Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdair air fad airson Alba air fad

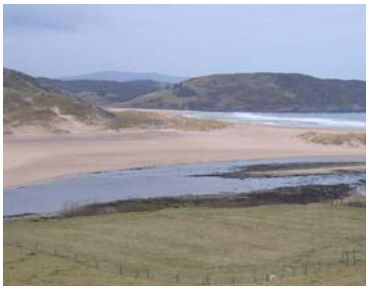
INVERNAVER
Site of Special Scientific Interest

SITE MANAGEMENT STATEMENT

Site code: 815

The Links, Golspie Business Park, Golspie, Sutherland, KW10 6UB. Tel. 01408 634063
north_highland@snh.gov.uk

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.

This Statement is available in Gaelic on request.

Natural features of Invernaver SSSI	Feature condition (date monitored)
Coastal geomorphology of Scotland (physical form of the sand dunes)	Favourable, maintained (July 2008)
Sand dune (habitat found in the sand dunes)	Favourable, maintained (July 2002)
Saltmarsh	Favourable, maintained (July 2002)
Upland assemblage	Favourable, maintained (December 2004)
Vascular plant assemblage	Unfavourable, no change (July 2003)

See Annex 1 for a list of natural features of overlapping SSSI and Natura sites.

Description of the site

Invernaver Site of Special Scientific Interest (SSSI) is located on the north coast of Sutherland between the Rivers Borgie and Naver, 0.5km west of Bettyhill. The site has a range of nationally and internationally important features that recognise the unusual landforms and the plant communities that are found here. There is a gradual transition from narrow glacial river valleys and stable sand dunes through areas of windblown sand on a low, rocky headland, to heathland and peatland vegetation where the influence of shell-sand disappears. The lower reaches of the Rivers Borgie and Naver also flow through the site. Atlantic salmon and freshwater pearl mussels are found in both these rivers which are important both for the conservation of these species and for the contribution that angling makes to the local economy.

Coastal geomorphology of Scotland

The geomorphological importance of Torrisdale Bay and Invernaver lies in the diversity of the landforms and the relationship between the coastal and glacial landforms. The site contains a wide diversity of dune and machair landforms that demonstrate various

stages of development, dynamism and stability of windblown features. Individual features of particular importance are the climbing dunes and hilltop machair that have been formed at a considerable altitude on Druim Chuibhe.

Monitoring of the coastal geomorphology occurred in July 2008. Localised areas of erosion due to irresponsible use of vehicles are recovering and areas of stable or growing dunes were also found. The area of new dunes at the north east of the site noted in 1996 has increased in area and now covers a substantial area. This implies there is a ready supply of sediment offshore and that the bay is acting as a sediment sink. The visibility of the features remained good and access to the site was unobstructed and safe. Overall the coastal geomorphology was found to be in favourable condition.

Sand dune

The sand dune system at Torrisdale Bay includes all the stages in development from mobile dunes on the foreshore, through semi-fixed and fixed dunes to dune slacks and machair grassland. The mobile and semi-fixed dunes are dynamic, specialised habitats colonised by a small number of plant species, notably marram grass. The dune slacks and machair are much more stable, diverse communities and support rare species such as curved sedge and purple oxytropis. Extensive climbing dunes are present on the headland of Druim Chuibhe. These have developed an interesting flora of mountain avens and glaucous sedge heath with crowberry, bearberry, heather, dwarf juniper and creeping willow. This unusual plant community is more commonly found on limestone outcrops and this is by far the largest area of this type of vegetation associated with shell-sand in Scotland.

The sand dune features were monitored in 2002. A full transition inland from fore dune to semi-fixed dune to short sward dune grassland was found at the site. Marram grass was common on the dunes, though flowering heads were uncommon. This may have been typical of marram in the north of Scotland that year as the same low flowering rates were encountered at other sites. The vegetation on the grey dunes and dune heathland showed a diversity of composition over most of the habitat, though at one restricted location heavy grazing resulted in a uniformly short sward height. An area of dunes next to the crofts by the River Naver was also suffering from heavy grazing pressure, but overall the sand dunes were found to be in favourable condition. Grazing levels have reduced dramatically since this monitoring was carried out and heavy grazing is no longer likely to be occurring anywhere on the site.

Saltmarsh

Well-developed areas of saltmarsh occur at the mouths of the Rivers Naver and Borgie, the extent of which is unusual in the far north. The saltmarsh at Torrisdale Bay, at the mouth of the River Borgie extends approximately 1.5kms from Aird Torrisdale cliffs in the north to the tidal limit at the footbridge near Crossburn in the south and includes characteristic creeks and runnels. A good example of zonation across the main saltmarsh types can also be seen here, from a sward of the more inland type of saltmarsh with red fescue and sea plantain at the west end of Torrisdale Bay to the more maritime type with saltmarsh-grass and thrift nearer the sea. Of particular interest here is the presence of stands of the uncommon saltmarsh flat-sedge which occurs with sea-milkwort and sea arrowgrass.

The areas of saltmarsh were also monitored in 2002. The saltmarsh contained plant species characteristic of this habitat with clear zonation between the vegetation types. Localised, heavy grazing was noted near an area of dunes at the mouth of the River Borgie, where the sward height was short with some plants uprooted and only the unpalatable ones were in flower. The affected area was small, however, and overall the saltmarsh was found to be in favourable condition. Grazing levels have reduced dramatically since this monitoring was carried out and heavy grazing is no longer likely to be occurring anywhere on the site.

Upland assemblage

Invernaver is one of the most important botanical sites in Scotland, with unusual plant communities and a rich flora. It provides one of the best examples of "altitudinal descent" in Britain (vegetation that normally only grows at the tops of mountains growing at low altitude due to the influence of the sea and being so far north). Wind-blown, calcareous sand influences large parts of the site, and reaches unusually high altitudes, creating rare plant communities on the base-rich soil. It is also one of the best sites in Britain to see the great variety of growth forms adopted by juniper, from fully erect tree to creeping dwarf shrub.

Mountain avens	Dark red helleborine
	

The SSSI 'upland assemblage' feature at Invernaver was found to be in favourable condition during monitoring in December 2004 as there had been no overall loss of habitat. However the related SAC features which are part of the European interest of the site (listed in Annex 1) were found to be in unfavourable condition due to an episode of heavy grazing from which the site has now largely recovered. This apparent anomaly is due to the more detailed measures by which the SAC features are judged compared to the less demanding measures required for the SSSI feature. However, during a more recent site visit in 2005 it was thought that the current level of grazing is too light and there is now a risk of losing the structural and species diversity of the upland habitats. This mean that the upland SSSI and SAC features could be at risk of being in unfavourable condition when the next formal monitoring is carried out unless the level of grazing is increased.

Vascular plant assemblage

Eight nationally rare and scarce plants have been found at Invernaver: purple oxytropis, hair sedge, curved sedge, an unusual eyebright (*Euphrasia foulaensis*), mountain avens, dark red helleborine, Baltic rush and Scottish primrose.

The vascular plants were monitored in 2003. Prior to 2003 the area had been extensively grazed, but the reduction in stock numbers meant signs of recent grazing damage to the plants were minimal or absent when the monitoring was carried out. However, of the eight rare plant species targeted during monitoring, two (hair sedge and dark red helleborine) were found to be in unfavourable condition. Three populations of hair sedge were recorded but none met the target for the size of the population. However, during a more recent visit in 2005 this species was found to meet the required targets. The population of dark red helleborine appears to have increased in the area near the broch since 2003. If the current low level of grazing continues on this part of the site the dark red helleborine population may increase further. However if very low levels of grazing continue for too long the dark red helleborine might decrease again if rank grasses or trees become established.

Other interests

There is a record of the great yellow bumblebee on Invernaver which dates back around 50 years. This nationally scarce species of bee has been in decline for a number of years across the UK and is now found only on the north and west coasts of Scotland including Orkney and the Hebrides. Conservation of this bee involves encouraging extensive areas of the main food plants to flower. The main food plants in north Sutherland are bird's-foot-trefoil, white clover, vetches and members of the knapweed family. Invernaver is also the only known site in Britain for the nationally rare moss *Brachythecium erythrorrhizon*.

The site also includes areas of geological interest. The rocks around Invernaver are part of the 'Moine Supergroup' (the main rock type north of the Great Glen and east of Loch Eriboll). These rocks were highly deformed deep within the Earth but are now particularly well exposed to the north-east of the SSSI. The 'Naver Thrust', an important zone of geological faulting that lies just west of Torrisdale Bay, separates these rocks from an area of less deformed rocks in the west of the Invernaver SSSI.

Otters that feed on the River Borgie and the River Naver also use the site for resting during when they are not foraging and may breed on the site.

Juniper	Purple oxytropis
	

Past and present management

The Invernaver headland has a long history of grazing by sheep and cattle and former

boundary features, namely old walls and fences are present on the site, though in the last twenty years or more there has been no restriction on stock movements across the site. Stock numbers on the site began to decline about a decade ago, and has recently accelerated till there are now only a handful of sheep on the site. Deer and rabbits also graze the site, but they are present in relatively small numbers. The lack of grazing is of great concern as most of the features on the site are maintained by grazing and the vegetation will change quickly in its absence. Historically, burning has been used as a management tool on the site. Past burning has affected the vegetation structure of the site, and uncontrolled and damaging fires have occurred in recent times.

A number of visitors use the site, particularly to visit Torrisdale beach, and most follow the coast around the north side of the headland. Only a small number take the path up to the high ground via the broch, though both the broch and the raised beach platform on the east site which are Scheduled Ancient Monuments are well known to archaeologists and historians. Pony trekking along the beach and around the dunes is available to visitors. There are no interpretation facilities at the site. Unauthorised, recreational use of vehicles has also been noted on the site in recent years and has caused damage to the sensitive dune habitats and saltmarsh vegetation.

Salmon fishing occurs on the Rivers Borgie and Naver with associated management activities.

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

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, where such disturbance could be significant in relation to the objectives of these Directives. The objectives below 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).

A list of Operations Requiring Consent forms part of the formal notification documents of the SSSI. These, and the discussions on land management involved in the issuing of formal consents, are intended to minimise the threat of any damage to the natural features.

1. To maintain the condition, extent and distribution of the sand dunes and populations of rare and scarce vascular plants that grow there
Three aspects of the sand dunes are notified features of Invernaver SSSI: the sand dunes themselves (Coastal Geomorphology of Scotland feature), the habitats that are found on the dunes (sand dune feature) and the rare or scarce plants found in those habitats (Vascular plant feature). The dunes themselves and the habitats and plants

found there will all benefit from similar management. No active management is needed of the dunes and natural processes of erosion and deposition should be allowed to continue to determine their physical form and extent. The size and shape of the dunes is likely to vary over time, especially in areas closest to the sea, with erosion in some areas and sand deposition in other areas.

More stable dunes are found further away from the sea and here the maintenance of a suitable level of grazing is a key factor maintaining the plant diversity and is crucial to the condition of vascular plant populations. Stocking levels across the site have recently swung from being on the heavy side to being worryingly low and it is expected the coastal habitats will soon show a response to this, although, with the levels of exposure on this site, it may take a few more years. While intensive agricultural operations such as ploughing or fertilising would be damaging, the site would benefit from a suitably structured grazing regime involving sheep and/or, cattle. Any vehicles should only be used very carefully, and occasionally, so that they do not break up the vegetation which could lead to rapid erosion of the fragile soils. This part of the site should not be burnt.

2. To maintain the condition, extent and distribution of the saltmarsh

This habitat requires little active management and can be maintained by continuing current land uses. The habitat would benefit from low levels of grazing. Vehicle use is not generally suitable as this can create ruts, breaking up the habitat and making it vulnerable to erosion.

3. To maintain the condition, extent and distribution of the upland habitats and populations of rare and scarce vascular plants that grow there

The upland habitats and the scarce plants that grow there will benefit from similar management. The level of grazing within these habitats is now too low for most species and undesirable changes in these features have already been noted. Reduction in grazing in the area near the broch appears to have allowed the population of dark red helleborine to increase, but if very low levels of grazing continue for too long this could be reversed if rank grasses or trees become established. Some of the heathland plants are increasing markedly while the more prolific grasses are becoming rank. The combined effect of this is likely to cause shading and loss of space for some of the smaller, less aggressive, species to grow. Burning has damaged the site in the past. Future burning should be in accordance with the Muirburn Code and all practical steps should be taken to avoid fires burning out of control.

Other factors affecting the natural features of the site

Off-road vehicles: Frequent use of off-road vehicles such as trail bikes, quad bikes or 4x4s in the sand dunes and machair would damage the vegetation. This could lead to the formation of large blow outs in the dunes and erosion in the machair that would be very difficult to control. Responsible use of vehicles below the high water mark is unlikely to be a problem.

Trampling by visitors: Large numbers of visitors walking through the dunes, or regular passage of horses to the beaches, could trample the vegetation, leading to erosion. Provision of paths and use of agreed routes will help to avoid this potential problem.

Non-native conifer seedlings: Parts of the upland habitats are being colonised by a scattering of non-native conifer trees. This is probably the result of seed blowing from Borgie forest. Although trees are not likely to grow particularly successfully in this area due to exposure to wind and salt they could still become large enough to start setting seed themselves leading to substantial and undesirable changes in the habitat.

Date last reviewed: 30 July 2009

Annex 1. List of natural features of overlapping SSSI and Natura sites

Part of Invernaver SSSI overlaps Invernaver Special Area of Conservation which is designated for the following features.

Features of overlapping Invernaver SAC that are not notified as SSSI natural features	**Feature condition (date monitored)**	**Designation**
Alpine and subalpine calcareous grasslands[1]	Unfavourable, no change (December 2004)	Invernaver Special Area of Conservation (SAC)
Alpine and subalpine heaths[1]	Unfavourable, no change (December 2004)	Invernaver SAC
Base-rich fens[1]	Unfavourable, no change (December 2004)	Invernaver SAC
Coastal dune heathland[2]	Favourable, maintained (July 2002)	Invernaver SAC
Dune grassland[2]	Favourable, maintained (July 2002)	Invernaver SAC
Dunes with creeping willow[2]	Favourable, maintained (July 2002)	Invernaver SAC
Dunes with juniper thickets[2]	Favourable, maintained (July 2002)	Invernaver SAC
Shifting dunes with marram[2]	Favourable, maintained (July 2002)	Invernaver SAC

[1] These SAC features are part of the SSSI Upland assemblage feature
[2] These SAC features are part of the SSSI Sand dune feature

A small part of Invernaver SSSI overlaps a small part of the River Borgie SSSI and SAC. A small part of Invernaver SSSI also overlaps a small part of Aird Torrisdale SSSI.

Features of other overlapping SSSIs and SACs that are not notified as natural features of Invernaver SSSI	**Designation**
Atlantic salmon	River Borgie SAC
Freshwater pearl mussel[3]	River Borgie SAC & SSSI
Otter	River Borgie SAC
Moine geology	Aird Torrisdale SSSI

[3]This feature is not found within Invernaver SSSI, although it could be affected by management activities within Invernaver SSSI. Please see the Site Management Statement for the River Borgie SSSI for more details of the features of this site.