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INTRODUCTION

Introduction

The Malvern Hills are one of the largest areas of contiguous Semi-natural habitat in the West Midlands and contain some of the rarest and most important habitats and species in the region. Over 1,000,000 people visit the Hills every year making the area one of the most important recreation destinations in the counties of Herefordshire, Gloucestershire and Worcestershire. With the tremendous resource that the area has to offer in terms of its wildlife and recreational value it is important that the area is well managed. Much of the work is often unseen and hopefully this plan sheds some light onto the many management decisions taken, the reasons for them and the amount of thought and preparation that goes into every management action.

The plan is an update of the 1999 management plan and should be considered additional to it rather than replacing it. The 1999 plan edited by Dr. P. J. Alma was a milestone in the history of the Malvern Hills Conservators as it clearly set out the importance of the processes of grazing and scrub/bracken management on the Hills and Commons around Malvern. The need for these processes remains and therefore there is little value in revisiting the justification set out in the 1999 plan. Similarly the zoning of different management areas, the maps and the site description do not need to be repeated as this is clearly reported in the previous plan. Each Feature in this document is described in full and so will cover any changes that have taken place during the period of the last management plan.

Rather than concentrating on the different zones or areas belonging to the Malvern Hills Conservators the plan will identify the different "Features of Interest" that the Malvern Hills Conservators manage. This may be driven by statutory duties through the Malvern Hills Acts, the designation of the Sites of Special Scientific Interest (SSSIs) and the Scheduled Ancient Monuments (SAMs) or the direct need for management of a feature driven by public or environmental pressure. The plan will provide a clear vision for how the Conservators believe each of these features should be so that people can understand more clearly what our aims are. It is also not supposed to be an exhaustive document covering every angle of the Malvern Hills Conservators' management but a flexible document that can be changed to reflect the different objectives that emerge over time. Any additional features that may need to be added can be slotted into the plan within the existing format. There are some features covered that do not fall within my area of expertise (notably geology and archaeology) these will be updated and improved following input from local experts.

As one of the most important roles of this report is to communicate to our partners and the public where we are heading it is very important that it is not a document full of complicated tables and jargon. With this in mind the Features identified in the plan are first described in their current state (or condition) and this is then followed by a "Feature Objective" that gives a clear unequivocal vision that the organisation has for each Feature. Following the Objectives are some simple one-line descriptions of:

- **FACTORS** affecting the achievement of the Objective.
- Quantifiable **ATTRIBUTES** of each Feature.
- **MANAGEMENT ACTIONS** needed to achieve the objective.
- **RECORDING/MONITORING ACTIONS** for monitoring Objectives.

The "Factors" and "Attributes" will need to be assessed as to their sustainable limits. The initial phase of recording will inform us as to the sustainable limits that need to be set. If and when these limits are reached it will indicate that the quality of an "Attribute" or the impact of a "Factor" has become unacceptable and should trigger a management action to correct it.

In order to make the document more palatable there are many photographs giving examples of what is being described in the text. These clearly demonstrate the impact that good land management can have far more effectively than the most descriptive prose and will hopefully lead to a greater understanding of the work that is carried out. To this end the plan has been kept as short as possible with only necessary detail included. Documents planning the scrub clearance, grazing management and protection of the Shire Ditch have already been produced and do not need to be repeated or re-done. These documents, along with the preliminary "Conservation Objectives" from Natural England, form the basis from which this plan has been written and so the Objectives for each Feature fit within the detailed plans that already exist.

For many of the Features the management processes necessary to achieve their objectives will be the same and there is little point in repeating the same description for each feature. Therefore the management processes are summarised at the end of the document to give a clear impression of the management and recording actions that take place.

There are some features of interest that have not been covered by this plan, most notably these relate to the Landscape and promotion of Tourism and Education. As a relatively small public body it is felt that the objectives for these features of interest are best delivered by our partners the Malvern Hills AONB and the Town, Parish and District Councils with the support and partnership of the Malvern Hills Conservators.

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A. FEATURES OF INTEREST

1.0 ACID GRASSLAND

1.0 Acid Grassland and Heathland

Figure 1. Harebells (*Campanula rotundifolia)* flowering in acid grassland on the Malvern Hills

1.1 Description

The acid grassland found on the Hills is classified as lowland acid grassland and is the main reason for the designation of the Hills as a Site of Special Scientific Interest. Although the data is not available it is generally accepted that there has been a marked reduction (up to 75%) in acid grassland over the last 50 years in lowland Britain thus demonstrating the importance of such a large extent on the Malvern Hills.

Although the grassland is classified as "Lowland" much of it occurs above an altitude of 300m, which would classify it as more of an upland environment. Grassland in Britain is usually classified using the "National Vegetation Classification" (NVC) described by Dr. John Rodwell in his series of "British Plant Communities". Within this classification the two major types of grassland found are known as U1 and U2 (with various Sub types/communities). Most of the lowland acid grassland communities that Rodwell described were from grassland on sand, gravel and sandstone. The grassland on the Hills is mainly on igneous rocks that you would more expect to find on upland sites in conjunction with more upland plant communities, and although they do match the classifications they are not as rich in species diversity as one would expect.

Although heather is present on some parts of the Hills (mainly British Camp but it is still found North of the Wyche Cutting) it was certainly more abundant across the Hills in the mid to late 19th Century and according to Edwin Lees' "Botany of the

Malvern Hills" in 1868 it was generally distributed across all of the Hills and Commons. There are quite a few theories about the origin of the heather, one of which is that it was planted on the Hills in the 1960's and 70's and that it is not a natural part of the flora, but Lees' records seem to suggest that it was once a major component of the flora. His assertion that it "Grows very dwarf" gives an impression of a high level of grazing pressure from cattle and particularly sheep at the time that could have led to its reduction in range across the Hills and Commons. Another theory is that the relatively species poor acid grassland remaining is the result of a change from acid heath to acid grassland caused by the high grazing pressure on the Hills from some time in the mid 1800's up to the early 1970's when the grazing pressure began to decline again.

The Acid Grassland and Heathland on the Hills is a mixture of short acidic turf on the higher slopes of each Hill blending into longer swards dominated by wavy hair grass that characteristically sways its red stems in the wind in the summer months. On British Camp the grassland contains some dwarf heather and also some drumstick heather that is becoming fragile due to the grazing pressure. On the Northern Hills there are patches of Bilberry (*Vaccinium myrtillis)* that are helped to spread by the current grazing regime and these provide an important habitat for nesting birds, butterfly and moth species and also berries for birds and local people. There are still areas that are being invaded by Rowan and Birch on the upper slopes on both the Northern and Central Hills and there are some areas that were previously Acid Grassland that are now blanketed in a thick covering of gorse.

There are a number of rare wax cap fungi found on the Hills. The importance of these species is not fully known and work is in progress to encourage more recording of fungi.

On Midsummer, Ragged Stone and Chase End Hills there is currently little or no regular grazing and a high proportion of scrub encroachment in these areas. In the case of Ragged Stone the scrub has overtopped the ridge. There has also been a major increase in bracken density on these Hills with a likely encroachment of the upper bracken front into the Acid grassland.

1.2 Objective for Acid Grassland and Heathland

There will be a mosaic of short turf and longer acidic grassland grazed by sheep and cattle across the Hills. The grassland will spread between the tops of the Hills and will reach down into both the Bracken and Scrub zones.

The short turf will be a mixture of herbs and grasses with Sheep Sorrel, Heath Bedstraw and grasses like "Common Bent" frequent. On thinner soils there will be a diverse range of Lichens and Mosses growing amongst the grasses and herbs.

The extent and importance of the Heather and Bilberry in the sward will be more fully known through further research and investigation and until such time as this is known these two species will be maintained at their present distribution and in good condition with evidence of young growth coming through to replace the older growth.

Further surveys will have identified the important grassland fungi species on the Hills and the areas where they are most abundant. These surveys will have provided information that can guide appropriate management.

Areas of coarse grasses such as Annual Meadow Grass/Yorkshire Fog will be limited to **small** patches next to areas of very high recreation pressure and False Oat Grass will only be found near livestock water sources and will not be dominant in the sward.

The grassland interface with the Bracken Zone will be inconsistent in its altitude, ranging from the lowest parts of the Hills to the very tops where bracken exists (or doesn't) in these areas. Where bracken starts to appear in the sward it will be very weak and dwarf in form. The bracken will gradually increase in height and density as one moves into the bracken zone but there will still be patches or "glades" of grassland here.

Meadow Pipits and Skylarks will nest undisturbed in the grassland and in the bracken fringe and Grayling butterflies will be seen resting on the Rocky outcrops and thin soils. Small Heath and Small Copper butterflies will be flying across the grassland and bracken edge where larks and pipits will be feeding on the abundant caterpillars of moths such as the Small Elephant Hawk, Shears and Antler. Martins and Swallows will hunt dung reliant invertebrates during the day while Barbastelle and Lesser Horseshoe bats will at night.

Figures 2. & 3. Broad Down before the re-introduction of grazing in 2001and after in 2004.

1.3 Factors

- Grazing pressure.
- Lack of active commoners.
- Local opinion.
- Disturbance of nesting birds.
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).
- Birch Cover. (Upper and Lower Limits)

1.4 Attributes

- Size of area covered in grassland. (Upper and lower limits).
- Quantity of breeding meadow pipits and Skylarks. (Upper and lower limits).
- Quantity of adult Grayling butterfly recorded. (Upper and lower limits).
- % of Acid grassland in Favourable condition. (Upper and lower limits).

1.5 Management actions

- Scrub clearance.
- Grazing as much of the Hills as possible.
- Facilitation/Coordination of commoners grazing.

1.6 Recording and Monitoring actions

- Grazing pressure. (Upper and lower limits).
- Local opinion.
- Ability of commoners to graze.
- Birch Cover. (Upper and lower limits)
- All attributes.
- Define all limits.

2.0 BRACKEN HABITATS

2.0 Bracken Habitats

Fig. 4. Bracken (*Pteridium Aquilinuim)*

2.1 Description

Bracken is a very successful plant on the Hills and covers large areas of land. It reproduces by the extension of rhizomes under the ground and so can only spread slowly by this continual expansion. On an unmanaged site it is thought that bracken can expand by up to 3% per year and even on managed sites it can increase by 1% per year. Bracken is not known to "seed" by its spores in this country and so existence of the bracken in any part of the Hills will be due to a contiguous area of bracken that has expanded.

The bracken on the Hills and commons has remained fairly stationary over the last 7 years. Having compared the aerial photos from 1999 to the bracken fronts plotted by GPS in 2006 one can see that there has not been a significant advance in the upper limit of the bracken on the Hills and Commons overall. In many cases the bracken is present above the highest of the contour paths. This shows that it must have been present at this height before the paths were built (in most cases, in Victorian times) as the rhizomes of the plant would not have been able to cross this man made barrier.

Figure 5. Swinyard Hill November 2006 showing the effects of rotational Bracken cutting and bruising.

The main changes in the bracken itself are increasing density of bracken fronds, a deepening of the litter layer and an increase in scrub content caused by the lack of grazing (2006 NVC survey, Carter Ecological). This thickening of the bracken layer with a greater incidence of scrub content is evident throughout the site although some areas are starting to recover with the management work that is taking place at the moment such as cutting, grazing and bruising.

Overall it is likely that there has been a reduction in the total area of bracken due to the scrub encroachment of the last 40-50 years. A study on the bracken cover of British Camp (Bundred 2001) showed that the total area of Bracken on the Camp had decreased markedly in the post war period due to scrub encroachment of the lower slopes. In a sense the bracken is responsible for its own demise. As the grazing pressure decreases the bracken litter builds up decreasing the amount of available forage under the bracken, which further deters any grazing animals. The ever-decreasing grazing pressure leaves any tree and shrub seedlings to grow on and remain protected by the dense, warm Bracken litter, until eventually they establish as a scrub layer.

Although Bracken is often seen as an invasive species it is a very important habitat in its own right. Differing levels of bracken cover provide a key element of the habitat requirements for species as diverse as the High Brown Fritillary butterfly, Adder, Viviparous lizard, Meadow pipit, Stonechat and various small mammals. This demonstrates the ecological importance of bracken as a habitat on the Hills and Commons and therefore why it is important that we intervene to maintain this habitat in a favourable condition.

2.2 Objective for Bracken Habitats On the Malvern Hills

There will be a mosaic of bracken habitats covering the middle slopes of the Hills and where the Hills join the lower Commons. The current extent of the bracken will have expanded on the lower bracken front at the expense of scrub and secondary woodland.

The bracken will have a diverse structure with a mosaic of varying densities and heights. In most areas the bracken will have a broken and bruised appearance with larger open "glades" and smaller open "patches" of grasses and wildflowers such as Tormentil, Violet, Harebell, Wavy Hair grass, Sheep Fescue and Heath Bedstraw. In winter the litter layer in these areas will also demonstrate this broken patchy appearance with an equal cover of open grassland patches and bracken litter.

Where the bracken meets the acid grassland/Heathland, on the higher slopes, the bracken will be smaller in stature and will have a sparse patchy distribution providing a nesting habitat for the many Meadow pipits and Skylarks on the site. The weak nature of the bracken will provide little threat to the important grassland and Heathland species. The bracken will be especially sparse or even not present where rocky outcrops and very thin soils occur within the bracken zone.

Along the interface between the scrub and bracken the density and size of the bracken will be greater. The bracken will provide a more continuous cover in these areas and will contain some Bramble, Gorse and Broom although pioneer seedlings such as Birch, Rowan and Sycamore will only be tolerated right on the edge of the interface. Stonechats, Yellow Hammers and Linnets will nest along this scrub edge and small mammals like Dormice and Field Voles will also use the bracken and scrub as cover from predators while feeding on blackberries and rowan-berries. Viviparous Lizards will occur in large numbers in the denser bracken and will provide a food source for other reptiles. Adders will use successional bramble growing through bracken as cover while basking and hunting for the voles and lizards. The ground flora in the areas of dense bracken will be more like a woodland flora containing Bluebells, Wood Anemone and Violets.

Where Violets are present they will be the dominant herb under the bracken, especially where the bracken litter is thickest. High Brown Fritillary caterpillars will be feeding on the abundant Violet plants and in summer adult butterflies will be seen skimming the tops of the bracken fronds in their tens.

Large parts of the bracken zone will be free from any kind of disturbance from recreational users, due to its steep nature and dog owners acting in a responsible way by keeping their dogs under control during the bird nesting season.

2.3 Factors

- Grazing pressure. (Upper and lower limits)
- Lack Of active Commoners.
- Local Opinion.
- Disturbance of nesting birds.
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).
- Scrub Cover (Bramble, Birch and Rowan). (Upper and Lower Limits).

2.4 Attributes

- Size of area with Bracken present. (Upper and Lower Limits).
- % of Bracken with grasses and herbs abundant in the under storey. (Upper and Lower Limits).
- Quantity of adult HBF butterflies recorded. (Upper and Lower Limits).
- Quantity of breeding meadow pipits and Skylarks. (Upper and lower limits).

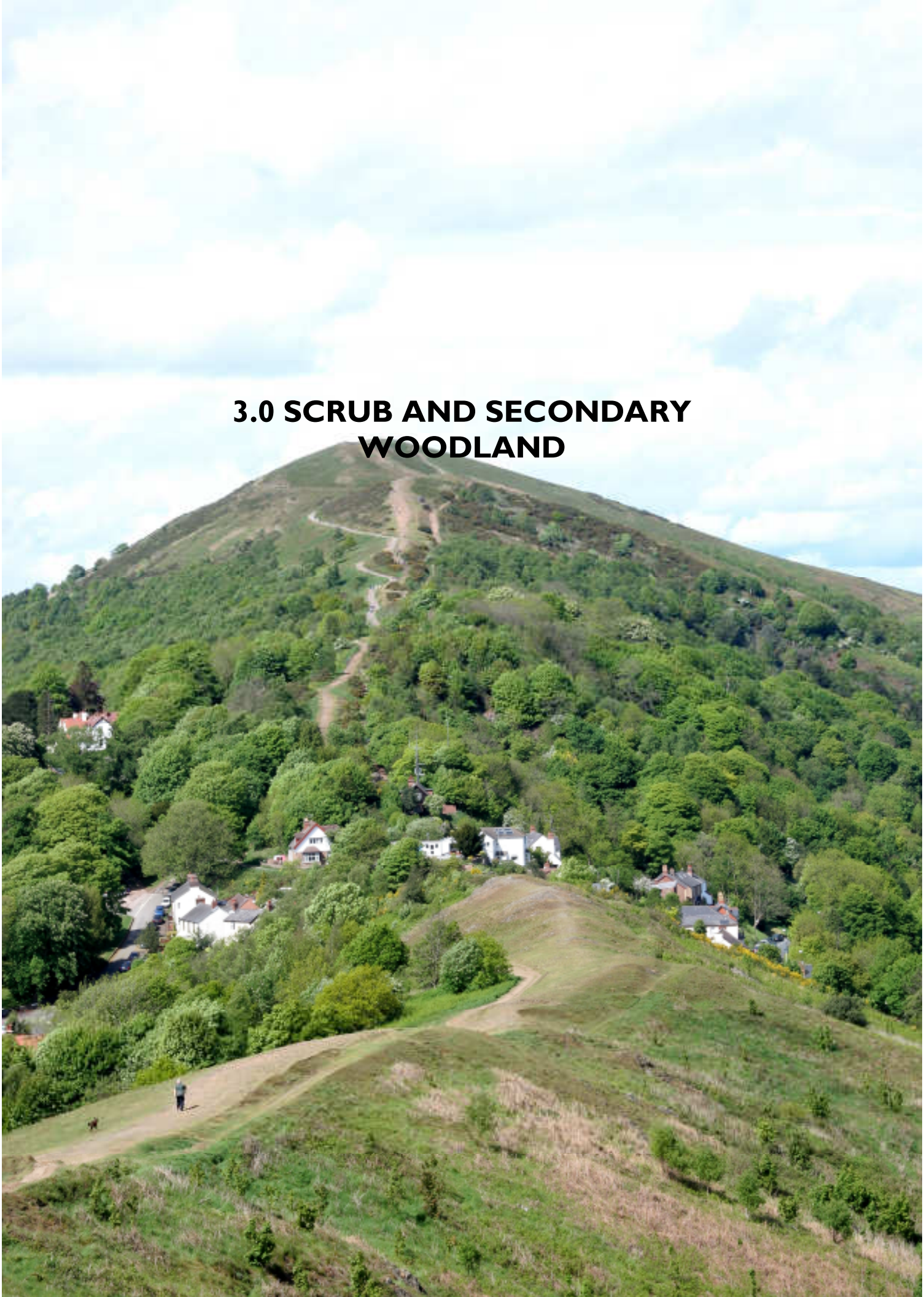
2.5 Management actions

- Scrub Clearance.
- Livestock Grazing.
- Bracken rolling/cutting.

2.6 Recording and Monitoring actions

- Grazing pressure. (Upper and lower limits).
- Local Opinion.
- Scrub Cover. (Upper and lower limits).
- All Attributes.
- Define all limits.

3.0 SCRUB AND SECONDARY WOODLAND



3.0 Scrub and Secondary Woodland

Figure 6. Scrub and Bracken advancing to the ridge of Ragged Stone Hill.

3.1 Description

The scrub on the Hills has increased significantly over the last 40 – 50 years. This is highlighted particularly well by figure 7 overleaf. The characteristic "bare hill" that Malvern was named after was still evident as recently as 1948. Scrub is a very important habitat on the Hills and supports many different wildlife species.

The scrub zone is made up of many species of tree and shrub including Gorse, Broom, Bramble, Hawthorn, Birch, Rowan, Ash, Oak and Sycamore. Of these species the Broom, Hawthorn, Ash and Oak are less of a risk in terms of encroachment into the important bracken and grassland habitats. In some cases the scrub has completely overtaken the Bracken Zone and started to encroach on the grassland. In these areas the scrub on the lowest slopes has grown into secondary woodland dominated by Sycamore and Ash. Although this woodland has a high component of dead wood due to the over shading of the pioneer species of Birch and Rowan, it is leggy and uniform in structure offering little in the way of nesting habitat for birds compared to the successional scrub found further up the slopes.

Where large encroachments into the other habitats have taken place they tend to be by single species. The biggest threat to the grassland zone is the massive Birch invasion on the Central and Northern Hills, as this tree species cannot practically be controlled on the Hills by grazing. These incursions into other habitats are also the

largest in area on the Hills. Birch is however an important component of the flora on the Hills and is the food plant for the caterpillars of many different moth species.

There are large blocks of Gorse covering more than a few acres at a time that provide a nesting habitat for Stonechats, and Linnets as well as being a food plant for the caterpillar of the Green Hairstreak Butterfly. This has mainly expanded at the expense of the acid grassland and was one of the earliest invaders onto the bare hills. In Edwin Lees' Botany of the Malvern Hills, from 1868, he describes the lower slopes as being covered in "Furze" (Gorse).

The Rowan on the Hills mainly invades the grassland of the upper slopes particularly in the northern Hills. Where it is cleared it tends to remain so, especially following grazing. Mature Rowan trees are scattered around this area and although they provide a seed source for more seedlings they also provide an important food supply for migratory birds such as Ring Ouzels, Redwing and Fieldfare.

Sycamore was decoratively planted by well meaning local people in the 1930's. Little did they know that this tree would spread so vigorously on the Hills with the cessation of grazing. In secondary woodland Sycamore tends to dominate and over shades any potential under storey that would be beneficial for nesting birds or Dormice. Although there are large parts of the Hills that are dominated by the non-native Sycamore, where it has been cleared it is easily controlled by a suitable grazing pressure. However, it does support huge populations of aphids, which provide an important food source for other invertebrates, birds and small mammals.

Figure 7. Aerial photo of British Camp 1948 showing a distinct lack of scrub.

The scrub is also associated with species such as adders, dormice and other small mammals that thrive on the supply of invertebrates and on each other. In particular they are associated with scrub and woodland edge. This gradient of woodland to scrub to grassland is the most species rich habitat we have in Britain today, so it is important that we maintain as much of the edge as possible by avoiding straight lines and uniform blocks of habitat.

Figures 8 & 9. Table Hill before grazing in 2001 and after scrub cutting and grazing September 2005.

3.2 Objective for Scrub and Secondary Woodland

Scrub and some secondary woodland will cover the lowest slopes of the Hills. There will be some areas where bracken and grassland habitats reach down to the lowest edge of the Hills breaking up the lower boundary of the scrub and woodland.

The edge of the scrub/secondary woodland will be varied in structure with open glades and fingers of scrub extending into the Bracken and Grassland Zones. Where secondary woodland exists it will be on steep slopes with thin soils that cause trees to be blown over creating temporary glades and a range of different heights, densities and species.

There will be ample nesting sites for birds such as Linnets, Whitethroats and Stonechats in the thick scrub layer and there will be Green Hairstreak butterflies seen perching on the tops of gorse twigs. In the autumn months there will be migratory birds such as Ring Ouzels feeding on the Hawthorn and Rowan Berries. Adders and Grass Snakes will be found on the very edge of the Scrub zone basking and hunting for small mammals, amphibians and other reptiles. Dormice will feed on the fruit and flowers of Bramble, Gorse, Hawthorn, Rowan and various Rose species, they will nest and hibernate in the thicker areas of scrub and dense under storey of the woodland areas.

Most areas of scrub will be diverse in their species makeup and there will be few stands of single species across the site.

Throughout the Scrub and Secondary Woodland zone there will be a good range of ages of all scrub species. There will be many seedlings and patches of regenerating scrub and the different structures and ages of the shrubs will provide habitats for many different species of plant and animal.

3.3 Factors

- Grazing pressure. (Upper and lower limits).
- Scrub cutting.
- Local Opinion.
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

3.4 Attributes

- Size of scrub zone. (Upper and lower limits).
- % of areas with good mix of scrub age classes. (Upper and lower limits).
- Area of open glades in Secondary Woodland. (Upper and lower limits).
- Number of breeding Stonechat/Whitethroat/Linnet. (Lower limits).

3.5 Management actions

- Rotational Scrub cutting to increase age diversity.
- Livestock grazing.

3.6 Recording and monitoring actions

- All attributes.
- Grazing pressure. (Upper and lower limits).
- Define all limits.

4.0 ANCIENT SEMI NATURAL WOODLAND

4.0 Ancient Semi Natural Woodland

Figure 10. STINKING IRIS (*Iris foetidissima)* in Park Wood 2004

4.1 Description

Ancient Semi Natural Woodland is woodland over 400 years old, often indicated by the kinds of plant present. The Ancient woodlands are concentrated in only a few areas around the Hills and Commons. The first is Hollybush Roughs situated on the southern boundary of Castlemorton Common and running up to the boundary with the Hill fort on Midsummer and Hollybush Hills (belonging to the National Trust). The other area in direct connection with the Hills is the area around the Holy Well along Holywell Road. Finally Park Wood lies to the west of the West Malvern Road just north of the Wyche Cutting and does not lie directly adjacent to the Hills but very close and next to some of the "In-Bye Land" owned by the Malvern Hills Conservators.

Hollybush Roughs and the woodland in the Holy Well area is Common Land and as such both have grazing rights across them. This has a limited impact on both sites as livestock are currently electric fenced out of the Holy Well woodland and the grazing levels in the Hollybush Roughs are minimal. Anecdotally, there has been an increase in the scrub/shrub layer in Hollybush Roughs showing that the grazing is not impacting significantly on this feature.

None of the woodlands have been regularly managed for at least the last 50 years and as such show a poor structural diversity with over-shading and a lack of

regeneration of younger trees and shrubs apparent in all three woodlands. The only tree species that is consistently seen regenerating in all three woodlands is Sycamore, which as a non-native is undesirable in these ancient woodlands.

Open space and light is minimal, with few, if any, rides and glades. The only light reaching the woodland floor is from the odd fallen tree. This means that there are limited places for plants to flower and therefore less pollen and nectar sources for the rare invertebrates found in the woodlands.

The topography and thin soils on all sites mean that there is a significant amount of naturally fallen trees present within all the areas of ancient Woodland. Naturally this means that there is ample dead wood habitat, especially in areas not accessible for the extraction of the fallen timber. As the woodlands have not been managed intensively there is also a large amount of standing dead wood to be found in all these woodlands. This dead wood habitat is important for many fungi and invertebrate species, which provide an important food source for the many bird species found in the woodlands.

Hollybush Roughs is a mixture of Ash/Maple woodland with an under-storey of bramble/Dog's Mercury and also Oak woodland with an under-storey of Hazel and Bluebells with occasional patches of Wood Anemone and Wood Sorrel. Species such as Wood Avens and Dog Violet are often seen within this woodland and in some places the Bramble layer is starting to over shade the wildflowers. White Letter Hairstreak butterflies are recorded from this area annually; the caterpillars feed on Wyche Elm.

Park Wood contains many different ancient woodland types within a relatively small wood. The Geology of the wood is very different from the rest of the woodland on the Malvern Hills Conservators' land as it lies over Silurian limestone rather than the more usual acidic granite composites. There is a mixture of Ash/Maple woodland along with Oak with an under storey of Hazel and the occasional Birch. There are also small patches of "wet woodland" characterised by Alder and various Willow species along with uncommon wild flowers like Opposite Leaved Golden Saxifrage and Yellow Pimpernel. As with Hollybush Roughs the woodland has many Hazel Coppice stools that indicate that there has been a strong history of coppice management within the wood. Plants such as Broad-leaved Helleborine, Woodruff, and Bitter Vetch indicate the ancient nature of the woodland. The Dingy Skipper butterfly is found in the area around Park Wood but is limited to a small, enclosed area.

There is little up to date survey information for the Holywell Road woodland and Park Wood.

These ancient woodlands are home to most of the common woodland bird species that you would expect to find but also some much more uncommon species reside and breed within the woodlands. Pied Flycatchers can be found in Hollybush Roughs, along with Lesser Spotted Woodpeckers, Redstarts and Turtle Doves.

4.2 Objective for Ancient Semi-Natural Woodland

All the Ancient Semi-Natural Woodland on Malvern Hills Conservators' land will be actively managed for the benefit of wildlife and public access.

The woods will be fully surveyed and there will be an individual management plan drawn up for each area of woodland. These surveys will guide the proportion of each woodland that will be either open space, non-intervention or rotationally managed.

The structure of each wood will be varied with young trees and regenerating seedlings present. From 2006 only new seedlings of native species of tree will be tolerated in the woodlands. Up to a quarter of each woodland will be open space providing a pollen and nectar source for butterflies such as the Dingy Skipper, Silver Washed Fritillary and the White Letter Hairstreak and also creating linkages between important bracken and grassland habitats. Some areas of open space will be permanent while others will be temporary plots that are filled in through natural regeneration.

There will be both standing and lying deadwood that will be used as a habitat by nesting birds, bats and deadwood feeding invertebrates, which will in turn provide a food source for woodland birds. Up to a third of each woodland will be non-intervention depending on the priorities that the surveys have guided. This non-intervention woodland will usually abound the open space and create linkages for small mammals like Dormice to navigate the area.

Up to half the area of each woodland will be actively managed as coppice with different lengths of rotations running simultaneously and variations in the size of each coppice "coup". This will create a diversity of plot sizes and ages of coppice regrowth maintaining ample fruiting nut trees while also providing appropriate nesting habitat for birds and small mammals like Dormice. In some areas the density of oak standards will have to be reduced to allow the coppice to re-grow properly.

There will be strong populations of Dormice and nesting birds such as Pied Flycatchers, Black Cap, Willow and Garden warblers. The different structures and age/species diversity of trees and shrubs will provide the food source and habitat for these species to thrive in.

The increased open space will encourage more people into the woodlands and will guide them away from sensitive sites.

4.3 Factors

- Inaction – lack of management
- Public Opinion
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

4.4 Attributes

- Extent of Ancient Woodland (Lower limit).
- Numbers of breeding Pied Flycatchers and Warblers (Lower Limits)
- Numbers of Dormice recorded annually (Lower Limits)
- % of standing and prone deadwood (Upper and Lower Limits)
- % of Open space (Upper and Lower Limits)

4.5 Management Actions

- Start coppice rotation in each woodland
- Create rides and glades for open space

4.6 Recording and Monitoring Actions

- All Attributes
- Public Opinion
- Define all limits.

5.0 PUBLIC RECREATION, ACCESS AND INFORMATION

5.0 Public Recreation, Access and Information

Figure 11. "Meet the Vet" and the Good Dog campaign event day July 2002.

5.1 Description

Over 1,000,000 people use the Hills and Commons each year (AONB visitor Survey 2000). There is no up to date survey information about visitor satisfaction but less than 0.1 % of people using the Hills voice any concerns they have about their experience on the Malvern Hills every year.

The recreational activities that take place on the Malvern Hills are incredibly diverse and are enjoyed by many different social groups within the local community and from outside the local area.

Recreational Activities on the Malvern Hills:

Informal	Formal
General Walking	Organised/Sponsored Walks
Dog Walking	Mountain Bike Clubs
Horse Riding	Exercising Hounds
Individual Mountain Biking	Orienteering
Kite Flying	Hang/Para Gliding
Mountain Boarding	Climbing
	Model Aircraft
	Sub Aqua Diving
	Canoeing

Rising right out of the town of Great Malvern and within easy reach of major transport links the Hills and Commons provide an almost unique resource to local people, day-trippers from nearby towns and tourists visiting the area. It is unusual for an open, rural area to be so close and accessible to an urban environment. Not only does it provide an area for many types of recreation but also has a major positive impact on the prosperity of the area.

The level of use and its importance to the local economy mean that these activities inevitably put pressure on other features of interest or users of the Hills. Conflicts between different user groups and between users of the Hills and the conservation management that takes place are occasionally reported but are not commonplace. The limit of acceptable recreational pressure (both in terms of its impact on other recreational users and its impact on environmental and historic features) has not yet been estimated. The incidences of these conflicts seem to be increasing with the rising use of the Hills.

Some areas of land do show erosion from footfall, bicycles and horses but this is in limited areas and mainly affects the ridge of the Hills and other places where users are concentrated.

The highest levels of use are on the Northern and Central Hills accessed from the town of Malvern and the surrounding villages. Considering its area British Camp has arguably the highest visitor pressure of all the Hills, mainly due to the large car park at its base situated on the main road between Hereford/Ledbury and Malvern/Worcester. South of British Camp the Hills are less frequently used as they are in a more rural location. They are mainly used by nearby residents, those wanting to avoid the crowds and walkers following specific trails or attempting the 9 mile length of the Hills.

Most of the Access to the Hills is from the Malvern Hills Conservators' car parks. This means that the majority of the access is via car and this can cause its own problems. At busy times the roads around the car parks can become congested to the disadvantage of local residents. The Hills Hopper bus service (set up in Partnership with the Malvern Hills AONB) that runs around the Hills from the Town goes some way to reducing this impact.

Once on the Hills most people stay on the ridge or the higher contour paths. The obvious attraction of views from the ridge aside, it is felt that people are discouraged from exploring lower down the Hills due to the scrub and secondary woodland that has encroached, concealing the views and reducing one's sense of direction. It is also felt that this discourages people from accessing the Hills from the town, as it is not obvious to the visitor that there are access points here. However, the reasons for the distribution patterns of visitors to the Hills are not fully known.

Castlemorton Common lies below the Southern part of the Malvern Hills and is used consistently by people who live around the Common all year, while a high visitor pressure is felt mainly in the summer months. This is also the area that has the most problems with antisocial behaviour, especially in the Gullet Quarry area where the Common meets the Hills. Through the Castlemorton Common Plan there will soon be a monitoring process to record any incidents.

There is a policy of access for all on the Malvern Hills Conservators' land and, where possible, provision is made for people with mobility difficulties. Obviously the nature of the Hills makes access difficult for some but there are several areas suitable for "easy access" already and two more trails have been created to increase provision.

Public rights of way are kept open and all 100 miles of paths are repaired when damaged by heavy use, severe weather and general wear and tear.

Three Wardens deal with breaches of the Malvern Hills Conservators' 49 byelaws. The Wardens use education and encouragement rather than direct enforcement as this is found to be more effective in managing inappropriate behaviour. Enforcement is used only as a last resort and this leads to greater feeling of inclusion and welcome on Malvern Hills Conservators' land.

Information Boards are placed in nearly all parking areas around the Hills and Commons and also placed on all gates around the electric fenced compartments on the Northern and Central Hills. They are restricted to these more "planned" areas to preserve the open, rural nature of the Hills and Commons.

A regularly updated Internet Web site, leaflets, regular articles in local papers, appearances on local radio, national television and local events (including the Three Counties Show) disseminate information about the work of the Malvern Hills Conservators. Generally all Conservators Board and Committee meetings are open to the public.

To summarise, the site is one of, if not *the* major rural recreation destination in the West Midlands and offers a fantastic resource to the people who use it.

Figure 12. Opening of the Easy Access trail at Black Hill in 2001.

5.2 Objective for Public Recreation, Access and Information

There will be recreational activities taking place across the Hills and Commons with participants from all sectors of the community made to feel welcome in the area.

Formally organised activities will be encouraged to take place away from where high levels of informal activities occur and where possible the pressure of recreation will be spread across the Hills. Particularly sensitive features will not be promoted for increased access but robust areas with a current low user rate will. This will take some of the pressure from the highest use areas and improve the overall visitor experience.

There will be a sustainable level of recreation on the Hills without excessive pressure felt between the different users. Any impacts on the environmental features will be at an acceptable and sustainable level. In fact a small level of disturbance will have a positive impact on some habitats and species.

This sustainable level of use will be known through various surveys of visitor satisfaction when pressure on the Hills is high. It will also be possible to determine the impact of recreational pressure on environmental features due to the monitoring programme that will be in place.

Areas that already have "easy access" will have improved facilities for people with other disabilities such as blindness and hearing impairment. All existing interpretation and information boards will be improved to incorporate new technologies so that they can be updated easily and user friendly for people with impaired hearing and/or vision. Information will continue to be regularly disseminated through the local and national media and the Internet website will be regularly updated and modernised to include information for people whose disabilities affect their ability to access this information.

Paths will continue to be maintained and enhanced and sustainable surfaces will have been experimented with to find a long-term sustainable solution to path maintenance. Similar solutions will have been found for car park surfaces.

The enforcement of byelaws will continue to be in a more educational/encouragement vein. All incidents will be fully recorded and this will allow assessments to be made on any control measures or solutions to these breeches.

There will be no further provision of car parking around the Hills and there will be more people accessing the Hills from the surrounding town and villages. There will be more views from the lower contour paths around the towns and villages and this will lead to a greater amount of access from these areas and a reduction of pressure on the ridge of the Hills.

Existing toilet facilities will be improved and maintained across Malvern Hills Conservators' land.

Overall visitors will be pleased with their experience of the Malvern Hills and will not feel pressured by other users of the Hills.

5.3 Factors

- Visitor Pressure. (Upper and Lower limits for each area).
- Antisocial behaviour/Breeches of Byelaws. (Upper limits for each area)
- Local/Visitor Opinion.
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

5.4 Attributes

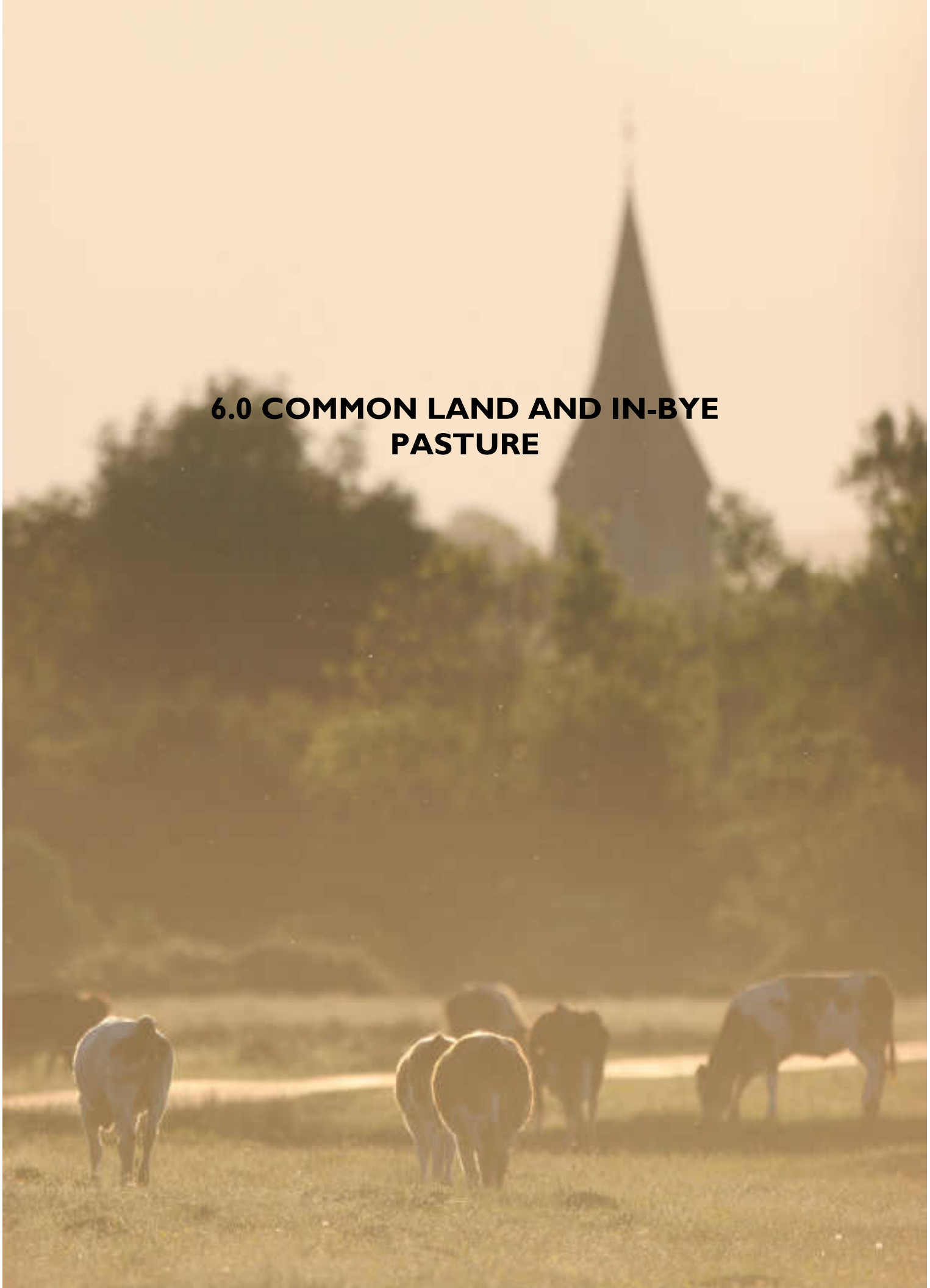
- Visitor Pressure. (Upper and Lower limits for each area).
- Provision of access for people with disabilities. (Upper and lower limits).
- Local/Visitor opinion.
- Levels of diversity of recreational user groups. (Upper and lower limits).

5.5 Management Actions

- Maintain/enhance good relations with recreational user groups.
- Enhance Interpretation/information dissemination.
- Clear views from lower contour paths, where appropriate.
- Continue to inform and encourage people to follow the byelaws.
- Maintain paths with sustainable materials.

5.6 Recording and Monitoring Actions

- All attributes.
- Antisocial behaviour/Breeches of Byelaws. (Upper limits for each area).
- Local/Visitor Opinion.
- Define all limits.



6.0 COMMON LAND AND IN-BYE PASTURE

6.0 Common Land and "In bye" Pasture

Figure 13. The Conservators' Stockman and his dog "Roy" tending the Sheep on British Camp.

6.1 Description

The vast majority of land owned by the Malvern Hills Conservators or under their jurisdiction is Common Land. This means that although the Malvern Hills Conservators own or manage the land it is local inhabitants with "commoners' rights" who have the first right to graze, fish, feed pigs on beech mast and acorns, cut bracken or collect fallen wood from it, depending on which rights they have.

The five Acts of Parliament (1884-1995) confer 4 main duties on the Conservators to carry out their function as common owners and protectors:

1. To preserve the natural aspect.
2. To keep the area as open spaces for the recreation and enjoyment of the public.
3. To prevent un-lawful buildings, enclosures and encroachments on the Malvern Hills Conservators' land.
4. The Conservators must not act in any way that would adversely affect the right of any commoner.

The cultural significance of a traditional working common is hard to overstate. In Worcestershire you can count the number remaining on one hand and so it is vital that the tradition of local people using their common rights is continued and encouraged. It is not only the value to the local people who farm on the commons but also to those with a recreation interest. Many people comment that they like to see the cattle and sheep on the Hills and Commons and this is obviously more valuable and informative as a real working process rather than one re-created by an organisation. Only two common land units are currently used regularly by local commoners to exercise their rights of common. Two more common land units are grazed by livestock belonging to the Malvern Hills Conservators and a further four common land units are only used very occasionally for the exercise of the rights of commoners. These working commons include commons like Castlemorton and the Old Hills.

The urban commons owned by the Malvern Hills Conservators are not currently grazed and all rights upon them are currently dormant. They are still kept as open spaces for people to recreate but could no longer be described as working commons. They are currently mown short for the benefit of the main activity on these areas, recreation. The rural commons are managed for their agricultural and ecological value by both the Conservators and by commoners exercising their grazing rights. The ecological value is covered in the other "Features of Interest".

There are over 200 Pollarded (pruned back hard) trees on the Commons and these were traditionally managed by commoners to provide them with firewood, fencing and building materials. These trees are largely Willows and Poplars and include Britain's rarest tree, the Black Poplar. In recent times these practices have declined and so the Malvern Hills Conservators carry out this work to increase the lives of these important trees.

Until the year 2000 only a fifth of Common land in Britain was legally open to the public. The Malvern Hills and Commons was part of this "fifth" and the Malvern Hills Conservators are charged in their Acts of Parliament to "keep the Hills and Commons as open spaces for the recreation and enjoyment of the public". As already stated over 1,000,000 people visit the land of the Malvern Hills Conservators every year and it remains an important tourist attraction and place of recreation for local people.

One of the main reasons that the Malvern Hills Conservators were set up in 1884 was to bring to an end the enclosure and encroachments upon the common land around Malvern. There is still a pressure of encroachments if not enclosure on the commons from new developments and garden/driveway expansion by neighbours to the common.

The "In Bye" pasture is currently used as supporting land for the grazing on the Hills. Some is kept in hand by the Conservators to support the grazing that the organisation has taken up and the remainder is leased to local commoners to aid them in grazing on the Hills and Commons. The wildlife value of the land is quite high and it is currently grazed to make sure that flowers can set seed and to make sure that it is not over poached (trodden up by livestock) in winter. The hedgerows

associated with this land are periodically trimmed or layed in the traditional manner to maintain their importance as boundaries, landscape features and habitats in their own right.

6.2 Objective for Common Land and "In Bye Pasture"

On Rural Commons there will be a mixture of livestock grazing the commons throughout the year tended by local commoners exercising their common grazing rights along with their other rights. On urban commons there will be open spaces where the rights of commoners could be continued and there will be no action that has taken place by the Malvern Hills Conservators that would adversely affect the right on any commoner on these commons or any other. The urban commons will continue to be managed for their main use as recreational areas.

The extent of Common Land will be no less in area than in 2005 and the only new buildings, enclosures and encroachments upon the Hills and Commons will be those permitted by the Malvern Hills Acts or by permission from the Secretary of State for the Environment.

The various habitats will be managed by the Malvern Hills Conservators in cooperation with local commoners, and other interested parties. Where possible a consensus with relevant partners will be reached on the long-term management of each common. The pollarded trees will continue to be pollarded in rotation. Where the commoners do not carry this out the Conservators will.

The Common land will remain as open spaces for the recreation and enjoyment of the public.

The In Bye land will be a mixture of grasses and wildflowers in the summer that are allowed to set seed so that annual species may continue in the sward. Butterfly species such as Marbled White and Meadow Brown will be commonly seen and any bracken present will be fairly weak with the grasses and Wildflowers thriving under its broken canopy. It will also be a place open to the public for their enjoyment but will mainly be used as a place for the livestock of the Malvern Hills Conservators and other common graziers of the Hills and Commons when they are not on common land.

The hedgerows associated with the in-bye land will be a mixture of layed coppiced and trimmed hedges, with varying ages of hedgerow regrowth present in all parcels of in-bye land.

6.3 Factors

- Number of ACTIVE graziers (Upper and Lower limits for each Common)
- Illegal Encroachments on the Commons (Upper limit)
- Local Opinion.
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

6.4 Attributes

- Extent of Common Land (Lower Limit).
- Number of ACTIVE graziers (Upper and Lower limits for each Common).
- Open character free of illegal enclosure and encroachments (Lower limit).

6.5 Management actions

- Foster support with local groups for working commons.
- Completion of a Plan for the future for Castlemorton Common.
- Find financial support for long-term management of Commons. E.g. Environmental Stewardship.
- Prevent illegal encroachments and enclosures.
- Malvern Hills Conservators to continue the tradition of grazing where too few commoners currently exercise their rights.
- Encourage local graziers to continue to graze/or take up their rights.
- Research the possibility of purchasing a farm/property with Commoners rights attached and let it on the basis that the common rights are exercised at an agreed level.

6.6 Recording and Monitoring Actions

- All attributes.
- Ability of commoners to graze.
- Local Opinion.
- Define all limits.

7.0 ARCHAEOLOGY

7.0 Archaeology

Figure 14. British Camp Hill Fort 1948 showing the Monument free from scrub.

7.1 Description

While there are many individual archaeological earthworks on the Malvern Hills Conservators' land there are only two that are considered of enough importance to be classified as Scheduled Ancient Monuments; The Shire Ditch and the British Camp Hill Fort. Both these and the non-scheduled earthworks are well described by local archaeologists.

The Shire Ditch is a linear archaeological feature almost running the length of the Malvern Hills. This "Ditch", also known as the Red Earls Dyke, is thought to have been built in the 13th Century by the Earl of Gloucester (the "Red Earl") to separate his land from the Bishop of Hereford's land. The ditch is rumoured to have acted as a "deer diode" to let deer pass only one-way across the ditch. There was conjecture that the Ditch was prehistoric in the mid 19th Century and recent studies have supported this theory.

The British camp is an Iron Age Hill fort built circa 200 BC. Popular legend has it that the British Chieftain Caractacus held his last stand at the Camp before being captured by the Romans. It is thought that the initial fort was the uppermost 3 ha of the Hill and that this was expanded to 13.5 ha at some time in the Iron Age to incorporate the spurs to the south and northeast.

The condition of these features varies across the two monuments as both cover a large area. There are two main threats to all monuments and other earthworks on the Hills. These are scrub encroachment and erosion.

As with many other features of interest on the Hills they have suffered from the encroachment of scrub. The shallow depth of the soil means that the roots/rhizomes of all trees, scrub and bracken can quickly break up the buried soil horizon that was sealed at the time of construction and could hold information about the time of construction. When trees, scrub and bracken are shading out the monuments they not only reduce their visibility but they also cause the features to silt up, further reducing the visibility of the monument. There has been some considerable scrub clearance from both the Shire Ditch and British Camp and the reintroduced grazing has the valuable impact of preventing regeneration of the scrub and also reducing the strength of the Bracken growth.

The erosion that impacts on the monuments varies from recreational pressure to the water bowsers that are put out for the cattle. Small mammals, in particular Rabbits, also cause localised damage to the earthworks through their burrowing behaviour. All these pressures work alongside the weather to damage the integrity of the earthworks on the Hills. Walkers, mountain bikers, and machinery all have their impacts on the surface. The heavy storms that have characterised recent weather patterns then worsen the initial damage along with the inevitable formation of rills and Gullies that the run off creates. These factors tend to be localised to where visitor pressure is highest, where livestock collect or where water collect and runs at speed down the Hills.

Figure 15. The Shire Ditch near the Worcester Beacon showing signs of erosion.

7.2 Objective for Archaeology

Both the Shire Ditch and the British Camp will be free from Scrub and the erosion apparent will have decreased from 2006 levels. The monuments will be covered with short turf or weak/patchy bracken habitats that will provide ample visibility of these features. Bare and/or eroded ground will not be obviously evident.

Scrub clearance further down the slope will have further enhanced the condition of the other earthworks on the Hills while the grazing in these areas will have prevented any scrub re-growth from causing further damage. The grazing will have also weakened the areas of Bracken and increased the visibility of the earthworks in these habitats.

The direct recreational pressure on the archaeological earthworks will have lessened and visitors will be encouraged to avoid using the monuments themselves by using different identified routes for their recreational purposes.

Livestock fences and water will, where possible, be sited away from the monuments but localised damage will be balanced with the necessity to provide grazing to keep the monuments in good condition. Small mammal populations will be such that damage to the archaeology is balanced with the valuable grazing resource they offer.

Where erosion causes damage it will be repaired as quickly as possible to protect the features before too much damage takes place.

There will be a regular fixed-point photography survey of the monuments to highlight any damage and therefore guide management.

7.3 Factors

- Grazing pressure. (Upper and Lower Limits).
- Visitor pressure. (Upper and Lower Limits).
- Area of bare eroded ground on monuments. (Upper limit).
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

7.4 Attributes

- % of monuments clearly visible. (Lower limit).
- % of monuments covered in Short turf and/or sparse bracken. (Lower limit).

7.5 Management Actions

- Scrub Clearance
- Encouraging recreational users away from the Monuments
- Quick repair of archaeological features

7.6 Monitoring and Recording Actions

- Fixed point photography.
- Grazing Pressure. (Upper and lower limits).
- Visitor Pressure. (Upper and lower limits).
- Area of bare eroded ground on monuments. (Upper limits).
- All attributes.
- Define all limits.

8.0 GEOLOGY

8.0 Geology

Figure 16. Spurriers quarry, near the Wyche Cutting after face clearance March 2002.

8.1 Description

The geology of the Malvern Hills is world-renowned and contains some of the oldest rocks in Britain. The main features of interest for Geology on the Hills and Commons are where the rock of the Hills is exposed in the disused quarries, pits, cuttings and rocky outcrops.

There are three main rock types that are found on the Hills. These are Cambrian Malvern Quartzite, Llandovery Siltstones and Shales and one of the largest and most important Precambrian outcrops in Southern Britain that has been subject to extensive research.

An exposure of Lower Cambrian Malvern Quartzite occurs in the Gullet area. In these grey conglomerates and quartzites various fauna has been found enabling precise dating of these rocks.

There is also an exposure of Llandovery siltstones and shales in Gullet Quarry is of key importance in establishing the nature of the contact between the Precambrian and Palaeozoic rocks in the Malvern block.

Most of the Cambrian and Llandovery exposures in the range are found within the quarries, pits and cuttings. While the Precambrian exposures are also found in these areas they are also prominent on the many rocky outcrops across the Hills. In

addition there are other interesting features such as "Clutters' cave" which presents a good example of pillow lava within an exposure of the Warren House Volcanics.
Many of the quarries, pits and cuttings have suffered from scrub encroachment over the last 40-50 years, much like the rest of the Hills and Commons. This means that many of the exposures have been covered over and lost to inspection. During 2001/2002 several quarries were cleared in the "Face lift" project and while it did open up some important exposures it also made some quarries inaccessible for safety reasons due to the destabilising effect it had on some quarry faces. Some of the quarries are still fairly open in character due to either very thin or lack of soils. Between the 1950's and 1970's the Conservators often planted these with non-native trees, such as buddleia, pines and laurels.

The decline in grazing not only caused scrub encroachment but also caused a thick thatch of grass and an increase in the humus layer. On the rocky outcrops the lichens and mosses also created a medium in which the grasses could germinate and grow leading to the outcrops becoming smothered and losing both the geological and the wildlife interest of the outcrops. The reintroduction of grazing has mostly restored these features, particularly where sheep grazing has been introduced. Over the last 5 years there has also been a significant amount of scrub clearance around both the quarries and the outcrops, improving both these kinds of features considerably.

There has been some storage of materials within some of the quarries that has obscured the exposures or prevented access to them. Recreational activities like rock climbing, and picnicking take place in some quarries, which are safely managed for this kind of use.

The quarries also have a varied wildlife interest with species like Adders, Barbastelle Bats, Peregrine Falcons and Grayling butterflies associated with the quarries. The faces are also home to a varied array of mosses and lichens that are currently being studied.

Figure 17. A well camouflaged Grayling Butterfly on a Rocky outcrop on North Hill

8.2 Objective for Geology

The quarries will have been assessed for the possibility of clearing and exposing the geological features only where a safe, stable quarry face can be maintained. This will have lead to an array of clear exposures offering examples of all the main rock types on the Malvern Hills. The necessity of clearing these exposures will be balanced with the need to conserve the protected/priority species residing in some of the quarries and the requirement to keep the quarry faces secure.

Rocky outcrops will have a broken structure of lichens and mosses across them with the rock exposures still visible underneath these lower plants. Where possible these rocky outcrops will not be over shaded by trees or scrub and they will be free from smothering grass growth.

There will be suitable interpretation signs for the most important geological exposures around the Hills and the importance of the geology will be promoted through partnership work with local geological groups.

Regular fixed-point photography will provide a record of change in the condition of the most important, restored features and will guide their maintenance.

8.3 Factors

- Scrub encroachment (upper and lower levels).
- Site Safety (Lower limit).
- Legal. (Malvern Hills Acts, SSSI, & Commoners rights).

8.4 Attributes

- Number of visible geological exposures each main rock type. (Upper and Lower Limits).

8.5 Management Actions

- Safely clear quarry faces.
- Keep rocky outcrops clear of scrub and over shading.
- Improve interpretation.

8.6 Recording and Monitoring Actions

- Fixed point photography of quarries.
- Scrub Encroachment. (Lower limit).
- Site Safety. (Lower limit).
- All attributes.
- Define all limits.

B. MANAGEMENT AND RECORDING PROCESSES

(A summary of how the objectives will be met and how the management actions will be carried out)

B. Management and Recording Processes

Figure 18. Bracken and Bramble being cut and collected on Swinyard Hill 2005 for the benefit of Adders and Butterflies.

9.0 Introduction

There are many processes that are used on the Hills and Commons to improve or just maintain various different habitats and also recreation features like paths or urban green space. Many of the features previously described require the same management processes to manage them effectively. Rather than repeat these processes for each feature it is better to describe them together to demonstrate how they integrate across all the Malvern Hills Conservators' land.

Apart from the direct maintenance of the infrastructure of the land, much of the work is in the form of wildlife or conservation management. After all, the organisation is called the Malvern Hills **Conservators**. There are those who suggest that the best way to conserve the wildlife and habitats of the Hills would be to leave them alone to develop on their own without man's interference. However, this assumes that all the natural processes that are necessary to create the Habitats for these species are with us today. Unfortunately we do not have Wild Oxen, European Bison or the giant Irish Elk roaming on the Hills as they are all either globally or at least nationally extinct. The loss of these natural grazing animals and the impact of visitors on those that are still around, means that this very important natural process has been eradicated or distorted by the actions of mankind. For centuries this process has been re-created through sheep and cattle grazing the Hills and Commons for meat production. As this activity has declined we have seen a degradation of the habitats due to the near complete loss of a vital natural management process.

The majority of the land management work that the Malvern Hills Conservators have carried out over the last 10 years has been focused on addressing this issue and returning the Hills and Commons to a balance between the different habitats and species. This has involved taking back the scrub line to previous levels, while maintaining plenty of scrub habitats for nesting birds (scrub related species are part of the management objective for this feature) and restoring the nationally important acid grassland to a favourable condition. Grazing and Machinery are used to achieve this but the long-term aim is to cut back on mechanical scrub control and let the natural process of grazing animals keep the balance between the different habitats.

Most of this work is about re-creating ***natural processes*** so if these management actions did not take place then it could be argued that this was just as "unnatural" as intervening.

10.0 Grazing

Figures 2, 3, 8 and 9 clearly show just how effective grazing can be in controlling scrub, bracken and grass growth on the Hills and Commons. Quite clearly the terrain of the Hills and Commons means that the scope for mowing the grass and scrub is very limited and would also be environmentally irresponsible considering the excessive use of fossil fuels needed for this kind of management.

The animals are far more likely to choose to graze an open lush grassy area than one thick with scrub and bramble. In some areas this is ideal as it ensures that the scrub and bramble are preserved where they are needed. On the higher slopes the grassland is the priority and areas where the livestock are unable or unwilling to graze are opened up by machinery to encourage them. Areas where sheep and cattle graze together also benefit. The cattle knock pathways through vegetation that the sheep would find impenetrable.

In some areas the Bracken is too strong for the annual actions of the livestock to keep it in check. In these areas the bracken is cut in the winter and bruised in the summer to weaken it enough so that the animals can keep it in balance.

Figure 19.
Sheep browsed thorn tree on Broad down

The Northern and Central Hills are grazed by livestock enclosed in temporary electric fences that are moved periodically so that as many areas as possible are grazed. There are some areas of acid grassland outside these fenced compartments (and therefore are not grazed) and they are characterised by thick tussocks with a "feg" or matt of dead grass under the green growth. There is considerable encroachment of scrub into these areas and where bracken is present it will start to dominate and create a litter layer reducing the grass and wild flower content. In some parts of the grazed compartment on the Northern Hills some coarse grasses are starting to dominate and are swamping the wild flowers in these areas.

On British Camp the sheep are hefted on the Hill, which means that they have learnt to stay on this part of the Hill, as this is where they spend time as lambs and are fed in the winter. The grassland is currently over grazed but much of the restoration has already been completed on this section with the "Feg" or Matt removed and the re-growth of the scrub kept down by the high grazing pressure. Although there are still areas of scrub to be restored to grassland the grazing pressure has been reduced to give the grassland a rest for a couple of years.

Where scrub clearance has taken place the trees and shrubs are quick to re-grow unless the stumps are grazed in the aftermath. Without grazing the field staff would be returning to the same areas to re-cut them, whereas with grazing the staff can keep moving on to new areas and cover a far greater area over the course of the management plan.

Apart from the impacts of the livestock on the vegetation they also have a beneficial impact in terms of their by-product, dung. The invertebrates that feed on dung are important food sources for birds, bats and other small mammals. One of the 10 largest colonies in Britain of the Lesser Horseshoe Bat occurs on the Hills and these bats rely on dung invertebrates to make up a large part of their diet.

While the Hills and Commons are all Common Land and therefore have grazing rights across them these are not always taken up for various reasons. Where this is the case the Malvern Hills Conservators take up these unused rights and carry out the grazing with their own "Conservation Flock/Herd". Where graziers are still active they are encouraged and supported in their actions and financial help is sought from various countryside stewardship schemes. Ideally common graziers would be the only graziers on common land and the organisation will continue to work towards this goal but until this is the case the Conservators will intervene and deliver the grazing where necessary.

Encouraging commoners to graze is not an easy task because many of the properties with commoners' rights have passed to individuals with little or no interest in exercising them. If this trend continues it is difficult to see how the tradition of a working common can be maintained. In the past the National Trust have bought farms/properties adjacent to Commons that they own with rights attached and let them with the condition that the common rights of grazing are exercised at an agreed level. This prevents the Trust from having to implement the grazing themselves while still maintaining their role as a landowner rather than a farmer. This option is something that will be considered by the Board.

11.0 Mowing, Cutting and Rolling with machinery

The mechanical management of the Hills and Commons is for the purposes of maintaining the urban green spaces, maintaining the rights of way and enhancing the habitats on the Hills for wildlife.

The urban commons are usually treated as urban green spaces now and although they are still managed for the benefit of important individual species, as a rule they are kept short cropped for the benefit of the public. A combination of contracted out and in-house staff time is used to cut the grass in these urban areas. The rights of way are mowed to keep them open and every year only one side of the paths is cut to maintain their wildlife value.

The habitat enhancement work is far more varied. Where clearance of bracken and bramble is required it is far more time efficient to carry it out with a flail mower or cut and collect machine than by hand. Where possible, and especially on sensitive sites, the material is cut and collected to remove the arisings from the area. By removing the arisings it prevents the nutrient levels from rising too high, which favours the fine grasses and flowers over the scrub and bramble. However it is not possible to do this on every site, as suitable storage for the cut material is limited. Areas where there is a lower amount of debris to clear are more suitable for flailing, where the cut material is shredded to mulch on the floor. Follow up grazing is very important with flailing as the stock break up the mulch to allow grasses to tiller and compete with the regenerating scrub. Wherever this machinery is used there is a balance between what is taken and what is left. Often local experts on the species that may be threatened by the work are consulted on the best approach. Where appropriate low impact machinery is used to carry out the work.

Figures 20 & 21.Scrub and Bracken clearance in October 2006 showing a balanced approach with patches of habitat retained.

Bracken Rolling (or bruising) is also used as a method to control the strength of the bracken through the summer. It is carried out with a specially designed roller that pinches the bracken stems causing them to bleed and also breaks up the canopy of the bracken. The extra light that reaches the ground promotes grass growth, which encourages livestock in these areas to further break up the bracken layer.

In many cases a site may be flailed/cut, grazed and rolled within one year. After a couple of years of this intensive management these sites can then be managed with low intensity grazing with very little disturbance from man made interventions.

12.0 Scrub Management

Malvern Hills Conservators Field Staff carry out most of the scrub management work that takes place with some smaller tasks contracted out or taken on by volunteer groups. In all cases of scrub management, whether it is clearance or maintenance, a balance is always sought between what is felled and what is left. Local experts on particular wildlife groups are regularly consulted to make sure our actions are not detrimental to wildlife species in the long-term. Depending on the size of the material to cut, this is carried out with flail/cut and collect mowers, chainsaws, brush cutters and by hand in difficult situations or where volunteers carry out the work.

On the higher slopes there is more of an objective to clear the scrub but on the lower slopes, within the lower end of the bracken zone and within the scrub zone, there is a genuine desire to maintain and enhance the scrub habitats. If scrub is left alone it will deteriorate into secondary woodland habitat that is of far less value and also tends to hamper the views enjoyed by people across the Hills. In order to have scrub in the long term it is necessary to cut down the oldest stands in rotation and then let it grow back. This ensures that there is always a succession of different ages of scrub habitat within a given area.

Figure 22. Field Staff Clearing scrub on Chase End Hill, February 2005.

The other main impact on scrub is obviously the grazing pressure. Without this follow up management it would be impossible to economically restore the important habitats and views on the Hills and Commons. The maintenance of cut areas by the

livestock, allows the management work to move onto new areas and have a far greater positive impact. The only shrub/scrub species that is not affected by the grazing is Birch. Birch is mentioned as a Factor in the plan as it is by far the most invasive species on the Hills. The leaves of Birch taste bitter to livestock in the spring and so they will choose to browse other species of plants while the Birch continue to grow through the season. Stump treatment with suitable herbicide may be necessary in areas where Birch is present.

13.0 Special Management Areas and Volunteer Action

There are currently 15 regular special management areas on the Malvern Hills Conservators' land with many more sites (particularly ponds) visited less frequently. These are managed by volunteers, co-ordinated by the Warden team, taking part in the monthly conservation days and Voluntary Site Wardens donating their free time more regularly to specific sites. The sites are made up of the wet flushes, bogs and ponds that occur around the Hills where springs emerge from the hillside and small inaccessible sites that are difficult to regularly manage on a large scale. Much of the work that the volunteers do is scrub and bracken cutting. Opening up the ponds and flushes to let the water plants thrive on the wetland sites and clearing the scrub from hard to reach sites with particularly rare species present is important work. One of the sites is the only known location in England and Wales for the Club Moss *Diphasiastrum x. isleri*. The volunteers are an indispensable resource and really help us to look after these small sites. The Volunteer Site Wardens are in the process of drawing up individual site management plans alongside Conservators staff so that there is a clear objective for each site. Local experts are often drafted in to help with advice on management for rare species and also to give talks on the wildlife to the volunteer groups.

Figure 23. The conservation Volunteers take a well-earned break.

14.0 Tree Work

There are many feature trees on the Malvern Hills Conservators' land with over 200 old Pollards (including 80 of Britain's rarest tree the Black Poplar). The fact that the commons are surrounded by properties and areas of public access means that it is important that these trees do not pose a risk to the public or property. Currently the trees in areas of high usage are assessed every three years for any safety work necessary. This work is carried out by qualified tree surgeons to keep these trees as safe as possible.

The Pollards are trees that have been managed for their timber for hundreds of years by cutting off their boughs above grazing height to ensure they re-grow. These trees come to rely on this form of management to prolong their lives and also improve the wildlife value of each tree. All the pollards are cut in rotation and a recent plan has been drawn up to carry this work out. The pollarding is done by both Field Staff and contract tree surgeons.

Figure 24. Cattle grazing around Pollarded Black Poplar trees on Castlemorton Common

15.0 Recording and Monitoring

To make sure all these management actions are having a positive impact on the long-term populations of wildlife species on the Hills it is important to record the changes in populations of the plants, fungi, invertebrates, mammals and reptiles on Malvern Hills Conservators' land.

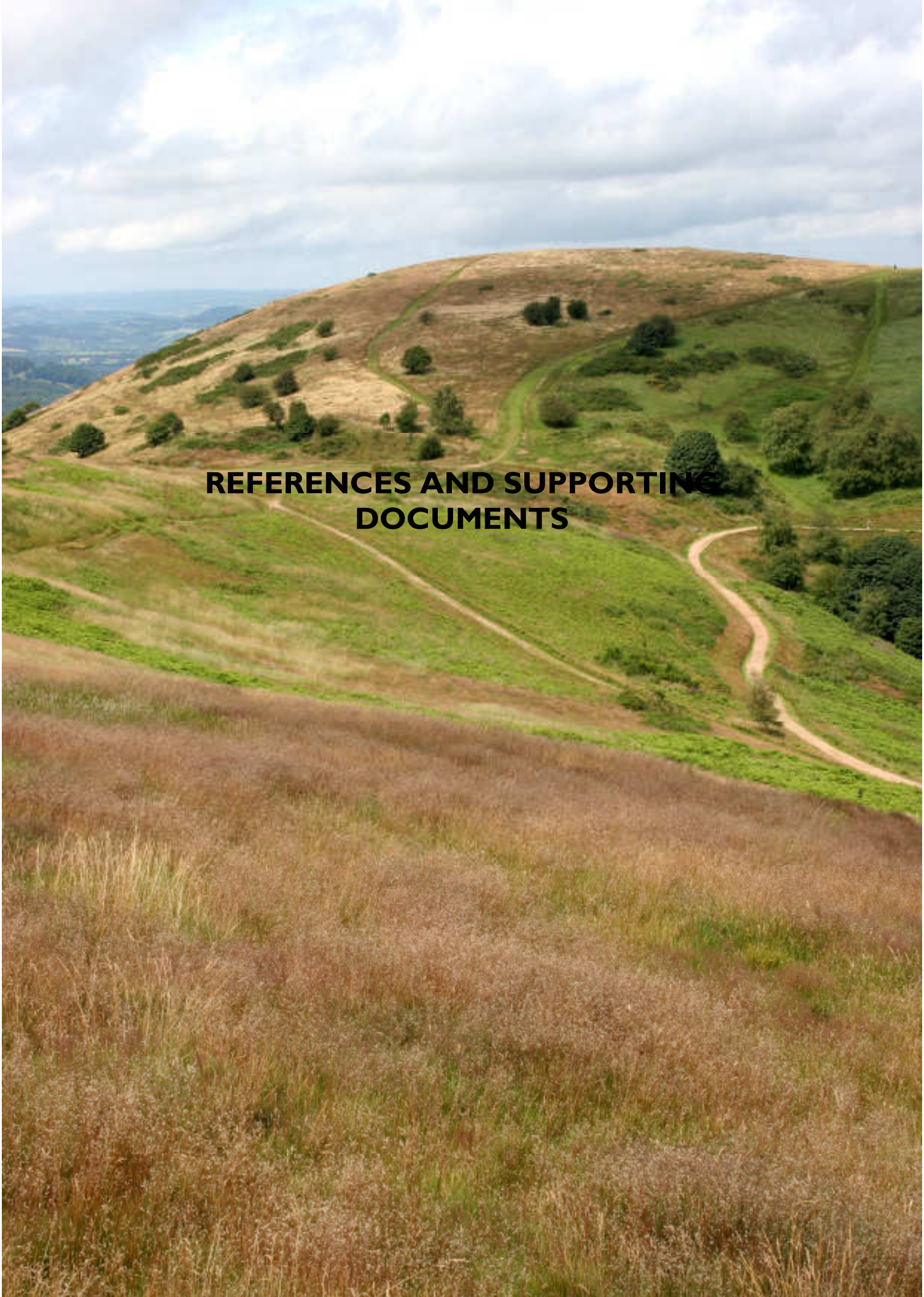
The Conservators employ professional staff that carry out and organise monitoring and a panel of local and national wildlife experts report to the Land Management

Committee and keeps the organisation aware of any significant changes in the status of the wildlife on the Hills. In addition to this the Conservators support targeted surveys of species where they can be used to indicate habitat quality. Recent surveys commissioned include those for grassland and wild flower communities, High Brown Fritillary and Grayling butterflies, Adders and Dormice. There are future plans to target surveys for rare wax cap fungi, and ground nesting birds, among others.

This work is not carried out unilaterally. There is a huge reliance on volunteer experts who give their time freely for the sake of the species for which they survey. To this end we support them through close partnership work with bodies such as the Biological Records Centres (in Herefordshire and Worcestershire), Butterfly Conservation, Herefordshire Amphibian and Reptile Team and Herefordshire Action for Mammals.

Through this partnership we are building a strong volunteer base with training to bring in replacement recorders to continue this vital work. This provides us with a very cost effective recording and monitoring system as well as building strong supporters within this sector.

Figure 25. Bilberry in the frost on Worcestershire Beacon. These patches are monitored by volunteers.



REFERENCES AND SUPPORTING DOCUMENTS

References and Supporting Documents

Alexander, Mike, *The CMS Guide to Management Planning* (Talgarth: CMS Consortium, 2005).

Alma, P J, *Management Plan for the land Managed by the Malvern Hills Conservators 2000 – 2005* (Malvern: Malvern Hills Conservators, 2000).

Bailly, Patrick, *An Investigation testing the null hypothesis "The Heather (Calluna Vulgaris) on the British Camp area of the Malvern Hills was introduced* (Worcester: University of Worcester, 2003).

Bowden, Mark, *The Malvern Hills an Ancient Landscape* (London: English Heritage, 2005).

Bowker, Ann & Smith, Hilary, *Dormice on the Malverns Project 2006* (Herefordshire Action for Mammals, 2006).

Bundred, J A, *Bracken on the British Camp (Herefordshire Beacon) – An Assessment* (Worcester: University of Worcester 2001).

Clayden, Paul, *Our Common Land* (Henley on Thames: Open Spaces Society, 2003).

Davies, Sarah, *The Malvern Hills SSSI: Feasibility study for the re-introduction of grazing* (London: University College London, 1994).

DEFRA, *Countryside Stewardship Scheme Agreement for the Malvern Hills SSSI*, 2003.

Garner, P & Barnett, K, *The Notable Plants of the Land Belonging to the Malvern Hills Conservators* (Malvern: Updated annually).

Hart, Edward, *The Practice of Hefting* (Ludlow: The Farmers Fund, 2004).

Havard, R E, *Review of the Delivery of the Management Plan for the Land Managed by the Malvern Hills Conservators 2000 – 2005* (Malvern: Malvern Hills Conservators, 2006).

Hayes, Elizabeth, Selman, Paul, Short, Christopher & Wragg Amanda, *A Common Purpose: A guide to agreeing management on Common land* (Chletenham: University of Gloucestershire, 2005).

Hurle, Pamela, *The Malvern Hills, a hundred years of conservation* (Chichester: Phillimore and Co. Ltd, 1984).

Joy, Jenny, *A review of bracken management for fritillary butterflies in the West Midlands and Gloucestershire region* (West Midlands Butterfly Conservation, 1997).

JNCC, The nature conservation value of scrub in Britain (Peterborough: English Nature, 2000).

Lees, Edwin, *The Botany of the Malvern Hills* (London: Simpkin, Marshall and Co, 1868)

Malvern Hills AONB Management Plan 2004 – 2009.

Malvern Hills Conservators, *Bracken Management Plan* (Malvern: Malvern Hills Conservators, 2003).

Malvern Hills Conservators, *Grassland Management Plan* (Malvern: Malvern Hills Conservators, 2003).

Malvern Hills Conservators, *Scrub Management Plan* (Malvern; Malvern Hills Conservators 2003).

Marrable, C J, *Ashdown Forest – A review of grazing* (Peterborough: English Nature, 2003).

Marrable, C J, Ashdown Forest Grazing Action Plan (Peterborough: English Nature, 2004).

Nicol, Tim, *Reclaiming the view on the Hills above Malvern* (Nicol Jones Lomax, 2006)

Parker, Sally, *An Action Plan For the Castlemorton Commons* (Bristol: LUC, 2006).

Perterken, G F, *Natural Woodland* (Cambridge: Cambridge University Press, 1996).

Rackham, Oliver, *History of the Countryside* (Phoenix Publishers, 1997).

Rodwell, J S, *British Plant Communities Volumes 1-3, Woodlands and Scrub, Mires and Heaths, Grasslands and Montane Communities* (Cambridge: Cambridge University Press, 1998).

Rohne Poulenc, Bracken Management Handbook

Smtih R T & Taylor J A, *Bracken Fern: Toxicity, Biology and Control* (Leeds: International Bracken Group, 2000)

Smith, Michael, *The Decline of Sheep-Farming in the Western World* (Oxford: Clarendon, 1992).

Stace, Clive, *New Flora of the British Isles, Second Edition* (Cambridge: Cambridge University Press, 2001).

Stephen, Katey, *A Study of the Woodland Boundaries within the Malvern Hills SSSI* (Countryside Consultants 2002).

Stephen, Katey, *National Vegetation Classification (NVC) Phase (II) Survey of Grassland within the Malvern Hills SSSI* (Countryside Consultants, 2003).

Stephen, Katey, *A Study of the National Vegetation Classification Communities within Castlemorton, Hollybed, and Coombe Green Commons* (Countryside Consultants, 2005).

Townsend, Martin & Waring, Paul, *Field Guide to the moths of Great Britain and Ireland* (Hook: British Wildlife Publishing, 2003).

Vaughan, Tom, *Condition Assessment of the Shire Ditch, The Malvern Hills, Herefordshire and Worcestershire* (Worcester: University of Worcester 2006).

Vera, F W M, *Grazing Ecology and Forest History* (Oxon: CABI, 2000).