

WHITLAW AND BRANXHOLME SPECIAL AREA OF CONSERVATION (SAC)

CONSERVATION ADVICE PACKAGE



Whitlaw Mosses © NatureScot

Site Details

Site name:	Whitlaw and Branxholme
Map:	https://sitelink.nature.scot/site/8408
Location:	Eastern Scotland
Site code:	UK0013594
Area (ha):	41.30
Date designated:	17 March 2005

Qualifying features

Qualifying feature	SCM assessed condition	SCM visit date	UK overall Conservation Status
Very wet mires often identified by an unstable 'quaking' surface (Transition mires and quaking bogs) [H7140]	Unfavourable No change	5 October 2004	Unfavourable - Bad
Base-rich fens (Alkaline fens) [H7230]	Unfavourable Declining	14 September 2008	Unfavourable - Bad
Slender green feather-moss (<i>Drepanocladus</i>) (<i>Hamatocaulis vernicosus</i>) [S1393]	Unfavourable Declining	22 October 2008	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.

Other overlapping Protected Areas:

[Whitlaw Mosses SSSI](#)

[Branxholme Wester Loch SSSI](#)

[Slaidhills Moss SSSI](#)

The SAC consists of the three SSSIs above. These SSSIs contain six moss locations roughly grouped into two broad areas. The six locations are: Bearrig Moss, Blackpool Moss, Murder Moss and Nether Whitlaw Moss (all part of Whitlaw Mosses SSSI) – located near Selkirk. The other two: Branxholme Wester Loch (Branxholme Wester Loch SSSI); and Slaidhills Moss (Slaidhills Moss SSSI) are located southwest of Hawick.

The Whitlaw Mosses SSSI part of the SAC are the best example in Great Britain of the northern type of fen, in which plants with a distinctly northern distribution occur.

Each moss has its unique suite of species which characterise the combinations of sedge fen, open water, moss lawns, reed swamp, lime-rich short sedge flushes, fringing tall herb meadow, or wet woodland of willow or birch. This uniqueness comes from the operating chemical and physical factors on each of these isolated sites, meaning this geographically fragmented SAC contains three successional stages of the Scottish Lowland raised bog dynamic that can be found on base-rich soil. See table below for information on which location hosted which qualifying feature at designation.

Location	SAC feature		
	<i>Base-rich fens</i>	<i>Slender green feather-moss</i>	<i>Transition mires</i>
Slaidhills Moss SSSI	No	Yes	No
Whitlaw Mosses SSSI	Yes	No	Yes
Branxholme Wester Loch SSSI	Yes	Yes	Yes

Key factors affecting the qualifying features

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

This feature is also known as transition mires and quaking bogs. The term 'transition mire' relates to vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich.

Transition mires and quaking bogs can occur in a variety of situations, related to different geomorphological processes. The water table is often close to or above the surface of the substrate giving rise to characteristic floating mats of vegetation.

Key factors affecting this habitat type are alterations to the hydrology, invasive native species and non-natives, over and under-grazing, and disturbance to the surface e.g. trampling.

The feature was assessed through NatureScot's site condition monitoring programme in 2008 as being in unfavourable condition at this SAC due to the increasing presence of invasives and non-native species such as common reed, Greater spearwort, and Sitka spruce in certain parts of the site. There was also evidence of some enrichment of parts of the site through sediment in-flows mainly resulting from neighbouring agricultural practices, leading to changes in the floristic composition.

Base-rich fens

Base-rich fens consist of a complex assemblage of vegetation types characteristic of sites where there is tufa and/or peat formation, with a high water table and a calcareous, base-rich water supply.

There is considerable variation between the locations within the SAC, and in the associated communities and the transitions that occur even within very small distances. There is also usually considerable variation of geomorphological types within a single moss location, which can contain some representation of flood plain mire, valley mire, basin mire, hydroseral fen (i.e. as zones around open waterbodies) and spring fen. The suite of species that are found both within, and across, the various locations of the SAC are another rare feature, with many species more typical of either upland or lowland fens found in the same location.

Key factors generally affecting this habitat type are land use changes/development, pollution to ground or surface water, and inappropriate adjacent grazing regimes.

The feature has been assessed through NatureScot's site condition monitoring programme as being in unfavourable condition at this SAC due to the increasing presence of invasives and non-native species such as common reed, Greater spearwort, and Sitka spruce in certain parts of the site. It is also due to some enrichment of parts of the site through sediment in-flows mainly resulting from neighbouring agricultural practices.

Slender green feather-moss

Slender green feather-moss is generally found in base-rich, but not strongly calcareous, flushes and springs in upland areas of Scotland; and in lowland sedge fens and mires, as is the case at Slaidhills Moss and Wester Branxholme Moss. Slender green feather-moss only rarely produces reproductive capsules. It is a turf-forming species composed primarily of non-creeping packed vertical stems with limited branching. Opportunity for dispersal between sites is therefore limited.

At Slaidhills Moss the central area of the moss is fen (vegetation dominated by species of sedge) and swamp, which shows little of the base-rich influence from the south-west. Slender green feather-moss is found in abundance along the southern margin of this central area.

The main general threats to this species are thought to be deterioration in quantity and/ or quality of the hydrological environment at some locations, or excessive grazing of flushes by sheep and deer.

The feature has been assessed through NatureScot's site condition monitoring programme as being in unfavourable condition at this SAC. This is due to the apparent disappearance of the moss from Wester Branxholme Loch, one of the two locations it was originally found at. It is believed that this might be due to changes in one or more of the hydrological conditions at Wester Branxholme Loch – such as enrichment or drying out; possibly indicated by the spread of reed beds and willow scrub on site, and the increases in forestry in the wider catchment around the SAC.

Further information about these [habitats](#) and [species](#) can be found on the JNCC website.

Conservation Priorities

There are no priority qualifying features within the site and no apparent management conflicts between the qualifying features, all of which require particular levels and types of nutrients, and are heavily water-dependent. If any conservation management conflicts between the qualifying features were to arise, consideration should first be given to: transition mires and ‘quaking’ bogs and slender green feather-moss - the primary reasons for site selection.

Overarching Conservation Objectives for all habitat features

1. To ensure that the qualifying features of Whitlaw and Branxholme 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 Whitlaw and Branxholme SAC is restored by meeting objectives 2a, 2b, 2c for each qualifying feature

The aim at this SAC is to restore the qualifying habitats to 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 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 the transition mires and quaking bogs habitat at the Whitlaw Mosses and Wester Branhholme part of the Whitlaw and Branhholme SAC is approximately 9.91 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.

Mire and fen communities, together with open water where present, should occupy at least 70% of the basin area.

However, by definition this habitat is transitional with other adjacent wetland habitats, so current baseline estimates may not be very precise and any changes in extent estimates, as a result of new survey work, may not represent real change but greater precision.

The extent and distribution of all functional components of the habitat, such as poor-fen, rich-fen, bog pools, base-rich spring, should be maintained.

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 very wet mires often identified by an unstable 'quaking' surface habitat

This habitat is usually present as a mosaic with other wetland habitats. 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 slightly base-rich to markedly acidic.

The maintenance of appropriate hydrology for this habitat is crucially important to retain its structure, function and processes. This habitat has developed here due to the ground being close to the water table. Natural fluctuations in water level need to continue to support the long-term existence of the habitat. The site should be damp or wet all year. As a part of this, management to prevent or reduce the detrimental effects of excessive nutrient enrichment from the surrounding area is key.

Light grazing can be beneficial in helping to maintain the species-rich nature of the habitat, and in preventing succession on Murder Moss and Slaidhills Moss. However, over-grazing and excessive poaching by sheep and cattle has a deteriorating effect, and can result in disturbed bare ground and damage the structure of this feature including the wider mosaic of wetland habitats in which it is found. Damage to ground surfaces by heavy trampling and/or tracking by livestock and ATVs, in places adjacent to the parts of the SAC where this feature is found, can increase sediment run-off into the mire, leading

to deterioration of the habitat through enriching the water through increased sediment inputs.

In-flows of sediments and or chemicals from adjoining land, through livestock or vehicular use, is presently influencing parts of the SAC by increasing/ altering nutrients, leading to changes in the floristic composition, and in some cases meaning more vigorous and or alien species can outcompete the more typical habitat communities. These in-flows need to be restricted to prevent further deterioration of parts of the SAC. Monitoring data from 2008 identified incursions of common reed (*Phragmites australis*) at Blackpool Moss, Murder Moss and Branxholme Wester Loch. There are also some self-seeded Sitka spruce at Nether Whitlaw Moss. These are presumed to originate from the adjacent forestry plantation at the eastern end of the Moss. Management is in place to address these issues, so that they are scarce on-site.

Colonisation of this habitat by vigorous native species such as common reeds, creeping bent grass, tussock-forming grasses, scrub growth, or invasive non-native species could lead to irreversible habitat loss in the longer term through vegetative competition, shading, drying out of the habitat, and possible conversion to other open-ground habitats or woodland. These plants should be kept to appropriate levels depending on the species: with vegetation such as willow carr tolerated provided it covers a small extent of the mire, while the SAC should be free of invasives, especially non-natives.

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

Across Whitlaw and Branxholme SAC transition mires occur as a part of valley mires and basin mires, in complexes of vegetation containing both bog and fen vegetation communities. This variation in habitat types across the various locations of the SAC should be maintained.

The vegetation is floristically intermediate between fen and bog, and also occupies transitional positions within vegetation zonation. The SAC provides excellent representation of transition mire; being transitional both in vegetation types (e.g. bog-moss *Sphagnum* with other, more fen-type, species such as lesser tussock-sedge *Carex diandra*), and in its hydrological characteristics.

The diverse NVC M9 community is abundant on all the designated mires. Characteristic species include sedges *Carex rostrata* and *Carex lasiocarpa*, *Sphagnum* moss species, and bryophytes such as *Calliergon cuspidatum* and *C. giganteum*. Nether Whitlaw, is slightly more acidic, and the transition mire community highlights slightly less base-rich conditions. At Nether Whitlaw, tall-herb fen communities occur along the edges of the *Sphagnum*-rich 'island'. The tall-fen typically includes bog bean (*Menyanthes trifoliata*), horsetail (*Equisetum fluviatile*), and water mint (*Mentha aquatica*) as common species.

The Whitlaw Mosses SSSI part of the SAC contains some nationally scarce vascular plants - holy grass (*Hierochloa odorata*), Scottish small reed (*Calamagrostis scotica*), alpine rush (*Juncus alpinoarticulatus*), cowbane (*Cicuta virosa*) and coral root orchid (*Corallorhiza trifida*) which is recorded as unfavourable. These can require differing management (e.g. cutting back other faster growing/more competitive plants, or themselves, at certain times), and this should be undertaken to ensure the distribution of these is maintained or restored as appropriate through management.

The habitat also supports a range of wildfowl such as teal, wigeon and mallard; with water rail and snipe found at Whitlaw Mosses

Conservation Objectives for base-rich fens (alkaline fens)

2a. Maintain the extent and distribution of the base-rich fen habitat within the site

The extent of the base-rich fen habitat at Whitlaw Mosses and Branxholme Wester Loch is approximately 7.02 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.

However, due to the small and fragmentary nature of this habitat current baseline estimates may not be very precise and any changes in extent estimates as a result of new survey may not represent real change but greater precision.

In the SAC this habitat feature is found at Blackpool, Beanrig, and Murder Mosses, and at Branxholme Wester Loch. In base-rich fens the vegetation is rich in sedges and brown mosses (bryophytes) which depend on high lime content. This constitutes the 'rich' fen. It is also found at Nether Whitlaw Moss, but the type is known as 'poor' fen here due to the slightly more acidic environment present.

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 base-rich fen habitat

This habitat is dependent on a high water table and is often found where there are springs or seepages, fed by base-enriched waters on both peat and mineral soils. Tufa deposition can sometimes occur. Any operations within the catchment, which have the potential to lower the water table or alter chemical inputs and outputs, such as clearance of drains or fertiliser-use, should be avoided.

Unplanned livestock ingress can lead to excessive poaching resulting in damage to the fragile tufa formations. The ground surface can also be broken and imprinted by hoof marks, wallows, human foot prints, or vehicle and machinery tracks. This can be detrimental to the habitat resulting in bare mineral, organic soil, or in ground only covered by an algal mat. Measures should therefore be taken to avoid these effects.

Further colonisation of this habitat by vigorous native species (common reed *Phragmites australis* and/or reed canary grass *Phalaris arundinacea*, and Greater spearwort *Ranunculus lingua*), scrub growth, or invasive non-native species would likely result in a deterioration in habitat quality, and could lead to irreversible habitat loss in the longer term, through conversion to other open-ground habitats or woodland. There is a degree of colonisation by these species already. Some of these species (e.g. *Phragmites*) are very responsive to nutrient increases and can extend their range within the feature quickly if provided with these changes, so a key objective should be to reduce nutrient inputs at the mosses.

Damage to adjacent ground surfaces at the Whitlaw Mosses group and Branxholme Wester Loch (though not at Slaidhills Moss) by heavy trampling and/or tracking by livestock and ATVs can increase sediment run-off into the mires, leading to deterioration of the habitat through enrichment. Measures should therefore be taken to avoid this.

2c. Restore the distribution and viability of typical species of the base-rich fen habitat

Each moss within the SAC has its unique suite of species which characterise the combinations of sedge, fen, open water, moss lawns, reed swamp, lime-rich short sedge flushes, fringing tall herb, meadow or wet woodland of willow or birch.

Whitlaw Mosses

Blackpool, Bearrig and Murder Mosses have vegetation rich in sedges and brown mosses (bryophytes) which depend on a high lime content. This is called "rich-fen".

A *Sphagnum*-rich variant of the NVC M9 community is found in a mosaic with other NVC communities at Bearrig Moss. The M9a sub-community is found at Blackpool and Bearrig; whilst the M9b sub-community is quite extensive at Murder Moss, Blackpool Moss and Nether Whitlaw Moss. At Nether Whitlaw, where there is 'poor' fen, the mire habitat often occurs in a mosaic with swamp habitats. Fen pondweed was recorded at Murder Moss in the past.

Short sedge fen formation occurs in the base-rich seepage areas at Murder Moss; in the tufa forming springs on the north and extensive flushes in the south; and at Bearrig Moss in a grassier flushed area at the south western edge.

Sedges such as *Carex dioica*, *Carex hostiana*, *Carex lepidocarpa*, *Carex panicea*, and *Carex pulicaris*; Cotton grass (*Eriophorum angustifolium*), Jointed rush (*Juncus articulatus*), Common butterwort (*Pinguicula vulgaris*), and mosses including *Bryum pseudotriquetrum*, *Campylium stellatum*, *Ctenidium molluscum*, *Drepanocladus revolvens* are constantly found on Murder Moss and Bearrig Moss.

Nether Whitlaw Moss is more acidic and there is a slightly different mixture of sedges generally dominated by *Carex rostrata*; as well as bog bean (*Menyanthes trifoliata*) and fen pondweed (*Potamogeton coloratus*) with extensive lawns of bog mosses *Sphagnum* known as "poor fen".

There are five Red Data Book (RDB) fly species that have been identified at Whitlaw Mosses *Tetanocera freyi*; *Parhelophilus consimilis*, a hoverfly; *Oxycera dives*; *Scathophaga tinctoria*; and the crane fly *Dicranomyia magnicauda*. The larvae of these species live variously in seepages or shallow water with fen or swamp vegetation. There is one RDB moth, *Aphelia unitana*, which was found in abundance around hemp agrimony on Nether Whitlaw Moss in 2004.

There are also a number of nationally scarce moss species such as woolly feathermoss present on these Mosses.

Wester Branxholme Moss

The site has a particularly good representation of habitats, which exemplifies the gradual change from open water, to waterlogged but terrestrial habitats, i.e. an open-water transition fen habitat. So the feature is part of a broader range of very closely-linked habitats within this location. There is also a relatively rich aquatic flora (and subsequently fauna) supported by the alkalinity of the water; including four stonewort species (*Chara*) and over 50 species of water beetle.

Arranged in typical concentric zonations are: common reed and sedge swamp fringing the open water, then vegetation rafts (quaking bog) floating on a liquid peat/silt substrate; slender sedge (*Carex lasiocarpa*) - brown moss dominated rich-fen and also poor-fen with scattered willow carr, birch and the odd conifer which surrounds a central area of

sphagnum-rich raised bog. On the peripheral slopes around the fen are areas of wet heath, small flushed (lime-enriched) seepages on mineral soils and deep spring-heads or “well-eyes”.

The moss and liverwort assemblage is particularly diverse at Wester Branhholme, and includes records for the nationally scarce or endangered species; Irish ruffwort (*Moerckia Hibernica*), Norfolk flapwort (*Leiocolea rutheana*), and lurid cupola-moss (*Cinclidium stygium*).

Across the relevant parts of the SAC, unintended excessive grazing/trampling by livestock and colonisation by vigorous native species, scrub, and invasive non-native species can contribute directly to a deterioration in the habitat structure, leading to a reduction or loss in the typical/indicator species for this habitat. At some of the Mosses it has also lead to nutrient enrichment of the SAC leading to losses in the quantity and quality of the qualifying feature. These potential impacts should be managed and minimised.

Conservation Objectives for slender green feather-moss (*Drepanocladus (Hamatocaulis) vernicosus*)

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

The aim at this SAC is to restore the slender green feather-moss to a favourable condition as a contribution to its wider conservation status. Therefore any impacts to the objectives shown in 2a, 2b or 2c below must not persist so that they prevent the achievement of this overall aim.

When carrying out appraisals of plans or projects, the focus should be on restoring site integrity, specifically by meeting the objectives outlined in 2a, 2b and 2c. If these are met then site integrity will be restored. Note that not all of these will be relevant for every activity being considered. Any impacts on the objectives shown in 2a, 2b or 2c below must not persist so that they prevent the restoration of site integrity. Temporary impacts on these objectives resulting from plans or projects can only be permitted where they do not

prevent the ability of a feature to recover and there is certainty that the features will be able to quickly recover.

This objective recognises that the qualifying 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. Restore the population of the slender green feather-moss as a viable component of the site

The conditions for the long-term existence of slender green feather-moss at Whitlaw and Branxholme SAC should be restored.

During the SAC designation process, this species was found at both Wester Branxholme Loch (a small population in a very localised area), and Slaidhills Moss (where it was locally abundant).

The key factors likely to affect the population of the species are changes in hydrology and/or scrub encroachment. Both of these factors have only been noted as threats at the component Branxholme Wester Loch, where the moss appears to have declined and was not found during the latest SCM assessment. The focus of this objective is therefore to stop the decline of the small population, and subsequently promote an increase in the presence of the moss at Branxholme Wester Loch.

Nearby poaching by cattle and burning have been noted as potential factors that could lead to impacts at the component Slaidhills Moss but neither of these threats are considered significant under current management. The population appears to be maintaining its extent and distribution in this portion of the SAC, where it is restricted to the wettest part of the site and remains abundant.

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. The appraisal should also consider the life history traits of the species and the scale and duration of the impact being assessed. The rate of recovery of this species is not fully understood.

2b. Restore the distribution of the slender green feather-moss throughout the site

The largest, and possibly only, extant population of Slender green feather-moss within the SAC occurs within the Slaidhills Moss component. In 2008 it was estimated there were in excess of tens of thousands of shoots in two colonies, covering a discontinuous strip of ground c. 70 x 2-10-m wide on the south side of a very wet central area. The population at this moss appears to maintaining its extent and distribution within the SAC.

A small population was recorded at Branxholme Wester Loch in 2002 but appears to have disappeared by 2008. This disappearance is most likely due to a change in hydrology at Branxholme Wester Loch such as enrichment or drying out and a resultant increase in vascular plants (reed beds and willow scrub), but this is not conclusive and the wider habitat appears to be in good condition.

Slender green feather-moss has never been found in the Whitlaw Mosses part of the SAC.

Conditions within the site should allow for the distribution of the species to be expanded or at least restored to their previous known extent. This should likely be focussed on Branxholme Wester Loch.

Land management changes in the form of forestry within the catchment can affect the hydrology and water quality of this site if not planned and managed carefully.

2c. Restore the habitats supporting the slender green feather-moss within the site

The distribution and extent of Slender green feather-moss habitat within the site should be restored, together with the structure, function and supporting processes of the habitat.

Slender green feather-moss is characteristic of fens which are mineral-rich but not strongly calcareous. Bryophytes associated with Slender green feather-moss include: *Calliergonella cuspidata*, *Plagiomnium affine*, *Rhizomnium pseudopunctatum*, *Sphagnum contortum* and *S. inundatum*. Associated vascular plants include: sedges *Carex rostrata*, *C. disticha*, Cotton grass (*Eriophorum angustifolium*), and bog bean (*Menyanthes trifoliata*).

The mire communities at Slaidhills Moss SSSI were apparently intact and in good health in 2008. Moss species such as *Drepanocladus cossonii* and *Campylium stellatum* were abundant in the most base-rich parts of the site, with *Palustriella commutata* var. *falcata*, *Philonotis calcarea* and *Scorpidium scorpioides* becoming frequent towards the wet centre. Sphagnum species are also dominant in the core area. These species are useful as indicators of habitat condition at this sub-site.

While Slender green feather-moss has not been found recently at Branxholme Wester Loch (and has never been recorded at Whitlaw Mosses SSSI), the habitat here appears to be suitable, barring concerns about potential drying at the former site. Mosses such as *Drepanocladus cossonii*, *Campylium stellatum*, *Sphagnum contortum* and *Moerkia hibernica*, along with scarcer species such as *Leiocolea rutheana* and *Tomentypnum nitens*, are good indicators of the habitat here.

The disappearance of the small population at Branxholme Wester Loch is most likely due to a change in hydrology there, and a resultant increase in vascular plants, but this is not conclusive and the wider habitat appears to be in good condition. The objective should be to create conditions so that the moss at Branxholme Wester Loch can restore to its former extent.

Conservation Measures

Whitlaw and Branxholme SAC is also notified as three Sites of Special Scientific Interest (Whitlaw Mosses SSSI, Branxholme Wester Loch SSSI and Slaidhills Moss SSSI) and management changes described on the SSSI list of Operations Requiring Consent must have prior consent from SNH (NatureScot).

Current and recommended management for base-rich fen, very wet mires often identified by an unstable ‘quaking’ surface, and slender green feather-moss

Issue	Measure	Responsible party
Water quality	Maintain monitoring of key water quality indicators e.g. species.	NatureScot/SEPA

	Maintain effective functioning of the silt trap at Whitlaw Mosses	NatureScot
	Maintain low-intensity land use within the catchment to ensure the low nutrient content of water entering the mire systems, and to maintain a low level of sediment input.	Landowners, land managers, NatureScot
	Upgrade livestock facilities (drinkers, gates) at Murder Moss, to avoid sediment run off and nutrient enrichment of the moss.	Landowners, land managers, NatureScot
Water management	Water levels and water tables within the site should not be lowered/raised in a way that would reduce the extent and distribution of the features.	Landowners, land managers, NatureScot, SEPA
Grazing/ livestock	Maintain light grazing at Slaidhills Moss (particularly at the south end) to retain sedge and brown mosses-rich flushes.	Landowners, land managers, NatureScot
	Ensure boundaries to the SAC are kept stock-proof to prevent livestock from entering the SAC	Landowners, land managers, NatureScot
	Avoid supplementary feeding of livestock close to lochs as this could concentrate livestock close to the water leading to excess nutrient or sediment entering lochs from poaching, heavy dunging or uneaten fodder.	Landowners, land managers, NatureScot
Heavy trampling and/or tracking	Trampling and/or tracking by livestock / ATVs to be minimal to be prevent active drainage of the SAC.	Land managers, NatureScot
Colonisation by vigorous native and/or non-native species	Minimise colonisation of the site by vigorous native species (such as, common reed <i>Phragmites australis</i> and/or Reed canary grass (<i>Phalaris arundinacea</i>), tree or scrub growth, or invasive non-native species to prevent the loss of Slender green feather-moss at Slaidhills Moss and Branxholme Wester Loch.	Landowners, land managers, NatureScot
	All anglers and other water users (such as canoeists, wild swimmers or researchers) should follow the Check, Clean, Dry biosecurity procedures to help prevent the spread of problem non-native species.	All
Habitat Management	Any muirburn plan for the area surrounding Slaidhills Moss should include measures to ensure the base rich fen habitat is avoided and adheres to the latest edition of the Muirburn Code.	NatureScot, landowners, land managers.
Forestry operations	Ensure that any forestry is not beyond the carrying capacity of the catchment and that design and management strictly follow the guidelines.	Land Managers
	Promote adherence to the Forest and Water Guidelines, and published best practice, during forest restructuring and highlight the need to strictly control fine sediment and other diffuse pollution release into the SAC.	Scottish Forestry, Forestry & Land Scotland, Forestry owners and managers

Monitoring – slender green feather-moss	Periodic monitoring of the extent and distribution of slender green feather-moss at Branxholme Wester Loch and Slaidhills Moss SSSI together with the rate and extent of scrub encroachment and water table levels.	NatureScot
Research	Conduct a baseline hydrological survey of Wester Branxholme Loch and Slaidhills to better understand the conditions that support the slender green feather-moss at these sites, and enable changes in hydrology to be interpreted.	NatureScot
	Trial translocations to areas within the SAC that appear to have suitable conditions and associated species, but where slender green feather-moss has been lost.	NatureScot

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