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MUIR OF DINNET
Site of Special Scientific Interest

SITE MANAGEMENT STATEMENT

Site code: 1212

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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

Habitats and species

The Muir of Dinnet forms a complex area of post-glacial topography and granite hills, containing fine examples of nutrient-poor lochs, reedbeds and basin mires, birch and pine woodland and species-rich dwarf-shrub heath. The interest of the site is greatly enhanced by the close spatial inter-relationships of these habitats and the overall diversity with an interesting transition from lowland to upland habitats. Few areas of comparable habitat diversity are found in northern Scotland. There are a number of agricultural fields within the mixture of natural and semi-natural habitats.

Many habitats and features are also of European importance. The lowland part of the site is one of the best sites for herb-rich dwarf-shrub heath with bearberry, a rare habitat which is restricted to the central and eastern Highlands. Associated plants include slender St John's-wort, intermediate wintergreen, bitter vetchling and common and heath violet. This part of the site has been designated a Special Area of Conservation (SAC) for this habitat. Further areas of dwarf-shrub heath with bearberry occur on the lower slopes of Culblean in the north of the SSSI. The rare moss *Dicranum spurium* has recently been recorded in heath in this area.

Lochs Kinord and Davan are internationally important refuges for passage and wintering wildfowl, supporting over 20 000 wintering wildfowl, primarily Icelandic greylag geese, with a 1989/90 to 1993/94 mean winter peak of 21 440 (21% of the British and total world population). The lochs also formerly held a nationally important wintering population of whooper swan, with a 1989/90 to 93/94 mean winter peak of 88 (1% of the British population).

The lochs are designated a Special Protection Area and Ramsar site for the wintering wildfowl and are also designated for their open water habitat as part of the SAC.

Loch Kinord exhibits a full range of hydroseral plant communities from a rich variety of aquatics such as pondweeds, through emergent fens with bottle sedge, and slender sedge, to bog myrtle scrub, fen-carr and birch woodland.

The Muir of Dinnet is also of European importance for its quaking mires and raised bogs, with fine examples in Ordie, Parkin's and Black Mosses. Dinnet's lochs and wetlands are important for otter, another qualifying species of the SAC. These wetlands also support a number of rare or

localised plant species, including the bog moss *Sphagnum fuscum*, small/common cranberry, lesser tussock sedge, slender sedge, water sedge, bog hair-grass, many-stalked spike-rush and few-flowered spike-rush and six-stamened waterwort.

Large areas of the site are covered by active regeneration of birch and Scots pine associated with remnant stands of ancient birch (e.g. on Ord Hill), and stands of long-established pine plantation in various other locations. Further broad-leaved woodland by New Kinord includes one of the largest-known clones of aspen. Areas of wet woodland, dominated by willows or alder, are also found, on the margins of the lochs, on the mosses and along the Vat Burn. These woodlands are important for the fauna and flora they support, in particular for breeding birds. A number of rare bryophytes have also recently been recorded including a bristle-moss, on aspen, and green shield-moss, on decaying wood along the Vat Burn.

The rich variety of habitats provides the basis for the support of an outstandingly important diversity of insects and birds. About 70-80 species of bird breed across the site.

The Muir of Dinnet is the richest site for dragonflies and damselflies, butterflies and moths, and aquatic beetles in south Aberdeenshire. Many rare/declining invertebrates are recorded, with a good population of pearl-bordered fritillary (in and around the birch woods), Kentish glory moth (on younger birch), several rare moth species associated with the dwarf-shrub heath, and the northern blue damselfly, which breeds in some of the mire pools. The rarer species of water beetle are found in bog pools in Black Moss and the fringes of Loch Kinord.

Geomorphology

The landscape at Muir of Dinnet was shaped by glaciers and meltwater at the end of the last ice age and includes a number of associated landforms such as mounds and ridges of sand and gravel, ice-smoothed rock, wet hollows (the biggest of which are the lochs), and dry river channels. One of the most impressive features is the meltwater channel now occupied by the Vat Burn. The channel and the Vat itself, a giant pothole, are far too large to have been carved out by the present-day stream. Lochs Davan and Kinord are classic examples of large kettle hole lochs, formed by giant lumps of ice left behind by melting glaciers.

The landforms at Muir of Dinnet have attracted a significant amount of research. They represent the deposits from the melting of the last Scottish ice sheet, sometime around 15 000 years ago. The most recent research suggests that a lobe of ice from the last Scottish ice sheet melted westwards up the Dee Valley, and that the meltwater from it was concentrated in the Dinnet area by the form of the land, producing the meltwater channels and the sand and gravel deposits.

Studies of the sediments and pollen preserved in the bottom of Loch Kinord have revealed the pattern of vegetation and environmental change since the ice melted, perhaps 15 000 years ago.

A comprehensive description of the geological features at the Muir of Dinnet can be found in the Scottish Natural Heritage Earth Science Documentation Series (MacTaggart 1997).

<u>Site condition monitoring (SCM) results for the Muir of Dinnet SSSI</u>

Natural Features of Muir of Dinnet SSSI	**Feature Condition (date monitored)**	**Other relevant designations**
Quaternary of Scotland	Favourable, maintained (June 2000)	
Oligo-mesotrophic loch	Favourable, maintained (June 2004)	SAC
Hydromorphological mire range	Not yet monitored	SAC
Lowland dry heath	Unfavourable, recovering*	SAC

	(August 2008)	
Lowland wet heath	Favourable, maintained (August 2011)	
Breeding bird assemblage	Unfavourable, no change (August 2004)	
Greylag goose *Anser anser*, non-breeding	Unfavourable, declining (April 2010)[@]	SPA, Ramsar
Dragonfly assemblage	Not yet monitored	
Invertebrate assemblage	Unfavourable, declining# (September 2003)	

[@] Muir of Dinnet is also classified for its Waterfowl assemblage, with the same condition
* Unfavourable, declining (February 2001), for SAC
# In September 2003 the moth component of the assemblage was assessed as Unfavourable, declining, while the beetles component was assessed as Favourable, maintained.

SCM results for Muir of Dinnet and River Dee SACs

Features of overlapping SACs that are not notified as SSSI natural features	**Feature condition (date monitored)**	**SAC name**
Raised bog	Favourable, maintained (June 2000)[#]	Muir of Dinnet
Very wet mires often identified by an unstable 'quaking' surface	Unfavourable, declining (August 2008)	Muir of Dinnet
Atlantic salmon	Favourable, maintained (October 2004)	River Dee
Otter	Favourable, declining (July 2010)*	Muir of Dinnet

* Favourable, maintained (September 2004), for River Dee

Recent monitoring of the rarer species of water beetle, in bog pools in Black Moss and the fringes of Loch Kinord, found these species to be present and their habitat to be in favourable condition. Monitoring of the rare moth species, most of which are found on the lowland bearberry heath, assessed the moth component of the assemblage as being in unfavourable condition due to the increasing cover of Scots pine and a lack of burning which has led to some of their food plants (e.g. mountain everlasting), being shaded out.

Grey lag numbers increased in the early 1990's reaching a peak of 40 000 in 1995/96 but have steadily declined since then. Recently, numbers have generally been around 200 birds. The wintering greylag geese feature was recently assessed as being in unfavourable condition. For a number of years, the number of Icelandic greylag geese wintering in north-east Scotland has been declining. These birds are wintering further north, mostly in Orkney, or the far north of Scotland. This appears to be a population shift and is not the result of habitat condition at the Muir of Dinnet.

The breeding bird assemblage was assessed in 2004 and was found to be unfavourable condition. This was mainly due to the colonisation of the dwarf-shrub heath by pine trees, though no noticeable decline in the number of breeding species of bird was noted.

The condition of the lowland dry heath feature was recently assessed as Unfavourable, recovering. A lack of burning on the heath led to the extensive regeneration of Scot's pine and birch trees, large patches of gorse and long heather growth. The pine trees have been largely removed, with over 7 ha of young pine cut and removed from the site. The heather also requires cutting or burning to keep the heath in good condition and some burning and swiping have been undertaken to remove the longest heather. Where this has been done, plants such as bearberry and mountain everlasting are regenerating.

The lochs were surveyed in June 2004 and assessed as being in favourable condition. Water quality in both Lochs Kinord and Davan was found to be good, though total phosphorous at Loch Davan was just over the target level of 20ug l-1for a shallow mesotrophic loch, and six-stamened waterwort was not re-found.

A survey of the raised bog in 2000 assessed the feature as being in unfavourable condition, with no more than occasional seedlings of birch and Scots pine.

A survey of the wet heath feature was recently carried out. This found it to be in good condition, maintained by cattle grazing. Scattered birch seedlings appear to be held in check by the grazing.

The areas of swamp and fen at Ordie and Black Mosses were surveyed in September 2004. This assessed the condition of the corresponding SAC feature as unfavourable. Aerial photos from 1964 and 1994 showed that much of the mires had been colonised by trees during the 30 years between the photographs. This was most pronounced at the centre of Ordie Moss and the north-eastern end of Black Moss.

An otter survey was recently carried out for cycle 2. This found good on-site factors, such as variety of prey, suitable habitat, undisturbed resting areas and limited pollution. But, long term data and observations by Professor Hans Kruuk suggests that, while the otter population is being maintained, off-site factors, namely the decline of eel, an important component of otter diet, may have caused a shift in the population from breeding females towards itinerant males.

The geomorphological feature was surveyed in June 2000 and assessed as being in favourable condition. The relict landforms are generally in good condition, although the crests of some of the esker ridges and meltwater channels are at present obscured by a thick tree cover (for example Cambus O' May).

Past and present management

The area was traditionally managed as part of a sporting estate, mainly as a grouse moor, but also including agriculture and forestry. Extensive areas of low-lying moorland were still present up to the 1950's, maintained by a combination of grazing by sheep and deer, as well as by muirburn. Since the 1950s, the owner's management objectives have moved more towards forestry, and much of the former moorland areas have reverted to pine/birch woodland.

Diatomite had been worked from the basins of Black and Ordie Moss and Loch Kinord until the turn of the century and this has contributed to the present day overall habitat diversity of the moss areas. Black Moss was formerly cut for peat, and has also been partly planted with Scots pine. Three dams were installed in 2008 to slow the water flow from the bog and encourage "wetting" of the fen areas.

Parkin's Moss was also formerly cut for peat, for fuel and for agriculture. Damming of ditches took place here in 1999, resulting in the bog becoming much wetter, with new sphagnum growth and dragonflies breeding in the bog pools. A boardwalk was installed in 2008 to allow the public to visit the bog.

The forest at Cambus O'May was planted in 1974. The plantation is now managed by Forest Enterprise. A new Forest Plan for this area is planned for 2011 and will detail the long-term management of the Cambus o' May section of the site.

The area has a long history of recreational use. The halt on the Deeside Railway at Cambus of May was used by many day visitors coming to view the dramatic glacial pothole on the Vat Burn. There is also a long tradition of scientific research on the site, with work on heathland ecology undertaken continuously since 1947.

The Muir of Dinnet was declared a National Nature Reserve (NNR) in 1977. The Reserve Agreement was renewed in 2006 and covers 1157 ha of the SSSI. The area within the NNR is managed under a 5-year management plan and the full details of this can be found on SNH's NNR website[1] or by contacting SNH for a copy.

In recent years there has been an increasing emphasis on forestry, with particular importance being attached to natural regeneration over much of the site. Plantations are also found, including mature Scots pine, with more non-native plantations on the western portion of the SSSI. These non-native trees will be removed as they reach commercial harvesting age. There is an increased emphasis upon selective-felling techniques in order to reduce the scale of disruption to wildlife and landscape at the time of felling. A suckler herd of cattle is grazed in areas of birch pasture and stubble fields in winter, usually moving to upland pasture off the site in summer. This is complemented by a traditional rotation of spring cereals and swedes on the tilled land.

The agricultural fields near Old Kinord have been planted with a mixture of wildflower-rich grassland and wild bird cover crops. This makes them far more useful to wildlife, and curlew, lapwing and oystercatcher now breed in the fields. In the winter, redpoll, reed bunting, twite and mixed finch flocks feed on the seeds in the wild bird cover.

Sport shooting for pheasants and wildfowl (over one small lochan), takes place during late autumn and coarse fishing, controlled by a strict licensing scheme, takes place from the north and south shores of Loch Kinord, during March to October. Up to 100 beehives are located in a small area near Loch Kinord during the summer. Roe deer and rabbits are controlled across the SSSI, largely by shooting.

Muirburn is still carried out in the north of the site outside the NNR. Within the reserve, muirburn was carried out by SNH staff up to 2002, when the initial NNR agreement lapsed. There was then a break in the burning of several years and trees, mostly Scot's pine, began to grow extensively across the heath. Occasionally, muirburn has been carried out under contract by the Estate and swiping has been carried out when burning was not possible. Regenerating Scots pine is cleared in rotation from the main area of dwarf-shrub heath with bearberry to allow muirburn or heather swiping to take place. However, scattered young birches are allowed to reach around 3m in height before being felled, to provide habitat for Kentish glory moth.

Work was carried out during autumn 2011, to "re-meander" a section of the Logie Burn about 250m north-east of Loch Davan. The aim of this project was to create a more "natural" channel for the burn, and allow it to flood nearby fields after heavy rainfall. This should, in the long term, reduce the amount of silt and phosphorous washed into the loch and help to improve the water quality.

Much of the site is used for by walkers, particularly around the Burn o' Vat visitor centre which opened in 1999. A network of trails is found between the visitor centre and car parking areas, in the village of Dinnet and at New Kinord, and links with a car park and path network on Forest Enterprise land, where orienteering also takes place. Occasional horse trials are also held. The area is also well used by educational groups, particularly Aberdeen University.

[1] http://www.nnr-scotland.org.uk/downloads/publications/The_Reserve_Plan_for_Muir_of_DinnetNational_Nature_Reserve_2008_2014.pdf

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

We wish to work with the owners and occupiers 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 and to monitor the effectiveness of the management agreement.

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).

1. **To maintain the diversity of habitats within the site and their associated flora and fauna**

   Very widespread woodland regeneration is occurring across the former moorland within the reserve. The regeneration comprises mainly birch on lower ground and Scots pine on Culblean Hill, but with a gradual mixing of the two. Some of this regeneration constitutes a positive development within the site, as the former woodland communities are restored on a large scale and will form part of a much larger woodland covering the mid-Deeside area. There are, however, a number of areas where this colonisation may have implications for the birds and invertebrates dependent on open moorland habitats, as well as the habitats themselves, with special concern for the dwarf-shrub heathland with bearberry. Management to maintain these areas as open heathland is ongoing and includes the clearance of pine and increased swiping or burning. Further clearance of birch trees is required in the south-west of the SAC to maintain the bearberry heath in that area.

   Muirburn in the north of the site should be carried out in accordance with the Muirburn Code, avoiding steep slopes, gullies and thin soils with exposed bedrock.

2. **To maintain accessibility to and the diversity of the geomorphological features and the physical and visual integrity of the geomorphic landforms**

   Any development affecting the integrity of the total landform assemblage or the individual glacial, glaciofluvial and fluvial relict landforms, such as additional planted afforestation, should be avoided.

   Any further applications for afforestation of the site should be discouraged as the trees will obscure the visual integrity of the site and any links between the landform assemblage. The physical integrity of the landforms could be threatened by sand and gravel extraction. Although unlikely within the reserve, this should be discouraged within the wider site.

3. **To support and encourage interpretation and use of the site for scientific and educational purposes**

Other factors affecting the natural features of the site

The Mondavan, Logie and Clarack Burns, adjacent wetland habitats and Loch Davan form part of the River Dee SAC. Works along or adjacent to these waters, for example along the A97 or along footpaths crossing the Clarack Burn, could affect the River Dee SAC. SNH will work with the local authority and estate to ensure that the River Dee SAC is not affected by any such works.

Date last reviewed: 16 November 2011.