



European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

Lake District High Fells Special Area of Conservation (SAC)
Site Code: UK0012960



Tall Herb Vegetation (NVC Type U17) on Helvellyn. © Bart Donato

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Lake District High Fells SAC. This advice should therefore be read together with the SAC Conservation Objectives available [here](#)

Where this site overlaps with other European Sites, you should also refer to the separate European Site Conservation Objectives and Supplementary Advice (where available) provided for those sites.

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England when developing, proposing or assessing an activity, plan or project that may affect this site'

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Lake District High Fells Special Area of Conservation (SAC)
Location	Cumbria
Site Map	The designated boundary of this site can be viewed on the MAGIC website here
Designation Date	1 April 2005
Qualifying Features	See section below
Designation Area	26,999.36ha
Designation Changes	None at time of writing
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Armboth Fells SSSI, Birk Fell SSSI, Buttermere Fells SSSI, Helvellyn and Fairfield SSSI, Honister Crag SSSI, Pillar and Ennerdale Fells SSSI, Scafell Pikes SSSI, Shap Fells SSSI, Skiddaw Group SSSI, Wasdale Screes SSSI
Relationship with other European or International Site designations	Adjacent to Borrowdale Woodlands Complex SAC , River Derwent and Bassenthwaite Lake SAC , River Eden SAC , Wast Water SAC

Site background and geography

This SAC includes the 10 SSSIs in the Lake District High Fells that have been designated for their semi-natural vegetation. Lying within the Cumbrian High Fells National Character Area ([NCA Profile 008](#)) it includes steep, sharp mountains including England's 3 highest massifs (Scafell, Helvellyn and Skiddaw). These are largely composed of acidic rocks but there are also more mineral rich intrusions which give rise to a richer flora in places, most notably Helvellyn and Honister. The site also includes land with a more rounded topography, some of which is blanketed by peat. There are large areas of deep peat on Shap Fells, Armboth Fells and the 'back-of-Skiddaw' which support blanket bog. England's highest mountains support important populations of arctic-alpine species including alpine saxifrage, mossy campion, alpine mousear and alpine catchfly. This land is subject to very high rainfall, catching precipitation from the Atlantic coast, feeding clean water tarns and allowing the land to support vegetation particularly rich in mosses, liverworts and lichens.

About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

Qualifying habitats:

- **H7230. Alkaline fens; Calcium-rich springwater-fed fens**

Areas where relatively mineral-rich ground water seeps out (known as flushes) which supports species-rich vegetation communities such as the UK National Vegetation Classification (NVC) types M10: *Pinguicula vulgaris*- *Carex dioica* mire and M11 *Carex demissa*-*Saxifraga azoides* mire

- **H4060. Alpine and Boreal heaths; Alpine and subalpine heaths**

These represent some of the most southerly examples of this vegetation type in Britain. High altitude heaths (generally above 600m) typically on slopes just below summits. Corresponds to NVC type H19 *Vaccinium myrtillus*-*Cladonia arbuscula* heath which tends to occur on the steeply-sloping, less-exposed ground below some of the summits of the Fells, with relatively intact examples within the Buttermere Fells and Skiddaw Group.

- **H7130. Blanket bogs**

There are relatively extensive areas of blanket bog in a number of the component SSSI, particularly Armboth Fells, Shap Fells and Skiddaw Group, with smaller areas in many of the other sites. Vegetation on deep (>40cm peat) includes the NVC type M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire with M17 *Scirpus cespitosus* – *Eriophorum vaginatum* blanket mire and occasionally M18 *Erica tetralix* – *Sphagnum papillosum* raised and blanket bog. M1 *Sphagnum auriculatum* bog pools and M2 *Sphagnum cuspidatum/recurvum* bog pools are also present.

The blanket bog has heather *Calluna vulgaris* and hare's-tail cottongrass *Eriophorum vaginatum* with varying amounts of cross-leaved heath *Erica tetralix*, deer-grass *Trichophorum cespitosum* and crowberry *Empetrum nigrum*. The bogs are often wet and rich in mosses, with carpets of *Sphagnum* and *Sphagnum*-filled hollows with species such as *S. papillosum* and *S. magellanicum*

- **H8210. Calcareous rocky slopes with chasmophytic vegetation; Plants in crevices in base-rich rocks**

Chasmophytic vegetation consists of plant communities that colonise the cracks and fissures of rock faces. In the Lake District, the presence of calcareous bands within otherwise mainly siliceous rocks means that Calcareous rocky slopes with chasmophytic vegetation may occur in close association. Siliceous rocky slopes with chasmophytic vegetation, and the site is listed for both types.

The vegetation is characterised by bryophytes such as *Amphidium mougeotii* *Tortella tortuosa*, *Anoetangium aestivum* and *Ctenidium molluscum* but is poorly described by the NVC –perhaps the OV40 *Asplenium viride* – *Cystopteris fragilis* community closest fit to this vegetation type. Associated vascular plants typical of this site include *Saxifraga nivalis*, *Saxifraga oppositifolia*, *Silene acaulis*, *Polystichum lonchitis*, *Cerastium alpinum* and *Poa glauca*.

- **H4030. European dry heaths**

Dry heath occurs throughout the site, and it is very extensive on a number of component SSSI such as Buttermere Fells, Skiddaw Group, Armboth Fells and to a lesser extent Pillar and Ennerdale Fells. Smaller areas are found throughout the other sites.

The principal NVC type present is H12 *Calluna vulgaris* – *Vaccinium myrtillus* heath, and H18 *Vaccinium myrtillus* – *Deschampsia flexuosa* heath also occurs. Smaller amounts of H9 *Calluna vulgaris* – *Deschampsia flexuosa* and H10 *Calluna vulgaris* – *Erica cinerea* heath are also found. Of particular significance is the occurrence of H21 *Calluna vulgaris* – *Vaccinium myrtillus* – *Sphagnum capillifolium* heath, a community particularly rich in mosses and known as Atlantic heath because it is confined to areas with high rainfall close to the Atlantic coast

- **H6430. Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels**

This is lush colourful tall herb vegetation corresponding to the NVC type U17 *Luzula sylvatica*-*Geum rivale* tall herb community which occurs on moist mineral rich soils. Almost all of this vegetation type in England is found within the Lake District.

Tall herb communities are mainly found in Helvellyn and Fairfield, Honister Crag, Scafell Pikes, Pillar and Ennerdale Fells, Wasdale Scree and Buttermere Fells, with scattered areas elsewhere.

A number of rare arctic-alpine species occur, including alpine cinquefoil *Potentilla crantzii* and alpine meadow grass *Poa alpina*, black alpine sedge *Carex atrata* and alpine saxifrage *Saxifraga nivalis* at Helvellyn and Fairfield. Buttermere Fells is also a locality for the rare alpine catchfly *Lychnis alpina*.

- **H5130. *Juniperus communis* formations on heaths or calcareous grasslands**

Three of the component upland SSSIs have extensive areas of juniper *Juniperus communis*, whilst scattered juniper occurs on many of the inaccessible cliffs and slopes throughout the complex. The NVC type is W19 *Juniperus communis* ssp. *communis* – *Oxalis acetosella* juniper woodland. Birk Fell supports the most extensive stand of juniper in the Lake District; with Helvellyn and Fairfield and Skiddaw Group also supporting large stands of juniper.

The juniper is associated with open silver birch *Betula pendula* woods with scattered rowan *Sorbus aucuparia*, ash *Fraxinus excelsior*, bird cherry *Prunus padus*, holly *Ilex aquifolium*, hawthorn *Crataegus monogyna* and dog rose *Rosa canina*. Bracken *Pteridium aquilinum* or fescue – bent grassland with bryophytes and wood sorrel *Oxalis acetosella* predominate over the woodland floor, although locally there are richer areas.

- **H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath**

On shallow peat (<40cm) at Armbboth Fells, Shap Fells, Skiddaw Group and the Buttermere Fells there are good examples of M15 *Scirpus cespitosus* – *Erica tetralix* wet heath. Shap Fells also has an area of M16 *Erica tetralix* – *Sphagnum compactum* wet heath. Heather *Calluna vulgaris* is dominant, with cross-leaved heath *Erica tetralix* and *Sphagnum* species. Purple moor-grass *Molinia caerulea* can be locally abundant.

- **H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland**

This habitat most closely corresponds with NVC type W17 *Quercus petraea*-*Betula pubescens*. The site includes Side Wood in Ennerdale, Birkrigg and Keskadale Oaks near Newlands pass and Young Wood near Mungrisdale. These are on steep south-facing slopes near the altitudinal limit for oak in Cumbria. In Birkrigg and Keskadale, bryophytes and lichens are abundant and include species such as *Hedwigia integrifolia*. Birk Fell also includes substantial areas of bryophyte- and fern-rich oak woodland. Notable bryophyte species include *Breutelia chrysocoma*, *Saccogyna viticulosa* and *Pleurozia purpurea*. Fragments of this habitat also occur elsewhere throughout the site, mostly in gills or other areas less accessible to grazing animals.

- **H3130. Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels**

The site includes many upland tarns. They include species typical of low-nutrient, clean waters such as water-starwort *Callitriche hamulata*, quillwort *Isoetes lacustris*, shoreweed *Littorella uniflora*, water lobelia *Lobelia dortmanna* and floating bur-weed *Sparganium angustifolium*. Axlwort *Subularia aquatica*, a locally rare species, occurs in Sprinkling and Styhead Tarns (Scafell Pikes) and Dock and Blea Tarns (Armboth Fells). The rare powan *Coregonus lavaretus* (locally called 'schelly') is a fish that occurs in Red Tarn in Helvellyn and Fairfield.

- **H6150. Siliceous alpine and boreal grasslands; Montane acid grasslands**

Siliceous alpine and boreal grasslands are typically found on summit plateaux above 700m. The NVC type present is U10 *Carex bigelowii* – *Racomitrium lanuginosum* moss-heath. Wavy hair-grass *Deschampsia flexuosa* and sheep's fescue *Festuca ovina* dominate the sward, with bilberry *Vaccinium myrtillus*, woolly fringe-moss *Racomitrium lanuginosum*, stiff sedge *Carex bigelowii*, fir clubmoss *Huperzia selago* and the lichens *Cladonia uncialis*, *C. coccifera*, *C. squamosa*, *C. subcervicornis*, *Cornicularia aculeata* and *Cetraria islandica*. Dwarf willow *Salix herbacea*, *R. lanuginosum* and alpine clubmoss *Diphasiastrum alpinum* can be locally abundant, the latter particularly where there is late snow-lie.

- **H8220. Siliceous rocky slopes with chasmophytic vegetation; Plants in crevices on acid rocks**

Chasmophytic vegetation consists of plant communities that colonise the cracks and fissures of rock faces. In the Lake District, the presence of calcareous bands within otherwise mainly siliceous rocks means that Calcareous rocky slopes with chasmophytic vegetation may occur in close association. Siliceous rocky slopes with chasmophytic vegetation, and the site is listed for both types.

The vegetation is characterised by bryophytes such as *Amphidium mougeotii*, *Tortella tortuosa*, *Anoetangium aestivum* and *Ctenidium molluscum* but is poorly described by the NVC –perhaps the OV40 *Asplenium viride* – *Cystopteris fragilis* community closest fit to this vegetation type. Associated vascular plants typical of this site include *Saxifraga nivalis*, *Saxifraga oppositifolia*, *Silene acaulis*, *Polystichum lonchitis*, *Cerastium alpinum* and *Poa glauca*.

- **H8110. Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*); Acidic scree**

The screes are chiefly base-poor. They vary from recently-formed loose scree in lower sections of gullies and below cliffs to stable areas colonised by grasses, bryophytes and ferns.

The main scree NVC type present is U21 *Cryptogramma crispa* – *Deschampsia flexuosa* community, but it may also include other NVC types in fragmentary form where the scree is more stable. It is found throughout the complex, but major scree areas occur in Wasdale Screes, Helvellyn and Fairfield, Buttermere Fells, Scafell Pikes, Pillar and Ennerdale Fells and Skiddaw Group. The site has the most extensive development of screes with parsley fern *Cryptogramma crispa* in the UK, with associated species such as alpine lady's mantle *Alchemilla alpina*, stone bramble *Rubus saxatilis*, Lemon-scented fern *Oreopteris limbosperma*, heath bedstraw *Galium saxatile*, sheep's fescue *Festuca ovina* and common bent *Agrostis capillaris*. Bryophytes such as woolly hair-moss *Racomitrium lanuginosum*, *R. fasciculare*, *Rhytidiadelphus loreus* and *R. squarrosus* can be frequent. The screes provide a suitable microclimate for many oceanic moss and liverwort species such as *Scapania ornithopiodes* and *Kiaeria starkei*, found in Helvellyn and Fairfield.

- **H6230. Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe); Species-rich grassland with mat-grass in upland areas**

Species-rich *Nardus* grasslands tend to develop where there is flushing through base-rich strata on siliceous bedrock. These may include moderately base-rich metamorphic and igneous rocks.

These upland calcareous grassland and grass-heaths, include NVC types CG10 *Festuca ovina*- *Agrostis capillaris*- *Thymus praecox* and CG11 *Festuca ovina*-*Agrostis capillaris*-*Alchemilla alpina* grass-heath.

Qualifying Species:

- **S1393 *Drepanocladus (Hamatocaulis) vernicosus*; Slender green feather moss (also known as Varnished hook-moss)**

This is a species of moss that occurs in mildly alkaline to alkaline fen habitat within larger mire complexes and is highly sensitive to disturbance.

It is Nationally Scarce. Many of its known English populations have been lost due to drainage or nutrient enrichment (e.g. from runoff of fertilisers or manures) and Cumbria is the remaining UK stronghold for the species outside of Wales and Scotland.

It is listed as a priority species under Section 41 (S41) of the 2006 Natural Environment and Rural Communities (NERC) Act.

Table 1: Supplementary Advice for Qualifying Features: H3130. Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the Isoëto-Nanojuncetea; Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature at 37.3 hectares.	<p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information.</p> <p>The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations.</p> <p>Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	Fisheries	Maintain a total projected estimate for biomass of total fish production at less than 200kg/ha.	<p>Fish communities may exert a strong influence on overall lake ecology and may cause or exacerbate eutrophication symptoms. Where fisheries are present it should be a balanced mixed fishery. There should be a presumption against stocking non-native species, carp and bream.</p> <p>The Definitions of Favourable Condition for the underpinning SSSIs within the SAC include targets for no introduction of fish, no fish farming, no fish stocking and no use of live bait. In view of the limited productivity of the site the biomass is likely to be significantly less than this maximum target figure.</p>	Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)
Structure and function (including its typical species)	Functional connectivity/ isolation	Maintain the natural lack of connectivity of the water body to other water bodies	The natural isolation of these standing water bodies can provide some protection from threats such as pollution and invasive species. Hydrological isolation can also lead to unique or diverse species assemblages this may be due to genetic isolation or the absence of predators. These water bodies should have their isolated state maintained.	
Structure and function (including its typical species)	Hydrology	At a site, unit and/or catchment level maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site.	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> <p>Hydrology influences lake ecosystem functioning in two ways: determining residence time (flushing) and water level fluctuations. Flushing of lakes is important for dilution and removal of nutrients and phytoplankton, and for reduction in</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>sedimentation. The timing of different flushing rates within the year influences the biology of the lake.</p> <p>For example, reduced flushing in summer would encourage bloom conditions. Modifications of inflows and outlets or changes in hydrology, e.g. from flood control regimes, abstraction and gravel removal can lead to unnatural changes in lake levels.</p>	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Non-native species categorised as 'high-impact' in the UK under the Water Framework Directive should be absent	<p>Non-native species constitute a major threat to many open water systems. Impacts may be on the habitat itself (e.g. damage to banks and consequent siltation) or directly on characteristic biota (through predation, competition and disease), or a combination of these. For example, species such as signal crayfish have been responsible for much of the decline of native crayfish through competition, habitat damage and the introduction of crayfish plague.</p> <p>The UK Technical Advisory Group of the Water Framework Directive produces a regularly updated classification of aquatic alien species (plants and animals) according to their level of impact. In general high impact species are of greatest concern but low or unknown impact species may be included in the target on a site-specific basis where there is evidence that they are causing a negative impact (for example high cover values or abundances). Those taxa considered likely to colonise lakes, are indicated by an 'L' in the UKTAG guidance. Examples of such high-impact species may include Water Fern <i>Azolla filiculoides</i>, New Zealand pygmyweed <i>Crassula helmsii</i> and the zebra mussel <i>Dreissena polymorpha</i>.</p> <p>All survey to date (2018) shows no high impact non-natives are present on site and the target is therefore to maintain this status.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical)	Macrophyte community structure	Maintain a characteristic zonation of macrophytes, with increasing depth, represented by <i>Littorella uniflora</i> then with overlapping	This is a strongly characteristic structural aspect of this habitat feature. It will be a response to water transparency, sediment type and disturbance.	Detail as listed in Annex C below This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		zones of <i>Littorella uniflora</i> with <i>Lobelia dortmana</i> then <i>Isoetes</i> spp.	Some of these upland tarns naturally support a reduced diversity of macrophyte species and for this reason, the three species listed within the target are not present in all of the waterbodies. However all of the waterbodies show a characteristic depth zonation of macrophyte species.	England's SSSI Condition Assessments
Structure and function (including its typical species)	Macrophyte community structure	Maintain maximum depth of plant colonisation. This will often be the maximum depth colonised by <i>Isoetes</i> .	<p>This is a strongly characteristic structural aspect of this habitat feature. It will be a response to water transparency, sediment type and disturbance.</p> <p>There is little survey to record maximum depth of plant colonisation in this suite of upland tarns. A maximum depth of 4 metres for <i>Callitriche</i> sp was recorded at Red Tarn although it is likely that <i>Isoetes</i> will be found at greater depth in other waterbodies as there is good water transparency.</p> <p>Should plans or projects be proposed which could impact on depth of colonisation then baseline surveys would be required.</p>	
Structure and function (including its typical species)	Macrophyte community structure	Restore a characteristic and well defined hydrosere associated with the water body where this is present	<p>This suite of upland tarns is within a heavily grazed setting. The hydroseres are therefore in poor condition and are degraded by grazing and trampling. The lake margins have poor structure and do not function effectively as buffer zones</p> <p>A hydrosere is a naturally-occurring plant succession which occurs in an area of standing fresh water. Over time, an area of open freshwater will naturally dry out, ultimately becoming woodland. During this change, a range of different wetland habitat types such as swamp and marsh, will succeed each other. This structure around the margins of the lake creates a buffer zone that can help protect the lake from a limited amount of sediment and nutrient inputs. It also increases habitat heterogeneity providing additional food sources and refugia.</p>	These communities are poorly described and have not been comprehensively surveyed. The available data is listed within Annexes B and C below
Structure and function (including its typical species)	Physical structure - lake shoreline	Maintain the natural shoreline of the lake.	Inclusion of hard engineering solutions to lake management may have detrimental effects on lake ecology, replacing near-natural substrates with man-made materials. Alteration of the shoreline may also result in changes in water movements within the lake, which would have effects on patterns of	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>sediment deposition.</p> <p>The shorelines of this suite of upland tarns are regarded as natural or near natural with little physical modification present. Red Tarn Helvellyn is the only site with known modification to shoreline. Here the level of the tarn was historically raised but is now restored to a near-natural condition.</p>	
Structure and function (including its typical species)	Physical structure - lake substrate	Maintain the natural and characteristic substrate for the lake. Substrate is typically sand, gravel, stones and boulders with low organic content, but there may be a locally high peat content.	<p>The substrates of this suite of upland tarns are regarded as natural or near natural no known physical modification. Some of the tarns may be affected locally by sedimentation as a result of heavy grazing pressures in catchment.</p> <p>The distribution of sediment particle size and organic content influences the biology of the lake and will affect the suitability of within-lake habitats for invertebrates and macrophytes, and fish spawning grounds. Increases in sediment loading from activities in the catchment area, including those on the lake shore, may result in the smothering of coarse sediments. Increased inputs of leaf litter, as a result of scrub encroachment, may also be cause for concern, as organic-rich sediments may be a poor rooting medium for macrophytes.</p>	
Structure and function (including its typical species)	Sediment load	Restore the natural sediment load	<p>Increased sediment loadings may result in clogging of the lake bed, increased siltation in the basin and deoxygenation of sediments. Blockage of coarser substrates with finer sediment restricts water flow-through, whilst increases in organic matter increase biochemical oxygen demand. Examples of causes of increases in siltation include: increased lake productivity, changes in catchment land-use (particularly over-grazing), lake level fluctuations or climatic fluctuations.</p> <p>The heavily grazed catchments of these upland tarns are considered to have increased the sediment load to these waterbodies. Restoration of natural sediment loading is therefore proposed.</p>	
Structure and function	Supporting off-site	Restore the extent, quality and spatial configuration of land or	This target includes marginal habitats such as fen, sedge stands, vegetated gravel and swamp. It also includes the	This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	habitat	habitat surrounding or adjacent to the site which is known to support the feature	<p>grazed catchments to the waterbodies. These habitats and the surrounding catchment is in poor condition.</p> <p>Include only where applicable. The structure and function of the qualifying habitat, including its typical species, may rely upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the feature and its component species. This supporting habitat may be critical to the typical species of the feature to support their feeding, breeding, roosting, population dynamics ('metapopulations'), pollination or to prevent/reduce/absorb damaging impacts from adjacent land uses e.g. pesticide drift, nutrient enrichment.</p>	England's SSSI Condition Assessments
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat;</p> <p>American shoreweed <i>Littorella uniflora</i>, Lake quillwort <i>Isoetes lacustris</i>, Water Lobelia <i>Lobelia dortmanna</i>, Water awlwort <i>Subularia aquatica</i>, Floating burweed <i>Sparganium angustifolium</i>, Water starwort <i>Callitriche hamulata</i>, Water-milfoil <i>Myriophyllum alterniflorum</i>, bog pondweed <i>Potamogeton polygonifolius</i>, Broad-leaved pondweed <i>Potamogeton natans</i>, White water lily <i>Nymphaea alba</i>, Bulbous Rush <i>Juncus bulbosus</i>, Floating club-rush <i>Eleogiton fluitans</i>, Water horse tail <i>Equisetum fluviatile</i>, Yellow water-lily <i>Nuphar lutea</i>,</p>	<p>Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include;</p> <ul style="list-style-type: none"> • Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. <p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.</p> <p>The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p>	Data describing the species distribution and abundance as listed in Annex C below.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p><i>Menyanthes trifoliata</i>, <i>Carex rostrata</i>, <i>Utricularia</i> spp., <i>Nitella</i> spp. <i>Sparganium natans</i>, <i>Fontinalis antipyretica</i> <i>Scirpus lacustris</i>, <i>Glyceria fluitans</i>.</p> <p>Schelly <i>Coregonus stigmaticus</i> (Red Tarn)</p>		
Structure and function (including its typical species)	Water quality - acidity	Acidity levels should reflect unimpacted conditions, typically a pH of 5.5-7.0 for oligotrophic lakes	<p>Changes in pH can alter the entire freshwater community present within a water body affecting all trophic levels. Potential causes of a shift in pH include air pollution and direct application of lime to the water column as an acidification amelioration strategy (this should not be carried out). Acidity levels should reflect unimpacted conditions - values of Acid Neutralising Capacity (ANC) considered to avoid significant impact on characteristic biota are laid out in the site's FCT (these are the same numerical values as used to protect high ecological status under the WFD in the UK). As a guide, pH 5.5-7.0 for oligotrophic lakes and 7.0-8.0 for mesotrophic lakes.</p> <p>Although, pH naturally fluctuates throughout the year, e.g. snow melt may lead to pulses of acid water, and increased plant biomass in summer may result in large fluctuations in pH, including daytime increases in pH values. Therefore pH is not used as a monitoring target, however its importance in affecting many in lake processes means that the pH of a water body should not be artificially altered.</p>	
Structure and function (including its typical species)	Water quality - algae	Chlorophyll a concentration should comply with WFD high ecological status and not have a negative impact on the ecosystem. Blooms of blue-green or green algae should not occur.	<p>Chlorophyll is the pigment used for photosynthesis by plants, and the concentration of chlorophyll in the water column during the growing season therefore provides a good measure of the abundance of phytoplankton. Phytoplankton is an important driver of structure and function in lakes and high phytoplankton levels (algal blooms) are usually associated with nutrient enrichment.</p> <p>Dense growths of tufted algae may grow on hard substrates where other plants have difficulty establishing, such as on</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			boulders or cobbles. On the whole this is not a cause for concern. However, formation of floating algal rafts or macrophytes being overgrown with filamentous algae is a cause for concern.	
Structure and function (including its typical species)	Water quality - dissolved oxygen	Adequate dissolved oxygen levels for health of characteristic fauna. DO>9mg/l throughout the year.	<p>This target is set on a baseline from Red Tarn Helvellyn and from West Water SAC. The other waterbodies have similar water quality and catchments. There is no justification for a lower target.</p> <p>As for species in terrestrial environments, dissolved oxygen (DO) is required for respiration by aquatic organisms. Anthropogenic activities leading to phytoplankton blooms and increased loadings of organic matter to lakes can cause decreases in the concentration of dissolved oxygen available to support the species present. Mean dissolved oxygen refers to DO being measured at 0.5m intervals throughout the entire water column where the water column is not stratified and measurements taken at 0.5 m intervals below the thermocline only where stratification occurs.</p>	
Structure and function (including its typical species)	Water quality - nitrogen	Maintain or Restore (as necessary in the specific water body) a stable nitrogen concentration which is typically lower than 1mg/l	<p>This target is based on known N annual averages for Red Tarn Helvellyn. The other waterbodies are in similar geology and have similar undeveloped catchments to Red Tarn with no reason to set a higher target.</p> <p>There is an increasing understanding that some standing waters are sensitive to nitrogen (N) enrichment and eutrophication may be driven by increases in N, but site-specific information is usually required to determine whether N or P is more important.</p> <p>Where P levels are significantly above their target values and there is evidence that the lake is N limited (for example by N levels falling to negligible levels in summer), N targets should be set in addition to P targets. We recommend that such targets should preferably be developed using site-specific information, but should be based around the threshold of 1.5mg/l identified by Barker <i>et al</i> 2008. In this situation N</p>	Barker T., Hatton K., O'Connor M., Connor L. and Moss B. 2008. Effects of nitrate load on submerged plant biomass and species richness: results of a mesocosm experiment. <i>Fundamental and Applied Limnology</i> , 173, 89-100.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			targets should be used in combination with P targets to drive a management strategy for the lake that reduces all nutrient inputs.	
Structure and function (including its typical species)	Water quality - other pollutants	Maintain good chemical status (i.e. compliance with relevant Environmental Quality Standards).	A wide range of pollutants may impact on habitat integrity depending on local circumstance. Good chemical status includes a list of EQSs for individual pollutants that are designed to protect aquatic biota with high levels of precaution.	
Structure and function (including its typical species)	Water quality - phosphate	Maintain stable nutrient levels appropriate for lake type. The maximum annual mean concentration of TP should be below 5 µg P l-1 for oligotrophic lakes. .	<p>This target is based best available data as described in the Natural England 2014 note which details agreed targets for SAC waterbodies.</p> <p>If palaeolimnological techniques or hindcast modelling have been employed to reconstruct natural background phosphorus concentrations for a particular lake, these can be used to set targets, although it may be necessary to accept a small deviation from these background conditions. Alternatively, historical water chemistry data may exist for individual lakes.</p> <p>Where existing, site-specific water column TP concentrations are consistently lower than the standard appropriate for the habitat type, a lower target should be applied to prevent deterioration from current status. Increased loadings of P to a water body are likely to lead to higher algal biomass in the water column, which in turn can have significant impacts on the standing water ecosystem through, for example, competition with vascular plants for nutrients and light, changes in pH, oxygen depletion and production of toxins. Decreasing dissolved oxygen and increasing ammonia levels are associated with death and decay of algal blooms, as is a release of toxins from toxin-producing species.</p>	<p>Natural England-Environment Agency P monitoring 2015-16</p> <p>Natural England, (2014) Total phosphorus targets for Lake Natura 2000 Protected Area Special Areas of Conservation (SACs).</p>
Structure and function (including its typical species)	Water transparency	Maintain the clarity of water at or to at least a depth of 4 metres	There is little survey to record water transparency. A maximum depth of plant colonisation of 4 metres for <i>Callitriche</i> sp was recorded at Red Tarn although it is likely that Isoetes will be found at greater depth in other waterbodies and there is known to be excellent water transparency	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Water clarity or transparency is the major determinant of the depth of colonisation by macrophytes, therefore, it should not be reduced. This should allow plant colonization to at least 3.5m, but if maximum depth of colonization has previously been recorded at greater water depths this should be maintained. Increased nutrient loads leading to increased algal growth will reduce water transparency, disturbance of the sediment by water sports and bottom feeding fish such as carp and bream also increase turbidity and reduce water transparency. Increased sediment loads to a lake would also have this effect.	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	<p>This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.</p> <p>Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis.</p> <p>Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p>	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Target for Non-natives, Dissolved oxygen, Phosphate and Fisheries adjusted to reflect no deterioration from existing level.				

Table 2: Supplementary Advice for Qualifying Features: H4010. Northern Atlantic wet heaths with *Erica tetralix*; Wet heathland with cross-leaved heath

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 585ha.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis; this is likely to be the case where wet heath vegetation occurs on peat >40cm deep. In this case it is likely to be regarded as degraded blanket bog and should be restored to this habitat.</p> <p>The figure quoted in the extent target only includes habitat recorded as M15 and M16. Some habitat recorded as M25 or U6 (where these occur on peat<40cm deep) will have been derived through degradation of wet heath and should also be restored to wet heath. Similarly, habitat recorded as M15 and M16 on peat>40cm deep would be regarded as degraded blanket bog and should be restored to blanket bog.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light,</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	Vegetation community transitions	Restore any areas of transition between this and communities which form other heathland-associated habitats, such as dry and humid heaths, mires, acid grasslands, scrub and woodland.	Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature
Structure and function (including its typical species)	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath M16 <i>Erica tetralix</i> - <i>Sphagnum compactum</i> wet heath	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).	See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure: cover of dwarf shrubs	Restore an overall cover of dwarf shrub species which is typically between 25-90%	Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the growing habits	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families).</p> <p>The ericaceous species heather or ling <i>Calluna vulgaris</i>, bell heather <i>Erica cinerea</i>, cross-leaved heath <i>Erica tetralix</i>, bilberry or blaeberry <i>Vaccinium myrtillus</i> and cowberry <i>Vaccinium vitis-idaea</i> are the commonest and most characteristic dwarf-shrubs. Crowberry <i>Empetrum nigrum</i>, another common species in some high altitude heaths, is not strictly ericaceous but is often treated as an ericoid species.</p>	
Structure and function (including its typical species)	Vegetation structure: heather age structure	Maintain a diverse age structure amongst the ericaceous shrubs typically found on the site	<p>Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth.</p> <p>Wet heath on this site is not subject to cutting or burning management and the heathers regenerate themselves by layering. Therefore all ages are present but in an intimate mixture.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure: tree cover	Maintain the open character of the feature, with a typically scattered and low cover of trees and scrub (<20% cover)	<p>Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, foodplants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this habitat feature should be maintained or restored to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable.</p> <p>The area of scrub/tree cover on this feature should be stable or not increasing as a whole at the SAC level.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat</p> <ul style="list-style-type: none"> Constant and preferential plant species of M15 <i>Scirpus cespitosus</i> - <i>Erica tetralix</i> wet heath and M16 <i>Erica tetralix</i> - <i>Sphagnum compactum</i> wet heath which comprises this feature on the SAC. 	<p>Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include;</p> <ul style="list-style-type: none"> Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. <p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.</p> <p>The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p>
Structure and function (including its typical species)	Vegetation: undesirable species	<p>Maintain the frequency/cover of undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread</p>	<p>Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.</p> <p>At the time of writing no particular problems have been noted with undesirable species in this habitat but these could occur in future. Any unusual or non-native species should be reported to Natural England who will advise on their management.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	<p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial.</p> <p>Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. These considerations are most likely to be relevant where there are contiguous (but non-designated) areas of upland habitat.</p>	
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	<p>This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in sea levels, precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary.</p> <p>Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.</p>	Natural England, 2015. Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being moderate taking into account the sensitivity, fragmentation, topography and management of its habitats</p> <p>This means that this site is considered to be vulnerable overall but moderately so. This means that some adaptation action for specific issues may be required, such as reducing habitat fragmentation, creating more habitat to buffer the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself. In many cases, change will be inevitable so appropriate monitoring would be advisable.</p>	
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Restore the structure, functions and supporting processes associated with the feature	<p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England.</p> <p>This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p>	Natural England (2014) Site Improvement Plan for the Lake District High Fells SAC http://publications.naturalengland.org.uk/publication/6534434434056192
Supporting processes (on which the feature relies)	Soils, substrate and nutrient cycling	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	<p>Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms.</p> <p>Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. This Annex 1 habitat has essentially raw soils with little humus and low nutrient status.</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Water quality	Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature	For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.	
Supporting processes (on which the feature relies)	Hydrology	At a site, unit and/or catchment level (as necessary, maintain or restore] the natural hydrological regime to provide the conditions necessary to sustain the feature within the site	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places				
Attributes relating to bracken and gorse removed because these species do not grow in this habitat in the Lake District, they are always on drier areas.				

Table 3: Supplementary Advice for Qualifying Features: H4030. European dry heaths

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 5566 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis; for example, some reduction of heath may be necessary to accommodate additional woodland or scrub.</p> <p>The figure quoted in the extent target only includes habitat recorded as H8, H10, H12, H18, H21 NVC communities. Some habitat recorded as U4 and U5 or as 'scree' will have been derived through degradation of dry heath and should also be restored to dry heath.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes.</p> <p>This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.	
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types</p> <p>H8 <i>Calluna vulgaris</i> - <i>Ulex gallii</i> heath</p> <p>H10 <i>Calluna vulgaris</i> - <i>Erica cinerea</i> heath</p> <p>H12 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> heath</p> <p>H18 <i>Vaccinium myrtillus</i> - <i>Deschampsia flexuosa</i> heath</p> <p>H21 <i>Calluna vulgaris</i> - <i>Vaccinium myrtillus</i> - <i>Sphagnum capillifolium</i> heath</p> <p>Also present as mosaics with all of the other features listed in this document</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p>
Structure and function (including its typical species)	Vegetation community transitions	<p>Restore any areas of transition between this and communities which form other heathland-associated habitats, such as montane heaths, wet heaths, mires, scrub and woodland.</p>	<p>Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities.</p> <p>Retaining such transitions can provide further diversity to the</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	
Structure and function (including its typical species)	Vegetation structure: cover of dwarf shrubs	Restore an overall cover of dwarf shrub species which is typically between 25-90%	<p>Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species which in most cases will be ericoids (i.e. plants that look like heathers, including members of the Ericaceae and Empetraceae families).</p> <p>The ericaceous species heather or ling <i>Calluna vulgaris</i>, bell heather <i>Erica cinerea</i>, cross-leaved heath <i>Erica tetralix</i>, bilberry or blaeberry <i>Vaccinium myrtillus</i> and cowberry <i>Vaccinium vitis idaea</i> are the commonest and most characteristic dwarf-shrubs. <i>Calluna</i> is usually the most abundant. Crowberry <i>Empetrum nigrum</i>, another common species in many higher altitude heaths, is not strictly ericaceous but is often treated as an ericoid species.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation composition: bracken cover	Restore a cover of dense bracken which is low, typically at <10%	<p>Bracken is a naturally occurring species in the uplands which often marks out the deeper soils. It has some conservation value, for example it provides song-posts for birds such as Whinchat and Stonechat, can provide cover for 'woodland' species such as bluebell and wood sorrel and the roots and rhizomes are good at binding soil together and preventing erosion.</p> <p>In the Lake District, its distribution is largely limited by soil depth (as the underground parts are vulnerable to frost). Large scale bracken invasion into dry heath habitat would probably be undesirable, although it could also be argued that this was marking out deeper soils which are suitable for woodland</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			restoration.	
Structure and function (including its typical species)	Vegetation structure: cover of gorse	Maintain cover of common gorse <i>Ulex europaeus</i> and western gorse <i>Ulex gallii</i> at levels appropriate to the particular location (Natural England will advise on site by site basis)	<p>Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting.</p> <p>The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. It can also act as a 'nurse' for other tree species and facilitate the development of oak woodland, which is a threatened and highly fragmented habitat on this site. However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Structure and function (including its typical species)	Vegetation structure: tree cover	Maintain the open character of the feature, with a typically scattered and low cover of trees and scrub (<20% cover, excluding dwarf birch <i>Betula nana</i> , bog-myrtle <i>Myrica gale</i> , juniper <i>Juniperus communis</i> , willow species (<i>Salix lapponum</i> and <i>Salix aurita</i>) and aspen <i>Populus tremula</i>	Scrub (mainly trees or tree saplings above 1 m in height) and isolated trees are usually very important in providing warmth, shelter, cover, foodplants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. However, excessive scrub cover could result in loss of heathland.	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Structure and function (including its typical species)	Vegetation structure: heather age structure	Maintain a diverse age structure amongst the ericaceous shrubs typically found on the site	Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)			<p>maintain a mosaic of heather in different phases of growth. Typically this age structure will consist of between 10-40% cover of (pseudo) pioneer heathers; 20-80% cover of building/mature heathers; <30% cover of degenerate heathers and less than <10% cover of dead heathers</p> <p>The majority of dry heath on this site is not subject to cutting or burning management. Heathers that touch damp ground or get covered by bryophytes regenerate themselves by layering. Therefore in unmanaged stands, all ages are present but in an intimate mixture and it is very difficult to estimate % cover of different growth phases. Unmanaged stands will be judged to be meeting the target provided sufficient layering is taking place.</p>	
Structure and function (including its typical species)	Vegetation: undesirable species	Restore the frequency/cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread.	<p>Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function.</p> <p>Undesirable species include: Norway spruce, larch, rhododendron, and other non-native tree species.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat</p> <ul style="list-style-type: none"> Constant and preferential plant species of the H8; H10; H12; H18 and H21 NVC communities which comprises this feature on the SAC. Important bryophyte populations including those 	<p>Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include;</p> <ul style="list-style-type: none"> Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. 	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		influencing the physical structure of the habitat and the development of underlying soils and also scarce and rare species	<p>There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.</p> <p>The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.</p>	
Structure and function (including its typical species)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	<p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.</p>	
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		and fungal: bacterial ratio, to within typical values for the habitat.	habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.	
Supporting processes (on which the feature relies)	Conservation measures	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the feature	<p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England.</p> <p>This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> <p>At higher altitudes within this SAC, these habitats are maintained by the severe climate and poor soils and do not require grazing or other forms of land management to maintain them. At lower altitudes, site by site decisions need to be made over the desirability of maintaining open heath compared with the desirability of increasing highly fragmented scrub and woodland habitats. Threats to the habitats include grazing and trampling, nitrogen deposition, recreation, use of all-terrain vehicles (ATVs), burning and climate change.</p>	<p>Natural England. 2014. Site Improvement Plan for the Lake District High Fells SAC</p> <p>http://publications.naturalengland.org.uk/publication/6534434434056192</p>
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places. Attributes for Water quality and hydrology removed as these not relevant to this relatively dry and freely drained habitat				

Table 4: Supplementary Advice for Qualifying Features: H4060. Alpine and Boreal heaths; Alpine and subalpine heaths

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 133 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The figure quoted in the extent target only includes habitat recorded as H19 NVC community. Some habitat recorded as bare ground, 'scree' or the acid grasslands U4 and U5 will have been derived through degradation of montane heath and should also be restored to montane heath.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Jerram. R. 1992. Montane Lichen and Moss Heath in the Lake District (a report for English Nature)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Jerram. R. 1992. Montane Lichen and Moss Heath in the Lake District (a report for English Nature)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Fragmentation of this feature is of particular concern given its restricted occurrence in England. In addition to the threats listed below, climate warming also has the potential to lead to vegetation zones and species shifting to higher elevations and/or becoming restricted to north facing slopes.	
Function (of the habitat feature) including typical species*	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	<p>Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter.</p> <p>Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature. For this feature its nutrient poor, acid soils are susceptible to elevation of nutrient input through atmospheric deposition and/or dunging by grazing livestock. Most of the characteristic species are adapted to low nutrient levels, and elevated levels can favour more vigorous species especially certain common grasses.</p>	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	<p>Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species.</p> <p>Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).</p>	
Structure and function (including its typical species)	Physical structure: ground disturbance	Significant areas of disturbed or eroding bare ground should not be present. Where present, the affected areas should not exceed 1% of the total feature, and be	It is important to make the distinction between bare ground that is a 'natural' part of the feature due to the harsh environment, exposure and thin soils and that caused by trampling or vehicle use. This habitat is very sensitive to grazing and trampling, and can only with stand very low levels of grazing. Vehicle use will	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		considered only as a temporary stage.	cause long term damage. Recovery may take decades.	
Structure and function (including its typical species)	Typical species: flora and fauna	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat;</p> <ul style="list-style-type: none"> • Constant and preferential plant species of the H19 <i>Vaccinium myrtillus-Cladonia arbuscula</i> NVC communities which comprises this feature on the SAC. 	See the explanatory notes for this attribute above in Table 1.	
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type</p> <ul style="list-style-type: none"> • H19 <i>Vaccinium myrtillus-Cladonia arbuscula</i>. 	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>Alpine and boreal heaths cover a relatively small area within England restricted by the availability of ground of high altitude (i.e. above 600-650m). In England the feature is only represented by NVC type H19 <i>Vaccinium myrtillus-Cladonia arbuscula</i> heath. The feature may form part of a mosaic with montane grassland and bare rock. The slopes where it occurs are often favoured by sheep, whose grazing can blur the distinction between this community and sub-montane H18</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<i>Vaccinium myrtillus-Deschampsia flexuosa</i> heath. Compared to NVC H18, NVC H19 heath has a more continuous underlayer of lichens, and more montane species. The vegetation carpet can vary from almost complete to very patchy depending on the altitude and degree of wind exposure.	
Structure and function (including its typical species)	Vegetation community transitions	Restore the pattern of natural vegetation zonation/transitions to H18 and H12 heath on the slopes below and U10 moss heaths (montane grassland) on the summits above	Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna.	
Supporting processes (on which the feature relies)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the explanatory notes for this attribute above in Table 2.	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore] the structure, functions and supporting processes associated with the feature	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Montane habitats include areas of near-natural vegetation in the UK, and are fragile and highly susceptible to human influences. These habitats are maintained by the severe climate and poor soils at high altitude and do not require grazing or other forms of land management to maintain them. Threats to the habitats include grazing and trampling, nitrogen deposition, recreation, use of all-terrain vehicles (ATVs), burning and climate change.</p>	
<p>Version Control Advice last updated: N/A</p>				
<p>Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places</p>				

Table 5: Supplementary Advice for Qualifying Features: H5130. *Juniperus communis* formations on heaths or calcareous grasslands

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 65 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The figure quoted in the extent target relates only to juniper mapped as NVC type W19. It does not include heathland with scattered juniper which should also be regarded as this feature. NVC surveys consistently under represent this feature, especially where it occurs in inaccessible areas such as crags. Many other areas of heathland will also have lost their juniper component and this should also be restored</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Uplands for Juniper End of Project Report, 2014. Cumbria Wildlife Trust and accompanying data</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site.	Distribution includes the spatial pattern or arrangement of this habitat feature, and its component vegetation types, across the site. Changes in distribution may affect the nature and range of the vegetation communities present, the operation of the physical, chemical, and biological processes in the system and the resiliency of the site and its features to changes or impacts.	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Uplands for Juniper End of Project Report, 2014. Cumbria Wildlife Trust and accompanying data</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				Condition for each component SSSI (Copy attached at Annex E)
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the explanatory notes for this attribute above in Table 2. Key to Juniper scrub being able to adapt will be an ability to reproduce; being able to set viable seed and for these to grow into mature bushes.	
Structure and function (including its typical species)	Physical structure: ground disturbance	Areas of disturbed and eroding bare ground are limited to a level which is compatible with maintaining or restoring the regeneration potential of the feature	Some areas of exposed bare ground may be required to encourage natural regeneration of juniper plants in order to sustain the feature into the longer-term.	
Structure and function (including its typical species)	Supporting off-site habitat	Restore the extent, quality and spatial configuration of land or habitat surrounding or adjacent to the site which is known to support the feature	The structure and function of the qualifying habitat, including its typical species, may rely upon the continued presence of areas which surround and are outside of the designated site boundary. Changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the feature and its component species. This supporting habitat may be critical to the typical species of the feature to support their feeding, breeding, roosting, population dynamics ('metapopulations'), pollination or to prevent/reduce/absorb damaging impacts from adjacent land uses e.g. pesticide drift, nutrient enrichment.	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat; <ul style="list-style-type: none"> • <i>Juniperis communis</i> • Constant and preferential plant species of the W19 and 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		heathland H8, H10, H12, H18, H21 NVC communities which support this feature on the SAC.		
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types.</p> <ul style="list-style-type: none"> W19 <i>Juniperus communis</i> ssp. <i>communis</i> - <i>Oxalis acetosella</i> woodland <p>The heathland NVC communities H8, H10, H12, H18 and H21 also support scattered juniper.</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community transitions	Restore expected patterns of natural vegetation zonation/transitions	Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna.	
Structure and function (including its typical species)	Vegetation structure - age class	Restore a population of Juniper comprising plants at different life stages; this should comprise phases of old growth (>100 years old), building to mature and pioneer/seedling (<5cm girth)	Juniper regeneration can be infrequent and episodic, resulting in populations with few age classes. Populations with full and wider age range tend to be associated with conditions providing regular opportunities for establishment, such as continual exposure of bare soils on steep slopes. These will be more self-sustaining in the longer term.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation: undesirable species	Maintain the frequency/cover of any undesirable species to within acceptable levels and prevent changes in surface condition,	Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		soils, nutrient levels or hydrology which may encourage their spread.	<p>of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants.</p> <p>This will vary site by site and influenced by the supporting vegetation communities found in conjunction with juniper; appropriate advice can be provided by Natural England on a case by case basis.</p>	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Restore the structure, functions and supporting processes associated with the feature.	<p>Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England.</p> <p>This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> <p>For this feature, conservation measures are largely related to ensuring juniper regeneration can occur; in many cases this requires the control of grazing livestock.</p>	
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		the site	<p>designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.</p>	
<p>Version Control Advice last updated: N/A</p> <p>Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places</p> <p>The attributes on balance between scrub canopy and open field layer has been removed because it is not helpful on a large site with numerous juniper stands of distinctly different character. Excessive juniper cover is not ever likely to be a problem</p>				

Table 6: Supplementary Advice for Qualifying Features: H6150. Siliceous alpine and boreal grasslands; Montane acid grasslands

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 199 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The figure quoted in the extent target only includes habitat recorded as U10. Some habitat recorded as bare ground or the acid grasslands U4 and U5 will have been derived through degradation of montane acid grassland and should also be restored to montane acid grassland</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Jerram, R. 1992. Montane Lichen and Moss Heath in the Lake District. Unpublished report for English Nature (Available on request from Natural England)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Jerram, R. 1992. Montane Lichen and Moss Heath in the Lake District. Unpublished report for English Nature (Available on request from Natural England)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Fragmentation of this feature is of particular concern given its restricted occurrence in England. In addition to the threats listed below, climate warming also has the potential to lead to vegetation zones and species shifting to higher elevations and/or becoming restricted to north facing slopes.	
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground disturbance	Significant areas of disturbed or eroding bare ground should not be present. Where present, the affected areas should not exceed 1% of the total feature, and be considered only as a temporary stage.	It is important to make the distinction between bare ground that is a 'natural' part of the feature due to the harsh environment, exposure and thin soils and disturbed bare ground caused by trampling or vehicle use. This habitat is very sensitive to grazing and trampling, and can only with stand very low levels of grazing. Vehicle use will cause long term damage. Recovery may take decades.	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	Soils are generally shallow rankers or podsols, and because of strong leaching are mostly acidic. In many places the ground is patterned by solifluction and frost-heave, so that plants have to contend with shifting unstable soils as well as a severe climate.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat:</p> <ul style="list-style-type: none"> Constant and preferential plant species of the U10 <i>Carex bigelowii-Racomitrium lanuginosum</i> moss-heath NVC communities which support this feature on the SAC. 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type:</p> <ul style="list-style-type: none"> U10 <i>Carex bigelowii-Racomitrium lanuginosum</i> moss-heath. 	<p>This habitat feature will comprise a number of associated near or semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>Siliceous alpine and boreal grasslands are one of the few predominantly near-natural habitats remaining in the UK. U10 <i>Carex bigelowii-Racomitrium lanuginosum</i> moss-heath is dominated by a short vegetation cover dominated variously by mosses, sedges, rushes or grasses depending on the degree of wind-exposure and snow lie experienced. These mossy heaths are often mat-like, and typically appear as mottled patches of vegetation. This is the predominant kind of vegetation on British mountains at high altitudes of around 750m, and it occurs above the zone dominated by ericaceous dwarf-shrubs.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation community transitions	Restore the pattern of natural vegetation zonation/transitions.	<p>Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities.</p> <p>Retaining such transitions can provide further diversity to the habitat feature, and support additional flora and fauna. U10 <i>Carex – Racomitrium</i> moss-heath occurs on windswept ground blown clear of snow during winter</p> <p>U10 moss-heath should give way to H19 <i>Vaccinium myrtillus - Cladonia arbuscula</i> heath on the slopes just below the summit. However, these transitions, as distribution of U10 itself, have often been disrupted by heavy grazing and will need to be restored.</p>	
Structure and function (including its typical species)	Vegetation structure - grazing.	Restore grazing pressure to no more than very low levels	Siliceous and boreal grasslands do not require land management to maintain their interest and the vegetation can be considered a climatic climax. The vegetation is slow-growing due to exposure and altitude, and grass-heaths and moss-heaths of this feature are very sensitive to grazing (and trampling). No grazing or very low levels of grazing are likely to be consistent with maintaining the interest of this feature.	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		and supporting processes associated with the feature	<p>This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> <p>Montane habitats include areas of near-natural vegetation in the UK, and are fragile and highly susceptible to human influences. These habitats are maintained by the severe climate and thin soils at high altitude and do not require grazing or other forms of land management to maintain them. Threats to the habitats include grazing and trampling, nitrogen deposition, recreation and access, use of vehicles, burning and climate change. In particular, careful management of visitor pressure (i.e. encouraging people to use specific paths and not trample widely over the summits) is increasingly necessary.</p>	
<p>Version Control Advice last updated: N/A</p>				
<p>Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places</p>				

Table 7: Supplementary Advice for Qualifying Features: H6230. Species-rich *Nardus* grassland, on siliceous substrates in mountain areas (and submountain areas in continental Europe); Species-rich grassland with mat-grass in upland areas *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to more than 359 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The figure quoted in the extent target only includes areas recorded as NVC types CG10 and CG11. Some area of U4 and U5 grassland may be derived from this habitat type and should be restored to this feature. In particular some areas of U4e grassland on Helvellyn and Fairfield SSSI were recorded as U4e grassland with CG11a features.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Wells, C. and Clay, P. 2012. Lake District High Fells Monitoring 2012, Honister Crag SSSI, Lake District High Fells SAC. (Available on request from Natural England)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature. Fragmentation of this feature is of particular concern given its restricted occurrence in England.	
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground disturbance	Ensure there are no significant areas of disturbed or eroding bare ground. Where present, the affected areas should not exceed 1% of the total feature, and should be considered only as a temporary stage.	Exclude dead leaves which are mostly upright, and scattered litter which does not form a "thatch" or "felt". Whilst this is a habitat where vegetation cover can be sparse, significant disturbance of the scree by herbivores or humans can cause damage.	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	Species-rich Nardus grasslands tend to develop where there is flushing through base-rich strata on siliceous bedrock. These may include moderately base-rich metamorphic and igneous rocks. The soils have an acidic pH (<7.0 and mainly <6.0) and are derived from bedrocks with at least some silica. Species-rich Nardus grasslands on limestone are excluded from the definition of this Annex I habitat because limestone lacks silica.	
Structure and function	Key structural,	Restore the abundance of the typical species listed below to	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
(including its typical species)	influential and/or distinctive species	<p>enable each of them to be a viable component of the Annex 1 habitat:</p> <ul style="list-style-type: none"> Constant and preferential plant species of CG10 and CG11 grassland NVC communities which comprise this feature on the SAC. 		England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types:</p> <ul style="list-style-type: none"> CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland CG11 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Alchemilla alpina</i> grass-heath 	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>Species-rich <i>Nardus</i> grasslands tend to develop where there is flushing through base-rich strata on siliceous bedrock. Species-rich <i>Nardus</i> grasslands on limestone are excluded from the definition of this Annex I habitat.</p> <p>As defined by the NVC, two main types of species-rich <i>Nardus</i> grasslands occur in the UK: CG10 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Thymus praecox</i> grassland, CG11 <i>Festuca ovina</i> – <i>Agrostis capillaris</i> – <i>Alchemilla alpina</i> grassland. Most of this interest feature in England is considered to be of the CG11 NVC type. There are small amounts of CG10. Species present in the grassland tend to be mesophilic. Swards consist of a complex mosaic of grasses, small herbs and bryophytes.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation community transitions	Restore the pattern of natural vegetation zonations/transitions.	These are vegetation transitions are complex. They depend largely on underlying soil and geology modified by management, mostly grazing. Typical adjacent communities would be H12 heath, U17, U16 and U19 tall herb and some woodland and scrub.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation composition: bracken, trees and scrub	Maintain the cover of dense bracken, scrub and scattered trees at or to less than 10% of the feature	Although bracken and scattered native trees and scrub can naturally occur as part of this community, they can smother and shade out smaller and more characteristic grassland vegetation. However this is a very low risk on this site as these habitats usually have thin soils and are often at high altitudes which makes them unsuitable for these species.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting processes (on which the feature relies)	Air quality	Restore the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the feature	See the explanatory notes for this attribute above in Table 1. Threats to the habitats include heavy grazing and trampling, nitrogen deposition, and recreation. Stock management levels may need to be carefully managed to prevent both undergrazing and overgrazing of this interest feature. However, some examples of this habitat on thin soils do not seem to require grazing by any livestock.	
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial.</p> <p>Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. Species-rich <i>Nardus</i> grassland occurs within the wider landscape and as part of a mosaic with other grassland types and part of an upland grazing regime.</p>	
<p>Version Control Advice last updated: N/A</p>				
<p>Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places.</p>				

Table 8: Supplementary Advice for Qualifying Features: H6430. Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to more than 8 hectares	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The figure quoted in the extent target only includes areas recorded as NVC type U17. Other areas recorded as grassland types U4 and possibly CG10 or CG11 may be derived from this feature and should be restored.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>See also Annex D below which shows detailed surveys on selected sites</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	<p>Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species.</p> <p>Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides). The main invasive species currently present is New Zealand willowherb (<i>Epilobium brunnescens</i>). This is a small plant which does not tend to dominate large areas but in any case there are unlikely to be any effective control mechanisms.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground disturbance	Ensure there are no significant areas of disturbed or eroding bare ground present. Where present, the affected areas should not exceed 1% of the total feature, and should be considered only as a temporary stage.	Sensitive to grazing pressure and given its typical location on steep slopes and ledges, disturbance by herbivores or access by humans is always a possibility.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	The soils typically are fertile browns loams and are usually flushed and moist, and there is always some base-enrichment, either directly from the rock or from irrigating water.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat:</p> <ul style="list-style-type: none"> Constant and preferential plant species of U17 <i>Luzula sylvatica</i> - <i>Geum rivale</i> tall-herb community NVC which comprise this feature within the SAC 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type:</p> <p>U17 <i>Luzula sylvatica</i> - <i>Geum rivale</i> tall-herb community NVC</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>The hydrophilous tall herb fringe community is a species-rich habitat corresponding to NVC type U17 <i>Luzula sylvatica</i> – <i>Geum rivale</i> tall-herb community. This habitat type is typically found on ungrazed upland cliff ledges, occasionally extending on to open steep slopes, and is restricted to base-rich substrates and somewhat sheltered situations. It is characterised by the abundance of a species-rich mix of tall, broad-leaved herbs, most of which are otherwise rare in the uplands owing to their sensitivity to grazing.</p> <p>Variation within the habitat type is related chiefly to</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			geographical position, altitude, and soil conditions and rock type. This is a very rare habitat with less than 8ha of this community occurring in England, all within the Lake District.	
Structure and function (including its typical species)	Vegetation community transitions	Restore the pattern of natural vegetation zonations/transitions.	<p>This is one of the few near-natural habitats remaining in Britain and frequently occurs in intimate mosaics with other Annex I habitat types in these ungrazed, or very lightly grazed, situations. It provides a refuge for rare, grazing-sensitive, montane plants. Closely related vegetation types, such as the hay meadows of the Pennines, conform to Annex I type 6520 Mountain hay meadows.</p> <p>Some of these species, can be found as very impoverished, non-flowering specimens in grazed pastures adjacent to cliff refuges and steeper slopes. This demonstrates the restrictive effects of grazing and the potential for expansion of the habitat. It is likely that this tall-herb vegetation would have once formed an understorey to sub-montane woodlands and montane willow scrub on base-rich soils, as well as forming herb-rich meadows on high slopes.</p> <p>U17 vegetation can occur adjacent or in mosaics with the other tall herb types (U16 and U19) any of the heath types present on the SAC, flushes (M10, M11) grass-heath (CG11) and also woodland and scrub. Grazing can result in transitions to grassland types, especially U4 and CG10.</p>	
Structure and function (including its typical species)	Vegetation structure - grazing.	Restore grazing pressure to no more than very low levels	<p>The hydrophilous tall herb fringe community persists only where grazing is absent or light. If stands are grazed too heavily, the characteristic tall herbs are soon lost, usually leading to the development of some form of calcareous grassland.</p> <p>At least 50% of tall herb stems should be more than 20 cm tall, or there should be few observable signs of grazing on tall herbs or ferns, and most tall herb species should be flowering or showing signs of being able to flower (exclude <i>Luzula sylvatica</i>) Less than 50% of live flowering shoots of indicator tall herbs should show evidence of grazing.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the feature	See the explanatory notes for this attribute above in Table 1. Threats to the habitats include grazing and trampling, nitrogen deposition, and outdoor sports (hill walking and climbing). Stock management levels need to be carefully managed to prevent anything other than light grazing of this interest feature. For any expansion of this community grazing levels would need to be significantly reduced, or stock removed from adjacent areas.	
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places				

Table 9: Supplementary Advice for Qualifying Features: H7130. Blanket bogs *

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the habitat feature to more than 2809 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>The extent target only includes areas that were recorded as supporting the NVC types M1, M2, M3, M17 and M19 There will also be other areas with deep peat (>40cm) that support other vegetation communities but which should be restored to blanket bog.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p> <p>Fragmentation of blanket bog is common with areas drying out through drainage, and burning encouraging a species-poor community dominated typically by <i>Calluna vulgaris</i> or <i>Molinia caerulea</i>. True bog species become fragmented or are lost. Hydrological fragmentation of the bog system can also occur.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2. Rotational burning, drainage and atmospheric deposition can all compromise this feature's ability to adapt, especially in response to the effects of climate change.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature.	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum herbicides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground disturbance (and peat erosion)	Significant areas of disturbed and eroding bare ground should not be present. Where present, any affected areas should typically not exceed 1% of the total feature, and be considered only as a temporary stage.	Bare ground and eroding peat not only affects the hydrology of bog systems and its associated biodiversity but can also have wider environmental impacts on e.g. water quality. There will also be a carbon loss from the system.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Presence/cover of woody species	Maintain a low cover (<10% of the area) of scrub or trees within stands of H7130.	Native trees and shrubs which can tolerate permanently waterlogged conditions can occur naturally on bog and fen surfaces. An abundance of scrub and trees on bogs and fens is sometimes regarded as detrimental because water is lost by evapotranspiration from the trees and, as the tree canopies develop and close, water is further prevented from reaching the bog surface by interception. This can reduce the amount of water reaching the bog surface. Birch, pine, willow and rhododendron (an invasive non-native species) are the main species of concern. The seeds of most invasive woody species are wind dispersed, so trees are able to establish on raised bog and fen surfaces. This excludes dwarf birch <i>Betula nana</i> and bog myrtle <i>Myrica</i>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<i>gale</i> which should be retained if present.	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungi: bacteria ratio, to within typical values for the habitat. For this feature the peat substrate should consist of both acrotelm and catotelm layers.	<p>Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.</p> <p>Peat is a soil distinguished from other soil types by its high content of organic matter (30%-100%). The organic matter content results form a combination of plant growth and waterlogging, the latter reducing oxygen diffusion to levels which are so slow that decomposition of the dead plant matter uses up this oxygen faster than it can be supplied. Consequently conditions rapidly become anaerobic, which reduces decomposition rates and the semi-decomposed plant material builds up over time to form peat.</p> <p>An active blanket bog should be made up of two layers, an acrotelm and a catotelm. The thin (5-75cm) upper layer or acrotelm consists of living plant material and is a zone of fluctuating water table, where relatively rapid plant decomposition occurs. Below this is the catotelm, a much thicker layer of peat (up to 10m), consisting of broken down plant material, and which is always below the water table. Degraded (through e.g. drainage and rotational burning) blanket bogs may have lost the acrotelm layer, and now has layer of damaged catotelm (haplotelm) at the surface.</p>	
Structure and function (including its typical species)	Structural diversity	Restore the full range of typical structural features associated with the feature at this site, e.g. vegetation cover, surface patterning and hydrological zonations	Bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage). These can occur at different macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as pools and hummocks, and terrestrial features such as ridges and hollows.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology. These can be modified or disrupted by activities such as drainage, burning, grazing, vehicular access and peat digging. These are likely to be missing or poorly represented in degraded blanket bog systems. These components may include areas with noticeably uneven structure, at a spatial scale of around 1 m ² or less. The unevenness should be the result of <i>Sphagnum</i> hummocks, lawns and hollows, or mixtures of well-developed cotton-grass tussocks and spreading bushes of dwarf-shrubs.	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	<p>Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat:</p> <ul style="list-style-type: none"> • Constant and preferential plant species of M1; M2; M3; M17; M18 and M19 NVC communities which comprise this feature within the SAC • Range of <i>Sphagnum</i> species 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types</p> <ul style="list-style-type: none"> • M1 <i>Sphagnum auriculatum</i> bog pool community • M2 <i>Sphagnum cuspidatum</i> / <i>recurvum</i> bog pool 	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of</p>	See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p>community,</p> <ul style="list-style-type: none"> • M17 <i>Scirpus cespitosus</i> – <i>Eriophorum vaginatum</i> blanket mire • M19 <i>Calluna vulgaris</i> – <i>Eriophorum vaginatum</i> blanket mire. <p>Normally occurs on peats 0.4m or deeper (but see supporting comments).</p>	<p>the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>As blanket bog 'blankets' extensive areas it is not surprising that the habitat supports a range of different vegetation communities. Transitions can occur between bog pools, wetter Sphagnum lawns, through to more mixed terrestrial bog communities associated with both hummocks and hollows. At its margins (normally on the steeper slopes), blanket bog communities will gradually be lost and replaced by wet heath and dry heath communities. Blanket bog communities can be heavily influenced by land management, notably drainage, managed rotational burning and grazing. In these situations typical blanket bog communities are replaced by a variety of degraded mire (M15, M16 and M25), dry heath (H8, H12) or acid grassland (U6) vegetation types.</p> <p>Where these vegetation types occur on deeper peats, they should be assessed as blanket bog and restoration back to blanket bog in favourable condition should be the objective.</p> <p>Note: Blanket bog vegetation can sometimes become established on peats shallower than 0.4m, especially where there is an impermeable rock layer beneath (such as granite).</p>	
Structure and function (including its typical species)	Vegetation composition: undesirable species	The following undesirable competitive species should be absent or rare; individually and collectively less than 1% of vegetation cover);	<p>These are species not considered to be a desirable part of the blanket bog vegetation community as they may spread and out-compete more sensitive typical species</p> <p>Undesirable species include: common bent-grass <i>Agrostis capillaris</i>, Yorkshire fog <i>Holcus lanatus</i>, common reed <i>Phragmites australis</i>, bracken <i>Pteridium aquilinum</i>, creeping buttercup <i>Ranunculus repens</i>.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		feature of the site on the Air Pollution Information System (www.apis.ac.uk).		(www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the feature	See the explanatory notes for this attribute above in Table 1. The active management required will usually be related to restoring the natural hydrology of the blanket bog, managing any public access (erosion) and in rare cases to restoring vegetation cover on bare peat. Apart from this, Lake District blanket bogs (which receive high levels of rainfall) normally benefit from reduced management (low levels of grazing and absence of burning).	
Supporting processes (on which the feature relies)	Hydrology	At a site, unit and/or catchment level (as necessary), maintain or restore] the natural hydrological processes to provide consistently near-surface water levels necessary to sustain the feature within the site	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. For this feature, various land management activities may impact on and interrupt natural hydrological processes and water levels, including artificial drainage, managed burning, wildfires; track construction; afforestation; and compaction by trampling and vehicular use. The loss of the acrotelm layer normally reflects significant changes to the hydrology of the bog. An increase in the cover of heather on the bog surface will also indicate a drying out of the bog, and can lead to further drying out through an increase in sub-surface peat pipes. Fire influences the near-surface hydrological functioning of peatland. This leads to enhanced overland flow and higher streamflow peaks and, in combination with a removed vegetation cover, can exacerbate surface erosion.	

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Version Control Advice last updated: N/A			
Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places			

Table 10: Supplementary Advice for Qualifying Features: H7230. Alkaline fens; Calcium-rich springwater-fed fens

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>This feature characteristically occurs as small flushes distributed widely within large areas of other habitat types. In NVC surveys, they are often indicated as being present within a mapped polygon rather than being individually mapped. Some sites were included in the detailed surveys referenced in the evidence column to the right but these surveys do not cover the entirety of the SAC. It is therefore not possible to give a meaningful area estimate.</p> <p>If there are any proposals for activities considered likely to affect this feature on areas out with the areas contained in the above surveys, then further survey work may be required</p>	<p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Jerram R, 2015. Survey of alkaline fen in the western Lake District (Pillar and Ennerdale, Armboth Fell, Buttermere Fells, Skiddaw and Birk Fell. Unpublished report to Natural England. (Available from Natural England on request)</p> <p>Tratt, R., Eades, P. O'Reilly, J., Shaw, S. 2015. Survey of Base-rich Wetlands in Cumbria (Group 3) – Helvellyn & Shap Fells. Unpublished report to Natural England (Available from Natural England on request)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	Distribution includes the spatial pattern or arrangement of this habitat feature, and its component vegetation types, across the site. Changes in distribution may affect the nature and range of the vegetation communities present, the operation of the physical, chemical, and biological processes in the system and the resiliency of the site and its features to changes or impacts.	As above
Structure and function (including its typical species)	Adaptation and resilience	Maintain or restore as appropriate the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Browsing and grazing by herbivores	Restore appropriate levels of grazing,	These habitat features are often preferentially grazed and may be vulnerable to significant overgrazing pressure associated with the management of the wider local landscape.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	<p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis.</p>	
Structure and function (including its typical species)	Hydrology	At a site, unit and/or catchment level (as necessary, maintain or restore natural hydrological processes to provide the conditions necessary to sustain the feature within the site, including a high piezometric head and permanently high water table (allowing for natural seasonal fluctuations).	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> <p>Wheeler <i>et al.</i> (2009) provide range and mean for summer & winter water levels for those wetland NVC types constituting Annex 1 habitats. This provides a rough guide to appropriate levels, but it is critical that individual sites and their needs are</p>	Wheeler, B.D, Shaw, SC, and Tanner, K.A. 2009. Wetland Framework for Impact Assessment at Statutory Sites. EA Science report.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			considered as there is considerable variation within the NVC communities listed and recorded water levels.	
Structure and function (including its typical species)	Integrity of tufa features	Ensure that no more than 1% of the vegetation in which tufa is visible is showing signs of damage or disturbance	Tufa is a fragile soft porous rock composed of calcium carbonate which is deposited as lime-rich subterranean water issues out from springs and chemically interacts with the air. It is easily damaged or disturbed.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Presence/cover of woody species	Maintain a low cover of woody species of not more than 10% scrub/tree cover. No woody species in flushes or springs; low Salix sp acceptable more than 5m from edge of spring/flush feature.	Native trees and shrubs occur naturally on bog and fen surfaces but an abundance of scrub and trees on bogs and fens is sometimes regarded as detrimental because they are indicators and perpetrators of drying out and may cause damage to vegetation structure through shading effects. Birch, pine, willow and rhododendron (an invasive non-native species) are the main species of concern. The seeds of most invasive woody species are wind dispersed, so trees are able to establish on raised bog and fen surfaces.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat: <ul style="list-style-type: none"> Constant and preferential plant species of M10 and M11 mire NVC communities which comprise this feature 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		within the SAC.		
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types:</p> <p>M10 <i>Carex dioica</i> - <i>Pinguicula vulgaris</i> mire</p> <p>M11 <i>Carex demissa</i> - <i>Saxifraga aizoides</i> mire</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC).</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. For this feature this is typically the M10 and M11 types.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Water chemistry	Maintain the low nutrient status of irrigating water, ensuring it is rich in base ions, particularly calcium.	UKTAG (2012) provides threshold values for nitrate concentration in groundwaters for different wetland types. The threshold values will mainly be used in the characterisation of GWDTE status for the WFD, primarily as a risk screening tool, to assess if sites are 'at risk' or 'not at risk' from groundwater mediated nutrient pressure. Due to the complex cycling of nutrients within many GWDTE, these threshold values are less well suited for application within sites but rather just to groundwater that is directly feeding the site.	UKTAG. 2012. Technical report on groundwater dependent terrestrial ecosystem (GWDTE) threshold values.
supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain or restore] the structure, functions and	See the explanatory notes for this attribute above in Table 1.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		supporting processes associated with the feature.		
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places. Attribute relating to exposed substrate has been removed because these flushes are very variable in their nature. Although on thin soils and stony ground, many are more vegetated than this (for example lush cover of <i>Saxifraga aizoides</i>) without suffering ill effects.				

Table 11: Supplementary Advice for Qualifying Features: H8110. Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladanii*); Acidic scree

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature of at least 200 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis. Careful consideration needs to be given to whether apparent 'scree' is the appropriate habitat type or whether it is actually a degraded form of another habitat created by heavy grazing.</p> <p>This figure is certainly an underestimate; the target only includes areas recorded as NVC type U21. Areas recorded in NVC surveys as 'scree' as opposed to U21 have not been included; these may or may not be unvegetated. U21 is likely to be under-recorded in NVC surveys due to the unstable and inaccessible nature of screes. Other vegetation, not well described in the NVC also falls into this feature definition.</p> <p>Some habitat recorded U21 or as 'scree' will have been derived through degradation of other habitats such as dry heath, juniper, oak woods and montane habitats and should be restored to such.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>See also Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes.</p> <p>This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move</p>	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	Siliceous scree normally occurs as a distinct and important part of part of the wider uplands landscape alongside woodlands, a variety of acid grasslands and heath communities	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground	Significant areas of disturbed scree should not be present. Where present, the affected	Whilst this is a habitat where vegetation cover can be sparse, significant disturbance of the scree by herbivores or humans can cause damage.	This attribute will be periodically monitored as part of Natural England's SSSI Condition

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
typical species)	disturbance	areas should not exceed 1% of the total feature, and be considered a temporary stage.		Assessments
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the habitat.	Siliceous screes are made up of siliceous rocks such as quartzite, granite and sandstone. Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat: <ul style="list-style-type: none"> Constant and preferential plant species of U21 <i>Cryptogramma crispa</i> - <i>Deschampsia flexuosa</i> community and other NVC communities on siliceous screes. 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types: <ul style="list-style-type: none"> U21 <i>Cryptogramma crispa</i> - <i>Deschampsia flexuosa</i> community 	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p>However a variety of other NVC communities (and other communities not described by the NVC may occur in fragmentary form where scree is more stable. Most likely other NVC type is H12 heathland, although woodland and scrub (including juniper) can also grow on similar substrates.</p>	<p>help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>This feature consists of a pioneer vegetation of open, rocky ground, usually on steep slopes at moderate altitudes. The vegetation is normally sparse and fragmented, but may thicken up in places, and is dominated by ferns and mosses, with fine-leaved grasses moderately frequent. Scattered herbs, dwarf-shrubs and patches of lichens may also occur. Siliceous screes and boulder fields can occur over a wide range of altitudes. The characteristic parsley fern (<i>Cryptogramma crispa</i>) may become sparse or absent at high altitudes.</p>	
Structure and function (including its typical species)	Vegetation community transitions	<p>Restore the pattern of natural vegetation zonation/transitions to other vegetation types including heathland, scrub and woodland and vegetation of siliceous rocky slopes.</p>	<p>This is a colonising vegetation type occurring on previously bare screes. Where screes are able to stabilise, it may succeed to a variety of heath, scrub or woodland vegetation. Climatic conditions, grazing or other disturbance (sometimes from footpaths) may arrest this succession or even create bare scree from other habitat types. In some cases it will be more desirable to allow this vegetation succession to proceed.</p> <p>Siliceous scree of the montane to snow levels can occur in close association with Annex I type 8220 Siliceous rocky slopes with chasmophytic vegetation, while stabilised block screes may support a range of vegetation types including other Annex I types.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>See also Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Structure and function (including its typical species)	Vegetation composition: trees and scrub	<p>Allow development of scrub / wood habitats on scree where appropriate</p>	<p>Some important woodland and scrub sites are intimately mixed with screes e.g. Keskadale and Birkrigg oaks. Succession to these biodiverse habitats would be welcomed whereas scree vegetation is an early successional type that can colonise new areas.</p> <p>Natural England will provide more detailed advice on a case by case basis.</p>	<p>This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation structure - grazing.	Restore grazing pressure to no more than very low levels	This interest feature can sustain low levels of grazing which can assist in keeping habitat in an open condition and preventing a build-up of stable vegetation communities. However too high levels can damage the feature.	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the feature	See the explanatory notes for this attribute above in Table 1. Risk of loss of this habitat on this site is extremely low as new substrate is continually formed by harsh environmental conditions on the steep slopes of the fells. Although rock based this is a fragile habitat and susceptible to human activity and land management change. Threats to the habitats include excessive grazing, heavy trampling, nitrogen deposition, recreation (scree running and path erosion), and vehicle use.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to restore the quality of this feature as it has been degraded by past management in many places				

Table 12: Supplementary Advice for Qualifying Features: H8210. Calcareous rocky slopes with chasmophytic vegetation; Plants in crevices in base-rich rocks; H8220. Siliceous rocky slopes with chasmophytic vegetation; Plants in crevices on acid rocks

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Maintain the total extent of the feature	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>This habitat occurs in characteristically small patches in cracks and fissures of rock faces, is poorly described in the NVC and is often in locations where rope access is necessary. For these reasons, no figure for habitat extent is available.</p> <p>The habitat is potentially present wherever there is a calcareous influence within a rock face. Before any proposals are carried out which may affect rock faces, baseline surveys should be carried out.</p>	<p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Surveys listed in Annex D below may refer to this habitat</p>
Extent and distribution of the feature	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p>	As above

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Adaptation and resilience	Restore the feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature.	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat <ul style="list-style-type: none"> Constant and preferential plant species of OV39, OV40 and U21 NVC communities that comprise these features within the SAC. 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Physical structure: ground disturbance	Ensure there are no significant areas of disturbed rocky slope. Where present, the affected areas should not exceed 1% of the total feature, and should be considered as a temporary stage.	Whilst this is a habitat where vegetation cover can be sparse, significant disturbance of the rocky slopes by herbivores or humans (rock climbing) can cause damage.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
species)		and fungal: bacterial ratio, to within typical values for the habitat.	<p>habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter.</p> <p>Chasmophytic vegetation consists of plant communities that colonise the cracks and fissures of rock faces. The type of plant community that develops is largely determined by the base-status of the rock face.</p> <p>Calcareous sub-types develop on lime-rich rocks such as limestone and calcareous schists.</p> <p>For siliceous types, soil is rarely more than a discontinuous raw humus derived from the decaying fern (<i>Cryptogramma crispera</i>) fronds. <i>Cryptogramma crispera</i> seems unable to colonise very fine or loose scree, but can be very common on more stable slopes. This habitat is especially associated with hard volcanic rocks.</p>	
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification types, or other species typical to this type of location in the Lake District</p> <p>On calcareous rocky slopes usually:</p> <ul style="list-style-type: none"> • OV39 <i>Asplenium trichomanes</i>- <i>Asplenium ruta-muraria</i> • OV40 <i>Asplenium viride</i>-<i>Cystopteris fragilis</i> NVC types. 	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. The type of plant community that develops is largely determined by the base-status of the rock face.</p> <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p> <p>On calcareous rocky slopes ferns and mosses are the most prominent plant constituents. Depending on the situation, the vegetation may range from being quite sparse to quite dense, but it is usually fragmented and limited in extent. It can occur over a wide range of altitudes. Some forms of the calcareous</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<p>On siliceous rocky slopes usually:</p> <p>U21 <i>Cryptogramma crispera</i> - <i>Deschampsia flexuosa</i></p>	<p>type correspond to NVC types OV39 <i>Asplenium trichomanes</i> – <i>Asplenium ruta-muraria</i> community and OV40 <i>Asplenium viride</i> – <i>Cystopteris fragilis</i> community, but other forms are not described by the NVC. The vegetation is characterised by bryophytes such as <i>Tortella tortuosa</i>, <i>Anoetangium aestivum</i> and <i>Ctenidium molluscum</i>. Associated vascular plants include brittle bladder-fern <i>Cystopteris fragilis</i>, green spleenwort <i>Asplenium viride</i> and glaucous meadow-grass <i>Poa glauca</i>. A rare habitat in England with an estimated 300ha.</p> <p>On siliceous rocky slopes vegetation types are poorly covered by the NVC, although some forms can be referred to U21 <i>Cryptogramma crispera</i> – <i>Deschampsia flexuosa</i> community, which can occur on scree or boulders. This is pioneer vegetation of open, rock ground, usually on steep slopes which comprises mixtures of bryophytes, such as <i>Amphidium mougeotii</i> and <i>Racomitrium</i> spp., and vascular plants, such as wavy hair-grass <i>Deschampsia flexuosa</i> and fir clubmoss <i>Huperzia</i>. Until such time as better information is available on community types, vegetation composition and indicator species, the attributes and targets are of necessity brief and aim to ensure that the habitat remains open and is impacted relatively lightly by human activities.</p>	
Structure and function (including its typical species)	Vegetation community transitions	Restore the pattern of natural vegetation zonations/transitions	The presence of calcareous bands within otherwise mainly siliceous rocks often brings the two types together on the same rock outcrop. As a result, H8210 Calcareous rocky slopes with chasmophytic vegetation may occur in close association with Annex I type 8220 Siliceous rocky slopes with chasmophytic vegetation, and some sites are listed for both types. Calcareous rocky slopes may also be closely associated with 8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i>).	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this	See the explanatory notes for this attribute above in Table 1	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		feature of the site on the Air Pollution Information System (www.apis.ac.uk).		(www.apis.ac.uk).
Supporting processes (on which the feature relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to Restore the structure, functions and supporting processes associated with the feature.	See the explanatory notes for this attribute above in Table 1. Although rock based this a fragile habitat and susceptible to human activity. Threats to the habitats include heavy grazing and trampling, nitrogen deposition, recreation (rock climbing). Rock ledges can act as an important refuge for many plants that are intolerant to heavy grazing. Fencing and/or stock management to lower grazing levels may allow these plants to expand their distribution on the site.	
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. Calcareous and siliceous rocky slopes normally occur as a distinct and important part of part of the wider uplands landscape alongside calcareous and siliceous scree, woodlands, and variety of grassland communities. This mosaic can be very important and the rocky slopes can act as a refuge for those plants that require increased humidity and shade, and	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			those that are intolerant of heavy grazing pressure.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance:				
<ul style="list-style-type: none"> • Targets are to restore the quality of this feature as it has been degraded by past management in many places • The attribute for Scrub and bracken has been removed as it is not relevant to these high altitude rocky habitats in the Lake District with extremely thin (almost absent) soils 				

Table 13: Supplementary Advice for Qualifying Features: H91A0. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles; Western acidic oak woodland

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the feature to significantly more than 75 hectares.	<p>See the explanatory notes for this attribute above in Table 1.</p> <p>There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature.</p> <p>For this feature tree roots (particularly of veteran trees) can extend a considerable distance beyond the boundary of the site - they can be impacted by soil compaction (such as caused by vehicles or construction works); agricultural operations or other soil disturbance (like trenches); and agro chemicals or other chemicals which get into the soil.</p> <p>Any loss of woodland area - whether at the edge or in the middle of a site will reduce the core woodland area where woodland conditions are found - these support significant assemblages of species dependent on woodland conditions (e.g. lichens and bryophytes - being one example).</p> <p>Loss of any woodland area which fragments a site into different parts will clearly disturb the movement of species between the remaining parts of the woodland.</p> <p>The extent target only includes areas recorded as NVC type W17. Area with sparse or remnant trees (which are often present in gills) which could be regarded as degraded examples of this habitat type are consistently under-recorded in the NVC surveys</p> <p>The NVC type W11 is quite closely related and many stands may be transitional between or a mixture of the two types. In addition, some relatively species-poor stands recorded as W11 might be better regarded as degraded forms of W17 (Rodwell, in "British Plant Communities Vol 1, notes that grazing tends to make the two types converge). Therefore consideration should also be given as to whether woodlands recorded as W11 should be entirely or partly regarded as being part of this</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			feature.	
Extent and distribution of the feature	Spatial distribution of the feature within the site	Restore the distribution and configuration of the feature, including where applicable its component vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat.</p> <p>Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature.</p> <p>This feature is already highly fragmented and considerable restoration and expansion is required.</p>	<p>See Annex A below which shows occurrence of this feature by site and Annex B which shows the NVC surveys which map this feature</p> <p>Statement on Habitat Dynamism that accompanies Table 2 in the Definitions of Favourable Condition for each component SSSI (Copy attached at Annex E)</p>
Structure and function (including its typical species)	Adaptation and resilience	Restore the resilience of the feature by ensuring a diversity (at least 2 species) of site-native trees (e.g. sessile oak, birch, holly) across the site.	See the explanatory notes for this attribute above in Table 2.	
Structure and function (including its typical species)	Browsing and grazing by herbivores	Restore browsing at a (low) level that allows well developed understorey with no obvious browse line, & lush ground vegetation with some grazing sensitive species evident (bramble, ivy etc), and tree seedlings and sapling common in	<p>Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities.</p> <p>In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		gaps.	allow fresh natural regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, barkstripping and a heavily grazed sward.	
Structure and function (including its typical species)	Functional connectivity with wider landscape	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	<p>This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying Annex I habitat features of the site.</p> <p>These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. This habitat is already highly fragmented and isolated and expansion and reconnection is necessary.</p>	
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure invasive and introduced non-native species are either rare or absent, but if present are causing minimal damage to the feature	<p>Invasive or introduced non-native species are a serious potential threat to the biodiversity of native and ancient woods, because they are able to exclude, damage or suppress the growth of native tree, shrub and ground species (and their associated typical species), reduce structural diversity and prevent the natural regeneration of characteristic site-native species.</p> <p>Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum pesticides). Such species can include</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Rhododendrons, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include pheasants, rabbits and non-native invertebrate 'pest' species.	
Structure and function (including its typical species)	Regeneration potential	Restore the potential for sufficient natural regeneration of desirable trees and shrubs; typically tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible in sufficient numbers in gaps, at the wood edge and/or as regrowth as appropriate ;	<p>The regeneration potential of the woodland feature must be maintained if the wood is to be sustained and survive, both in terms of quantity of regeneration and in terms of appropriate species. This will include regeneration of the trees and shrubs from saplings or suckers, regrowth from coppice stools or pollards, and where appropriate planting.</p> <p>Browsing and grazing levels must permit regeneration at least in intervals of 5 years every 20. The density of regeneration considered sufficient is less in parkland sites than in high forest. Regeneration from pollarding of veteran trees should be included where this is happening.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Root zones of ancient trees	Maintain or restore the soil structure within and around the root zones of the mature and ancient tree cohort in or to an un-compacted condition	<p>The management of land within and around forest habitats which are characterised by ancient trees can be crucial to their individual welfare and long-term continuity, and the landscape they are part of can be just as or even more important. The condition of the soil surrounding such trees will affect their roots, associated mycorrhizal fungi and growth.</p> <p>Plants have difficulty in compacted soil because the mineral grains are pressed together, leaving little space for air and water which are essential for root growth. Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.</p>	
Structure and function (including its typical species)	Soils, substrate and nutrient cycling	Restore the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, to within typical values for the	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		habitat.	soil properties may therefore affect the ecological structure, function and processes associated with this Annex I feature.	
Structure and function (including its typical species)	Tree and shrub species composition	Maintain a canopy and understorey of which 95% is composed of site native trees and shrubs	Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species).	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Restore the abundance of the typical species listed below to enable each of them to be a viable component of the Annex 1 habitat; <ul style="list-style-type: none"> Constant and preferential plant species of W17 <i>Quercus petraea</i> - <i>Betula pubescens</i> - <i>Dicranum majus</i> woodland which comprises this feature within the SAC 	See the explanatory notes for this attribute above in Table 1.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation Classification type: <p>W17 <i>Quercus petraea</i> - <i>Betula pubescens</i> - <i>Dicranum majus</i> woodland</p> <p>Transitions to other native woodland, scrub, tall herb and heathland types</p>	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). <p>Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations).</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Structure and function (including its typical species)	Vegetation structure - age class distribution	Restore at least 3 age classes (pole stage/ medium/ mature) spread across the average life expectancy of the commonest trees.	A distribution of size and age classes of the major site-native tree and shrub species that indicate the woodland will continue in perpetuity, and will provide a variety of the woodland habitats and niches expected for this type of woodland at the site in question.	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure - canopy cover	Restore an appropriate tree canopy cover across the feature, which will typically be between 40-90% of the site	<p>Canopy cover is the overall proportion of vegetative cover consisting of any woody layer ranging from established regeneration to mature and veteran stages. Woodland canopy density and structure is important because it affects ecosystem function and in particular microclimate, litterfall, soil moisture, nutrient turnover and shading; this in turn influences the composition of plants and animals in lower vegetation layers and soil.</p> <p>Open canopies with just scattered trees will have less of a woodland character and reduced diversity of woodland-dependent species (although they may be still be important as a form of woodland-pasture).</p> <p>Completely closed canopies across the whole woodland are not ideal either however, as they cast heavier shade and support fewer species associated with edges, glades and open grown trees, and have little space where tree regeneration could occur. In general, the woodland canopy of this feature should provide a core of woodland interior conditions with some open and edge habitat as well.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure - dead wood	Restore the continuity and abundance of standing or fallen dead and decaying wood, typically between 30 - 50 m ³ per hectare of standing or fallen timber or 3-5 fallen trees >30cm per hectare, and >10 standing dead trees per hectare	<p>Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.</p> <p>Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important component of woodland ecosystems, and supports a range of specialist invertebrates, fungi, lichens and bryophytes, and</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			associated hole-nesting birds and roosting bats, all of which may be very typical of the feature.	
Structure and function (including its typical species)	Vegetation structure - old growth	Restore the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 20% of the feature at any one time) and the assemblages of veteran and ancient trees (typically >10 trees per hectare).	<p>Good woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.</p> <p>For this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features, and their continuity should be a priority.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure - open space	Maintain or restore areas of permanent/temporary open space within the woodland feature, typically to cover approximately 10% of area	<p>Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute should reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known interest, history, past management and the landscape context.</p> <p>Having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants. Such open space can be permanent or temporary and may consist of managed grazed areas, linear rides and glades, or naturally-produced gaps caused by disturbance events such as windthrow/fire/tree falling over/snow damage.</p>	This attribute will be periodically monitored as part of Natural England's SSSI Condition Assessments
Structure and function (including its typical species)	Vegetation structure - woodland edge	Maintain a graduated woodland edge into adjacent semi-natural open habitats, other woodland/wood-pasture types or scrub.	Woodland edge is defined as being the transitional zone between the forest feature and adjacent but different habitat types - the best woodland edges will have a varied structure in terms of height and cover. Many typical forest species make regular use of the edge habitats for feeding due to higher herb layer productivity and larger invertebrate populations.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Grasslands / arable fields managed with high doses of agro-chemicals could potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site (pollution/ nutrient enrichment etc).	
Supporting processes (on which the feature relies)	Air quality	Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).
Supporting processes (on which the feature relies)	Hydrology	At a site, unit and/or catchment level (as necessary, restore natural hydrological processes to provide the conditions necessary to sustain the feature within the site	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> <p>This is included as disruption/ damage to hydrological processes could be caused by activities at some distance from the site boundary. E.g. through extraction of ground or surface waters; diverting or damming river channels; pollution of water source; channel alignment that disrupts natural geomorphological processes; tunnelling etc.</p>	
Supporting processes (on which the feature relies)	Illumination	Ensure artificial light is maintained at a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.	Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour. For example, light pollution (from direct glare, chronically increased illumination and/or temporary, unexpected fluctuations in lighting) can affect animal navigation, competitive interactions, predator-prey relations,	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			and animal physiology. Flowering and development of trees and plants can also be modified by un-natural illumination which can disrupt natural seasonal responses.	
<p>Version Control Advice last updated: N/A</p>				
<p>Variations from national feature-framework of integrity-guidance: Targets are to restore the extent and quality of this feature as it has been degraded by past management in many places</p> <p>The attribute for vegetation structure-shrub layer has been removed because the high altitude woodlands on this site naturally tend to have a simplified, scrubby structure. Often there is little or no difference between the height of the canopy trees and any potential scrub layer.</p>				

Table 14: Supplementary Advice for Qualifying Features: S1393. *Drepanocladus (Hamatocaulis) vernicosus*; Slender green feather-moss

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Population (of the feature)	Population abundance	Maintain or restore as appropriate the abundance of the population at a level which is above the baseline population-size estimated at the time of SAC designation; whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	<p>This will ensure there is a viable population of the feature which is being maintained at or increased to a level that contributes as appropriate to its Favourable Conservation Status across its natural range in the UK.</p> <p>Due to the dynamic nature of population change, the target-value given for the population size or presence of this feature is considered to be the minimum standard for conservation/restoration measures to achieve. This minimum-value may be revised where there is evidence to show that a population's size or presence has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>Given the likely fluctuations in numbers over time, any impact-assessments should focus on the current size of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is designated, and seeks to avoid plans or projects that may affect the site giving rise to the risk of deterioration.</p> <p>Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the</p>	Natural England (Various) – Definitions of Favourable Condition for the underpinning SSSIs (Available on request from Natural England)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>feature at such higher levels in future should also be taken into account in any assessment. Unless otherwise stated, the population size or presence will be that measured using standard methods, such as peak mean counts.</p> <p>Population size has not yet been estimated as the species is difficult to identify and no systematic search has been made by an appropriate specialist.</p> <p>Any proposals are made which are likely to result in impacts on habitat that may be suitable for this species will necessitate survey by an appropriate bryophyte specialist to ascertain whether the species is present</p>	
Supporting habitat: extent and distribution	Distribution of supporting habitat	Maintain or restore the distribution and continuity of the feature and its supporting habitat, including where applicable its component vegetation types and associated transitional vegetation types, across the site	<p>A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes.</p> <p>Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability.</p>	
Supporting habitat: extent and distribution	Extent of supporting habitat	<p>Maintain the total extent of the habitat(s) which are likely to support the feature.</p> <p>A list of locations where the</p>	In order to contribute towards the objective of achieving an overall favourable conservation status of the feature at a UK level, it is important to maintain or if appropriate restore the extent of supporting habitats and their range within this	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		species is known to occur is given in the 'evidence' column to the right. However, note that this is not comprehensive as the species is difficult to identify and no systematic search has been made by an appropriate specialist.	<p>SAC.</p> <p>The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending on the nature, age and accuracy of data collection, and may be subject to periodic review in light of improvements in data.</p> <p>This species has been recorded from: Uldale Common; Caldbeck Common and Mungrisdale Common.</p> <p>However, note that these locations are not comprehensive as the species is difficult to identify and no systematic search has been made by an appropriate specialist</p> <p>Any proposals which are likely to result in impacts on habitat that may be suitable for this species will necessitate survey by an appropriate bryophyte specialist to ascertain whether the species is present</p> <p>For information on supporting habitat see NVC survey (table B above) and also: Jerram R, 2015. Survey of alkaline fen in the western Lake District. Report to Natural England.</p>	
Supporting habitat: structure/function	Ground disturbance	Maintain the total extent of bare ground < 10% within the primary habitat areas of <i>H. vernicosus</i> .	Areas supporting <i>H. vernicosus</i> are fragile and easily damaged by over-grazing, trampling and other disturbance, which may create exposed substrate that is vulnerable to the effects of water-scour. Grazing by livestock needs to be set at a level that is not damaging to the species, and on sites where <i>H. vernicosus</i> is restricted there may be a need to restrict the frequency of botanists wishing to see the moss.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: structure/function	Hydrological features	Maintain or restore (as necessary at specific location) all distinctive hydrological features of sites that are likely to support <i>H. vernicosus</i> including flushes, springs seepages and fens.	<i>H. vernicosus</i> occurs in flush and fen habitats, and thus any damage to or loss of these habitats is likely to be damaging to the species.	
Supporting habitat: structure/function	Hydrology	Maintain or restore (as necessary at specific location) water levels at sites that are likely to support <i>H. vernicosus</i> at a level sufficient to support the species, in particular water tables should not be lowered.	<i>H. vernicosus</i> occurs in flush and fen habitats, and thus any changes in hydrology which result in the damage or loss of these habitats, in particular the lowering of water tables, are likely to be damaging to the species. Increased levels of water abstraction caused by development may lower water tables and thus damage sites supporting <i>H. vernicosus</i> by desiccation.	
Supporting habitat: structure/function	Soils, substrate and nutrient cycling	Maintain or restore (as necessary at specific location) the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal: bacterial ratio, within typical values for the supporting habitat	Soil supports basic ecosystem function and is a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with the supporting habitat of this feature.	
Supporting habitat: structure/function	Vegetation composition: invasive non-native species	Ensure invasive non-native species are either absent within the primary habitat areas of <i>H. vernicosus</i> or being contained at a level which does not significantly affect the feature.	<i>H. vernicosus</i> is vulnerable to competition from invasive non-native species which can spread rapidly once established. Such species within fens and flushes may include New Zealand pygmyweed <i>Crassula helmsii</i> , parrot's-feather <i>Myriophyllum aquaticum</i> , sweet flag <i>Acorus calamus</i> , Mimulus <i>Mimulus spp.</i> , Himalayan balsam <i>Impatiens glandulifera</i> and Giant hogweed <i>Heraclium mantegazzianum</i> .	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting habitat: structure/function	Vegetation composition: Scrub and tree cover	Maintain the primary habitat areas of <i>H. vernicosus</i> as tree and scrub free.	<i>H. vernicosus</i> favours areas that are not heavily shaded. Invasion by woody species is likely to be damaging, and their development to maturity may indicate drying out, dereliction, disturbance and/or enrichment of wetland habitats.	
Supporting habitat: structure/function	Vegetation composition: undesirable species	Ensure common reed <i>Phragmites australis</i> is either absent or rare within the primary habitat areas of <i>H. vernicosus</i>	Increasing cover of Common Reed outside target is likely to indicate habitat management is inappropriate and likely to lead to the vegetation community becoming tall fen, to the detriment of <i>H. vernicosus</i> .	
Supporting habitat: structure/function	Water quality	Maintain or restore (as necessary at specific location) a natural nutrient regime to the any supporting river habitat, with any anthropogenic enrichment above natural/background concentrations limited to levels at which adverse effects on the feature are unlikely.	<i>H. vernicosus</i> is considered to require low to neutral nutrient conditions, thus pollution and activities that increase nutrient levels are likely to have a negative effect on the species.	
Supporting processes (on which the feature and/or its supporting habitat relies)	Adaptation and resilience	Maintain or restore (as necessary at specific location) the feature's ability, and that of its supporting habitat, to adapt or evolve to wider environmental change, either within or external to the site.	See the explanatory notes for this attribute above in Table 2.	
Supporting processes (on which the feature and/or its supporting habitat relies)	Air quality	Restore concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	See the explanatory notes for this attribute above in Table 1.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature and/or its supporting habitat relies)	Conservation measures	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes associated with the feature and/or its supporting habitats.	See the explanatory notes for this attribute above in Table 1.	
Supporting processes (on which the feature and/or its supporting habitat relies)	Water quantity/ quality	Where the feature or its supporting habitat is dependent on surface water and/or groundwater, maintain or restore (as necessary at specific location) water quality and quantity to a standard which provides the necessary conditions to support the feature	<p>For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type.</p> <p>Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed to reflect the ecological needs of the species feature. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC.</p>	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: Targets are to 'maintain or restore' the quality of this feature as it may have been degraded by past management in many places, but baseline data is lacking				

Annex A: Known Occurrence of Interest Features

	Armboth Fells	Birk Fell	Buttermere Fells	Helvellyn and Fairfield	Honister Crag	Pillar and Ennerdale Fells	Scafell Pikes	Shap Fells	Skiddaw Group	Wasdale Screes
H7230 Alkaline Fens	X	X	X	X	X	X		X	X	X
H4060 Montane Heaths			X	X		X	X		X	
H7130 Blanket Bog	X	X	X	X	X	X		X	X	
H8210 Calcareous Rocky Slopes with chasmophytic vegetation				X	X		X			X
H4030 European dry Heath	X	X	X	X	X	X	X	X	X	X
H6430 Hydrophilous tall herb fringe communities	X		X	X	X	X	X		X	X
H5130 <i>Juniperus communis</i> formations		X	X	X	X	X			X	
H4010 North Atlantic wet heath	X	X			X	X		X	X	
H91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i>	X	X	X			X		X	X	
H3130 Oligotrophic – mesotrophic standing waters	X		X	X			X		X	
H6150 Siliceous alpine and boreal grasslands			X	X		X	X		X	
H8220 Siliceous rocky slopes with chasmophytic vegetation			X	X	X	X	X		X	X
H8110 Siliceous scree of montane – snow levels	X	X	X	X	X	X	X		X	X
H6230 Species-rich <i>Nardus</i> Grassland			X	X	X					
S1393 Slender Green Feather-moss									X	

Note that there may be small areas of these interest features which are not picked up at the resolution of whole site surveys and are therefore not included in this table

Annex B: NVC Survey Information:

(Documents held by Natural England)

SSSI	Title	Author	Date	Notes
Armboth Fells SSSI	Armboth Fell Vegetation Condition Monitoring 2000	R. Jerram for North West Water	June 2000	NVC survey includes land owned by NWW, now United Utilities, on the east of the watershed
	Armboth Fells (west) SSSI, Survey of National Vegetation Classification Communities	R. Jerram	January 2003	NVC survey includes land owned by the National Trust on the west of the watershed
Birk Fell SSSI	NVC Survey of Birk Fell SSSI with assessment of areas for potential heath/woodland restoration	N. Dayton	February 2003	
Buttermere Fells SSSI	NVC Survey of Buttermere Fells SSSI with assessment of areas for potential restoration	K. Proctor, T. Rafferty and N. Dayton	February 2003	Survey did not include rope access so misses some features on steep ground; see later specialist surveys referenced in following tables.
Helvellyn and Fairfield SSSI	A survey of National Vegetation Classification Communities	R. Jerram	January 2003	See Buttermere Fells SSSI
Honister Crag SSSI	NVC survey of Honister Crag SSSI with assessment of areas for potential heath/woodland restoration.	N. Dayton	February 2003	Although the NVC classification in this report is broadly correct, the species list at Appendix 1 contains cut and paste errors and is not reliable. Survey did not include rope access so misses some features on steep ground; see later specialist surveys referenced in following tables.
Pillar and Ennerdale SSSI	A survey of National Vegetation Classification Communities	R. Jerram	January 2003	See Buttermere Fells SSSI
Scafell Pikes SSSI	NVC survey of Scafell SSSI with assessment of areas for potential restoration	K. Proctor, T. Rafferty and N. Dayton	February 2003	See Buttermere Fells SSSI
Shap Fells SSSI	NVC Survey of Shap Fells SSSI with assessment of areas for potential restoration	L. Brandon-Jones and N. Dayton	February 2003	
	NVC Mapping of Birkbeck Fells	Natural England	April 2015	Covers Birkbeck Fells part of the SSSI
Skiddaw Group SSSI	A survey of National Vegetation Classification Communities	R. Jerram	October 2003	
Wasdale Screes SSSI	Survey of SAC Feature Communities	R. Jerram	December 1997	This survey did not include rope access so misses some features on steep ground; see later specialist surveys referenced in following tables.

Annex C - Baseline survey data of Oligotrophic Lakes and Tarns

The baseline data for the macrophyte flora of this suite of tarns is recorded by Ralph Stokoe: (Stokoe, R. (1983), Aquatic Macrophytes in the Tarns and Lakes of Cumbria Freshwater Biological Association, Occasional Publication No 18 (See extract below). The most recent (at time of writing) and most comprehensive records for the waterbodies are recorded in the table below:

Parent SSSI	Waterbody name	Baseline data (Available on request from Natural England)
Armboth Fell	Dock Tarn	Brendon O'Hanrahan 2007
	Blea Tarn	Brendon O'Hanrahan 2007 Cumbria Tarns survey 7 August 2006
Buttermere Fells	Dalehead Tarn	Cumbria Tarns survey 9 August 2006
Helvellyn and Fairfield	Red Tarn	Natural England 2010 - Aquatic macrophyte, survey by snorkelling Cumbria Tarns survey July 2005
	Grisedale tarn	J Dunbavin 7/2005 Cumbria Tarns Survey National lakes survey 2007
Scafell Pikes	Sprinkling Tarn	Cumbria Tarns survey 17 July 2006
	Styhead Tarn	Cumbria Tarns survey 4 July 2006
	Sprinkling Crag Tarn	Cumbria Tarns survey 4 July 2006
Skiddaw Group	Scales Tarn	Natural England 10 December 2010 Condition monitoring report Cumbria Tarns survey 22 Oct 2005
	Bowscale Tarn	English Nature 8 July 1983 Cumbria Tarns survey 23 Sept 2004

Extract from Stokoe (1983) covering the suite of 10 tarns within the SAC

(Stokoe, R. (1983), Aquatic Macrophytes in the Tarns and Lakes of Cumbria, Freshwater Biological Association, Occasional Publication No 18)

Blea Tarn, Armboth, Surveys: 3/75; 8/78; 7/79	<i>Agrostis stolonifera</i> ; <i>Callitriche hamulata</i> ; <i>Carex</i> spp.; <i>Eleocharis palustris</i> ; <i>Equisetum fluviatile</i> ; <i>Fontinalis</i> spp; <i>Glyceria fluitans</i> ; <i>Isoetes lacustris</i> ; <i>Juncus articulatus</i> ; <i>Juncus bulbosus</i> ; <i>Juncus conglomeratus</i> , <i>Juncus effusus</i> ; <i>Littorella uniflora</i> ; <i>Lobelia dortmanna</i> ; <i>Menyanthes trifoliata</i> ; <i>Myriophyllum alterniflorum</i> ; <i>Nuphar lutea</i> ; <i>Potamogeton natans</i> , <i>Potamogeton polygonifolius</i> ; <i>Ranunculus fluitans</i> ; <i>Ranunculus hederaceus</i> , <i>Sparganium angustifolium</i> ; <i>Subularia aquatica</i>
Dock Tarn, Waterndlath, Surveys: 3/75; 7/76; 7/79	<i>Alisma plantago-aquatica</i> ; <i>Carex rostrata</i> ; <i>Eleocharis palustris</i> ; <i>Equisetum fluviatile</i> ; <i>Juncus acutiflorus</i> ; <i>Juncus articulatus</i> ; <i>Juncus bulbosus</i> var <i>fluitans</i> , <i>Juncus conglomeratus</i> ; <i>Littorella uniflora</i> ; <i>Lobelia dortmanna</i> ; <i>Menyanthes trifoliata</i> ; <i>Myriophyllum alterniflorum</i> ; <i>Nuphar lutea</i> ; <i>Nymphaea alba</i> ; <i>Phragmites australis</i> ; <i>Potamogeton natans</i> ; <i>Potamogeton polygonifolius</i> ; <i>Ranunculus fluitans</i> ; <i>Scirpus lacustris</i> ; <i>Sparganium angustifolium</i> ; <i>Subularia aquatica</i> ; <i>Utricularia minor</i>
Dalehead Tarn, Honister, Survey: 10/75	<i>Equisetum fluviatile</i> ; <i>Juncus bulbosus</i> ; <i>Littorella uniflora</i> ; <i>Lobelia dortmanna</i> ; <i>Menyanthes trifoliata</i> ; <i>Myriophyllum alterniflorum</i> ; <i>Potamogeton</i> spp; <i>Ranunculus flammula</i> ; <i>Utricularia</i> spp
Grisedale Tarn, Helvellyn Surveys: 5/76; 8/77	<i>Fontinalis antipyretica</i> ; <i>Fontinalis squamosa</i> ; <i>Isoetes lacustris</i> ; <i>Littorella uniflora</i> ; <i>Sparganium angustifolium</i>
Red Tarn, Helvellyn. Surveys: 9/75; 9/76	<i>Callitriche hamulata</i> ; <i>Callitriche platycarpa</i> ; <i>Fontinalis antipyretica</i> ; <i>Juncus bulbosus</i> ; <i>Montia fontana</i>
Sprinkling Crag Tarn, Great End. Surveys: 10/75; 5/76; 7/80	<i>Isoetes lacustris</i> ; <i>Juncus bulbosus</i> ; <i>Littorella uniflora</i> ; <i>Lobelia dortmanna</i> ; <i>Potamogeton polygonifolius</i>
Sprinkling Tarn, Great End Surveys: 10/75; 7/80	<i>Agrostis stolonifera</i> ; <i>Callitriche hamulata</i> ; <i>Fontinalis</i> spp; <i>Glyceria maxima</i> ; <i>Isoetes lacustris</i> ; <i>Juncus bulbosus</i> ; <i>Littorella uniflora</i> ; <i>Myriophyllum alterniflorum</i> ; <i>Potamogeton polygonifolius</i> ; <i>Ranunculus fluitans</i> ; <i>Sparganium angustifolium</i> ; <i>Subularia aquatica</i>
Styhead Tarn, Great Gable Surveys: 10/75;7/80	<i>Eleocharis palustris</i> ; <i>Juncus bulbosus</i> ; <i>Juncus effusus</i> ; <i>Myriophyllum alterniflorum</i> ; <i>Potamogeton natans</i> ; <i>Potamogeton polygonifolius</i> ; <i>Ranunculus fluitans</i> ; <i>Scirpus lacustris</i> ; <i>Sparganium angustifolium</i> ; <i>Subularia aquatica</i>
Bowscale Tarn Surveys: 9/75; 5/80	<i>Isoetes lacustris</i> , <i>Juncus effuses</i> , <i>Juncus bulbosus</i> (not var <i>fluitans</i>), <i>Littorella uniflora</i> , <i>Lobelia dortmanna</i>
Scales Tarn, Blencathra Survey 9/75	<i>Isoetes lacustris</i> , <i>Juncus bulbosus</i>

Annex D: List of Arctic Alpine Restoration programme surveys covering Lake District High Fells SAC (Held by Natural England)

Date	SSSI	Title/Description
1997	Helvellyn and Fairfield	Downy Willow
1997	Helvellyn and Fairfield	Helvellyn Coves Arctic Alpines
2004	Helvellyn and Fairfield	Helvellyn fixed point quadrats
2005	Helvellyn and Fairfield	Tarn & Falcon Crag, Helvellyn
2006	Pillar and Ennerdale	Ennerdale fixed point quadrats
2007	Helvellyn and Fairfield	Fairfield (Scrubby, link Cove, Hart Crag
2007	Helvellyn and Pillar	Alpine saw-wort, fixed points
2007	Helvellyn and Fairfield	Alpine mouse-ear , fixed points
2009	Buttermere Fells	Alpine catchfly
2009	Scafell Pikes	Skew Gill, Wasdale
2009	Wasdale Screes	Wasdale Screes
2010	Wasdale Screes	Mountain avens, Wasdale Screes
2010	Scafell Pikes	Piers Gill, Ruddy Gill & Greta Gill
2010	Skiddaw Group	Skiddaw Summit, fixed point repeats
2011	Scafell Pikes	Upper Eskdale- Cam spout etc
2012	Honister Crag	Honister Crag
2012	Helvellyn and Fairfield	Cawk Cove - Hutable Crag
2013	Pillar and Ennerdale	Wild Ennerdale Fixed point repeats
2013	Helvellyn, Buttermere, Scafell,	Alpine cinquefoil (Lake District)
2013	Helvellyn and Fairfield	Helvellyn fixed point quadrats (repeats)
2014	Pillar and Ennerdale	Pillar Coves & conifer removal
2014	Buttermere Fells	Forked Spleenwort and Serrated Wintergreen
2015	Buttermere Fells	Yew Crag Honister

Annex E: Statement on Habitat Dynamism for the Lake District High Fells SAC

The habitats within this SAC occur as a mosaic of related upland communities with a distribution shaped by soils, hydrology, climate and past and current management. Some habitats (for example springs and flushes, calcareous grassland, montane habitats, blanket bog and vegetation on rocky slopes) will always have quite a restricted distribution within the site – due primarily to specialised soils, hydrology and climate. Other habitats have a much broader potential distribution across the fellsides due to their being associated with more ubiquitous conditions – for example scree, heath, scrub and woodland and tall herb vegetation.¹

The impacts of past and current management are then overlain onto these natural constraints. In particular, grazing, burning or a combination of the two, has over the centuries, resulted in the reduction or fragmentation of many habitats.² The habitats most affected are often those closest to the successional climax, for example, woodlands and scrub and tall herb vegetation but other habitats are also fragmented in some areas.

The reduction of fragmentation of habitats is desirable to enable them to achieve their natural distribution and to maintain their structure and function as required by the Habitats Directive³ (Article 1(e)). According to accepted theories of island biogeography^{4,5}, species are more likely to survive in large habitat patches than in small ones, so the reduction of fragmentation will also improve the chances of long term survival of the typical species dependent upon those habitats as required by the Directive (Article 1(e) and (i))

In some cases this is best achieved through dynamic change of one successional stage to another, for example heath to scrub or woodland. Therefore an apparent loss of area of one habitat, when this 'loss' is caused by progression to a later successional stage is likely to be acceptable. Indeed, oak, juniper and mountain willows do not regenerate under the shade of their own canopies⁶ so must be allowed to regenerate within open habitats if they are to achieve one of their most basic ecological functions.

The ecological relationships between habitats also needs to be considered, for example, when there is scrub or woodland regeneration over heath, especially on thin soils and/or at high altitudes, the heath is often retained as the woodland ground flora.⁷ Although some characteristics of the heath (and some of the species it supports) will alter, this should be regarded as an addition of a structural layer to the habitat rather than as a loss of habitat - and overall biodiversity is likely to increase.⁸

The overall objective for the Lake District High Fells SAC is for a more natural distribution of habitats, all with natural processes functioning as necessary to ensure their long term survival. This necessarily means accepting that there must be some dynamic change between habitats. The maintenance of early successional habitats (which are primarily dry heath, calcareous grasslands and some of the springs and flushes) is covered in the Favourable Condition Tables for the individual SSSIs within the SAC. Within the Lake District High Fells this succession will be restricted and regulated by both natural constraints (soil, hydrology, climate, browsing) and by management intervention (grazing).

¹ For descriptions of the factors affecting the distribution of each habitat, see the 'Habitat' and Zonation and Succession' sections in the relevant chapters of British Plant Communities, Vols I-V (1991 -2000). Edited by JS Rodwell.

² Descriptions of the effects of management are also included in the 'Zonation and Succession' sections of the above.

³ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna

⁴ MacArthur RH and Wilson EO (1967). The Theory of Island Biogeography. Princeton University Press

⁵ Holt R, Lawton J, Polis G and Martinez N (1999). Trophic band and the species-area relationship. Ecology. 80: 1495-1504

⁶ Hill MO, Mountford JO, Roy DB, Bunce RGH (1999). Ellenberg's indicator values for British Plants. Centre for Ecology and Hydrology.

⁷ British Plant Communities, Vol I, e.g. W17 description

⁸ Tews J, Brose U, Grimm V, Tielborger K, Wichmann MC, Schwager M, Jeltsch F. Animal species diversity driven by habitat heterogeneity/diversity: the importance of keystone structures. Journal of Biogeography (2004). 31: 79-92.