extend productive farm land often reduces the riverside tree growth to a single line of trees along the river bank.</p> <p><u>Nutrient Levels</u> Upstream domestic sewage treatment works are believed to give a significant nutrient loading. Recent increases in the occurrence of alder disease also pose a risk through loss of shading bankside tree cover. Some of these issues will be addressed by revised authorisation, Review of Consents /AMP 4 processes.</p> <p><u>Sedimentation (Diffuse and Point Sources)</u> Higher intensity land uses than the catchment can naturally sustain and sometimes inappropriate land management are thought to be the root cause of diffuse pollution. Fine sediments, nutrients and pesticides are the main causes of the deterioration in the rivers habitats. Fine sediments smother and choke the gravel beds that are needed by fish such as salmon, Pearl mussels and invertebrates to live and reproduce. Examples of point sources include track crossings, areas of intense stock activity adjacent to the river and sections of eroding river bank.</p> <p><u>Channel Management</u> Larger, more powerful flows have more energy. This energy is used by</p>

<p>Site Name: River Clun Location Grid Ref: SO393754 JNCC Site Code: UK0030250 Size: 14.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>the river to erode and transport more sediment. It also contributes to the accelerated bank erosion observed throughout the river network. Loss of trees results in substantially accelerated rates of bank erosion, more sediment in the river and loss of habitat. Woody debris in the river is generally good from an ecological perspective, but too much can accelerate bank erosion and damage Pearl mussel beds.</p> <p><u>Invasive Species</u> Himalayan balsam is known to be widespread throughout the Teme catchment (of which the Clun is a part). In ungrazed areas it can cover large areas of river bank. A key risk occurs when it dies back during the winter, exposing areas of bare bank to erosion. There is potential further spread of Signal Crayfish. Key risks are a) that they are voracious predators (for instance of small fish such as the bullhead and juvenile salmonids) and b) that they can reduce bank stability (and increase sediment supply by burrowing).</p> <p><u>Climate Change</u> Risk of increase in sediment input to river as a result of climate change. During the 25-year time period of this strategy it is possible that the ecosystems of the Clun could be substantially stressed by a combination of direct and indirect effects:</p> <ul style="list-style-type: none"> • Direct Impacts a likely increase in extreme flows and a reduction in the resilience of soils to erosion (leading to higher fine sediment loads in the river). • Indirect impacts (of the response of agriculture to climate change): the take up of new crops and extended grazing seasons could generate a significant increase in sediment, nutrient and pesticide runoff from the catchment into the river. <p><u>Development Pressure</u> A generally increasing population in the vicinity of the site is considered likely to increase the potential for physical loss of habitat as a result of development (infrastructure, housing, employment, sport/recreation facilities or waste management facilities); noise, light and air pollution resulting from construction activities and/or an increase in vehicle traffic; erosion/ trampling as a result of recreation pressures, and interruption to hydrological regimes as a result of increased demand for water abstraction and treatment.</p>

<p>Site Name: River Clun Location Grid Ref: SO393754 JNCC Site Code: UK0030250 Size: 14.93 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Landowner/ Management Responsibility</p>	<p>No Information Available.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Shropshire’s Core strategy (2006-2026) Stage 2 of Report, February 2010 available at: http://www.shropshire.gov.uk/planning-policy/habitat-regulation-assessment/</p> <p>HRA Screening of Herefordshire’s Core Strategy (2011-2031) Revised preferred Option 2011 available at: https://www.herefordshire.gov.uk/planning-and-building-control/planning-policy/sa-and-hra</p>

<p>Site Name: The Stiperstones & the Hollies Location Grid Ref: SJ375006 JNCC Site Code: UK0012810 Size: 601.46 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Many of the heaths in this part of Shropshire have characteristics of both upland and lowland heath and are transitional between the two. However, on balance the Stiperstones seems to have more characteristics of upland heath than lowland heath. Its altitude varies between 300 and 540m and its breeding bird assemblage of Raven, Grouse, Whinchat, Wheatear, Meadow Pipit and Snipe is more similar to Upland heath than Lowland heath. It contains none of the Lowland heath specialities such as Nightjar, Dartford warbler or Woodlark.</p>
<p>Qualifying Features</p>	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • European dry heaths. <p>Annex I habitat present as a qualifying feature, but not a primary reason for site selection</p> <ul style="list-style-type: none"> • Oak sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles.
<p>Conservation Objectives</p>	<p>Vision for the site: The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar) as:</p> <p>Habitat Types represented (Biodiversity Action Plan categories). Broadleaved, Mixed & Yew Woodland. Dwarf shrub Heath. Acid grassland. Fen, marsh and swamp.</p> <p>Geological features (Geological Site Types). Disused quarries, pits and cuttings (ED). Inland outcrops and stream sections (EO). Static (fossil) geomorphological sites (IS).</p> <p>Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and</p>

<p>Site Name: The Stiperstones & the Hollies Location Grid Ref: SJ375006 JNCC Site Code: UK0012810 Size: 601.46 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.</p> <p>Subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of qualifying natural habitats and habitats of qualifying species. • The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species. • The supporting processes on which qualifying natural habitats and habitats of qualifying species rely. • The populations of qualifying species. • The distribution of qualifying species within the site.
<p>Component SSSIs</p>	<p>The above species apart from the Broadleaved, Mixed & Yew Woodland and Dwarf Shrub Heath are SSSI designated interest features.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<ul style="list-style-type: none"> • Control of Afforestation. • Control of Grazing Pressure. • Maintain appropriate Woodland Management. <p><u>Synthesised Conditions to Maintain Integrity</u> Having researched the JNCC and Natural England websites', no further information could be found. Therefore the above will be relied upon for further assessment.</p>
<p>SAC Condition Assessment</p>	<p>Subject to natural change, to maintain in favourable condition the dry heath communities with particular reference to the internationally important heathland communities (H8: <i>Calluna vulgaris-ulex</i> hallii heath, H10: <i>Calluna vulgaris – Eric cinerea</i> heath, H12: <i>Calluna vulgaris – Vaccinium myrtillus</i> heath, H18: <i>Vaccinium myrtillus – Deschampsia flexuosa</i> heath).</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p><u>Land Management</u> The heathland is dependent on the continuation of traditional heather moorland management with rotational burning or cutting supplemented by light grazing. In the recent past, lack of management on parts of the site has resulted in scrub encroachment, and on other parts high stocking levels has caused overgrazing and a deterioration of the heathland interest. These issues are being addressed by an effective</p>

<p>Site Name: The Stiperstones & the Hollies Location Grid Ref: SJ375006 JNCC Site Code: UK0012810 Size: 601.46 ha Designation: SAC</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p>management programme on that part of the site which is managed as a National Nature Reserve and, on land in private ownership, by management agreements and ESA payments.</p> <p>The sessile oak woods have been traditionally managed either as high forest or as oak coppice. Neglect and grazing of coppiced woods in the past has led to deterioration in woodland interest. Traditional management of these woods has been reinstated by effective management of the National Nature Reserve and by agreement of a site management statement with woodlands in private ownership.</p>
<p>Landowner/ Management Responsibility</p>	<p>Effective management programme on that part of the site which is managed as a National Nature Reserve and, on land in private ownership, by management agreements and ESA payments.</p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Shropshire's Core strategy (2006-2026) Stage 2 of Report, February 2010 available at: http://www.shropshire.gov.uk/planning-policy/habitat-regulation-assessment/</p>

<p>Site Name: Midlands Meres and Mosses JNCC Site Code: UK11080 + UK11043 Size: 2099.12 ha Designation: RAMSAR</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>The Meres and Mosses form a geographically diverse series of lowland open water and peatland sites in the north-west Midlands of England and north-east Wales. These have developed in natural depressions in the glacial drift left by receding ice sheets which formerly covered the Cheshire/Shropshire Plain. The 18 component sites include open water bodies (meres), the majority of which are nutrient-rich with associated fringing habitats, reed swamp, fen, carr and damp pasture.</p> <p>Peat accumulation has resulted in the nutrient-poor peat bogs (mosses) forming in some sites on the fringes of the meres or completely infilling basins. In a few cases the result is a floating quaking bog or schwingmoor. The wide range of resulting habitats supports nationally important flora and fauna.</p>
<p>Qualifying Features</p>	<p>The Ramsar designation relates to three interest features:</p> <ul style="list-style-type: none"> • Standing open water. • Fen, marsh and swamp. • Broadleaved, mixed and yew woodland. <p>Ramsar Phase 1.</p> <ul style="list-style-type: none"> • Natural or near natural wetland supporting a range of habitats. • Contains the nationally scarce six-stamened waterwort <i>Elatine hexandra</i>, needle spike-rush <i>Eleocharis acicularis</i>, cowbane <i>Cicuta virosa</i>, marsh fern <i>Thelypteris palustris</i> and elongated sedge <i>Carex elongate</i>. • Contains invertebrates, including the following rare wetland species. 3 species considered to be endangered in Britain, the caddis fly <i>Hagenella clathrata</i>, the fly <i>Limnophila fasciata</i> and the spider <i>Cararita limnaea</i>. • Other wetland Red Data Book species are; the beetles <i>Lathrobium rufipenne</i> and <i>Donacia aquatica</i>, the flies <i>Prionocera pubescens</i> and <i>Gonomyia abbreviata</i> and the spider <i>Sitticus floricola</i>. <p>Ramsar Phase 2</p> <ul style="list-style-type: none"> • Natural or near natural wetland supporting a range of habitats. • Supports a number of rare plants, including the nationally scarce cowbane <i>Cicuta virosa</i>, elongated sedge <i>Carex elongate</i> and bog rosemary <i>Andromeda polifolia</i>. Also, bryophytes <i>Dicranum undulatum</i>, <i>Dicranum affine</i> and

<p>Site Name: Midlands Meres and Mosses JNCC Site Code: UK11080 + UK11043 Size: 2099.12 ha Designation: RAMSAR</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
	<p><i>Sphagnum pulchrum.</i></p> <ul style="list-style-type: none"> • Containing an assemblage of invertebrates, including 16 species of Red Data Book insect listed for the site including the following endangered species: the moth <i>Glyphipteryx lathamella</i>, the caddisfly <i>Hagenella clathrata</i> and the sawfly <i>Trichiosoma vitellinae</i>.
<p>Conservation Objectives</p>	<p>Vision for the site: The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, cSAC, SPA, Ramsar) as individually listed in Table 1.</p>
<p>Component SSSIs</p>	<p>Phase 1 of the Ramsar designation covers 513.25ha and is entirely co-incident with the following 16 Sites of Special Scientific Interest (SSSI). These are:</p> <ul style="list-style-type: none"> • Bagmere. • Berrington Pool. • Betley Mere. • Bomere. • Shomere & Betton Pools. • Brown Moss. • Chartley Moss. • Clarepool Moss. • Fenemere. • Flaxmere. • Hatchmere. • Marton Pool (Chirbury). • Quoisley Meres. • Tatton Mere. • The Mere (Mere). • White Mere. • Wynbunbury Moss SSSI's. <p>Phase 2 of the Ramsar sites covers 1740.3ha and is entirely co-incident with the following 19 Sites of Special Scientific Interest (SSSI). These are:</p> <ul style="list-style-type: none"> • Abbots Moss. • Aqualate Mere. • Black Firs & Cranberry Bog. • Brownheath Moss.

<p>Site Name: Midlands Meres and Mosses JNCC Site Code: UK11080 + UK11043 Size: 2099.12 ha Designation: RAMSAR</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>							
	<ul style="list-style-type: none"> • Chapel Mere. • Cole Mere. • Cop Mere. • Fenn's. • Whixall. • Bettisfield. • Wem & Cadney Mosses. • Hanmer Mere. • Hencott Pool. • Linmer Moss. • Llyn Bedydd. • Morton Pool & Pasture. • Oak Mere. • Oakhanger Moss. • Oss Mere. • Rostherne Mere. • Sweat Mere & Crose Mere. • Vicarage Moss. 							
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. However, no information is available.</p> <p><u>Synthesised Conditions to Maintain Integrity</u></p> <p>Having researched the JNCC and Natural England websites', no further information could be found. Therefore the above will be relied upon for further assessment.</p>							
<p>SAC Condition Assessment</p>	<p>No Information Available.</p>							
<p>Vulnerabilities (includes existing pressures and trends)</p>	<ul style="list-style-type: none"> • Eutrophication. • Introdutin/invasion of non-native plant species. • Pollution – pesticides/agricultural runoff. 							
<p>Landowner/ Management Responsibility</p>	<table border="1"> <tr> <td>Ownership category</td> <td>On-site</td> </tr> <tr> <td>Non-governmental organisation (NGO)</td> <td>+</td> </tr> <tr> <td>Local authority, municipality etc.</td> <td>+</td> </tr> </table>		Ownership category	On-site	Non-governmental organisation (NGO)	+	Local authority, municipality etc.	+
Ownership category	On-site							
Non-governmental organisation (NGO)	+							
Local authority, municipality etc.	+							

<p>Site Name: Midlands Meres and Mosses JNCC Site Code: UK11080 + UK11043 Size: 2099.12 ha Designation: RAMSAR</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>		
	National/Crown Estate	+	+
	Private	+	+
<p>HRA/AA Studies undertaken that address this site</p>	<p>HRA Screening of Shropshire's Core strategy (2006-2026) Stage 2 of Report, February 2010 available at: http://www.shropshire.gov.uk/planning-policy/habitat-regulation-assessment/</p>		

<p>Site Name: Llyntegid JNCC Site Code: UK0030252 Size: 1308.93 ha Designation: RAMSAR</p>	<p><u>Habitats Regulations Assessment: Data Proforma</u></p>
<p>Site Description</p>	<p>Llyn Tegid is the largest natural lake in Wales. The lake bed is owned by Snowdonia National Park Authority although the water is the property of the Environment Agency. It is important for its internationally rare plant species, particularly floating water plantain <i>Luronium natans</i> and its unique fish fauna, including the endemic whitefish or gwyniad, <i>Coregonus lavaretus</i>. The glutinous snail <i>Myxas glutinosa</i> was considered to have been lost from this locality, as it had not been found in Llyn Tegid since 1953. However it was rediscovered in the lake in summer 1998.</p>
<p>Qualifying Features</p>	<p>Largest natural lake in Wales, lying deep in a formerly glaciated trough. Plant species growing in or beside the lake are mudwort <i>Limosa aquatica</i>, six-stamened waterwort <i>Elatine hexandra</i>, water sedge <i>Carex aquatilis</i> and floating water plantain <i>Luronium natans</i>, all of which are scarce in Britain. The latter species is regarded as vulnerable on a global scale. This site is also one of only six sites in Britain for the whitefish or gwyniad <i>Coregonus lavaretus</i>; the Welsh population of this fish is genetically distinct. Llyn Tegid is also an unusual habitat for the normally riverine fish grayling <i>Thymallus thymallus</i>. The Nationally Rare glutinous snail <i>Myxas glutinosa</i> has been rediscovered in the shallow gravels of the lake shore.</p>
<p>Conservation Objectives</p>	<p>No information available.</p>
<p>Component SSSIs</p>	<p>No information available.</p>
<p>Management Plan - Key Environmental Conditions (factors that maintain site integrity)</p>	<p>No information available.</p>
<p>Vulnerabilities (includes existing pressures and trends)</p>	<p>Llyn Tegid is an important recreational resource supporting local tourism. Sailing, fishing and other water sports are all important. In general these activities are not detrimental, although increased visitors to the area may add to sewage inputs.</p>
<p>Landowner/ Management Responsibility</p>	<p>The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.</p>

<p>Site Name: <i>Llyntegid</i> JNCC Site Code: <i>UK0030252</i> Size: <i>1308.93 ha</i> Designation: <i>RAMSAR</i></p>	<p><u><i>Habitats Regulations Assessment: Data Proforma</i></u></p>
<p>HRA/AA Studies undertaken that address this site</p>	<p>N/A</p>