



Scotland's National Nature Reserves

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The Story of Loch Lomond National Nature Reserve



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Foreword

Loch Lomond National Nature Reserve (NNR) lies in the southeast corner of Loch Lomond, in the southern part of the Loch Lomond and Trossachs National Park. The Reserve includes some of the woodlands for which Loch Lomond is renowned, including the wooded shores on the mainland and on the islands of Inchcailloch, Clairinsh, Torrinch, Creinch and Aber Isle and the wetlands at the mouth of the River Endrick. People have managed these habitats for a variety of different purposes over the centuries, but today these wonderful woodlands and wetlands are managed primarily for wildlife and for people to enjoy.

Loch Lomond NNR is one of over 50 NNRs in Scotland. These special places are managed very carefully to enhance some of Scotland's finest natural heritage. Management of the natural and cultural heritage is the top priority on NNRs, but they are also managed so that people can enjoy, explore and discover these wonderful places too.

The Story of Loch Lomond NNR describes the rich natural heritage in the Reserve with its long history and culture. It introduces us to the history of the Reserve, and describes the land use and management before and since the NNR was declared.

The Reserve Story is one of the documents Scottish Natural Heritage (SNH) uses to manage NNRs. Another document, the Reserve Proposals, outlines how we intend to manage the NNR in future years. We invite feedback on these Proposals and we use your comments to help inform the future management of the Reserve.

All of the documents are available on the Loch Lomond page of the NNR website or can be obtained from the address below.

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<http://www.nnr-scotland.org.uk/managing.asp>

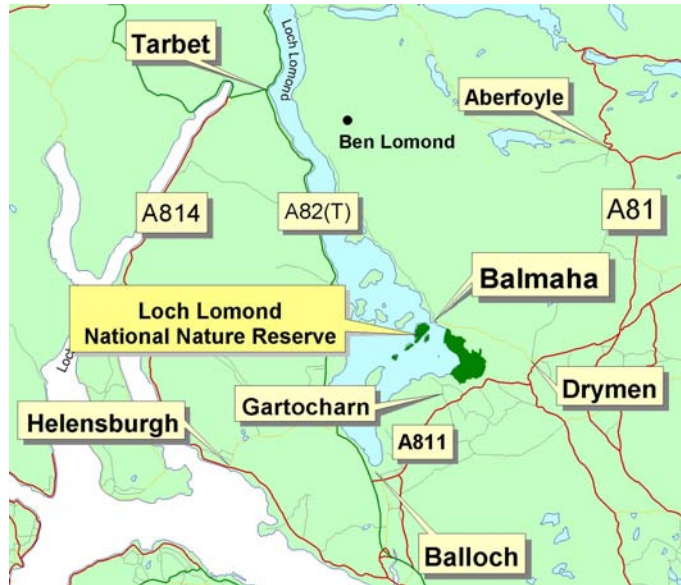
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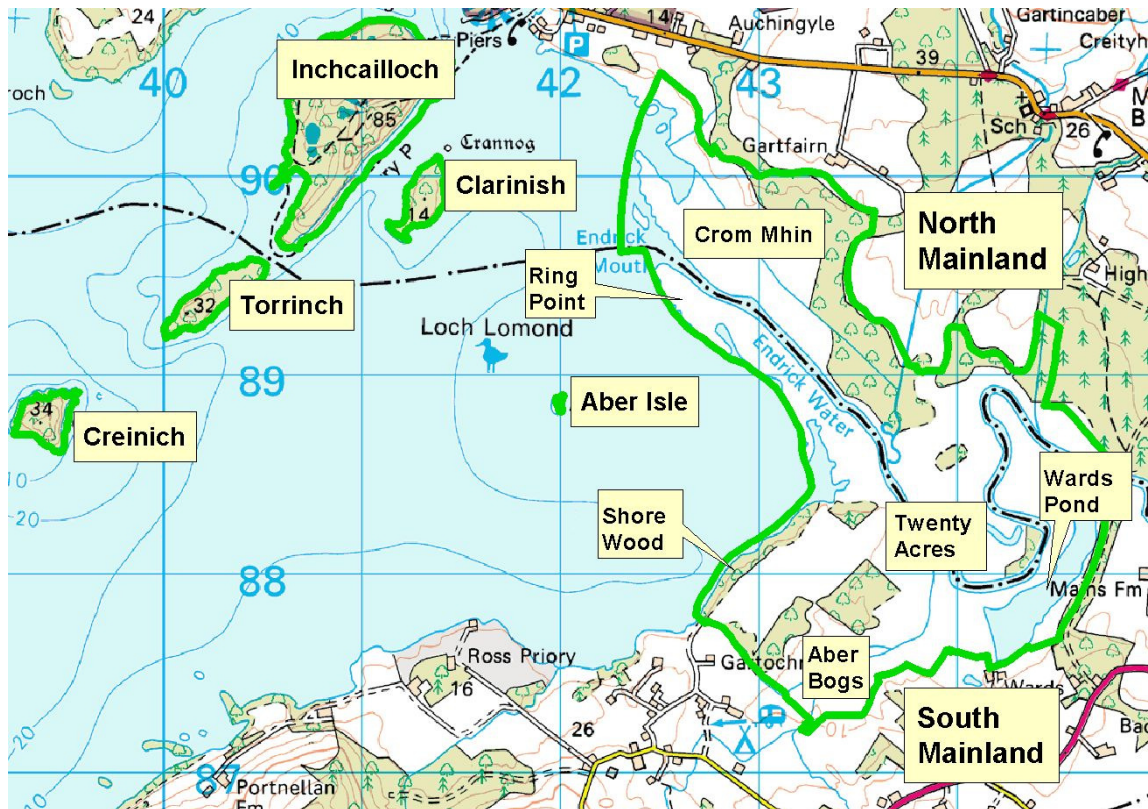
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Boundary Map



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1 Introduction to Loch Lomond NNR

Loch Lomond NNR is 430 hectares (ha) in size and is incredibly diverse. Oak woodlands cover the islands, and a mosaic of open water, wetland, grassland and woodland habitats occupy the Mainland. The diversity is also high because of its geographical position; it sits on the dividing line between the Highlands and Lowlands so habitats and species at the limits of both their northern and southern ranges in Britain are found here. The climate at Loch Lomond is relatively oceanic with mild winters.

The importance of the Reserve is reflected by the number of habitats and species which are either legally protected (see Table 1) or are covered by Biodiversity Action Plans (see appendix 9).

SNH owns two parts of the NNR, Inchcailloch and a small part of Gartfairn Wood, the remainder is privately owned. The Reserve is managed in conjunction with its owners and tenants under agreements and in partnership with the Loch Lomond and Trossachs National Park.

Before it became an NNR, people managed this land for farming, to produce woodland products and, to a lesser extent, for recreation. Today we still use some of their management practices to manage the Reserve and help maintain its diversity, but we use other more specialised wildlife management practices too. The Reserve is also a place where people can go to enjoy and learn about the rich natural and cultural heritage, so we maintain the facilities we've installed for visitors and provide information about the Reserve.

Table 1: Designations and qualifying features of Loch Lomond NNR

		Special Protection Area	Special Area of Conservation	Ramsar	Site of Special Scientific Interest	BAP/HAP
Greenland White-fronted Goose	<i>Anser albifrons flavirostris</i>	✓		✓	✓*	
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles			✓1		✓*	
Otter	<i>Lutra lutra</i>		✓1			✓
Brook lamprey	<i>Lampetra planeri</i>		✓2			✓
River lamprey	<i>Lampetra fluviatilis</i>		✓2			✓
Atlantic salmon	<i>Salmo salar</i>		✓2			✓
Greylag goose	<i>Anser anser</i>				✓*	
Breeding bird assemblage					✓*	
Hydromorphological mire range					✓*	
Flood-plain fen					✓*	
Bryophyte assemblage					✓*	
Beetle	<i>Eutheia linearis</i>				✓*	
Vascular plant assemblage				✓	✓*	
Basin Fen					✓***	
Quaternary of Scotland					✓****	
Pipistrelle bat	<i>Pipistrella pipistrellus</i>					✓
Pipistrelle bat	<i>Pipistrella pygmaeus</i>					✓
Brown hare	<i>Lepus europaeus</i>					✓
Water vole	<i>Arvicola terrestris</i>					✓
Skylark	<i>Aluada arvensis</i>					✓
Linnet	<i>Carduelis cannabina</i>					✓
Reed bunting	<i>Emberiza schoeniclus</i>					✓

The Story of Loch Lomond National Nature Reserve

		Special Protection Area	Special Area of Conservation	Ramsar	Site of Special Scientific Interest	BAP/HAP
Spotted flycatcher	<i>Muscicapa striata</i>					✓
Tree sparrow	<i>Passer montanus</i>					✓
Bullfinch	<i>Pyrrhula pyrrhula</i>					✓
Capercaillie	<i>Tetrao urogallus</i>					✓
Barn owl	<i>Tyto alba</i>					✓
Farmland waders						✓
Grassland and wetland						✓
Upland oakwood						✓
Wet woodland						✓
Rivers and burns						✓
Lochs, lochans, and ponds						✓

Names of designated areas included in table:

SPA - Loch Lomond

¹SAC - Loch Lomond Woods

²SAC - Endrick Water

* SSSI - Endrick Mouth and Islands

** SSSI - Aber Bog, Gartocharn Bog & Bell Moss

*** SSSI - Portnellan, Ross Priory, Claddochside

2 The Natural and Cultural Heritage of the NNR

This section introduces the tremendous diversity of the natural and cultural heritage at Loch Lomond NNR.

Geology

The Reserve straddles the Highland Boundary Fault, one of Scotland's most striking geological features, which stretches from Stonehaven to Arran. This massive fault cuts across Loch Lomond through the elongated islands of Inchmurrin, Creinch, and Inchcailloch.

To the north of the Highland Boundary fault lie the Highlands where the landscape is carved predominantly from 'Dalradian' rocks, originally formed 700-600 million years ago as sediments on an ancient ocean floor. During continental collisions these were folded, faulted, compressed and heated, to form hard rocks, giving a landscape characterised by mountainous, rugged terrain.

To the south of the Highland Boundary Fault lie younger, softer rocks formed from river sediments some 416-359 million years ago, creating the rolling lowland landscape.



Aerial view of Loch Lomond

Along the Highland Boundary Fault itself there are narrow outcrops of rocks of intermediate age that mostly formed 488-444 million years ago and are the oldest exposed rocks in the Reserve. These sediments deposited on an ocean floor were changed by continental collisions. These collisions deformed the Dalradian rocks and brought the soft southern and Highlands rocks together due to lateral movements along the line of the Highland Boundary Fault.

Glaciation and Geomorphology

The most powerful, recent influence on the present landscape was the ice of the last glacial period, the 'Ice Age'. At its height, some 22,000 years ago, a large ice sheet covered Scotland extending southwards to the English Midlands. The ice retreated and disappeared during a short warm period around 15,000 to 12,900 years ago, when air temperatures were similar to those of today or perhaps warmer. The glaciers returned temporarily during the short cold period that followed; this is known as the 'Loch Lomond Readvance' because the evidence for its occurrence was first found in the Loch Lomond area.

The islands in Loch Lomond are upstanding nubs of more resistant rock which the Loch Lomond glaciers never finished wearing away. In contrast, sediments, some dumped by the glaciers and others deposited by the sea, overlie the loch shore of the Mainland. This sequence provides evidence that during the warmer period the sea flooded across the area and Loch Lomond became an arm of the Firth Clyde, at this time marine sediments known as the 'Clyde Beds' were deposited. As the climate cooled, the glaciers returned and advanced across the land, during the Loch Lomond Readvance glacial material was deposited on top of the Clyde Beds.

There is a line of old sea cliffs, along parts of the southern shore of the loch high above the current loch shoreline. This cliff was probably cut when temperatures plummeted at the end of the warm period, before the Loch Lomond Readvance. A second shoreline was cut later when the sea flooded into Loch Lomond again between about 8000 and 6000 years ago. This later shoreline is very close to that of the original cliff, so in the Reserve there appears to be only one shoreline, but further west two distinct shorelines are visible. The old shorelines are now cliffs 'raised' above the loch shore because the land has risen since the weight of the ice was removed. In many places the old line of sea cliffs are hidden by debris deposited during the Loch Lomond Readvance.

Ring Point is a spit of land made up of sediment washed down Endrick Water. It probably started to form soon after the glaciers of the Loch Lomond Readvance retreated and is still growing today.

Geology and geomorphology timeline for Loch Lomond	
410 million years ago:	Mountain building period draws to an end
390 million years ago:	Some visible features on Conic Hill being formed by Highland Boundary fault
350 million years ago:	Warm seas cover much of Midland Valley of Scotland
340 million years ago:	Volcanoes erupt. Duncryne Hill dates from this time
2 million years ago:	Ice ages begin - Loch Lomond's trench formed
27,000 years ago:	All plant and animal life in region obliterated by an ice-sheet so thick it completely covered even the highest mountains
13,000 years ago:	Last of the ice-sheets melted. Seawater floods into Loch Lomond, which becomes an arm of the Firth of Clyde. The old coastline still visible on the southside of the loch.
12,000 years ago:	Glacial ice again covers the area
11,000 years ago:	Ice melts and Loch Lomond is filled with fresh water. Tundra vegetation becomes established, followed by birch forest.
10,300 years ago:	Hazel supplanting birch as climate warms further. Aspen, rowan, large willows, holly and ivy become established.
9,500 years ago:	Sessile oak becomes main canopy tree in woodland
8,000 years ago:	Rising sea levels flood in and Endrick Water forms a raised delta.
7,400 years ago:	Alder starts to appear as climate becomes wetter.

Habitats

Woodlands

The Reserve has a variety of woodland types, all of which have been managed and manipulated by man at some time in their history; some of the woods were even planted.

The old sessile oak woodlands of the islands are particularly important for their rich flora and their distinctive communities of birds and lichens. These woodlands, known as western Atlantic oakwoods because they are confined to the wet western parts of the UK and Ireland, are of European importance. They are moist, humid woodlands and are characterised by specially adapted mosses that thrive on the moisture trapped under the tree canopy.

Loch Lomond Woods is one of three SAC sites representing old sessile oak woods in the most bryophyte-rich area of the UK, the southwest Highlands. This extensive site has a mosaic of woodland types, including oak, ash, elm and alder woodland. Pedunculate oak, rather than sessile oak, is locally abundant, and in places the oak grades into ash-elm and then into alder on flushed sites by the loch.



Oakwood

The woodland on each island is slightly different. The woodland on Clairinsh is considered the richest and most natural in the Loch Lomond area. This is probably because intensive woodland management ceased here first, so the woodland has had the longest time to develop naturally. On Creinch there are a number of large coppiced wych elms, whilst on Aber Island guelder rose is abundant and there are the only hornbeams in the Reserve. Torrinch has more birch than the other islands and some aspen.

On Inchcailloch oakwood is dominant, with some alder coppice in the wetter areas and Scots pine and larch on the higher ground. Holly, hazel and rowan, which can tolerate shade, grow under the oaks. It is claimed that Inchcailloch supports one of the highest concentrations of woodland breeding birds in the UK, evidence of the high quality of the woodland.

On the slightly higher and drier, sloping ground on the Mainland there are stands of sessile oak and birch. On the flat and low lying ground around the mouth of the River

Endrick there are types of wet woodland, such as low-growing alder-willow carr with some birch.

Wetlands

The Mainland is naturally low lying and includes part of the Endrick's natural floodplain. This disappears under floodwaters during most winters, and is one of the best examples of a natural floodplain in Scotland. It has habitats such as swamp, mire, fen, marsh, reed bed, wet woodland and open water, and is one of the main reasons why the area has received national recognition as a nature conservation site. The Endrick has retained this rich variety of habitats because, unlike the floodplains of many European rivers, it has not been severely modified by drainage or flood defences.



Aerial view of the River Endrick

Wet Meadow

Twenty-Acre meadow is a wet hay meadow on the Mainland with over 120 plant species. The floral diversity is maintained by the regular annual mowing of the vegetation combined with cattle and sheep grazing when possible.

Fauna and Flora

Birds

The NNR supports internationally important numbers of Greenland white-fronted geese. The majority of the world's Greenland white-fronted goose population spends the winter on Islay and in Ireland. The Loch Lomond site is important because it typically receives over 200 geese, 1% of the global



Greenland white-fronted geese

population. The Reserve plays an important role in maintaining the populations geographical wintering range because it provides open water used by the geese for roosting and feeding. In recent years the global population as a whole has declined, but the numbers roosting on the Reserve have increased slightly.

The Reserve can also have up to 3,000 wintering greylag geese and good numbers of other wintering wildfowl.

The range of habitats on the NNR helps to support an exceptional variety of breeding bird species including grasshopper warbler, sedge warbler, reed bunting, redstart, spotted flycatcher, tree pipit, skylark, buzzard and snipe. In fact the islands have some of the highest densities of breeding insectivorous birds in Britain. Of particular note are the pied flycatchers which breed on Inchcailloch.

There are good numbers of ground nesting birds such as skylark and snipe on the Reserve, but records suggest that the overall numbers of breeding birds may have declined in recent years. However, there have been some successes too. There have been a number of records of spotted crane, a rare secretive bird, which may be breeding on the Reserve. Another success story is that of the osprey, one of our most impressive migrants, which can regularly be seen fishing at the Endrick Mouth during its summer stay.

Plants

The Reserve has a wide variety of habitats, so it is not surprising that it also boasts an exceptionally diverse flora and is very much a plant 'hot spot'. The flora has been well studied, not least by John Mitchell, the Warden for 27 years. In total, nearly 400 vascular plants have been recorded on the Reserve, representing about 25% of the species found in Britain.

The Mainland alone has over 200 species of vascular plants, including a number of rare plants. Gartfairn Wood supports a rich wet woodland flora, including Scottish dock, a striking two metre high plant. Most of the UK population grows on the Mainland and it is perhaps not surprising that it was voted the county plant for Stirlingshire in a poll organised by Plantlife.

North of the River Endrick there are inundated marshes with reedbeds, rough grassland and scarce wetland plants such as thread rush, tufted loosestrife, and further colonies of Scottish dock. Aber Bog, on the south side, is a flood-plain mire



Globeflower

consisting mainly of swamp communities, with extensive areas of reed canary grass, patches of sharp flowered rush, bladder sedge, water sedge and common sedge.

The rare eight-stamened waterwort and awlwort are found on the loch shore and around the mouth of the Endrick. The shores of Creinch and Clairinsh are particularly rich and support a good variety of plants including globeflower, columbine and goldilocks buttercup.

The woodland understorey is rich in wildflowers; common species such as greater wood-rush, ramsons (wild garlic), bluebell and primrose carpet the islands in spring. Less common are wood-sorrel and dog's mercury. In late summer blaeberrries grow amongst the ling and bell heather.

In the last five years, two new rare plants have been recorded on the Reserve - *Callitriche palustris*, a nationally important starwort, and flowering rush. Other rare plants include elongated sedge, six-stamened waterwort, cowbane, summer snowflake, mudwort, and the hybrid sedge *Carex hibernica*.

The Reserve has a good numbers of mosses and liverworts too. These include the rare dwarf bladder moss, which has been recorded on Wards Pond, one of only 9 sites in the UK, and the western liverworts, *Marchesinia mackaii* and *Colojunea rossettiana*.



Cowbane

Fish

The fish community of Loch Lomond is of international significance. It includes populations of the rare powan and non-migratory river lamprey. The shallow water of the Endrick Mouth and its aquatic vegetation is particularly important for species such as pike.

The Endrick Water is a stronghold for river and brook lamprey and Atlantic salmon. These species pass through the NNR when migrating to and from their spawning grounds. All three species are distributed across the cleaner rivers of northwest Europe.

The strong population of river lamprey present in the Endrick is of particular importance because, unlike other populations which migrate to the sea, they remain in freshwater as adults, feeding on freshwater fish in Loch Lomond. This is the only instance of this unusual behavioural trait recorded in the UK.

Mammals

Otters take advantage of the mosaic of woodland, wetland and open water, and the rich fishing of the Endrick Mouth. There is good evidence of their presence across the Reserve but the Mainland appears to be a real hot spot of activity. Although the Reserve's wetland habitats look ideal for water voles, no evidence of their presence has been found.

However the wetlands are a good breeding ground for insects and this is reflected in the significant number of large bat roosts around the NNR. Bats feed entirely on insects, and are another element of the Reserve's wildlife that is sustained by the quality and diversity of the natural habitats of the NNR.

The islands lack some native species, such as fox and pine marten, but have other introduced species. They are home to fallow deer, a non-native species that was introduced for sport, allegedly by Robert the Bruce. The NNR, like the rest of Loch Lomondside, has mink and grey squirrel, which are non-native and invasive species that pose a threat to native mammals like otter and red squirrel.

Invertebrates

The wetlands and woodlands are fantastic for their abundance of invertebrates but so far only a few rarities have been recorded on the NNR. One of these is *Eutheia linearis*, a woodland beetle found on Inchcailloch in 1980. A more recent survey in 2003 found *Dropephylla heeri*, another rare beetle, also on Inchcailloch. The marsh and open water at Endrick Mouth supports a wide variety of dragonflies, damselflies and the bulrush wainscot moth, a Red Data Book species.

Cultural Heritage

Loch Lomond NNR has a wealth of cultural history, which can be seen in the many visible traces people have left of their presence on the Reserve over time. The church on Inchcailloch is now just a ruin, but it was built in the 13th century and was the parish's first stone church. In fact, until 1621 the parish was named 'Inchcailloch' suggesting that the island was very much at the heart of the local community. The cultural importance of the church and its burial ground are now recognised and is the only Scheduled Ancient Monument in or around the Loch Lomond area.

The islands have number of other interesting historical remains; the most notable are the crannog just off Clairinsh and the drying kilns and ruined farm on Inchcailloch.

The most significant remains on the Mainland are the tumble down stonewalls that remain of Aber 'village', this small collection of dwellings housed the few families who farmed much of the south Mainland.

Summary

Loch Lomond's geological diversity, combined with its location straddling the ranges of species at their northern or southern limits, makes the Reserve very diverse. The Reserve is particularly rich in woodland and wetland, and the flora and fauna includes many rare and uncommon species. People have lived in the area for several millennia and have left a rich cultural heritage.



The burial ground on Inchcailloch

3 Land Management at Loch Lomond before the NNR

It is believed that man first arrived on Loch Lomondside after the glaciers had retreated, some 7,000 years ago. These people lived by hunting and gathering. At this time the forests and woodlands were at the peak of their development, covering all but the highest ground. The Reserve area was within the transition zone between oak-hazel forest to the south and pine-birch forest to the north.

Later, during the Late Stone Age, herdsmen practising slash and burn agriculture would have lived in the area. Pollen analysis shows an increase in species associated with open ground, like grasses, at this time.

It was in the Iron Age that man began to make substantial modifications to the natural environment. Two thousand years ago settlers built a crannog (artificial island) close to Clairinsh, which still survives today. They would have used considerable quantities of timber to construct the fortifications atop this and other crannogs. The clearance of the natural forests began around this time, as the population increased and people turned to farming and making iron tools like axes.

Early written records show the sale of timber from the area to religious houses in the 13th century, and the felling and processing of timber on Inchcailloch to make a large barge for King James II in 1494. By this time, timber for building was scarce in Scotland's central belt, so Loch Lomondside became a prime source, with much being taken out by boat via the River Leven. Over the next 200 years new housing in Glasgow and the Clyde ports, together with wooden barrels used by the booming herring industry, added to the demand for wood.

Well before the industrial revolution began in the 18th century there were few large trees left. It was an open landscape and the woodlands (on the current Reserve area) were confined to parts of the islands and remnants around Buchanan Castle. In fact there was so little large timber that bark from coppiced trees had become a more valuable product than the wood itself. Crofters continued to cultivate potatoes and oats and graze common areas with cattle and other livestock, cutting bog hay for fodder. Even parts of Inchcailloch, today completely covered in oak woods, were cleared to grow grain.

A slow transformation took place over the century or so from 1700 as changes in land ownership and new agricultural methods began to affect the land. In rural areas the population fell, farms got larger and estates grew more powerful. The Montrose Estate, which controlled much of the present Reserve area east of the Aber Burn, became a leader in the new technology and pioneered land drainage on a new scale. Ditches, still in use today, were dug and burns were straightened or even had their beds paved to allow carts easier access through the marshes. Arable farms prospered in areas now used as rough grazing for cattle.

On both sides of the Endrick Water and on the islands, there were huge changes in the woodlands over this period. On the Montrose Estate, local tradition says that tree planting commenced on a large scale after the second Duke's bride burst into tears when she saw the denuded state of the countryside around her new home. Whatever the Duke's motivation, it is certain that plantations were established and expanded on areas that had previously been farmed.

Perhaps even more dramatic, was the re-establishment of woods around the ruined village of Aber after an absence of at least 200 years. The 1862 Ordnance Survey map shows Shore Wood, Ring Wood and Pentagonal Wood for the first time; all are prominent and much-loved features of the Reserve today. On Inchcailloch too, woodland was carefully nurtured, and oak, larch, Scot's pine, beech, ash, elm and sycamore were all planted. For centuries, trees had provided a host of products for industries, based as far away as North America, ranging from leather to chemicals. The signs of this still remain, with trees coppiced for charcoal, tan-bark, building, barrel, clog and basket making long ago surviving on many parts of the Reserve.

From the early 19th century, when pheasants were introduced, shooting became one of the principle activities on what is now the Reserve. In the 35 years up to the First World War, the game-books record that about a quarter of a million head of game were shot on the Montrose Estate. Bags included species that today are no longer present like black grouse, partridge, corncrake and quail.

Such high numbers of game birds could be shot because gamekeepers exterminated predators. Pine martens, polecats and wild cats became extinct around the loch. Birds of prey suffered too and the heronry on the estate reputedly only survived because of a heron-like bird on the family's coat of arms.

The species hunted indicate how much the landscape and habitats of the area have changed since. Inchcailloch for instance was open enough for black grouse to do well. The Mainland had well-drained arable areas supporting healthy populations of partridge and hares. Geese were generally absent; indeed the open water that they favour at Wards Ponds was only created in the 1920s, partly to improve the duck shooting.

By the early years of the 20th century, intensive management of the woods and fields was declining. In the 1920s, the closure of a factory at Balmaha that used wood to make various chemicals, ended centuries of industrial demand for coppiced oak. Stock rearing gradually replaced arable farming throughout the Mainland because it was proving too costly to keep the fertile but low-lying lands drained. Records show that the reeds were last cut for thatch on Aber Bogs in 1952.

By the time the Reserve was established, visitors were becoming an important influence on the islands, adding a new dimension to the age-old leisure activity of fly-fishing, first recorded on the loch in 1694.

Most of the past remains hidden, but glimpses can be seen in many ways. Isolated rowans, still to be found near to piles of stones in the woods, were charmed trees planted by Gaelic-speaking Highlanders next to their crofts. Names on modern maps, like Tom na Nigheanan (Hill of the Maiden) on Inchcailloch, speak of the long past. It is clear though that the wildlife interest on the recently-established Reserve, however wild it might seem at times, is largely the unforeseen result of centuries of varied and shifting use of the land by people.

4 Management of Loch Lomond NNR

The first part of the National Nature Reserve to be declared was Clairinsh in 1958. The NNR was extended on three subsequent occasions to reach its present size. More recently the international importance of the site has been recognised by international designations. The following table is a brief summary of the Reserve's milestones.

A Timeline For Loch Lomond NNR	
1958	Clairinsh was declared as a National Nature Reserve under an agreement with the Buchanan Society/landowner.
1962	Loch Lomond NNR was first declared with Inchcailloch being purchased and Mainland South, Torrinch, Creinch, Aber Isle and Clairinsh under agreements with landowners.
1964	First management plan for Loch Lomond NNR produced.
1970's	Inchcailloch's paths were rationalised and formalised.
1976	The South Mainland and islands were designated under the RAMSAR Convention as a wetland of International Importance.
1977	The NNR was extended to include the Mainland North.
1980's	A mowing regime is reinstated on the Twenty Acres' wet hay meadow.
1980's	Scrub removed from Ring Point to assist ground-nesting birds.
1981	The Inchcailloch Nature Trail was developed.
1981	The major works to control rhododendron on the islands was completed.
1987	The NNR was extended to include the Aber and Gartocharn Bogs.
1988	The project to bund and enhance the Aber and Gartocharn Bogs wetland was completed.
1994	John Mitchell retires after 27 years as Warden of the NNR
1997	The Mainland is designated as part of the Loch Lomond Special Protection Area (for its wintering Greenland white-fronted geese).
2000	<i>Callitriche palustris</i> , a member of the water starwort family was found in Wards Pond. This was the first confirmed location in the UK.
2001	The Loch Lomond and Trossachs National Park was created, taking the NNR within its boundary.
2004	The National Park starts to take on the management of Inchcailloch under a partnership agreement with SNH.
2005	The Endrick Water which runs through the Mainland section of the NNR is declared an SAC.
2005	The islands of the NNR are confirmed as part of the Loch Lomond Woods Special Area of Conservation designation.
2005	Shorewood footpath substantially upgraded.

Previous Management Plans

SNH works with the landowners to manage the whole NNR and not only Inchailloch which we own. We have written four management plans for the Reserve since its beginnings in 1958. The first plan in 1964 stipulated that we should survey the Reserve thoroughly before deciding how to manage the habitats. The plan also emphasised that we should provide facilities for education and research.

The second, third and fourth management plans (1976, 1986 & 1991) focussed much of the active conservation management on the Mainland (particularly the southern half). The complex mosaic of habitats on the Mainland was seen very much as an opportunity for demonstrating the integration of wildlife conservation, agriculture and the sporting interest. The development of educational facilities and the 'management of the public' were concentrated on Inchailloch.

We are now preparing the fifth management plan for Loch Lomond NNR and the following paragraphs briefly describe the ways we currently manage the Reserve.

Habitat Management

Woodland management

The woodlands on the NNR are diverse and of high quality, so our policy is to allow the woods to develop naturally with limited management intervention.

However we do carry out some management work. We control deer to prevent damage and aid natural regeneration in the woodland. We put considerable effort into controlling invasive species such as rhododendron, beech and sycamore. We also have to make sure visitors to the Reserve are safe, so we remove any trees and branches alongside paths that pose a risk to visitors. We leave the cut and dead wood heaped into piles for the benefit of wildlife.

Wetland management

We manage the wetlands on the Mainland using a combination of traditional farming methods and wildlife management methods. We graze cattle and sheep on most of the wetlands, and we cut some areas later in the year to prevent the build up of rank vegetation and to benefit ground-nesting birds.

Twenty Acres is a small wetland that floods most winters and we manage it for its plant diversity. The vegetation is not grazed between April and the end of August so that most plants can flower and seed. Then, when the ground conditions are dry enough, we mow it, and after that we put cattle and sheep on to graze it over winter.

Aber Bogs was abandoned as grazing land in the early 1980's. The Reserve Managers saw this as an opportunity to enhance this wetland habitat for wildlife. So they banded the bogs first and then flooded them. This made the bogs much wetter throughout the year and created the right conditions for the arrival of a number of important species such as cowbane.

Species Management

Over the years we have gradually developed a number of different ways to manage for important species.

Plants

All the rare plants on the Reserve grow on the wetlands on the Mainland. The way we manage these wetlands clearly benefits many of the Reserve's plant species, for monitoring has recently shown that all of the rare plant populations have either increased or have remained stable.

We manage Wards Pond specifically for plants which require bare mud. Here, we gradually lower the sluice during the spring so that the unusual plants, such as six and eight-stamened waterwort and narrow-fruited water-starwort have a chance to germinate.

In addition to the rare plants, we put considerable effort into controlling exotic, invasive plants such as giant hogweed, Japanese knotweed, skunk cabbage and Himalayan balsam. The seeds of these plants are usually carried onto the Reserve by the Endrick's floodwater creating a continual problem.

Birds

Our habitat management works often benefits birds as well as plants.

We carry out specialised management for birds on Ring Point and Wards Pond. We manage Ring Point for ground nesting birds, so we try to create an ideal sward by cutting scrub and cutting and grazing the more vigorous vegetation and we control predators.

We manage around Wards Pond in a similar way but we also attract winter wildfowl by raising the water level in the autumn. In years gone by we also removed pike from the pond to stop them preying on fledgling water birds.

In some places, particularly Inchcailloch and in Shore Wood, we wanted to boost opportunities for other breeding birds so we have installed nest boxes for owls and passerines.

Mammals

In the 1980's we fenced two stretches of riverbank and planted willows to create additional habitat for otters. But most of our management of mammals involves controlling unwanted predators such as mink, grey squirrels and deer.

Invertebrates

We have carried out a number of projects over the years to benefit selected groups of insects. Probably the most notable was the creation of a dragonfly pond which is alive with dragonflies through summer.

Management for People

Visitors to Inchcailloch

Inchcailloch has a fantastic setting in Loch Lomond and arguably has some of the best views in Scotland. Given the setting and attractions of the island it is not surprising that it is popular with a wide range of visitors from keen naturalists to those just wanting to enjoy a picnic on a beach in the beautiful surrounds. Typically there are more than 15,000 visitors each year with good numbers coming from the local area and central Scotland. Most visitors use the local ferry service from Balmaha, but some arrive in their own boats too.

Over the years we have gradually upgraded the facilities in a way in keeping with the superb setting. In 2006 upgrading included work on the paths, a new jetty, composting toilets and ranger base. The island now has a good path network, landing jetties, a small picnic and camping site, toilet, an ancient ruined church with burial ground and a ranger base and is now more accessible for visitors with a wider range of abilities. For a long time SNH managed Inchcailloch for visitors, as well as wildlife, but in 2004 rangers working for the Loch Lomond and Trossachs National Park took over the responsibility.



Visitors on Inchcailloch

Visitors to the Mainland

Access to the Mainland part of the NNR will always be limited by the nature of the location and the need to protect its important species and habitats. For many years there were very few facilities for visitors but recently we have been trying to make the area more suitable for visitors seeking quiet enjoyment of nature. We have upgraded the Shore path which leads to several pleasant viewpoints with seating. This path is already well used, particularly by the local community and by local birdwatchers.

Events

Every year we hold a variety of events for visitors on the Reserve. Most events are held on Inchcailloch as it has easier access. We publish details of the events on the NNR website, www.nnr-scotland.org.uk.

Publications

There are currently three leaflets about the reserve, one about the whole Reserve, one for Inchcailloch and one for the Mainland path starting in Gartocharn. SNH has also produced a booklet 'Loch Lomond to Stirling' which provides a thorough account of the geology of the Reserve and surrounding area.

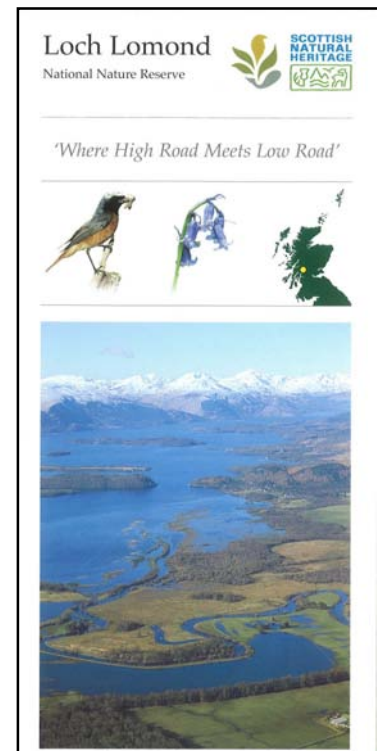
Information on the Reserve can also be found on the Scottish National Nature Reserve website, www.nnr-scotland.org.uk.

Education

Schools and education establishments from across central Scotland have used Inchcailloch for many years. Rangers from the National Park have been able to increase the educational use of Inchcailloch in the last two years because of the partnership agreement between SNH and the National Park.

Volunteers

Local people, volunteer groups and other individuals regularly help with wildlife monitoring and conservation management on the Mainland and Inchcailloch. Reserve staff would not have time to carry out all this work themselves, so we are very grateful for the extra work carried out by volunteers on the Reserve. This includes regular biological monitoring including bird surveys and conservation management work.



NNR Leaflet

Local communities

In recent years, we have strengthened links with local communities, particularly with Gartocharn. The Gartocharn community provided helpful advice when we upgraded the access through Shore Wood and consequently there is now a very pleasant walk leading from the village down to the loch and on to the Reserve.

Management of the Property

Land

SNH own Inchcailloch and a small part of Gartfairn Wood. The rest of the Reserve is privately owned and is managed in conjunction with its owners and tenants under agreements.

Partnership with the National Park

The creation of the Loch Lomond and Trossachs National Park provided an opportunity to develop Inchcailloch within the context of the National Park. Since April 2004, the island has been managed by staff from the National Park and under a partnership agreement with SNH.

Infrastructure

We are responsible for managing the visitor infrastructure on the Mainland, including the path and associated structures, and share responsibility with the landowners for some of the farming infrastructure.

Although SNH owns Inchcailloch, staff from the National Park are now responsible for managing the island and its infrastructure, including the ranger base, burial ground, jetties, toilets and path network.

Staffing

Loch Lomond is one of six NNRs managed by SNH's NNR team in Argyll and Stirling. The Reserve Manager and two Site Management Officers spend about 50% of their time on this Reserve.

The National Park's countryside ranger service who are based in the Balmaha National Park Centre also work on Inchcailloch. They have the support of other National Park staff who can assist with all aspects of the island's management.

Responsibilities

SNH, like every land manager including the other owners and tenants of the Reserve, has obligations and responsibilities for its property. We have to keep the land, the infrastructure and our vehicles and equipment in good order and we work closely with the landowners and National Park staff to ensure that the Reserve is managed to the highest standards.

Summary

Loch Lomond National Nature Reserve is a fantastic wildlife site - a real biodiversity 'hot spot' and a place where visitors are welcome and have a good opportunity to find out about its wildlife. SNH, the National Park, the landowners and the tenants are all involved in managing the site for wildlife and for people and for maintaining all the buildings, infrastructure, vehicles and equipment on the Reserve in good order.

References

Sections of the Loch Lomond NNR Reserve Record (1986, unpublished, edited by C Placido) by John M Cameron and John Mitchell.

Loch Lomondside, by John Mitchell; Harper Collins, published 2001, places the area's natural history in a wider historical and geological context. It contains a useful bibliography.

'Loch Lomond to Stirling' Scottish Natural Heritage, ISBN 1-85397-119-7

Appendix 1 - National Nature Reserves (NNR)

Scotland's NNRs are special places for nature, where many of the best examples of Scotland's natural heritage are protected. Nature comes first on our NNRs, (referred to as primacy of nature). These Reserves, also offer special opportunities for people to enjoy and find out about the richness of our natural heritage. NNRs (NNRs) are declared under the National Parks and Access to the Countryside Act 1949 or the Wildlife and Countryside Act 1981.

A new policy for NNRs in Scotland was developed in 1996. This Policy requires NNRs in Scotland to have four attributes, and to be managed for one or more of the three purposes.

The attributes are:

- **Primacy of nature:** The needs of nature will be placed at the heart of decisions about land-use and management of our NNRs, and nature conservation will be the overriding land use, although it may not be the sole purpose of management.
- **National importance:** It must be of national importance that the NNR be managed as a nature Reserve, for the protection of geological features, habitats, or species found there.
- **Best practice management:** NNRs must be well managed, not only to safeguard the nature conservation interests, but also to provide for people's enjoyment and understanding.
- **Continuity of management:** Both research and management on NNRs require us to take a long-term view, so it is important that management continuity is assured.

The purposes are:

- **National awareness of NNRs** - on these Reserves people can take pride in the natural heritage 'on display' and come to understand it better and enjoy it to the full.
- **Specialised management of NNRs** - the character of the interest requires specialised and pro-active management, which is best, delivered by a nature Reserve.
- **Research-related NNRs** - These NNRs will offer opportunities for research into the natural heritage and its management, which specifically require a nature Reserve location and which are not available elsewhere.

From 2000 - 2003 all of Scotland's NNRs were reviewed against this policy. Because of the review there are now 55 NNRs in Scotland. There are currently a number of NNRs identified during the review which have still to be taken through the de-declaration process. As a result of this a search on many SNH systems will show more than 56 NNRs until this work is completed.

Scotland's National Nature Reserves: A policy statement

<http://www.snh.org.uk/pdfs/polstat/nnrpolcy.pdf>

National Nature Reserves - General Information

<http://www.nnr-scotland.org.uk>

Appendix 2 - Special Protection Area (SPA)

Special Protection Areas are areas designated under Article 4 of the European Community Directive on the Conservation of Wild Birds 1979 (EC79/409), commonly known as the Wild Birds Directive. SPAs are intended to safeguard the habitats of migratory and certain particularly threatened species of birds. Together with Special Areas of Conservation, which are designated under the Habitats Directive for habitats and non-bird species, SPAs form the Natura 2000 network of sites. The Natura 2000 network is designed to conserve natural habitats and species of animals and plants which are rare, endangered or vulnerable in the European Community. In Great Britain the designation is generally operated through the SSSI mechanism for terrestrial sites and protected via the Conservation (Natural Habitats &c.) Regulations 1994, which are relevant to Special Areas of Conservation (SACs) as well as SPAs. The Scottish Executive Rural Affairs Department Circular No. 6/1995 (Revised June 2000) on the Habitats and Birds Directives gives further details of how the Regulations apply in Scotland.

SNH acts as the advisor to Government in proposing selected sites for ministerial approval as potential SPAs. SNH then consults with key parties over the site proposals on behalf of Scottish Ministers. The consultees, who include owners and occupiers of land, local authorities and other interested parties, are sent details of the proposed site boundaries and the species for which the site qualifies. SNH also negotiates the longer-term management of these sites. Following consultation, SNH forwards all responses to Scottish Ministers who then make a decision about whether to classify the site as a Special Protection Area.

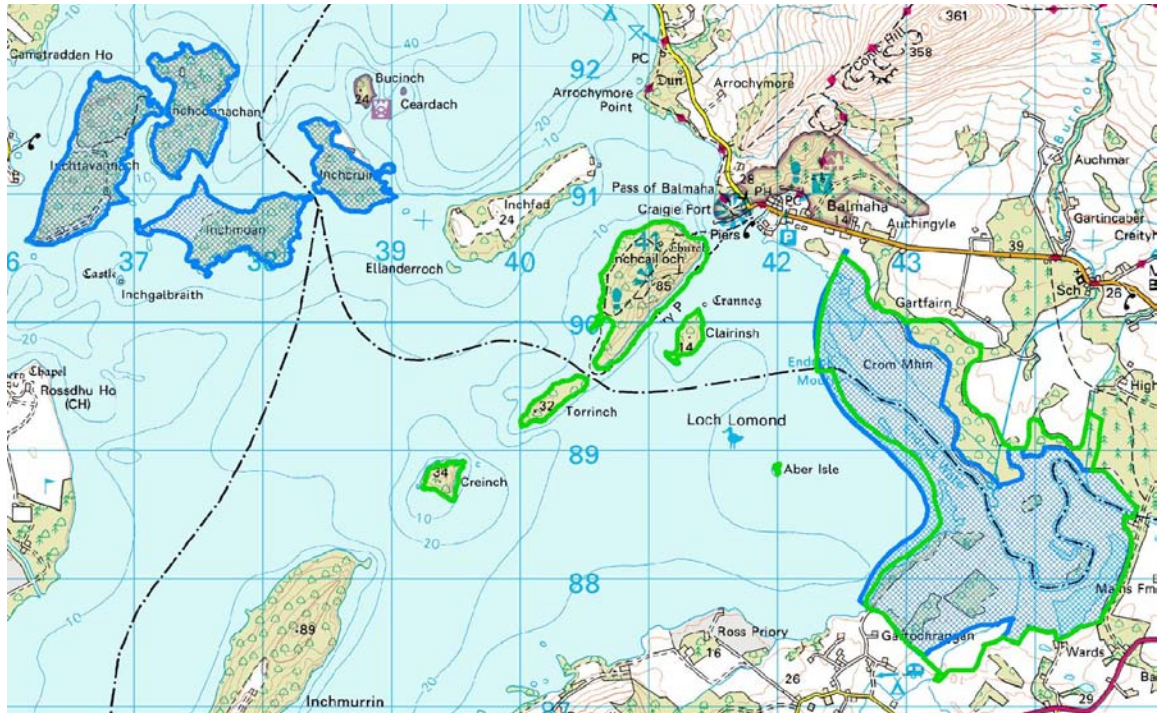
The following websites provide further information:

Special Protection Areas: <http://www.jncc.gov.uk/UKSPA/default.htm>

Loch Lomond SPA

Country	Scotland
Unitary Authority	Argyll and Bute, Stirling and West Dunbartonshire
Latitude	56 03 45 N
Longitude	04 30 30 W
SPA EU CODE	UK9003021

 SPA Area  NNR Boundary



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Loch Lomond is located across the Highland Boundary Fault in Argyll and Stirling, north-east of Dumbarton and the Vale of Leven. The SPA consists of the marshy hinterland around the lower reaches of the River Endrick where it flows into the south-east corner of the loch, and a group of four wooded islands in the loch. The marshy loch shore portion of the site comprises low-lying, regularly flooded wetlands, woodland fringes and rough pasture. The islands are mainly covered by Oak *Quercus robur* woodland with a well-developed shrub layer. The Endrick Mouth supports an internationally important population of Greenland White-fronted Goose *Anser albifrons flavirostris*. The islands are used by breeding Capercaillie *Tetrao urogallus*.

Qualifying species

During the breeding season;
Capercaillie *Tetrao urogallus*, 33 individuals representing up to 1.5% of the breeding population in Great Britain (Count, as at mid-1990s)

Over winter;

Greenland White-fronted Goose *Anser albifrons flavirostris*, 237 individuals representing up to 1.7% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

Conservation Objectives for Loch Lomond Special Protection Area

To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Qualifying Species:

- Capercaillie (*Tetrao urogallus*)
- Greenland white-fronted goose (*Anser albifrons flavirostris*)

Appendix 3 - Special Area of Conservation (SAC)

Special Areas of Conservation are areas designated under the European Community Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC), commonly known as the Habitats Directive. Together with Special Protection Areas, which are designated under the Wild Birds Directive for wild birds and their habitats, SACs form the Natura 2000 network of sites. The Natura 2000 network is designed to conserve natural habitats and species of animals and plants which are rare, endangered or vulnerable in the European Community. Annexes I and II to the Habitats Directive list the habitats and (non-bird) species respectively for which SACs are selected. In Great Britain the Directive was transposed into domestic legislation via the Conservation (Natural Habitats &c.) Regulations 1994, which are relevant to Special Protection Areas (SPAs) as well as SACs. Natura sites are generally underpinned by the SSSI mechanism in the terrestrial environment, although there are a few exceptions where other management measures are employed. The Scottish Executive Rural Affairs Department Circular No. 6/1995 (Revised June 2000) on the Habitats and Birds Directives gives further details of how the Regulations apply in Scotland.

SNH acts as the advisor to Government in proposing selected sites for ministerial approval as possible SACs. SNH then consults with key parties over the site proposals on behalf of Scottish Ministers. The consultees, who include owners and occupiers of land, local authorities and other interested parties, are sent details of the proposed site boundaries and the habitats and/or species for which they qualify. SNH also negotiates the longer-term management of these sites. Following consultation, SNH forwards all responses to Scottish Ministers who then make a decision about whether to submit the site to the European Commission as a candidate SAC. Once submission of all candidate sites is completed, the Commission, together with Member States, will consider the site series across Europe as a whole. At this stage sites which are adopted by the Commission become Sites of Community Importance (SCIs), after which they can be finally designated as Special Areas of Conservation by national governments.

The following websites provide further information:

Special Areas of Conservation: <http://www.jncc.gov.uk/ProtectedSites/SACselection>

Loch Lomond Woods

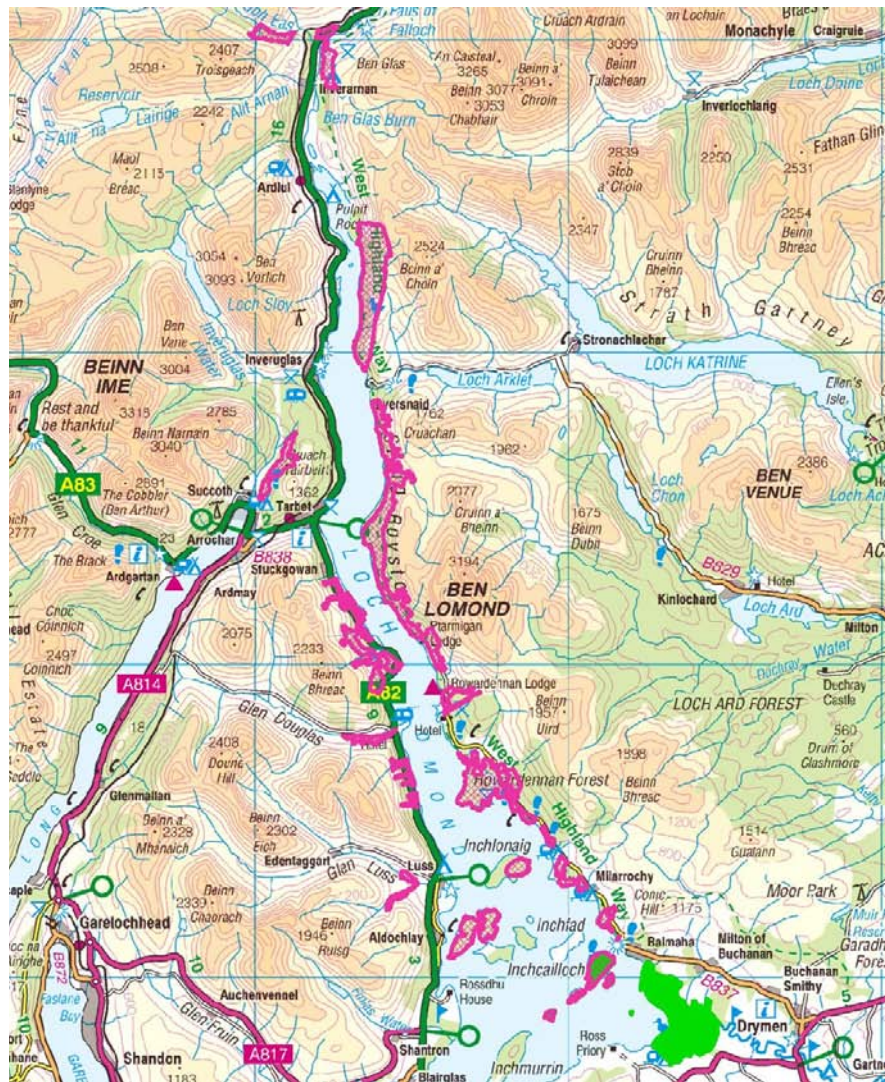
Country	Scotland
Unitary Authority	Argyll and Bute; Stirling; West Dunbartonshire
Grid Ref*	NN338040
Latitude	56 12 00 N
Longitude	04 40 45 W
SAC EU CODE	UK0013573
Web link	http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0013573
* This is the approximate central point of the SAC. In the case of large, linear, or composite sites, this may not represent the location where a feature occurs within the SAC.	



SAC Area



NNR Area



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Annex I habitats that are a primary reason for selection of this site

Old sessile oak woods with Ilex and Blechnum in the British Isles

Loch Lomond Woods is one of three sites representing old sessile oak woods in the most bryophyte-rich zone in the UK, the south-west Highlands zone. This extensive block of woodland in western Scotland comprises a mosaic of woodland types, including ash *Fraxinus excelsior*, elm *Ulmus* spp. and alder *Alnus glutinosa* woodland, which adds to the ecological variation of the site. Pedunculate oak *Quercus robur*, rather than sessile oak *Quercus petraea*, is locally abundant, and the oak stands intergrade in places with ash-elm stands, and with alder at flushed sites by the loch. The stands on the islands include areas that have been less subject to grazing than many other examples of this type of woodland.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

Not applicable.

Annex II species that are a primary reason for selection of this site

Not applicable.

Annex II species present as a qualifying feature, but not a primary reason for site selection

Otter *Lutra lutra*

Conservation Objectives for Loch Lomond Woods Special Area of Conservation

To avoid deterioration of the qualifying habitat (listed below) thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
To ensure for the qualifying habitat that the following are maintained in the long term:

- Extent of the habitat on site
- Distribution of the habitat within site
- Structure and function of the habitat
- Processes supporting the habitat
- Distribution of typical species of the habitat
- Viability of typical species as components of the habitat
- No significant disturbance of typical species of the habitat

Qualifying Habitat:

- Western acidic oak woodland

Endrick Water

Country	Scotland
Unitary Authority	Stirling, West Dumbartonshire
Grid Ref*	NS506873
Latitude	56 03 20 N
Longitude	04 24 00 W
SAC EU CODE	UK0019840
Web link	http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0019840

* This is the approximate central point of the SAC. In the case of large, linear, or composite sites, this may not represent the location where a feature occurs within the SAC.

 SAC Area  NNR Boundary



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Annex II species that are a primary reason for selection of this site

Brook lamprey *Lampetra planeri*

The Endrick brook lamprey *Lampetra planeri* population is strong and healthy and represents the species in Scotland. The site also supports important populations of River lamprey *Lampetra fluviatilis*, for which it is also selected.

River lamprey *Lampetra fluviatilis*

A strong population of river lamprey *Lampetra fluviatilis* is present in the Endrick. This population is of particular importance because, unlike other populations which migrate to the sea, they remain in freshwater as adults, feeding on freshwater fish in Loch Lomond. This is the only instance of this unusual behavioural trait recorded in the UK.

Annex II species present as a qualifying feature, but not a primary reason for site selection

Atlantic salmon *Salmo salar*

Conservation Objectives for Endrick Water Special Area of Conservation

To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species, including range of genetic types for salmon, as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Qualifying Species:

- Atlantic salmon
- Brook lamprey
- River lamprey

Appendix 4 - Site of Special Scientific Interest (SSSI)

Scottish Natural Heritage is the key statutory agency in Scotland for advising Government and for acting as the Government's agent in the delivery of conservation designations in Scotland. Site of Special Scientific Interest (SSSI) is the main nature conservation designation in Great Britain. These sites are special for their plants or animals or habitats, their rocks or landforms or a combination of these.

The SSSI series has been developed over the last 50 years and since 1981 as the national suite of sites providing statutory protection for the best examples of GB's flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, many SSSIs were renotified and others newly notified under the Wildlife and Countryside Act 1981 or the Nature Conservation (Scotland) Act 2004. Further changes in the protective mechanisms were introduced by the 2004 Act.

These sites are also used to underpin other national and international nature conservation designations. Most SSSIs are privately owned or managed; others are owned or managed by public bodies or non-government organisations. There are more than 1400 SSSIs in Scotland.

Web Links:

'The Nature of Scotland - A Policy Statement'

<http://www.scotland.gov.uk/library3/environment/nas-00.asp>

'People And Nature: A New Approach To SSSI Designations In Scotland'

<http://www.scotland.gov.uk/library/documents-w1/pandn-00.htm>

Guidelines For Selection Of Biological SSSIs

<http://www.jncc.gov.uk/Publications/sssi/default.htm>

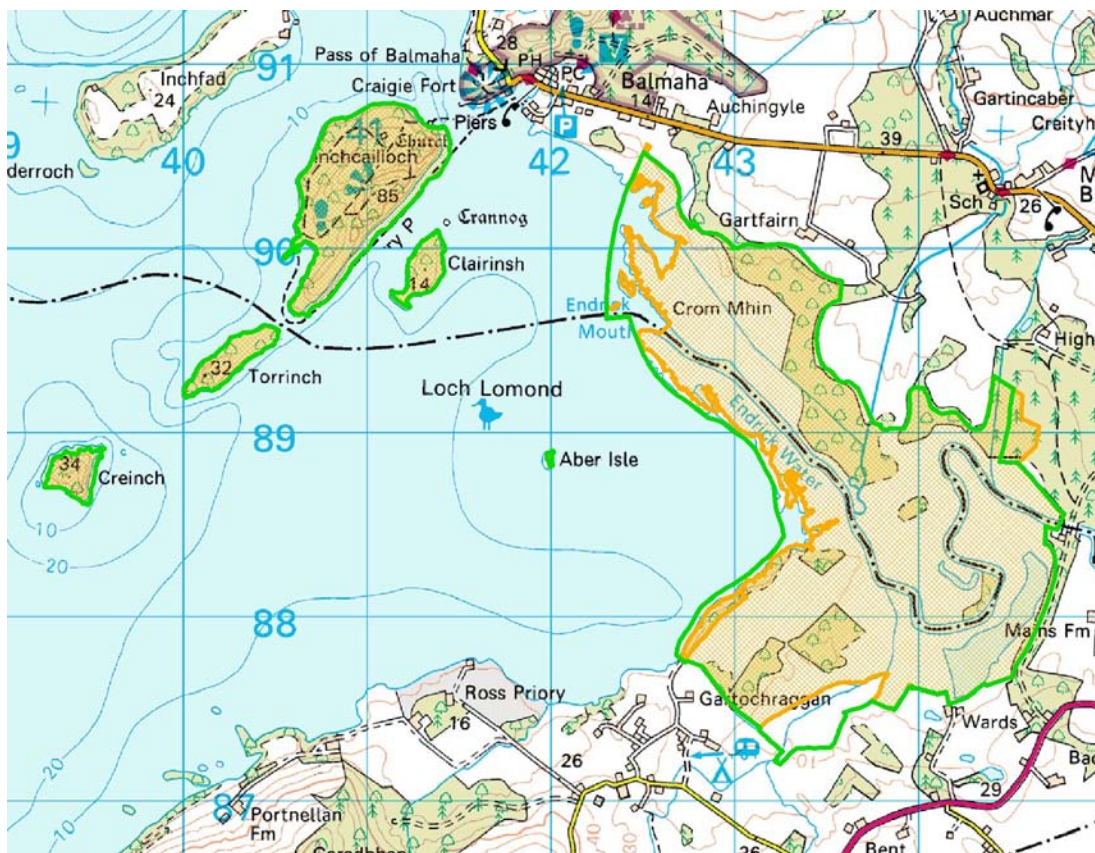
Site of Special Scientific Interest (SSSI):

<http://www.snh.org.uk/about/ab-pa01.asp>

Endrick Mouth and Islands

Country	Scotland
Unitary Authority	Stirling District/Dumbarton District
Grid Ref*	NS 430895
Notified	24 October 1988
Area	451.1 ha.
* This is the approximate central point of the SSSI. In the case of large, linear, or composite sites, this may not represent the location where a feature occurs within the SSSI.	

 SSSI Area  NNR Area



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Biological: Habitat: Woodland: Peatland: Open Water
 Biological: Species: Invertebrates: Birds: Vascular Plants

This site is a large and varied area of woodland, open water and mire communities at the south-east corner of Loch Lomond, partly on the line of the Highland Boundary Fault.

South-west of the River Endrick the woodland is mainly sessile oak and birch, while north of the river the woods range from low-growing alder-willow carr with a very wet ground flora to dry acidophilous oak woodland. Gartfairn Wood supports a good wet woodland flora, including Scottish dock *Rumex aquaticus*, which is confined in the British

Isles to Loch Lomond and its environs, summer snowflake *Leucojum aestivum* and elongated sedge *Carex elongata*. It also has a heronry of 10-15 nests.

The woodland on the islands is particularly rich and exhibits a range of oak woodland communities with a varied ground flora. Inchcailloch is mainly oakwood but also has wet areas with alder coppice, and Scots pine on the two summits. Torrinch has more birch, and some aspen. Clairinsh is notable for the wide range of age classes of oak, ranging from 21-165 years. Creinch is characterised by a number of large coppiced wych elms and mature ash, whilst Aber Isle has an abundance of guelder rose and supports the site's only hornbeams. Plants found on the islands include Tonbridge filmy-fern *Hymenophyllum tunbridgense*, hay-scented buckler-fern *Dryopteris aemula* and the western liverworts *Marchesinia mackaii* and *Cololejeunea rossettiana*. The wych elms on Creinch support the parasitic plant toothwort *Lathraea squamaria*. The island woodlands have some of the highest recorded densities of breeding insectivorous birds in Britain. The shore zone of the islands, particularly Creinch and Clairinsh, is rich and supports a good variety of plants including globeflower *Trollius europaeus*, columbine *Aquilegia vulgaris* and goldilocks buttercup *Ranunculus auricomus*.

There is a range of mire communities on the mainland. Inundated mineral marshes, including reedbeds and rough grassland, occur on the north side of the river and include scarce wetland plants such as thread rush *Juncus filiformis*, tufted loosestrife *Lysimachia thysiflora* and further colonies of Scottish dock. On the south side the Ring Bog is a tract of flood-plain mire consisting mainly of eutrophic-mesotrophic swamp communities. There are extensive areas of reed canary-grass *Phalaris arundinacea* with patches of sharp-flowered rush *Juncus acutiflorus*, bladder sedge *Carex vesicaria*, water sedge *Carex aquatilis* and common sedge *Carex nigra*. The Twenty Acres is managed as a bog hay meadow, and is dominated by sedges, in particular bladder sedge, with the local tufted loosestrife also occurring.

The loch shore and the mouth of the River Endrick, support a good ephemeral flora, which includes the rare eight-stamened waterwort *Elatine hydropiper* and awlwort *Subularia aquatica*. The rare ephemeral moss *Physcomitrium sphaericum*, recorded recently in only nine 10 km squares in the British Isles, has been found on exposed mud at Wards Ponds.

The wetland and open water are noted for breeding and migrant birds. The area is a regionally important wintering refuge for wildfowl, with more than 200 Greenland white-fronted geese and up to 3,000 greylag geese. The Limehill Field and the Pentagonal Fields, both improved pastures, are important grazing areas for geese. In summer the area holds one of the largest inland breeding populations of shelduck in Scotland and a regionally important inland wader breeding population.

The site is rich in invertebrates and supports three Red Data Book species; a rare moth, the bulrush wainscot *Nonagria typhae* in stands of bulrush *Typha latifolia* on the mainland, a beetle endemic to Scotland, *Dropephylla grandiloqua* in dead wood on

Inchcailloch, and the endangered beetle *Eutheia linearis* in rotting vegetable material on Inchcailloch. In addition, the slow-moving rivers and lagoons of the mainland are rich in aquatic invertebrates.

REMARKS

Area significantly increased.

The woodland component forms part of the Loch Lomond Woods Nature Conservation Review site. The peatland habitats form part of the Aber Bogs and Loch Lomond Marshes Nature Conservation Review site. The marginal strip of the loch lies within the Loch Lomond Nature Conservation Review site, while the river section is part of the River Endrick Nature Conservation Review site.

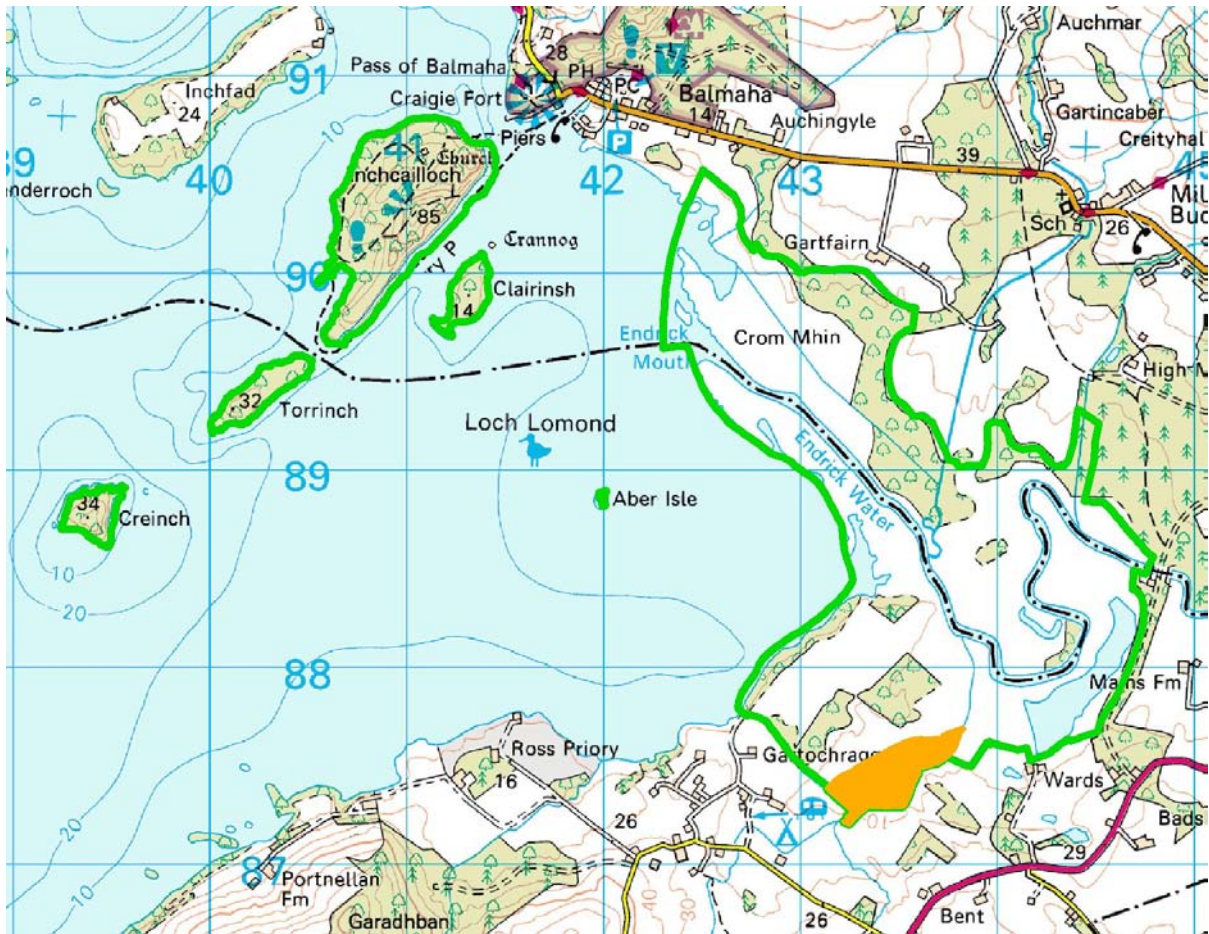
The islands (except Aber Isle) and the mainland south of the River Endrick were designated a wetland of international importance in 1976 under the Ramsar Convention.

The islands and most of the mainland section (total area: 428 ha) have been declared a National Nature Reserve.

Aber Bog, Gartocharn Bog & Bell Moss

Country	Scotland
Unitary Authority	West Dumbartonshire Council
Grid Ref*	NS 435875
Notified	20 May 1983
Area	13.8 ha.
* This is the approximate central point of the SSSI. In the case of large, linear, or composite sites, this may not represent the location where a feature occurs within the SSSI.	

 SSSI Area  NNR Boundary



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Biological: Habitat: Peatland

A patchwork of swamp and mixed fen communities with small areas of willow carr and scattered pools of open water. The mire is underlain by deep deposits of fluvio-glacial clays and silts. The area provides an extensive open habitat for marshland breeding birds, a feature of additional interest.

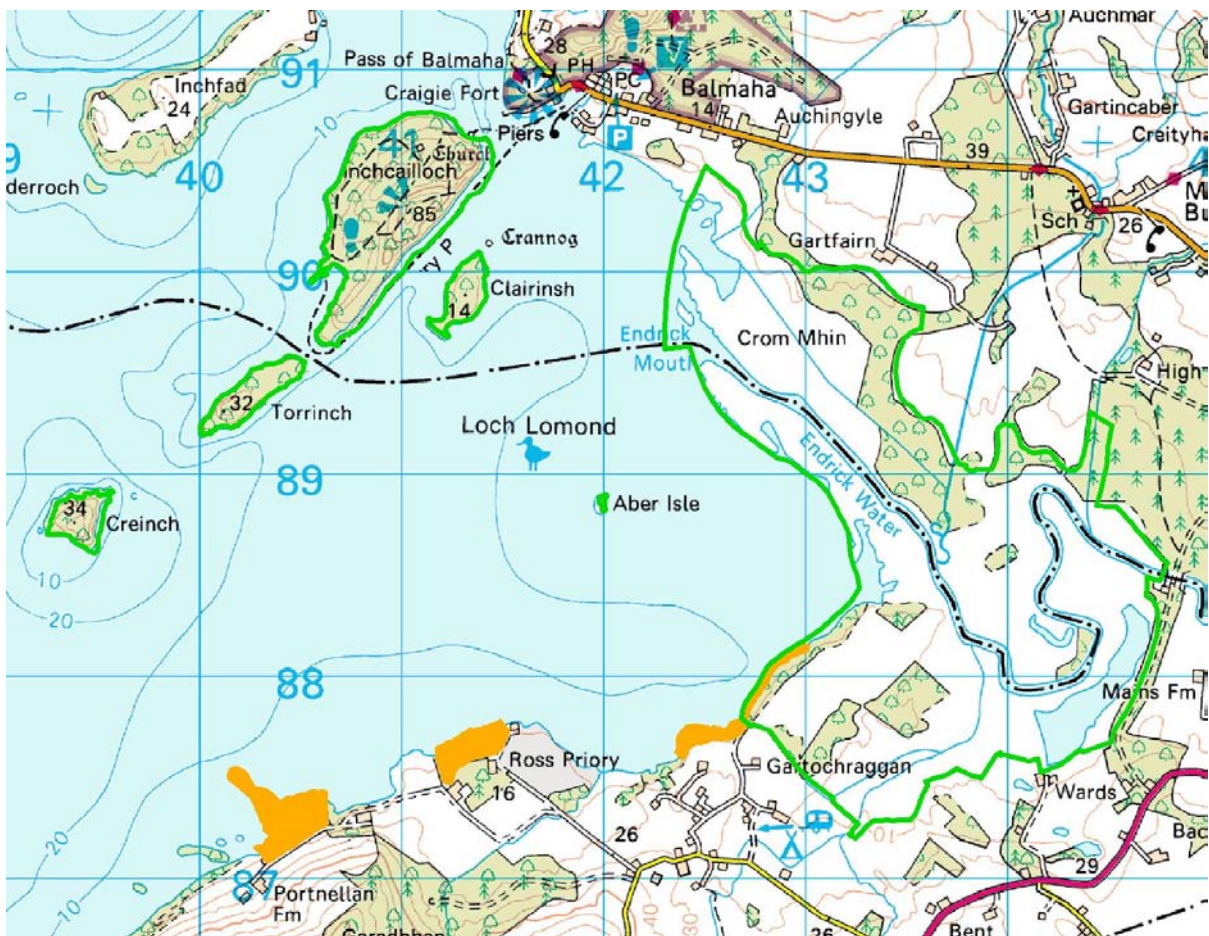
REMARKS - A Grade 1 site.

Previously notified as part of the Endrick Mouth SSSI in 1959 and as Aber Bog since 1972.

Portnellan – Ross Priory – Claddochside

Country	Scotland
Unitary Authority	Dumbarton District Council
Grid Ref*	NS 404872, NS 413876, NS 427878
Notified	3 October 1991
Area	22.1 ha.
* This is the approximate central point of the SSSI. In the case of large, linear, or composite sites, this may not represent the location where a feature occurs within the SSSI.	

 SSSI Area  NNR Area



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Description: Geological: Quaternary

Portnellan, Ross Priory and Claddochside together provide important stratigraphic and geomorphological evidence for the Lateglacial sequence of marine and glacial events in the type area for the Loch Lomond Advance. They demonstrate a Lateglacial marine transgression, indicated by "Clyde Beds" at Claddochside, followed by the formation of a very prominent shoreline seen as an impressive rock platform at Ross Priory. This

shoreline has been correlated with the Main Lateglacial shoreline of western Scotland. At Portnellan the platform and backing cliff are covered by Loch Lomond Advance till, providing clear evidence that the shoreline was formed before the glacier advance reached its maximum extent. The till also buries the "Clyde Beds" at Claddochside. A further marine transgression after the Loch Lomond Advance is indicated by the Main Postglacial Shoreline represented at Portnellan and Ross Priory, whose width in part reflects exhumation of the Main Lateglacial Shoreline. The three sites thus provide a key assemblage of geomorphological and stratigraphic evidence demonstrating that the Loch Lomond Advance in its type area represents a distinct glacier advance after a period of marine transgression, sedimentation and shoreline formation. Furthermore, they illustrate the detailed pattern of Lateglacial and Postglacial changes in relative sea level.

REMARKS

This is a new site. In part overlaps with the Loch Lomond NNR and Endrick Mouth and Islands SSSI.



Appendix 5 - Ramsar

Scottish Natural Heritage is the key statutory agency in Scotland for advising Government and acting as the Government's agent in the delivery of conservation designations in Scotland. Ramsar sites are designated under the Convention of Wetlands of International Importance. The Convention was adopted in Ramsar, Iran, in 1971 and ratified by the UK Government in 1976. There are currently 131 Contracting Parties to the Convention with 1 148 wetland sites designated for inclusion in the Ramsar List of Wetlands of International Importance.

The mission of the Convention is "the conservation and wise use of wetlands by national action and international co-operation as a means to achieving sustainable development throughout the world."

Loch Lomond Ramsar site

Designation date	05/01/1976
Size of Area	237 ha
Co-ordinates	56°04'N 004°30'W

 Ramsar
  NNR



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Location: The site lies approximately 25 km northwest of Glasgow, in West Dunbartonshire and Stirling (Scotland).

Criteria: (2b, 3c): 3, 6

Importance: The site supports several scarce and one British Red Data Book wetland plants, and three rare species of invertebrates. Over winter, the site regularly supports almost 1% of the Greenland/Ireland/UK population of *Anser albifrons flavirostris*

Wetland Types: Ts (66.4%), Tp (2.1%), M (1.3%), other (30.2%)

The site consists of the marshy hinterland around the lower reaches of the River Endrick where it flows into Loch Lomond, and there are five islands in the loch. The marshy loch shore portion of the site

comprises low-lying regularly flooded wetlands, woodland fringes and rough pasture. There is also a mesotrophic fen.

Biological/
Ecological
Notes:

The site supports several species of nationally scarce plants. The slow-moving river and lagoons are especially rich in aquatic invertebrates, including the national Red List moth species *Nonagria typhae*. Some areas contain *Phalaris arundinacea*, *Juncus acutiflorus* and *Carex* spp. There also are species-rich grasslands cut as hay meadows. The shore zone of the islands supports a wide variety of plants too, including *Trollius europaeus*, *Aquilegia vulgaris* and *Ranunculus auricomus*. There is a range of mire communities on the mainland, consisting mainly of eutrophic-mesotrophic swamp communities containing *Rumex aquaticus*, *Lysimachia thyrsoiflora* and *Elatine hydropiper*. The area is noted for its wintering waterbirds, which feed on the rough pastures composing over half of the hinterland. Another bird of national importance occurring in the area is *Tetrao urogallus*.

Hydrological/
Physical
Notes:

The area forms part of a freshwater floodplain consisting of alluvial sediments. It is meso- to eutrophic, and varies from basic to neutral to acidic. The site plays a role in shoreline stabilisation and dissipation of erosive forces.

Human Uses:

The site and its surroundings are almost exclusively privately owned. Inchcailloch, within the site, is owned by Scottish Natural Heritage. Parts of the area, both in and around the site, are being grazed or mowed. There are watering pools. Loch Lomond is also used for industrial and domestic water supply. A barrage controls abstraction of water. The area is also used for sewage treatment/disposal. Outside the site, there is some commercial forestry and arable agriculture, and there are non-urbanised settlements. However, both at the site and in the surrounding areas nature conservation, tourism and different forms of recreation are the main activities. Inchcailloch is the only part of the site where access for visitors is actively facilitated. There are possibilities for fishing, walking and birdwatching, both on the mainland and on the islands. Waterbird hunting is permitted under a Nature Reserve Agreement. Water-based recreation, including fishing from boats, jet skiing, canoeing and windsurfing, is allowed. Park rangers provide information, occasional guided walks and occasional talks to public groups. There is a general information leaflet for Inchcailloch. Several scientific research projects have been and are being carried out, and monitoring programmes are in place, for example of waterbirds, and of the effects of powerboats on Loch Lomond.

The Story of Loch Lomond National Nature Reserve

Conservation Measures: The site has been designated as a National Nature Reserve, an EU Special Protection Area and a Site of Special Scientific Interest. It is also a candidate EU Special Area of Conservation. A management plan has been devised and implemented. The site receives high numbers of visitors but disturbance to the interest is reduced by the control of visitor numbers through the operation of a permit system.

Adverse Factors: No adverse factors currently reported.

Site Management: Scottish Natural Heritage. No address information provided.

Based on the 1999 Ramsar Information Sheet and the 2002 National Report to the Ramsar Convention.

Appendix 6 - National Parks

National Parks in Scotland are designated by Scottish Ministers under the National Parks (Scotland) Act 2000. They are designated to deliver more integrated management of large areas of outstanding natural and cultural heritage. To this end, the aims of National Parks are:

- to conserve and enhance the natural and cultural heritage;
- to promote the sustainable use of the natural resources of the area;
- to promote understanding and enjoyment of the special qualities of the area by the public;
- and to promote sustainable social and economic development of the communities of the area.

A new body called the National Park Authority will be established for each National Park. This body will have the responsibility for drawing up the National Park Plan and ensuring its implementation. The Park Authority will be funded by Government and will report directly to Scottish Ministers. SNH has had a close involvement in the preparation of the proposals for National Parks in Scotland. In 1999 we developed the advice, which led to the National Parks (Scotland) Act 2000. In 2001, we were asked to act as the statutory reporter to Scottish Ministers on the National Park proposals for Loch Lomond & the Trossachs and for the Cairngorms. SNH also has wider role in respect of National Parks based on its statutory responsibilities under the Natural Heritage (Scotland) Act 1991. These include specific functions for the notification and management of international and national designations, and the promotion of measures to implement the new legislation on access. We also have a general advisory function to Scottish Ministers, local authorities and other bodies including the National Park Authorities.

Loch Lomond and The Trossachs National Park

The National Park feels worlds apart from the bustle of city life. Yet it's less than an hour from Glasgow and not much more from Edinburgh. A place of contrasts, it covers four distinctly different and special areas:

- Ben Lomond standing guard over Loch Lomond, the largest expanse of freshwater in Great Britain
- The Trossachs, wild glens and sparkling lochs between Callander and Aberfoyle
- Breadalbane, the high country of the north, with some of Scotland's finest Munros, Ben Lui, Ben Challum, Ben More and Ben Vorlich
- The Argyll Forest of the Cowal peninsula watched over by the Arrochar Alps and bordered by sea lochs.

The National Park encompasses around 720 sq miles (1,865 sq km) of some of the finest scenery in Scotland. It is an area of contrasts from rolling lowland landscapes in the south to high mountains in the north, and has many lochs and rivers, forests and woodlands. It is also a living, working landscape which has been influenced by people for generations and is visited and enjoyed by many for its recreational value.

The Loch Lomond and the Trossachs National Park became fully operational on 19 July 2002 and was officially opened by Princess Anne on 24 July 2002.

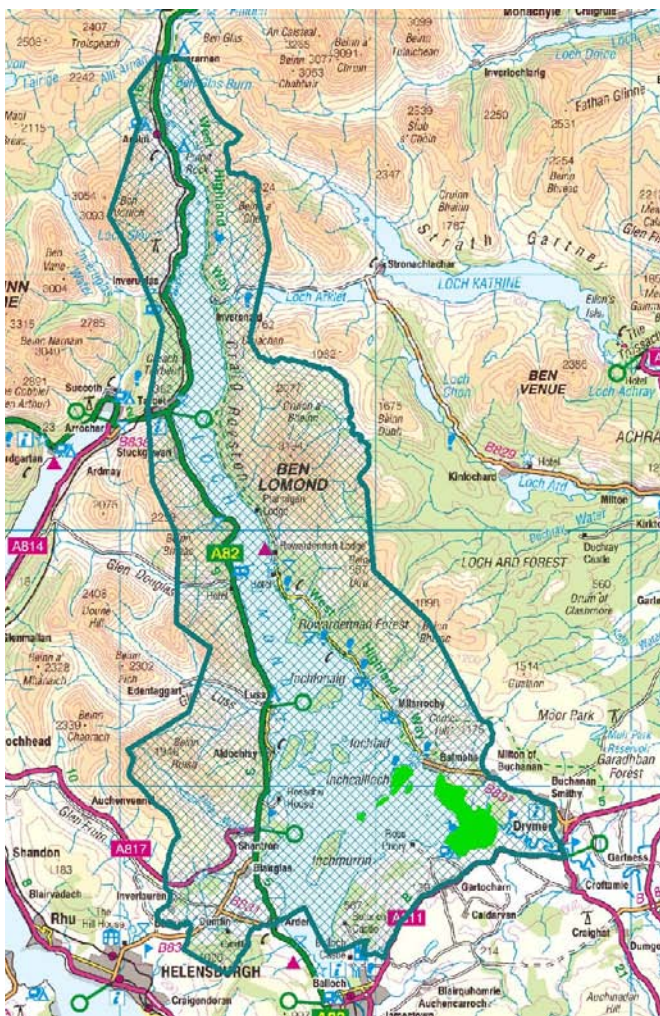
Facts and Figures

- The Park is 1,865 sq km (720 sq miles) and has a boundary length of 350km (220miles).
- There are 20 Munros (mountains above 3,000ft) in the Park and the highest is Ben More at 1,174m.
- There are 20 Corbetts (mountains between 2,500ft and 3,000ft).
- There are 22 larger lochs, with numerous smaller lochs and lochans.
- About 50 rivers and large burns.
- 15,600 people live in the National Park (2001 census).
- Two Forest Parks - Queen Elizabeth in the Trossachs and Argyll in Cowal.

Appendix 7 - National Scenic Area

National Scenic Areas are Scotland's only national landscape designation. They are those areas of land considered of national significance on the basis of their outstanding scenic interest, which must be conserved as part of the country's natural heritage. They have been selected for their characteristic features of scenery comprising a mixture of richly diverse landscapes including prominent landforms, coastline, sea and freshwater lochs, rivers, woodlands and moorlands.

There are currently 40 NSAs in Scotland, covering a total area of 1,001,800 ha. At the southern mainland extremity of the Highlands, Loch Lomond is the largest water body in Great Britain. The loch straddles the highland boundary fault, and thus has a variety of scenery stretching from the lowland character of the south shore to the deeply entrenched fjord like northern head of the loch at Ardlui.



NSA Area



NNR Area

of deciduous woodland, nowhere more noticeable than at the wide island-studded section of the loch, where the semi-natural woods of the islands are complemented by the fine policy woodlands on the shore. The east side of the loch also has extensive coniferous plantations which contribute variety to the scene as part of the Forestry Commission's Queen Elizabeth Forest Park. North of Ross Point the loch becomes a ribbon or finger lake, dominated by the towering summit of Ben Lomond (974m). Waterfalls, waterside meadows, and wooded promontories enliven the scene. The changing seasonal colours of bracken and heather, deciduous and coniferous woodlands, and the range of vertical relief, ensure that there is no time of year when the environs of the loch do not live up to their off-sung fame¹.

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¹ Extract from Scotland's Scenic Heritage, Countryside Commission for Scotland, 1978.

Appendix 8 - Species

There are a number of laws protecting species in the UK; this is only a brief synopsis.

The Wildlife and Countryside Act 1981

This is a key Act, which makes it an offence to intentionally kill, injure, or take any wild bird or their eggs or nests (except for species listed in Schedule 2). Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young. The Act also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.

The Act makes it an offence (subject to exceptions) to intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals. The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

Other Acts protect Wild Mammals, Badgers, Deer, and Seals.

The Habitats Directive

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora requires Member States to take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV, i.e. animal and plant species of community interest in need of strict protection. There are 13 European Protected Species in Britain.

The Biodiversity Convention

The Convention on Biodiversity was adopted at the Earth Summit in Rio de Janeiro, Brazil in June 1992. In the UK the Government launched the UK Biodiversity Action Plan, a national strategy which identified broad activities for conservation work over the next 20 years, and established fundamental principles for future biodiversity conservation. A number of Biodiversity Action Plans (UKBAP) have been produced for selected habitats and species, and some areas have developed local biodiversity action plans (LBAP) too.

Red Data Book Species

Red Data Books list species that are threatened or endangered. In the past species in Britain were included as Red Data Book species if they occurred in fewer than 15 10km x 10km squares. Britain is moving towards the IUCN (The World Conservation Union) criteria which categories species as Extinct, Extinct in the Wild, Critically Endangered, Endangered, or Vulnerable.

The Story of Loch Lomond National Nature Reserve

	Wildlife and Countryside & Act 1981	Red Data Book Species	LBAP*	UK BAP**	Birds of concern red list
HABITATS					
Upland oakwood			✓	✓	
Rivers and burns			✓		
Lochs, lochans and ponds			✓		
Wet woodland			✓		
SPECIES					
Mammals					
Brown hare			✓	✓	
Otter	✓		✓	✓	
Pine marten	✓				
Pipistrelle bat	✓		✓	✓	
Water vole			✓	✓	
Reptiles					
Common lizard	✓				
Amphibians					
Common frog	✓				
Common toad	✓				
Palmate newt	✓				
Birds					
Barn owl			✓		
Bullfinch			✓	✓	✓
Capercaillie			✓	✓	✓
Grasshopper warbler					✓
Linnet				✓	✓
Reed bunting				✓	✓
Skylark			✓	✓	✓
Song thrush			✓	✓	✓
Spotted flycatcher			✓	✓	✓
Tree sparrow			✓	✓	✓
Fish					
Atlantic salmon			✓		
Lampreys			✓		
Trout			✓		
Plants					
Scottish dock		✓			
Summer snowflake		✓			

* BAP - Local Biodiversity Action Plan

** UK BAP - UK Biodiversity Action Plan