



**Scottish Natural Heritage**  
All of nature for all of Scotland

**LOCH LEVEN**  
**Site of Special Scientific Interest**

**SITE MANAGEMENT STATEMENT**

**Site code: 993**

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**Purpose**



This is a public statement prepared by SNH for owners and occupiers of the SSSI. It outlines the reasons it is designated as an SSSI and provides guidance on how its special natural features should be conserved or enhanced. This Statement does not affect or form part of the statutory notification and does not remove the need to apply for consent for operations requiring consent.

We welcome your views on this statement.

**Description of the site**

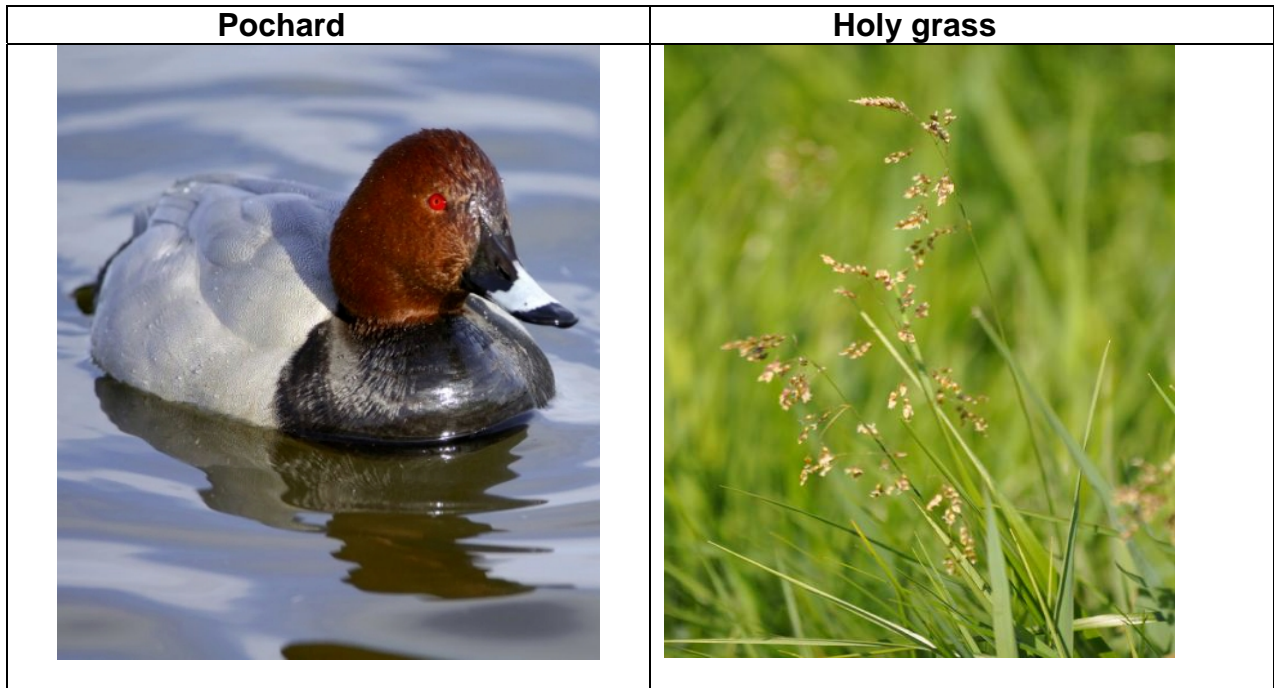
Loch Leven Site of Special Scientific Interest (SSSI) lies midway between Edinburgh and Perth, to the east of the M90 motorway and the town of Kinross. The loch is an attractive centrepiece to Kinross-shire; set in a mainly arable farming landscape, against an impressive backdrop of Bishop Hill to the East and the prominent ridge of Benarty Hill to the South. The SSSI is made up of the 1300ha of the loch itself together with its islands, and a narrow strip of shoreline wetlands and woodlands. It is the largest naturally eutrophic (nutrient-rich) loch in the British Isles and is one of a series of lochs of glacial origin between the Firth of Forth and the Highland Boundary Fault, lying in drift (glacial and river deposits) largely originating in the Highlands.

This site was selected as an SSSI on account of:

- Its freshwater habitat, being naturally rich in nutrients, it supports a huge web of life.
- The range of fen and mire types around the loch edges, which is important for both plant and animal life.
- Exceptional numbers of breeding and wintering waterfowl - including the largest concentration of breeding duck in Britain and inland Europe and very large migratory and wintering wildfowl populations, which peak in October. (see the list below)
- An outstanding number of higher plant species, with nationally and locally rare plants including thread rush, holy-grass and creeping spearwort and including a good assemblage of aquatic higher plants, typical of a nutrient-rich water body
- A range of scarce beetles, including an endangered carrion beetle (which feeds on the strandline on dead animals)

The importance of the loch for wintering wildfowl is recognised internationally. It is classified as a Special Protection Area, under the Birds Directive, for regularly supporting internationally important wintering populations of a range of wildfowl. Loch Leven is also designated as a Ramsar site, under the Ramsar Convention on wetlands of international importance (since 1976).

Part of the loch shore lies within the Kinross House Gardens and Designed Landscape.



**Current condition of the natural features**

Surveys in recent years have shown real and sustained recovery in the water quality and ecology of the loch. However, there is still a need to further reduce external inputs of phosphorus, in particular from septic tanks and diffuse pollution from agriculture to ensure the recovery is sustained.

The wetlands have suffered in the past from a lack of grazing, resulting in an unwelcome growth of scrub. Now that all areas of wetland are in assured management, the wet grasslands, fens and reed beds are on the road to recovery. Monitoring of the plants at Loch Leven was last carried out in 2010, and revealed that the holy grass is flourishing, with more colonies found than previously. In addition the lesser butterfly orchid is thriving at Loch Leven, with the highest ever population count in 2011.

The breeding bird assemblage was assessed in 2007 as in favourable condition, although it was noted that common tern and ringed plover no longer breed at the site. The important breeding populations of tufted duck and gadwall were monitored in 2011, using data from the previous 5 years. While the breeding gadwall was assessed as in favourable condition, the breeding population, particularly of tufted ducks, has seen a decline, probably due to fox predation on St Serfs and is currently in unfavourable condition. However it is hoped that the management works carried out to improve the availability of nesting and brood rearing habitat, together with efforts to keep St Serf’s Island fox free during the breeding season, will help ensure that the population of breeding ducks improves over the next five years. Monitoring in 2007 showed that

most wintering species of wildfowl have increased in numbers, with species such as teal and pochard increasing markedly. This is thought to be due to management as a safe refuge, wetland restoration and improvements in water quality and therefore food availability. The exceptions being shoveler and whooper swan which had reduced in numbers. The only wintering species to have seen a large reduction in numbers was greylag goose; however this reflects a national change in the distribution of this species, consequently the wintering bird features were assessed as in favourable condition.

The rare carrion beetle has been seen at a number of locations around the shoreline of the loch, both when formal monitoring was carried out in 2004 and more recently. The quality of the site for beetles has been highlighted by the discovery of a number of other nationally rare or scarce beetles living in the loch shore habitat.

A summary of the latest site monitoring information is given below:

<b>Natural features of Loch Leven SSSI</b>	<b>Feature condition (date monitored)</b>	<b>Other relevant designations</b>
Eutrophic loch	Unfavourable recovering (December 2008)	Ramsar
Hydromorphological mire range <sup>1</sup>	Unfavourable recovering (July 2009)	
Vascular plant assemblage	Favourable maintained (September 2010))	
Breeding bird assemblage	Favourable maintained (March 2007)	
Tufted duck (breeding)	Favourable maintained (October 2011)	
Gadwall (breeding)	Favourable maintained (October 2011)	
Cormorant (non-breeding)	Favourable maintained (March 2007)	SPA
Gadwall (non-breeding)	Favourable maintained (March 2007)	SPA
Goldeneye (non-breeding)	Favourable maintained (March 2007)	SPA
Greylag goose (non-breeding)	Unfavourable declining (March 2007)	
Pink-footed goose (non-breeding)	Favourable maintained (March 2007)	SPA, Ramsar
Pochard (non-breeding)	Favourable maintained (March 2007)	SPA
Shoveler (non-breeding)	Favourable maintained (March 2007)	SPA, Ramsar
Teal (non-breeding)	Favourable maintained (March 2007)	SPA
Tufted duck (non-breeding)	Favourable maintained (March 2007)	SPA
Whooper swan (non-breeding)	Favourable maintained (March 2007)	SPA
Beetle assemblage	Favourable maintained (August 2004)	

<b>Features of overlapping Natura sites that are not notified as SSSI natural features</b>	<b>Feature condition (date monitored)</b>	<b>SPA or SAC or Ramsar</b>
Waterfowl assemblage (non-breeding)	Favourable - maintained (March 2007)	SPA, Ramsar

<sup>1</sup> Monitored as Open Water Transition Fen

## **Past and present management**

Most of the SSSI forms part of Kinross Estate, and was declared a National Nature Reserve (NNR) in 1964, managed through a Nature Reserve Agreement. Loch Leven was once regarded as the finest brown trout fishery in the world and the reserve agreement allowed for continued management of the fishery by Kinross Estate. In the 1970s catches began to decline, and in response the Estate reinstated the hatchery and fishponds in the 1980s. As catches of trout continued to decline, the estate introduced North American rainbow trout in 1993 for the first time to supplement the fishery. Stocking with Rainbow Trout ceased in 2005 with the fishery once more seeking to become a place celebrated for brown trout. The presence of a healthy fish population is of importance to both the ecology and economics of the loch system. There is some limited wildfowling on the loch in the winter months, with more carried out on surrounding farmland.

Before the 1830's extensive marshes surrounded Loch Leven and the shoreline was seasonally flooded. In 1830 a major scheme of drainage resulted in the lowering of the loch level by 1.5m, reducing the surface of the loch by a quarter and revealing four new islands. The drainage scheme allowed the marshes to be turned into farmland. Vegetation colonised the new shoreline, and records show there were extensive reed beds; in some places local farmers were cutting reeds for thatch as late as the 1930s. During the first half of the 20<sup>th</sup> century the luxuriant growth of aquatic plants meant that channels had to be cut to allow boats to pass.

However after the Second World War nutrient enrichment became a growing issue, with increased fertiliser run off from the surrounding farmland and the discharge of domestic sewage and industrial effluent. This led to a reduction in the diversity and numbers of plants in the loch, and the reduction in water clarity confined plants to areas less than 2m deep. The increased nutrient enrichment also led to changes to insect populations, and a detrimental impact upon the loch's value as a good example of a nutrient-rich loch.

Since the 1970's a concerted effort has been made to improve the quality of the water discharged into Loch Leven, particularly to reduce phosphorus. Major reductions in phosphorus loading occurred in the late 1980's / 1990's by addressing some of the major sources of these discharges, such as the woollen mill in Kinross, and four sewage treatment works. Since 1995 the Loch Leven Catchment Management Project - a partnership between SNH, Perth and Kinross Council, Scottish Environment Protection Agency, and the Scottish Agricultural College - has worked to ensure continued improvements to the water quality of the SSSI. Although pollution from agricultural land, and discharges from septic tanks still contribute to the high phosphorus levels entering the loch, an improvement in water quality and clarity has seen the return of aquatic plants to deeper water. In order to safeguard and sustain this improvement, efforts to reduce additional nutrient input to the loch ecosystem continue. To this end, in 2011 and 2012 SNH, along with SEPA, RPID and specialist advisors, carried out a number of workshops and site visits with local farmers to provide practical advice on how farmers can help reduce diffuse pollution to the loch.

By the 1970s the combination of increased grazing pressure around the loch from cattle, sheep and horses and poor water quality resulted in the loss of much of the shoreline vegetation, including the reed beds. Without the protection from vegetation the shoreline was exposed to the erosive forces of the weather, which effectively

prevented any new plants from becoming established. Shoreline reed bed vegetation has been restored with the assistance of 2.2km length of gabions installed in the 1980's at the southeast end of the loch, providing protection from wave action. More recently a reduction in livestock grazing resulted in areas of wet grasslands around the loch becoming overgrown by tall rushes, coarse grasses, and scrub. In order to ensure these areas remained suitable habitat for wildfowl nesting, feeding and shelter, all areas of open wet grassland, including Classloch and Orwell, are now in conservation management, either through grazing or mowing. This includes St Serf's Island which is the main nesting area for breeding ducks.

A habitat enhancement programme has begun at Carsehall Bog which includes silt traps, reed beds, hides, path and wader scrapes. Willow and birch scrub regeneration control in areas of lowland heath and marsh is an ongoing management activity.

Mink, rats and jackdaw are controlled to prevent predation on nesting birds. For a period large gulls were culled with the objective to protect the breeding ducks. Following a review this practice ceased in 1996, with the large gull numbers rising to a stable level in 2000. In recent years foxes accessed St Serf's Island at periods when the loch was frozen. Control of these was necessary to safeguard the breeding wildfowl.

Prior to the passing of the Land Reform (Scotland) Act 2003, public access to the SSSI was limited to Lochleven Castle on Castle Island – managed by Historic Scotland, together with three shoreline areas at Kirkgate Park, Burleigh Sands and Findatie. The location of the SSSI in the heart of Kinross-shire led to pressure for increased access to the NNR and hence the SSSI. This led to the creation of the Loch Leven Heritage Trail. The 12.5km trail runs around the loch from Kinross Pier to the RSPB Vane Farm and was opened in 2008. The design of the trail incorporates screening to protect the internationally important wildfowl from disturbance and access guidance for visitors has been developed in order to help people take access on the site responsibly. Monitoring continues to ensure that these measures are effective at protecting the bird populations of the SSSI from significant disturbance. In 2011 the trail was extended west around Factory Bay including similar screening safeguards.

A part of the south west shore of the loch at Carden has recently been leased by RSPB. Extensive management works are currently underway to remove scrub and restore wetlands and damp grassland for breeding waders as part of a wider project including the adjacent land in the NNR at Vane Farm.

**Objectives for Management** (and key factors influencing the condition of natural features)

1. To maintain and enhance the loch as a major site for wintering birds, birds on migration especially waterfowl, and for breeding water birds, by keeping it as a quiet place, free from excessive disturbance and large numbers of predators.
2. Restore the water quality in Loch Leven to that of a naturally eutrophic loch and associated plant and animal communities by continuing to work through the Loch Leven Catchment Management Plan to reduce inputs of nutrients to the loch system.
3. To maintain and improve the wetland, grassland, shoreline and woodland habitats around the loch, maintain the associated important invertebrates and plant species and also to expand the area of wetlands around the loch.

We wish to work with the owners to protect the site and to maintain and where necessary enhance its features of special interest. SNH aims to carry out site survey, monitoring and research as appropriate to increase our knowledge and understanding of the site, its natural features and the effectiveness of management.

The EU Habitats and Birds Directives oblige Government to avoid, in SACs and SPAs, the deterioration of natural habitats and the habitats of species, as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of these Directives. The objectives above have been assessed against these requirements. All authorities proposing to carry out or permit to be carried out operations likely to have a significant effect on the European interests of this SSSI must assess those operations against the relevant Natura conservation objectives (which are listed on our website through the SNHi - SiteLink facility).

**Other factors affecting the natural features of the site**

None known

**Date last reviewed: 29 June 2012**