



Scottish Natural Heritage
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RIVER BORGIE Site of Special Scientific Interest

SITE MANAGEMENT STATEMENT

Site code: 1685

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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.

This Statement is available in Gaelic on request.

Natural features of the River Borgie SSSI	Condition of feature (date monitored)	Other relevant designations
Freshwater pearl mussel	Favourable, maintained (May 2004)	Special Area of Conservation (SAC)

Features of overlapping Natura sites that are present within the River Borgie SSSI but are not notified as SSSI natural features	Designation
Atlantic salmon	SAC
Otter	SAC

Parts of the River Borgie SSSI also overlap the Natura and Ramsar sites listed in Annex 1.

Description of the site

The River Borgie Site of Special Scientific Interest (SSSI) flows from Loch Slaim to the sea at Torrisdale Bay on the north coast of Sutherland, between Tongue and Bettyhill. This site is internationally important for freshwater pearl mussel, Atlantic salmon and otter. As well as being of conservation importance, the population of Atlantic salmon is of considerable economic value due to income from fishing.

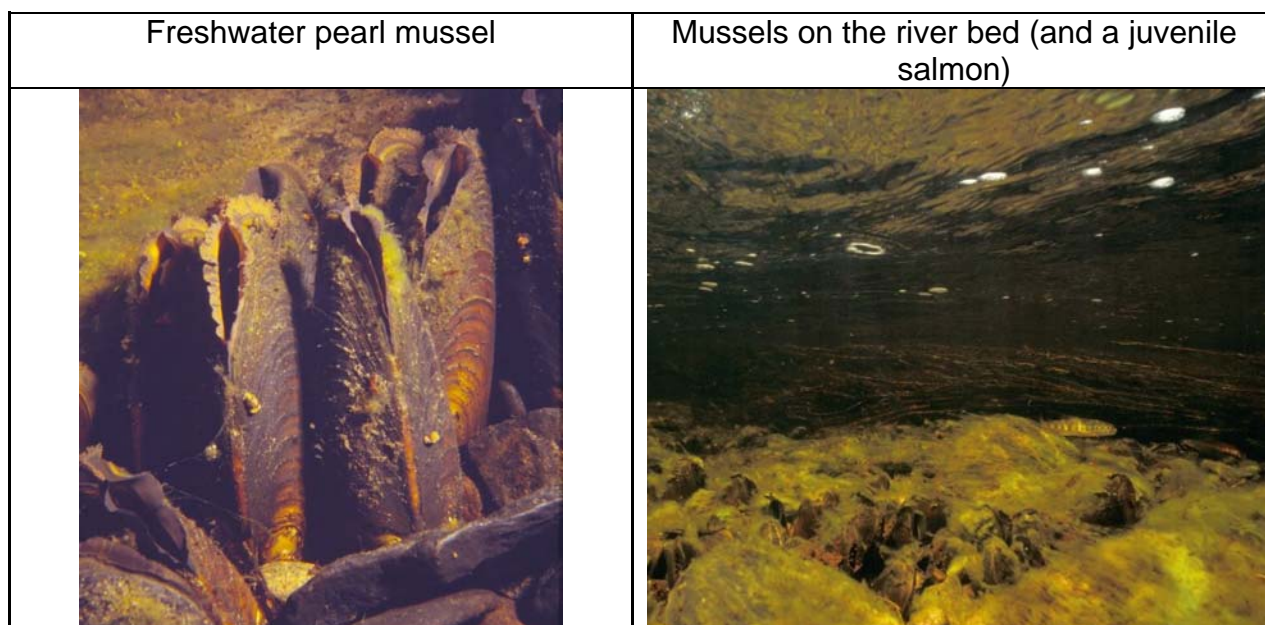
Freshwater pearl mussel

The River Borgie is one of the few remaining rivers in Scotland known to support a large, viable population of freshwater pearl mussels. Although the species is widely distributed in the northern hemisphere, populations have declined sharply throughout Europe. Scotland is now considered to be the main European stronghold for the species but, in recent years, it has been lost or has ceased breeding at many sites. The fact that both adult and juvenile mussels are abundant in the River Borgie indicates that the population has the potential to remain viable in the long term.

The river catchment includes extensive tracts of blanket bog and the upland massifs of Ben Loyal and Beinn Stumanadh in its headwaters. In its middle reaches the river flows through the Borgie Forest, a Forestry Commission plantation of over 1700ha. The river is flanked by occasional stands of riparian woodland and relatively small areas of land improved for agriculture near the river mouth. The River Borgie enters the sea at Torrisdale Bay where small areas of salt marsh and intertidal mud and sand occur. Throughout its course, the riverbed is highly varied with a number of pools, riffles, rapids and a waterfall, which give rise to a mixture of substrate types from boulders to fine gravel.

Freshwater pearl mussels can grow up to 15cm long and live for over 100 years. The adults live attached to or buried in the substrate of rivers and filter small particles of food from the flowing water. They become mature at about 10 to 12 years of age and each female can produce between one and four million larvae that are released in synchrony over one or two days in late summer.

The survival of freshwater pearl mussels is inextricably linked to the availability of juvenile salmon and trout. Mussel larvae released into the flow of the river must attach themselves to the gills of young salmon and trout if they are to develop. Only a small proportion of larvae will succeed in this and survive to drop off their host fish and take up the sedentary life of the adults on the riverbed. In addition, freshwater pearl mussels are critically dependent on high water quality and suitable riverbed substrates. The inclusion of riparian habitats in the SSSI, with areas of birch, common alder and willow, provide shaded stretches of water, a supply of leaf litter and insects that are beneficial to salmon and trout and therefore also to the mussel populations.



The freshwater pearl mussel population of the River Borgie was monitored in 2004. Mussels were found to be abundant in the river and there was a healthy proportion of small, young mussels present, suggesting successful reproduction is occurring. No evidence of illegal pearl fishing activity was seen during the monitoring visit. Overall the freshwater pearl mussel feature was found to be in favourable condition.

Atlantic salmon

An internationally important population of Atlantic salmon breeds in the River Borgie. Fish that hatched in the River Borgie return to the river to breed after spending several years at sea. The clean water of the river and gravel beds that have not been disturbed or clogged by sediment are crucial for successful breeding by Atlantic salmon.

Otter

An internationally important population of otters uses the River Borgie for foraging and the banks are used as resting places and breeding holts.

Other interests

Part of the upper reaches of the River Borgie SSSI overlap with West Borgie SSSI, designated for its blanket bog, breeding birds and geology. West Borgie SSSI forms part of the Caithness and Sutherland Peatlands Special Area of Conservation (SAC), part of the Caithness and Sutherland Peatlands Special Protection Area (SPA) and part of the Caithness and Sutherland Peatlands Ramsar site. The mouth of the River Borgie also overlaps with Invernaver SSSI and Invernaver SAC. A list of the habitats and species that are included in the SACs, SPAs and Ramsar site is given in Annex 1. West Borgie SSSI and Invernaver SSSI each have their own Site Management Statements that give advice on how to conserve and enhance the special natural features of those sites.

Past and present management

The river is managed as a sporting fishery for Atlantic salmon. This includes limited engineering works in the river channel such as repair and maintenance of the existing weirs. Bank stabilisation work also takes place and the bank vegetation is managed to allow access for fishing and improve the river's productivity. The river is stocked with native juvenile salmon.

Back from the immediate river edge, the banks are managed in conjunction with adjacent land, much of which is used for rough grazing. Apart from a slight reduction in stock numbers in recent years, this land use has seen little change over the last century. For approximately one third of its length, the site passes through a commercial conifer plantation. The plantation dates back to the early part of the twentieth century and is currently undergoing major restructuring.

SEPA have assessed the water quality in the River Borgie as high, however the overall status of the river has been assessed as 'moderate' due to artificial regulation of the flow by a weir at Loch Craggie and intensive forestry near the middle of the river.

A road and track run parallel to the lower reaches of the river along its western side allowing access for fishing and forestry operations. Two road bridges, one disused, cross the site. The Forestry Commission has installed interpretation and created paths to encourage recreational use of forestry plantations adjacent to the river and there is a popular footbridge and path near the mouth of the river that gives access to Torrisdale Beach.

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 and to monitor the effectiveness of the management agreements.

The EU Habitats and Birds Directives oblige Government to avoid, in SACs and SPAs, the deterioration of natural habitats and the habitats of species, as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of these Directives. The objectives 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 water quality of the River Borgie

Water levels and water quality play a crucial role in the suitability of the River Borgie for freshwater pearl mussel and Atlantic salmon. Where possible, any increase in drainage, abstraction or other activities affecting the hydrology of the river catchment should be avoided. Agriculture or forestry operations within the catchment should be carefully managed to prevent the input of sediment, chemicals or nutrients into watercourses in order to maintain the high water quality required by freshwater pearl mussels and salmon. The Forestry Commission's Forests and Water Guidelines should be carefully adhered to when carrying out any forestry operations within the River Borgie catchment.

2. To avoid disturbance to the freshwater pearl mussels

Freshwater pearl mussels are sedentary animals that attach themselves to the substrate of the river. Disturbance to the substrate can result in the death of mussels. Therefore, in-river engineering works should be minimised and carefully planned to avoid areas containing mussel populations. Operations such as gravel extraction and channel dredging have the potential to destroy mussel populations if they occur in sensitive areas of the river. Sediment from in-river engineering works can also be carried downstream, potentially smothering mussel beds. These operations should only be carried out with the prior agreement of SNH following an assessment of the likely impacts of any specific proposal.

3. To increase the populations of Atlantic salmon

Young freshwater pearl mussels need to attach themselves to young Atlantic salmon or trout for part of their development, therefore healthy salmon and trout populations are essential for maintenance of the freshwater mussel population. The population of Atlantic salmon is presently recovering from being in unfavourable condition.

Populations of Atlantic salmon and trout can be enhanced by good river management which includes maintaining clean water and minimising sediment load that might smother the gravel beds where fish spawn. Encouraging the formation of shaded pools with overhanging branches, alder and willow can also benefit fish by providing a source of leaf litter and insects that can enhance their food supply.

Other factors affecting the natural features of the site

Illegal Pearl Fishing: Freshwater pearl mussels have been significantly affected by fishing in the past. Pearl fishing from freshwater pearl mussels is now illegal. Any suspicious activity should be reported to the Police as soon as possible.

Forestry: Forestry could influence water flow rates and water quality in the river downstream of the non-native conifer plantations.

Date last reviewed: 23 April 2009

Annex 1 Features of additional Natura sites that overlap parts of the River Borgie SSSI

Parts of the River Borgie SSSI overlap the following Natura and Ramsar sites. Most of the features for which these sites are designated are not found within the River Borgie SSSI, although many of them are found close by and could be affected by management activities within River Borgie SSSI.

Features of additional Natura sites that overlap the River Borgie SSSI	Feature condition (date monitored)	Designation
Acid peat-stained lakes and ponds (dubh lochans)	Favourable, maintained (August 2004)	Caithness and Sutherland Peatlands SAC
Blanket bog	Favourable, maintained (August 2004)	Caithness and Sutherland Peatlands SAC & Ramsar
Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SAC
Depressions on peat substrates	Favourable, maintained (August 2004)	Caithness and Sutherland Peatlands SAC
Very wet mires often identified by an unstable 'quaking' surface (ladder fens)	Favourable, maintained (August 2004)	Caithness and Sutherland Peatlands SAC
Wet heathland with cross-leaved heath	Not assessed	Caithness and Sutherland Peatlands SAC
Marsh saxifrage	Not assessed	Caithness and Sutherland Peatlands SAC
Breeding bird assemblage	Not assessed	Caithness and Sutherland Peatlands Ramsar
Black-throated diver	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SPA
Common scoter	Favourable, maintained (August 2004)	Caithness and Sutherland Peatlands SPA
Dunlin	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SPA & Ramsar
Golden eagle	Favourable, maintained (July 2003)	Caithness and Sutherland Peatlands SPA
Golden plover	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SPA
Greenshank	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SPA
Greylag goose	Not assessed	Caithness and Sutherland Peatlands Ramsar
Hen harrier	Favourable, maintained (June 2003)	Caithness and Sutherland Peatlands SPA
Merlin	Favourable, maintained (July 2004)	Caithness and Sutherland Peatlands SPA

Red-throated diver	Not assessed	Caithness and Sutherland Peatlands SPA
Short-eared owl	Not assessed	Caithness and Sutherland Peatlands SPA
Wigeon	Not assessed	Caithness and Sutherland Peatlands SPA
Wood sandpiper	Favourable, maintained (June 2004)	Caithness and Sutherland Peatlands SPA
Alpine and subalpine calcareous grasslands	Unfavourable, no change (December 2004)	Invernaver SAC
Alpine and subalpine heaths	Unfavourable, no change (December 2004)	Invernaver SAC
Base-rich fens	Unfavourable, no change (December 2004)	Invernaver SAC
Coastal dune heathland	Favourable, maintained (July 2002)	Invernaver SAC
Dune grassland	Favourable, maintained (July 2002)	Invernaver SAC
Dunes with creeping willow	Favourable, maintained (July 2002)	Invernaver SAC
Dunes with juniper thicket	Favourable, maintained (July 2002)	Invernaver SAC
Shifting dunes with marram	Favourable, maintained (July 2002)	Invernaver SAC