

LOCH WATTEN SPECIAL AREA OF CONSERVATION (SAC)

CONSERVATION ADVICE PACKAGE



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Site Details

Site name:	Loch Watten
Map:	https://sitelink.nature.scot/site/8308
Location:	Highlands and Islands
Site code:	UK0012983
Area (ha):	428.33
Date designated:	17 March 2005

Qualifying features

Qualifying feature	SCM assessed condition on this site	SCM visit date	UK overall Conservation Status
Naturally nutrient-rich lakes or lochs which are often dominated by pondweed (Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> -type vegetation). [H3150]	Unfavourable Declining	18 August 2016	Unfavourable - Bad

Notes:

Assessed condition refers to the condition of the SAC feature assessed at a site level as part of NatureScot's [Site Condition Monitoring \(SCM\)](#) programme.

Conservation status is the overall condition of the feature throughout its range within the UK as reported to the European Commission under Article 17 of the Habitats Directive in 2019.

Overlapping Protected Areas

Loch Watten SAC has the same boundary as Loch Watten Site of Special Scientific Interest (SSSI) <https://sitelink.nature.scot/site/1068> and forms part of Caithness Lochs Special Protection Area (SPA) <https://sitelink.nature.scot/site/8477> .

Key factors affecting the qualifying features

Naturally nutrient-rich lakes or lochs which are often dominated by pondweed

Loch Watten is an example of a natural eutrophic loch which has nutrient levels that are higher than most lochs found more commonly in northern Scotland. Nutrients are naturally present in Loch Watten due to leaching from the underlying sandstone bedrock. The loch has relatively high natural productivity and species-richness. Even though lochs of this type are relatively rich in natural nutrients, Loch Watten has the potential to be subject to unnatural over-enrichment. Loch Watten is a loch of type I in the Duigan (2006) classification scheme.

Key factors affecting Loch Watten include surface water pollution, nutrient input leading to over-enrichment, non-native species (e.g., Canadian pondweed), changes to the hydrology and potential changes to water temperature.

The feature has been assessed through NatureScot's site condition monitoring programme as being in unfavourable condition at this SAC due to a reduction in the water quality through

over-enrichment, loss of some of the species that are typical of a loch of this type and the presence of the invasive, non-native Canadian pondweed.

Further information about this habitat can be found [here](#).

Conservation Priorities

Loch Watten SAC overlaps with part of the Caithness Lochs SPA. Any management of the SAC or assessment of plans or projects will also need to take account of the SPA interests.

Conservation Objectives for naturally nutrient-rich lakes or lochs which are often dominated by pondweed (natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation)

1. To ensure that the qualifying feature of Loch Watten SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.

Favourable Conservation Status (FCS) is considered at a European biogeographic level. When determining whether management measures may be required to ensure that the conservation objectives for this site are achieved, the focus should be on maintaining or restoring the contribution that this site makes to FCS.

When carrying out appraisals of plans and projects against these conservation objectives, it is not necessary to understand the status of the feature in other SACs in this biogeographic region. The purpose of the appraisal should be to understand whether the integrity of the site (see objective 2) would be maintained. If this is the case then its contribution to FCS across the Atlantic Biogeographic Region will continue to be met. Further details on how these appraisals should be carried out in relation to maintaining site integrity is provided by objective 2 (including parts a, b, and c). If broader information on the feature is available then it should be used to provide context to the site-based appraisal.

Note that “appropriate” within this part of the conservation objectives is included to indicate that the contribution to FCS varies from site to site and feature to feature

2. To ensure that the integrity of Loch Watten SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature

The aim at this SAC is to restore the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat to a favourable condition as a contribution to its wider conservation status. Therefore any impacts to the objectives shown in 2a, 2b or 2c below must not persist so that they prevent the achievement of this overall aim. When carrying out appraisals of plans or projects the focus should be on restoring site integrity, specifically by meeting the objectives outlined in 2a, 2b and 2c. If these are met then site integrity will be restored. Note that not all of these will be relevant for every activity being considered. Any impacts on the objectives shown in 2a, 2b or 2c below must not persist so that they prevent the restoration of site integrity. Temporary impacts on these objectives resulting from plans or projects can only be permitted where they do not prevent the ability of a feature to recover and there is certainty that the features will be able to quickly recover.

This objective recognises that the qualifying habitat is exposed to a wide range of drivers of change. Some of these are natural and are not a direct result of human influences. Such changes in the habitats’ extent, distribution or condition within the site which are brought about by natural processes, directly or indirectly, are normally considered compatible with the site’s conservation objectives. An exception to this is when the favourable condition of a habitat is dependent on halting or managing natural succession. An

assessment of whether a change is natural or anthropogenic, or a combination of both, will need to be looked at on a case by case basis.

2a. Maintain the extent and distribution of the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat within the site

The extent of the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat at Loch Watten is approximately 385 ha. This should be maintained.

The area figure has been taken from the Standard Data Form. There should be no measurable net reduction in the extent of the habitat and its distribution throughout the site should be maintained.

This should include the total surface area, depth of water and type and distribution of loch substrate sediments.

This conservation objective is considered to be met if the conditions to ensure the habitat's long-term existence are in place.

2b. Restore the structure, function and supporting processes of the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat

The structure and function of lochs are strongly influenced by activities within their catchment. Changes in land management or development can affect the integrity of the feature which will manifest itself in changes to the loch.

Physical Attributes

-Surface Area

Changes to surface area can indicate pressures on the structure and function of lochs. The surface area of a loch may fluctuate slightly naturally. However changes to surface area and the associated change to depth should be avoided as these can adversely affect the character of the loch, particularly the edge vegetation. Artificial fluctuations to depth found in controlled water bodies such as reservoirs should be avoided as these can adversely affect the vegetation.

Changes to the surface area may also indicate a number of pressures such as abstraction, regulation, construction, excessive sediment deposition and natural succession which may be caused by issues in the catchment.

-Hydrological regime

The hydrology of the loch should be maintained as this affects both water level fluctuations and annual and within year flushing patterns. Flushing is important as it is strongly related to dilution and removal of nutrients and plankton. Changes to the flushing pattern can be caused by factors similar to those affecting area; abstraction, regulation, construction, excessive sediment deposition and natural succession which may occur in the catchment.

-Loch substrate character

The type and distribution of sediment particles within the loch should be maintained as this will affect the biology of the loch and the availability of habitats. Changes to the substrate character may also be indicative of changes to the area and hydrological regime.

Reduction in area or flushing may affect the substrate character as finer sediments become trapped and there is increased input of leaf-litter from scrub encroachment.

-Natural sediment load

Accumulation of nutrient-rich sediment may have a strong effect on the water quality and biology of the loch. Release of nutrients bound to silt can increase enrichment. Increases in

sediment loading from both changes in land management practice in the catchment or on the shoreline and short term events such as construction should be avoided. Evidence is growing that an increase in storm events associated with climate change may increase the amount of sediment deposited in lochs. This should be minimised by avoiding having large areas of bare ground close to the loch.

-Connectivity between the loch and the surrounding area

While a loch is often perceived as a discrete entity the connections between it and the surrounding area are vital to its functioning as part of a natural system. These natural connections should be maintained by, for example, avoiding hard engineering works on the shoreline or loch bed and anything that impedes the exchange of water either on the surface or with the underlying water table.

Water Quality

-Dissolved Oxygen

Dissolved oxygen in loch water is vital for respiration of all aquatic animals, including fish, as well as for aquatic plants. An artificially high biomass caused by increased loadings of organic matter or algal blooms should be avoided as this can create a heavy demand which causes low levels of dissolved oxygen. Dissolved oxygen is likely to be lowest in July and August. The target for Loch Watten is dissolved oxygen >6.0 mg/l during July and August.

-pH

This influences many of the chemical processes in lochs such as the binding of phosphorus. Eutrophic lochs should have pH of 7 to 9. Artificial changes through eutrophication or acidification should be avoided as these can have a significant effect on pH.

-Nutrients

In general issues with nutrient levels are inferred from effects upon the vegetation. Phosphorus is one of the main nutrients required for plant growth and there is strong correlation between Total Phosphorus (TP) concentration and phytoplankton biomass. The level of TP in Loch Watten should be reduced to below an annual mean of 50 µgP/l by avoiding new sources of nutrients to the water in the catchment, e.g., sewage treatment systems, and reducing sources of nutrients that already flow into the loch

Nitrogen is the other main nutrient important in loch ecosystems. It is generally less likely to be limiting than phosphorus because of the ability of some organisms to fix nitrogen from the atmosphere. The target for Loch Watten is that annual mean Total Nitrogen should not exceed 1.5 mg/l.

Measurements of Chlorophyll are used as a proxy for algal growth. Phytoplankton is an important part of the processes of a lake ecosystem affecting light penetration and oxygen demand. Excessive chlorophyll a should be avoided as this is usually associated with nutrient enrichment. Dense floating rafts of filamentous algae, blooms of blue-green algae and thick algal coatings on aquatic plants should also be avoided as these are negative indicators associated with high nutrient levels.

2c. Restore the distribution and viability of typical species of the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat

The following species that are typical of naturally nutrient-rich lakes or lochs which are often dominated by pondweed should be widespread in Loch Watten:

Littorella uniflora, Potamogeton filiformis, Potamogeton crispus, Potamogeton obtusifolius, Potamogeton praelongus, Potamogeton perfoliatus, Potamogeton x nitens, Callitriche hermaphroditica, Chara contraria, Chara aspera and Chara globularis.

Three of these characteristic species (*Chara globularis*, *Potamogeton x nitens* and *Potamogeton obtusifolius*) were not refound in recent surveys (2016, 2010), which may mean that they have very small populations rather than being lost from the loch altogether. If conditions are restored as described in 2b, the distribution and abundance of these species is likely to be restored.

The distribution of the characteristic species should be restored so that at least 60% of survey points have at least one characteristic species (rather than less than 40% in the 2016 survey). All characteristic species should be possible to find during site survey (rather than three of them being missing in 2016).

The viability of the characteristic species is determined by water quality and other conditions that support the plant community such as water clarity. Loss, or a reduction in the population of species, is therefore likely to be linked to the unnaturally high nutrient levels in Loch Watten noted in 2b. Natural levels of nutrients should be restored in Loch Watten to restore the growth and viability of typical species.

Alien species can have direct effects upon the natural plant communities through competition. They may also have more subtle effects as the niche they fill is different and this may directly or indirectly affect the rest of the ecosystem. A list of high impact species has been agreed as part of the Water Framework Directive. Canadian pondweed *Elodea canadensis* cover in Loch Watten should be reduced and the species removed if possible to restore habitat availability for typical species.

Whooper swan and greylag geese and a variety of ducks often roost on Loch Watten in the non-breeding season. These and other birds will have an impact on the nutrient balance in the loch.

Conservation Measures

Loch Watten is notified as a Site of Special Scientific Interest and management changes described on the SSSI list of Operations Requiring Consent must have prior consent from SNH (NatureScot).

Current and recommended management for naturally nutrient-rich lakes or lochs which are often dominated by pondweed

Issue	Measure	Responsible party
Water abstraction	Ensure timing and volume of any abstraction that may be proposed in future is not damaging through discussions with SEPA. Drought plans should adequately address the interests of the site.	SEPA
Afforestation and felling	Ensure that additional forestry is not beyond the carrying capacity of the catchment.	Land Managers, Scottish Forestry, Forestry & Land Scotland,
	Planning and implementation of forest	Scottish Forestry,

	harvesting operations should better identify high risk areas. Management should include improved pollution control and blocking of drains.	Forestry & Land Scotland, Forestry owners and managers
	Promote adherence to the Forest and Water Guidelines, and published best practice, during forest restructuring and highlight the need to strictly control fine sediment and other diffuse pollution release into the loch.	Scottish Forestry, Forestry & Land Scotland, Forestry owners and managers
Water quality - enrichment	Implement and maintain monitoring of key water quality parameters.	NatureScot/SEPA
	Any development proposals in the catchment should include appropriate measures to minimise sediment run-off and prevent pollutants from entering the loch.	The Highland Council
	Ensure no adverse impacts from diffuse or point sources. The width of buffer zones of vegetation between agricultural land and the loch should be increased to reduce man-made nitrogen and phosphorous run-off into the loch from surrounding land. Buffer zones should also be applied to watercourses and drainage directly connected and flowing into Loch Watten. Any new sewage treatment systems in the catchment must not add nutrients to the loch.	Land Managers, SEPA
Sediment load in the loch from un-afforested land	Avoid land management activities that lead to sediment input into the site either directly or indirectly from elsewhere within the catchment.	Land Managers SEPA The Highland Council
Grazing	Soil erosion should be prevented by ensuring grazing avoids poaching of edges of streams that flow into the loch and of the loch itself. Avoid supplementary feeding of livestock close to the loch as this could concentrate livestock close to the water leading to excess nutrient or sediment entering the loch from poaching, heavy dunging or uneaten fodder.	Land Manager
Development	Ensure any development proposals do not adversely affect the site and should include appropriate measures to minimise sediment run-off and prevent pollutants from entering the loch.	Land Managers The Highland Council NatureScot

Invasive species	Maintain surveillance for invasive species (e.g. Canadian pondweed) and agree control measures with NatureScot or SEPA if they are found in Loch Watten.	All
	All anglers and other water users (such as canoeists, wild swimmers or researchers) should follow the Check, Clean, Dry biosecurity procedures to help prevent the spread of problem non-native species.	All
Fishing	Stocking and feeding should be avoided as this can cause enrichment. Introduction of some fish species could also affect the ecosystem of the loch.	Marine Scotland Caithness DSFB

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