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Scotland's Nature Agency
Buidheann Nàdair na h-Alba

LOCH OF ISBISTER
SPECIAL AREA OF CONSERVATION (SAC)

CONSERVATION ADVICE PACKAGE

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Site Details

Site name:	Loch of Isbister
Map:	https://sitelink.nature.scot/site/8302
Location:	Highlands and Islands
Site code:	UK0030193
Area (ha):	105.41
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 *Magnopotamion* or *Hydrocharition*-type vegetation). [H3150]	Unfavourable Declining	2 September 2014	Unfavourable - Bad
Very wet mires often identified by an unstable 'quaking' surface (Transition mires and quaking bogs) [H7140]	Favourable Maintained	29 September 2012	Unfavourable - Bad
Otter (Lutra lutra) [S1355]	Favourable Maintained	15 September 2011	Favourable

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 of Isbister Special Area of Conservation (SAC) has the same boundary as

- Loch of Isbister and the Loons Site of Special Scientific Interest (SSSI) https://sitelink.nature.scot/site/1031

Key factors affecting the qualifying features

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

Loch of Isbister is at the lower nutrient end of the range of natural eutrophic lochs (type E in the Duigan (2006) classification scheme; lake type 4 in the Palmer (1992) classification scheme). Due to being a shallow loch on moderately calcareous sandstone bedrock, it has nutrient levels that are naturally relatively high. This leads to naturally high productivity and species-richness with abundant pondweeds and stoneworts. Even though Loch of Isbister is naturally relatively rich in nutrients, lochs of this type are still potentially subject to unnatural over-enrichment. There is a weir or sluice controlling water flow in the loch ditch, but this is at some distance outside the site boundary.

The feature has been assessed through NatureScot's site condition monitoring programme as being in unfavourable condition at Loch of Isbister due to reduction in the cover of typical plant species, low water clarity, increased cover of filamentous algae and erosion of the bank due to cattle poaching.

Key factors affecting this feature include surface water pollution, nutrient input from the catchment leading to over-enrichment, potential effects of geese, prevention of colonisation by non-native species, changes to the hydrology and potential changes to water temperature.

Further information about naturally nutrient-rich lakes or lochs which are often dominated by pondweed can be found here.

Very wet mires often identified by an unstable 'quaking' surface

The very wet mire on this site has formed around the margin of the Loch of Isbister and is part of the natural succession between open water to drier land. The feature includes floating vegetation (the 'quaking' part of the mire feature) at the edge of the loch and extensively in the 'Loons' section of the site. Small burns and field drains enter the mire from the north, and the high water level is maintained by these together with direct precipitation and springs, with overspill from the loch in winter. The mire is extensively flooded in winter and the water level is close to the surface in summer. The vegetation also represents a transition between plant communities of acidic and calcareous conditions. The bedrock is moderately calcareous sandstone, however peat (which has more acidic growing conditions) has formed in parts of the site. Historic peat cutting has helped to create to the mosaic of drier and wetter areas within the mire.

Key factors affecting this habitat are alterations to the hydrology and nutrient input as well as the potential for expansion of dense stands of common reed *Phragmites australis* and potential effects of geese. It is particularly sensitive to any over and undergrazing or disturbance to the surface i.e., trampling or use of vehicles.

Further information about very wet mires often identified by an unstable 'quaking' surface can be found here.

Otter

This loch together with the marshes, small lochans and ditches provide ideal feeding, resting and shelter areas for otter *Lutra* and support a good population. There is good prey availability, with populations of fish, plus frogs, toads and other prey.

Otter require continued proximity to unpolluted open water. There should be a plentiful food supply and habitats for providing shelter for both resting and breeding. They are wide ranging and normally occur at low densities. At this site, otter associated with the SAC are likely to have holts or resting places outside the site boundary as well as within the site itself. Recreational disturbance can have an effect but they have large ranges and can largely avoid people.

Previous population declines in otters were primarily due to pollution, and persecution. Otters can be trapped and drown in disused equipment such as eel traps. Otters from this site remain vulnerable to becoming road casualties.

Further information about otters can be found here.

Conservation Priorities

There are no priority qualifying features within the site and no apparent management conflicts between the qualifying features. If any conservation management conflicts between the qualifying features were to arise consideration should first be given to the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat, the primary reason for site selection. However, the impact of any proposed management measure on all the qualifying features should first be considered as part of a Habitats Regulations Appraisal.

All qualifiers rely on good water quality, and appropriate water levels and hydrological functioning.

Conservation Objectives for habitats

1. To ensure that the qualifying features of Loch of Isbister SAC are in favourable condition and make 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 of Isbister SAC is restored by meeting objectives 2a, 2b and 2c for each qualifying feature.

The aim at this SAC is to maintain, or where appropriate restore, the qualifying habitats in a favourable condition as a contribution to their 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 habitats are 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.

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

2a. Maintain the extent and distribution of the habitat within the site

The extent of the naturally nutrient-rich lakes or lochs which are often dominated by pondweed habitat at Loch of Isbister has been estimated at 38 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.

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. There should be no increases in sediment loading from land management practices in the catchment, from the shoreline or short term events such as construction.

Evidence is growing that an increase in storm events associated with climate change may increase the amount of sediment deposited in lochs.

-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. Loch of Isbister used to be larger in the past and it has gradually filled in, so that the loch now merges gradually into the quaking mires feature and then into drier ground. 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. Any areas where local erosion has occurred due to cattle poaching should be restored by restricting access for cattle to the loch in these locations.

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 of Isbister is dissolved oxygen >6.0mg/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 about 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 of Isbister should be below an annual mean of 50 ugP/l by avoiding new sources of nutrients to the water in the catchment, e.g. from 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 of Isbister is that annual mean Total Nitrogen should not exceed 1.5mg/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.

The nutrient status of the loch should be restored by reducing inputs to the loch from the surrounding agricultural land and houses so that the water is clear and there are no negative indicators associated with high nutrient levels such as dense floating rafts of filamentous algae, blooms of blue-green algae or thick algal coatings on aquatic plants.

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 indicator species for naturally nutrient-rich lakes or lochs which are often dominated by pondweed are:

Potamogeton x nitens	a hybrid pondweed
Chara (each species counts)	Stoneworts
Littorella uniflora	Shoreweed
Potamogeton crispus	curled pondweed
Potamogeton filiformis	slender-leaved pondweed
Potamogeton pusillus	lesser pondweed

The significant decline in cover of these notable species, especially of *Chara curta*, *Potamogeton filiformis* and *Potamogeton pusillus*, should be restored.

The loch is used by a wide variety of waterbirds during the breeding season including: little grebe, shelduck gadwall, pintail, garganey, shoveler, tufted duck and red-breasted merganser. Large numbers of greylag geese use the loch year round. These and other birds may have an impact on the nutrient balance in the loch.

Otters forage throughout the loch.

Conservation Objectives for very wet mires often identified by an unstable 'quaking' surface (transition mires and quaking bogs)

2a. Maintain the extent and distribution of the very wet mires often identified by an unstable 'quaking' surface habitat within the site

The extent of transition mires and quaking bogs at Loch of Isbister has been estimated as 42 ha. This should be maintained. It is found in a lowland situation, on the margins of Loch of Isbister.

Accurate measurement of the extent of the transition mires and quaking bogs habitat is hard

to achieve due to gradual transitions in vegetation to adjacent habitats. The area figure has been taken from the Standard Data Form and is therefore used as a guide only. There should be no measurable net reduction in the extent of the habitat and its distribution throughout the site should be maintained.

This habitat is transitional with other adjacent wetland habitats so current baseline estimates may not be precise and any changes in extent estimates as a result of new survey may not represent real change but greater precision. Habitat survey may be needed prior to assessing whether any plans or projects would alter the distribution and extent of the habitat.

Dense stands of common reed *Phragmites australis* (NVC habitat type S4, which is not a component of the very wet mires feature) have the potential to expand into the very wet mire. The extent of the reed beds should be monitored and, if necessary, management should be undertaken to limit their expansion.

2b. Maintain the structure, function and supporting processes of the very wet mires often identified by an unstable 'quaking' surface habitat

This habitat is found as a mosaic with other wetland habitats at Loch of Isbister SAC. The term "transition mire" relates to vegetation that, in floristic composition and general ecological characteristic, is transitional between acid bog and alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich.

The maintenance of appropriate hydrology is crucial to retain the structure and function of this habitat. Management to prevent or reduce detrimental effects of drainage, including in the wider surrounding area, is key. This habitat has developed here due to the extensive area of flat, low lying ground which is fed rainwater from a large catchment but which has limited drainage for the water to flow away. Lower areas made by old peat cuttings have added to the natural pools.

Colonisation of this habitat by vigorous native species should be minimised as this could lead to irreversible habitat loss in the longer term, through shading, drying out of the habitat and possible conversion to other open-ground habitats.

One vigorous native species on this site is Common reed *Phragmites.* The change in frequency and extent of common reed may be in response to a higher water table and/or lower grazing, both of which favour this species. Common reed is very susceptible to summer grazing.

Trampling by cattle should be avoided as this can damage the habitat structure, function and supporting processes through creating areas of bare, heavily poached ground. This is where a substrate of bare humus, bare peat, bare mineral soil or soil covered only by an algal mat, has its surface broken and imprinted by hoof marks or wallows.

The emphasis is on avoiding 'disturbed' ground rather than 'bare' ground as natural processes can sometimes cause bare ground. Trampling should be avoided as this has the potential to change drainage patterns to other parts of the site as well as the obvious destruction of plants and soil structure in the trampled area.

Low levels of cattle grazing or cutting of vegetation (topping) are beneficial in helping to maintain species-richness, in slowing succession to drier habitats and preventing a build-up of thick mats of dead plant matter which can supress plant growth in subsequent years.

2c. Maintain the distribution and viability of typical species of the very wet mires often identified by an unstable 'quaking' surface habitat

This habitat is found extensively in transition with open water and other fen habitats in 'The Loons', to the northwest of Loch of Isbister. On this site the following NVC types are found;

M5 *Carex rostrata – Sphagnum squarrosum* mire
The main block of this type of mire is east of the Loons hide. It is scarce elsewhere on the site, though small patches, sometimes occupying just a few square metres, may be found intermingled with other vegetation. The M5 vegetation on this site is unusual because it lacks bottle sedge *Carex rostrata* (which is normally typical of this habitat type) and includes crowberry *Empetrum nigrum* (which is not normally a typical plant in M5 vegetation). Other typical species in this habitat include bog bead-moss *Aulacomnium palustre, Sphagum* mosses, marsh cinquefoil *Potentilla palustre*, devil's bit scabious *Succisa pratensis*, common sedge *Carex nigra* and common cotton grass *Eriophorum angustifolium*.

M9 *Carex rostrata – Calliergon cuspidatum/giganteum*
This rich mire is found around the perimeter of the Loons and along a network of lower ground in old tracks, peat cuttings and natural depressions. It is present also to the south-west of the Loch of Isbister. The plants in this habitat are typically quite tall in summer (up to 70 cm). Bottle sedge *Carex rostrata* (which is normally typical of this habitat type) is only found very locally. Instead, the dominant sedge is common sedge *Carex nigra.* This habitat is very rich in species, the most frequent ones being pointed spear-moss *Calliergonella cuspidata,* bogbean *Menyanthes trifoliate,* marsh cinquefoil *Potentilla palustre* common cotton grass *Eriophorum angustifolium* and marsh bedstraw *Galium palustre*.

S27 *Carex rostrata – Potentilla palustre*
This is the most extensive mire community on this site and forms gradations with M9. As with M9, common sedge *Carex nigra* takes the place of bottle sedge *Carex rostrata* as the most common sedge. Other typical plants include marsh cinquefoil *Potentilla palustre* marsh bedstraw *Galium palustre*, bogbean *Menyanthes trifoliate* and common cotton grass *Eriophorum angustifolium*. Common reed *Phragmites australis* forms an upper storey to the vegetation at the edges of reed beds and water horesetail *Equisetum fluviatile* is locally frequent.

In the long term, the typical species will benefit from topping and cattle grazing which is low enough to avoid excessive poaching resulting in disturbed bare ground but sufficient to control vigorous species such as common reed.

This habitat also provides a breeding habitat for water rail, little grebe, shelduck, gadwall, pintail, garganey, shoveler, tufted duck and red-breasted merganser. Otters also forage here and have resting places amongst the vegetation.

Conservation Objectives for Otter (*Lutra lutra*)

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

The aim at this SAC is to maintain otter in 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 species is exposed to a wide range of drivers of change. Some of these are natural (e.g. population fluctuations/ shifts or habitat changes resulting from natural processes) and are not a direct result of human influences. Such changes in the qualifying species' distribution and use of the site, which are brought about by natural processes, directly or indirectly, are normally considered compatible with the site's conservation objectives. 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 population of otter as a viable component of the site

The conditions for the long-term existence of the otter at Loch of Isbister SAC should be maintained.

An estimate of the number of otters occupying the site is not available and therefore there is no numerical baseline that can be given for the site.

This conservation objective is considered to be met if the conditions for the species' long-term existence are in place. This includes:

- Avoiding effects that could lead to a permanent reduction in the otter population through mortality, injury, or impacts caused by disturbance or displacement. This includes for example the effects caused by development, river engineering, water pollution, roads without adequate crossing provision for otters or suitable culverts, or entanglement in fishing gear.
- Maintaining the species' ability to use all areas of importance within the site (to be considered under conservation objective 2b).
- Maintaining access to, and availability of, undisturbed resting places.
- Maintaining access to, and availability of, supporting habitats and prey (to be considered under conservation objective 2c).

Otters are wide-ranging and highly mobile. The population at Loch of Isbister SAC is reliant on suitable habitat in the surrounding wider countryside, including the marine environment,

and is unlikely to be viable (capable of functioning) in isolation. The home range of an otter will vary depending on their sex, habitat quality and food availability. It will also vary between freshwater and coastal environments. At this SAC some otters that have parts of their territories within the site may also feed in coastal waters that lie outwith the boundary of the site (for example Loch of Boardhouse and Mar Wick). In coastal areas otter densities may be as high as 0.5 - 0.7 animals/km. Males living in rivers and streams can have a mean linear range size of around 40km and females living in the same habitat can have a linear home range of 20km. Males have been known to range as far as 80km.

When assessing the effects of any plan or project consideration should be given to whether impacts outwith the SAC could affect achievement of this conservation objective.

Otters are a European protected species (EPS) and it is an offence to deliberately or recklessly capture, injure, kill, harass or disturb them in certain circumstances, or to damage or destroy their breeding or resting places anywhere in Scotland unless a licence has been issued to do so. A licence can only be issued for particular purposes which the law allows. Further, there must be no satisfactory alternative and no detrimental impact on the contribution to the maintenance of otter at a favourable conservation status for a licence to be issued. This assessment considers impacts on the otter population at a local and regional level. The licensing requirement is in addition to considering whether a plan or project will result in any impacts (including incidental impacts) to the otter population within the SAC.

2b. Maintain the distribution of otter throughout the site

The spatial extent of otter within the Loch of Isbister SAC should be maintained.

The ability for otter to use and access all areas of importance within the SAC should be maintained.

Distribution of otters within the site can be affected by disturbance originating both within and outwith the site. Plans and projects that cause displacement and barrier effects to the species can also affect species distribution. Examples include use of night-time floodlighting of watercourses, road and bridge construction works and general disturbance from human activity (and dogs) by watercourses especially at dusk/night-time.

2c. Maintain the habitats supporting otter within the site and availability of food

The distribution and extent of otter habitat within the site should be maintained, together with the structure, function and supporting processes of the habitat.

Sufficiently high water quality and natural flow conditions should be maintained to provide the necessary conditions for otter and their prey.

Otters require suitable habitat for foraging, breeding and resting. Abundant boulders, crevices and/or peat are needed to provide secure holt sites above high water. Dense scrub is also valuable for providing lie-ups and couches. Suitable areas supporting a healthy fish population within a nearby watercourse or still water body are required within each otter's home range, to enable foraging for key prey species such as salmonids and eels. Access to ponds, ditches and wetlands where amphibians may breed is also important. Otters which forage along the coast as well as using the SAC also need freshwater within the SAC to remove salt from their fur.

Changes to water flow and water quality can adversely affect otter habitat and prey on which they depend. Otters' food supply is normally associated with good water quality and therefore the water quality standards for Good Ecological Status (GES) under the Water

Framework Directive should be met. These targets are intended to support a healthy, naturally functioning riverine ecosystem which protects the whole biological community and individual species to a degree characteristic of the river.

Conservation Measures

Loch of Isbister 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,**
- **very wet mires often identified by an unstable 'quaking' surface**
- **otter**

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
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.	Orkney Islands 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 of Isbister. Application of slurry to fields within the catchment should follow regulation guidelines. Any new sewage treatment systems in the catchment must not add nutrients to the loch.	Land Managers, SEPA
	In future, greylag geese may need to be controlled on this site as droppings from these birds have the potential to contribute to eutrophication.	Land managers, NatureScot

Sediment load in the loch from run-off from the catchment	Naturally nutrient-rich lakes or lochs which are often dominated by pondweed- avoid land management activities that lead to sediment input into the site either directly or indirectly from elsewhere within the catchment.	Land Managers SEPA Orkney Islands Council
Grazing/trampling by cattle and greylag geese	Naturally nutrient-rich lakes or lochs which are often dominated by pondweed- soil erosion should be prevented by ensuring grazing avoids poaching of edges of streams that flow into the loch and of the loch itself. Alternative sources of drinking water should be provided if cattle drinking from the loch causes significant poaching. 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. In future, greylag geese may need to be controlled on this site as they have the potential to trample the edges of the loch.	Land Manager NatureScot
	Very wet mires often identified by an unstable 'quaking' surface - ensure that livestock impacts on the feature are 'low' based on the FCS/NatureScot Herbivore Impact Assessment Process to prevent poaching and/or loss of typical species.	Land managers, NatureScot, SGRPID (GEAC)
	Very wet mires often identified by an unstable 'quaking' surface - trampling by livestock to be minimal to prevent active drainage of this habitat.	Land managers, NatureScot, SGRPID (GEAC)
Development	Appropriate water, sediment and nutrient flows into this habitat can be promoted by any development proposals in the catchment being planned to include appropriate measures to maintain the natural hydrological regime, minimise sediment run-off and prevent pollutants or excess nutrients from entering the loch system.	Orkney Islands Council, Developer, NatureScot
Habitat Management	Update and implement management plans as required.	NatureScot, Landowners, Land managers, RSPB
Ongoing species protection - otter	Otter are a European protected species and therefore the species protection provisions of the Habitats Regulations apply.	All
	Encouraging natural processes of stream flow and morphology, and recruitment and	Al

	survival of otter prey, by a policy of non-intervention.	
Road mortality-otter	Any upgrading or bridges or culverts, or widening of roads such as the A967, A986 and B9056, or other work on roads, should be assessed and adequate allowance made for otters to safely use underpasses or culverts, so they are not forced to cross the road.	Transport Scotland, Orkney Islands Council, NatureScot
By-catch – otter	Disused eel or fyke nets should be removed when found, and any active nets should use otter guards.	Land managers
Fishing	Naturally nutrient-rich lakes or lochs which are often dominated by pondweed - 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
Invasive species	All anglers and other water users (such as canoeists or researchers) should follow the Check, Clean, Dry biosecurity procedures to help prevent the spread of problem non-native species.	All
	Naturally nutrient-rich lakes or lochs which are often dominated by pondweed - maintain surveillance for invasive species (e.g. Canadian pondweed) and agree control measures with NatureScot or SEPA if they are found in Loch of Isbister.	All
	Very wet mires often identified by an unstable 'quaking' surface - ensure colonisation of this habitat by vigorous native species, such as willow or scrub growth is minimal to prevent loss of indicator species and conversion to other open ground habitats.	Land managers, NatureScot
	Stoats, or other animals that are not native to Orkney, have the potential to kill Orkney voles and waterbirds which in turn could affect the habitats in Orkney in unpredictable ways. Stoats should be removed and no new predators introduced.	NatureScot

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