GARRON PLATEAU SAC
UK0016606

CONSERVATION OBJECTIVES

Document Details

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Revision History:

Version	Date	Summary of Changes	Initials
V1.0	June 2013	Internal working document	PC
V2.0	Nov 2014	Complete review	RMK
V2.0	01.04.2015	Effective date of Version 2	PC
V2.1	12.10.2017	Removed wording '*excluding recently burnt areas*' from bare peat target in all relevant Annex tables	PMC

Site relationships

To fully understand the conservation requirements of this site, it is necessary to also refer to the Conservation Objectives for Antrim Hills SPA.

The Garron Plateau SAC boundary partially overlaps with the Antrim Hills SPA boundary.

1. INTRODUCTION

EU Member States have a clear responsibility under the Habitats and Birds Directives[1] to ensure that all habitats and species of Community Interest are maintained or restored to Favourable Conservation Status (FCS). Natura 2000 sites have a crucial role to play in achieving this overall objective since they are the most important core sites for these species and habitats. Each site must therefore be managed in a way that ensures it contributes as effectively as possible to helping the species and habitats for which it has been designated reach a favourable conservation status within the EU.

To ensure that each Natura 2000 site contributes fully to reaching this overall target of FCS, it is important to set clear conservation objectives for each individual site. These should define the desired state, within that particular site, of each of the species and habitat types for which the site was designated.

Once a site has been included in the Natura 2000 network, Member States are required to implement, on each site, the necessary conservation measures which correspond to the ecological requirements of the protected habitat types and species of Community Interest present, according to Article 6.1 of the Habitats Directive. They must also prevent any damaging activities that could significantly disturb those species and habitats (Article 6.2) and to protect the site from new potentially damaging plans and projects likely to have a significant effect on a Natura 2000 site (Article 6.3, 6.4).

Conservation measures can include both site-specific measures (i.e. management actions and/or management restrictions) and horizontal measures that apply to many Natura 2000 sites over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, Natura 2000 sites are usually underpinned by the designation of an Area of Special Scientific Interest (ASSI) under the Environment (NI) Order 2002 (as amended).

[1] 92/43/EEC and 2009/147/EC (codified version of Directive 79/409/EEC as amended)

2. ROLE OF CONSERVATION OBJECTIVES

Conservation Objectives have a role in

- Conservation Planning and Management – guide management of sites, to maintain or restore the habitats and species in favourable condition

- Assessing Plans and Projects, as required under Article 6(3) of the Habitats Directive - Habitats Regulations Assessments (HRA) are required to assess proposed plans and projects in light of the site's conservation objectives.

- Monitoring and Reporting – Provide the basis for assessing the condition of a feature, the factors that affect it and the actions required.

3. DEFINITION OF FAVOURABLE CONSERVATION STATUS

Favourable Conservation Status is defined in Articles 1(e) and 1(i) of the Habitats Directive:

The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined in Article 1(i).

For species, favourable conservation status is defined in Article 1(i) as when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and;
- there is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long term basis.

3.1 DEFINITION OF FAVOURABLE CONDITION

Favourable Condition is defined as "**the target condition for an interest feature in terms of the abundance, distribution and/or quality of that feature within the site**".

The standards for favourable condition (Common Standards) have been developed by JNCC and are applied throughout the UK. Achieving Favourable Condition on individual sites will make an important contribution to achieving Favourable Conservation Status across the Natura 2000 network.

4. SITE INFORMATION

COUNTY: ANTRIM

GRID REFERENCE: ID230187

AREA: 4650 ha

5. SUMMARY SITE DESCRIPTION

The Garron Plateau is a basaltic headland area undulating to a maximum height of 440 m but generally lying between 330 and 380 m with scarps to Glenariff Glen and the Antrim coast and a gentler descent inland. The Upper Basalts predominate with limited exposure of the Lower Basalts. Notable features include flow-banded porphyritic lava's at Trosk.

The blanket bog, which covers much of the plateau, is the largest intact bog in Northern Ireland. Peat depth is variable and consequently the peatland structure is highly diverse with hummock, lawn and pool complexes on the deepest peats grading into large expenses of blanketing peats on low gradients to heathland communities on the steepest and more exposed slopes. Several lakes, on site have characteristically nutrient poor waters with some conforming to EU 'Habitats Directive' Annex I types.

Elsewhere locally mineral enriched flushing provides the alkaline fens priority habitat, and in hollows on the wetter more level parts of the blanket bog, the influence of mineral rich water provides the transition mires and quaking bog systems that are also listed in Annex I. The bog is well known for rare plant species from various represented habitats, including the Annex II Marsh saxifrage *Saxifraga hirculus* from a linear flush.

Further details of the site are contained in the ASSI Citation and Views About Management statement, which are available on the NIEA website (www.doeni.gov.uk/niea).

5.1 BOUNDARY RATIONALE

The boundary was drawn to include all areas of intact peatland, which included all small areas of damaged peatland contained within the greater expanse of intact peatland. Acidic grassland and large areas of degraded peatland were generally excluded. However, about 35% of the site owned by Northern Ireland Water (formerly Water Service NI) in the south of the site, was at their request included within the boundary and encompassed areas not central to the site interest.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/extent/ population
Habitat	Active blanket bog	B	3274 ha
Habitat	Alkaline fen (upland)	B	estimated 5 ha
Species	Marsh saxifrage *Saxifraga hirculus* L	B	1 small colony
Habitat	Oligotrophic to mesotrophic standing water with vegetation belonging to *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*	C	at least 2 lakes*
Habitat	Northern Atlantic wet heath	C	372 ha
Habitat	Natural dystrophic lakes and pools	C	1>1ha lake, 4< 1 ha, numerous pools total est. 15.3 ha
Habitat	Transition mires and quaking bogs	C	Estimated 23 ha
Habitat	European dry heath	D	74.4 ha

*40.7 ha reported on the Natura 2000 form is probably an overestimate

Table 1. List of SAC selection features. Those with global status A-C will be referred to in ANNEX I.

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex I habitat. Sites have been graded A, B or C - in the UK these gradings have been interpreted as follows:

A - Sites holding outstanding examples of the habitat in a European context.

B - Sites holding excellent stands of the habitat, significantly above the threshold for SSSI/ASSI notification but of somewhat lower value than grade A sites.

C - Examples of the habitat which are of at least national interest (i.e. usually above the thresholdfor SSSI/ASSI notification on terrestrial sites) but not significantly above this. These habitats are not the primary reason for SACs being selected.

D - Habitat present but not of sufficient extent or quality to merit listing as SAC feature.

There is therefore a distinction between the principal features for which sites have been selected (those graded A or B) and those which are only of secondary interest (those graded C). This is a useful distinction but it is important to note that all three grades are qualifying SAC interest features.

Click here to go to the Natura 2000 Standard Data Form for Garron Plateau SAC.

6.1 ASSI SELECTION FEATURES

Garron Plateau ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Blanket Bog	3297 ha
Habitat	Fens	5 ha
Habitat	Oligotrophic Lakes	40.7 ha
Habitat	Wet Heath	372 ha
Habitat	Dystrophic Lakes	15.3 ha
Habitat	Dry Heath	74.4 ha
Habitat	Mesotrophic lakes	Several lakes
Species	Hen Harrier	
Species	Merlin	
Species	Marsh Saxifrage *Saxifraga hirculus* L	
Species	Invertebrate Assemblage	
Earth Science	Tertiary Igneous series – flow-banded porphyritic lava's at Trosk	

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The *Conservation Objective* for this site is:

To maintain (or restore where appropriate) the

- Active Blanket Bog
- Alkaline fen (upland)
- Marsh saxifrage *Saxifraga hirculus* L
- Oligotrophic to mesotrophic standing water with vegetation belonging to *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*
- Northern Atlantic wet heath
- Natural dystrophic lakes and pools
- Transition mires and quaking bogs

to favourable condition.

For each SAC feature, there are a number of component objectives which are outlined in the table below. These include a series of attributes, measures and targets which form the basis of *Condition Assessment*. The results of this will determine whether the feature is in favourable condition or not. The feature attributes and measures are found in the attached annex.

8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Global Status	Component Objectives
Active blanket bog	B	Maintain the extent of intact blanket bog and actively regenerating blanket bog vegetation.
		Maintain and enhance the quality of the blanket bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating blanket bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the blanket bog, especially where these exhibit natural transition to the blanket bog.
		Maintain the hydrology of the intact blanket bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be the potential for blanket bog rehabilitation.
Alkaline Fen (upland)	B	Identify the main areas of upland alkaline fen, describe and delineate them with more precision.
		Maintain the extent of existing alkaline fen.
		Maintain the diversity and quality of different alkaline fen habitat.
		Maintain and enhance fen species diversity including the presence of notable or rare species, within each type.
		Maintain the diversity and quality of associated habitats.
		Absence of erosion features associated with human impacts, and no exacerbation of natural erosion features.
Marsh saxifrage *Saxifraga hirculus*	B	Expand the existing population of Marsh Saxifrage *Saxifraga hirculus*.
		Seek nature conservation management over suitable areas within the SAC where there is possibility of restoring Marsh Saxifrage. (There is crossover here with the BAP for this species).

Oligotrophic to mesotrophic standing water with vegetation belonging to *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*	C	Open water area and water level regime to remain stable.
		The lake water to remain poor in plant nutrients and not to fluctuate outside normal limits.
		Characteristic aquatic vegetation to remain present.
		Minimal negative impacts from artificial structures.
		Minimal negative impacts from recreation.
Northern Atlantic wet heath with *Erica tetralix*.	C	Maintain the extent of existing Northern Atlantic wet heath vegetation.
		Maintain and enhance the quality of the existing wet heathland.
		Seek to expand the extent of the wet heath communities into degraded areas of species poor, wet acid grassland.
		Maintain the diversity and quality of other habitats of conservation interest, especially where these exhibit natural transition to the Northern Atlantic wet heath.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be the potential for wet heath rehabilitation.
Natural dystrophic lakes and pools	C	Maintain the open water area of ponds and lakes.
		Maintain the extent of pool complexes and the numbers of pools within.
		The lake water to remain poor in plant nutrients and not to fluctuate outside normal limits.
		Characteristic aquatic vegetation to remain present.
		Minimal negative impacts from artificial structures.
		Minimal negative impacts from recreation.

		Identify the main areas of transition mires and quaking bog and describe and delineate them with more precision.

Transition mires and quaking bogs	C	Identify the main areas of transition mires and quaking bog and describe and delineate them with more precision.
		Maintain the area of open transition mire vegetation.
		Maintain the integrity of the various plant communities that are typical in different situations where this feature occurs.
		Maintain the water table at or very close to the surface. Ground should be soft, bouncy & squelchy.
European dry heath.	D	Maintain the extent of existing European dry heath vegetation.
		Maintain and enhance the quality of the existing dry heathland.
		Seek to expand the extent of the dry heath communities into degraded areas of species poor, dry acid grassland.
		Maintain the diversity and quality of other habitats of conservation interest, especially where these exhibit natural transition to the European dry heath.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be the potential for dry heath rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Blanket Bog	See SAC Selection Feature Objective Requirements Table
Fens	See SAC Selection Feature Objective Requirements Table
Oligotrophic Lakes	See SAC Selection Feature Objective Requirements Table
Wet Heath	See SAC Selection Feature Objective Requirements Table
Dystrophic Lakes	See SAC Selection Feature Objective Requirements Table
Dry Heath	See SAC Selection Feature Objective Requirements Table
Mesotrophic Lakes	See SAC Selection Feature Objective Requirements Table
Hen Harrier	To be finalised
Merlin	To be finalised
Marsh Saxifrage *Saxifraga hirculus L*	See SAC Selection Feature Objective Requirements Table
Invertebrate Assemblage	To be finalised
Tertiary Igneous series	Maintain extent and quality of exposure, together with access to the feature subject to natural processes

10. MANAGEMENT CONSIDERATIONS

Ownership

In total over 100 owners/occupiers have been identified in the area as owners, or having grazing, turbary or sporting rights over various portions of the site. This complex pattern of ownership and grazing rights together with the added complication of turbary and shooting rights makes a unified approach to site management more difficult. Even within the Northern Ireland Water ownership, management is not straightforward.

11. MAIN THREATS, PRESSURES AND ACTIVITIES WITH IMPACTS ON THE SITE

Both on-site and off-site activities can potentially affect SAC/ASSI features. The list below is not exhaustive, but deals with the most likely factors that are either affecting Garron Plateau, or could affect it in the future. Although **Active blanket**

bog, Alkaline fen, Marsh Saxifrage, Oligotrophic to mesotrophic standing water with vegetation belonging to *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*, North Atlantic wet heath, Natural dystrophic lakes and pools and Transition mires and quaking bogs are the qualifying SAC features, factors affecting ASSI features are also considered

NOTE - Carrying out <u>any</u> of the Notifiable Operations listed in the ASSI schedule could affect the site.

Peat Cutting.

There has been extensive peat cutting around the periphery of the Garron Plateau SAC in the recent past. Peat cutting by any method is a particularly damaging activity, including extrusion cutting which far from sparing surface vegetation, has very profound effects upon its ecology and hydrology. Although peat extraction has almost ceased within the SAC, there are some localised areas where peat extraction by hand is continuing. There should be no peat cutting within the SAC.
ACTION: No peat cutting within the SAC.

Burning

Burning of the vegetation is evident in places right across the site, although whether this is an agricultural management practice or an incidental effect of turf cutting is often unknown. Excessive burning favours acid grasses, *Molinia caerulea* and *Trichophorum cespitosum* at the expense of dwarf shrubs and destroys mature communities of *Sphagnum* mosses and of lichens. Blanket bog and wet heath should not be burnt and dry heath should not be burnt more than once every 12-20 years, and not at all in areas where the gradient is > 25^{o} as this may result in erosion. If burning is practiced, it should only be carried out between late October and early March and preferably on days when the wind is light and the ground is frozen or damp. If it is too dry or too windy the fire will be too hot, if it is too wet, combustion will be poor and subsequent regeneration weak. Therefore burning of peatland should only be carried out under controlled conditions.
ACTION : No burning within the SAC

Drainage

Reclamation of peatland involves drainage, liming and fertilisation that will always damage a functioning peatland. Heathland is particularly vulnerable to reclamation; the obtrusive bright green rectangles of re-seeded grass are a common adjunct to heathland landscapes throughout the country. Many of the lakes on the plateau are very nutrient-poor and thus very vulnerable to nutrient accumulation. Without study of the movement of water through the peat, within the lake areas, it would be difficult to predict the lakes exact catchment, so fertilisation for reclamation could also lead to their eutrophication.
ACTION :- Ensure there is no further reclamation of the lowland or upland heaths or blanket bogs within the SAC. Where active drains do occur seek management agreements with landowners/managers to arrange for them to be blocked. A

concerted effort should also be made to block 'moor-grips' that are continuing to carry water from the blanket bog. Ensure that all existing dams are maintained. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.
ACTION: Block active drains where appropriate.

Grazing
Over wintered sheep exert the most pressure on a peatland as this is when vegetation growth is minimal and the forces of erosion, most effective. At the most damaging intensities this can lead to soil exposure by vegetation removal and trampling which in turn can instigate erosion. Sheep are selective grazers and a less dramatic form of damage, at lower grazing intensities, is the decline in dwarf shrubs. Summer grazing intensity should be set at an appropriate level.

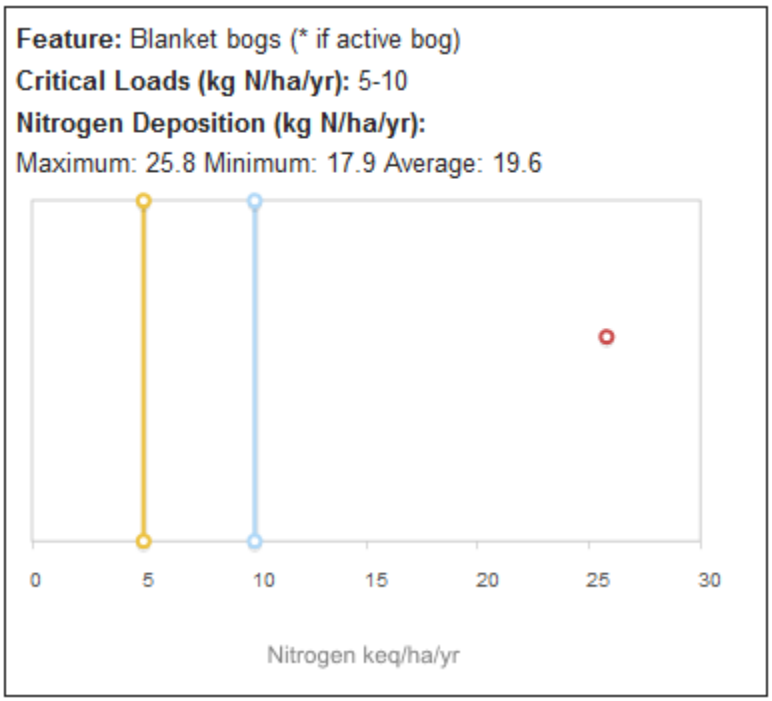
Ling heather (*Calluna vulgaris*) can tolerate the removal by grazing of 40% of the season's growth but heavier grazing begins to have more of an effect on the plant. Autumn grazing is potentially more damaging to heather and particular care should be taken to avoid autumn overgrazing. The commonage system tends to promote overstocking. Under-grazing, or the cessation of grazing, results in the prevalence of over-mature and degenerate Ling heather (*Calluna vulgaris*) (burning may then be a useful form of restorative management).
ACTION: Establish a sustainable stocking density within each management unit of the Garron Plateau SAC and ensure set grazing prescriptions are strictly adhered to. Continue careful monitoring of the blanket bog and heathland communities to establish if the set grazing prescriptions are allowing the peatland communities to recover towards favourable condition. Setting grazing levels are particularly important around the flush with the Marsh saxifrage, where it could be excluded by rank vegetation, or alternatively completely grazed out by sheep.

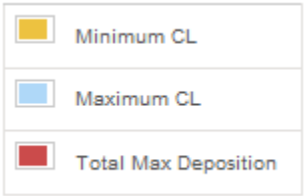
Supplementary stock feeding
Supplementary feeding causes localised overgrazing and poaching damage.
ACTION : Supplementary feeding should be avoided. If this not an option, it should be confined to less sensitive areas. Particularly avoid denuded sloping areas and pockets of deeper level peat which are vulnerable to counter wind and gully erosion.

Afforestation
Preparation for afforestation involves disturbing the surface by draining, ploughing, or mounding. Establishment of the trees involves fertilisation, pest control and often liming. A successfully established plantation will shade the peat surface and intercept airborne pollutants. Peatland subjected to forestry operations has little potential to recover after harvesting.
ACTION: There should be no further afforestation of peatland. Every effort should be made by Forest Service to ensure wind blown fertiliser and lime does not affect peatlands of conservation interest.

Nitrogen Deposition

Excess nitrogen deposition can favour the growth of competitive plants and lead to changes in ecosystem structure or function and to a reduction in biodiversity. National scale studies show the potential adverse effects of excess nitrogen on natural and semi-natural habitats to be widespread across the UK. Lower and upper critical loads have been calculated for Garron Plateau SAC.



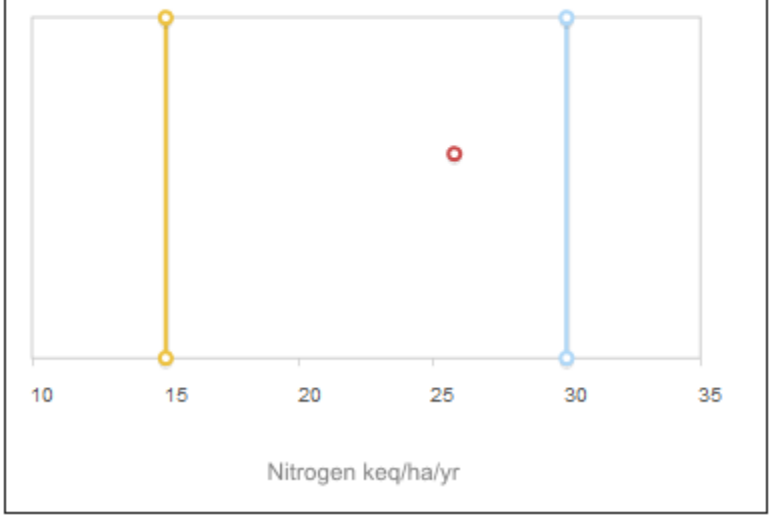


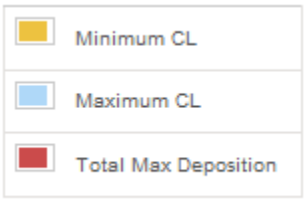
Feature: Alkaline fens

Critical Loads (kg N/ha/yr): 15-30

Nitrogen Deposition (kg N/ha/yr):

Maximum: 25.8 Minimum: 17.9 Average: 19.6



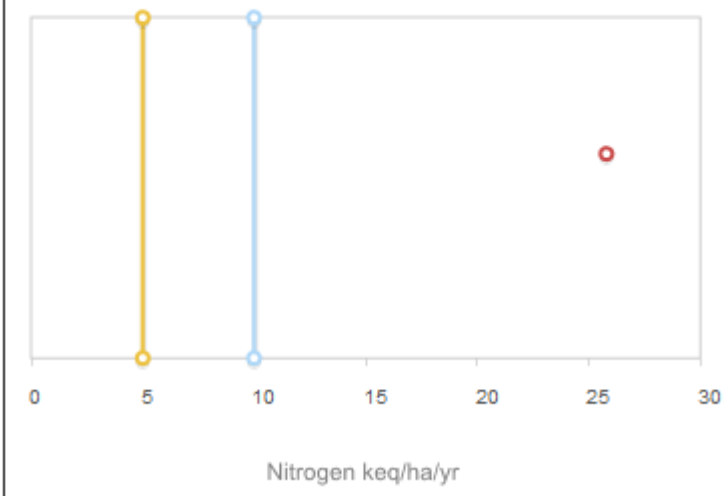


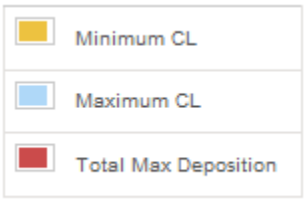
Feature: Saxifraga hirculus - Marsh saxifrage

Critical Loads (kg N/ha/yr): 5-10

Nitrogen Deposition (kg N/ha/yr):

Maximum: 25.8 Minimum: 17.9 Average: 19.6



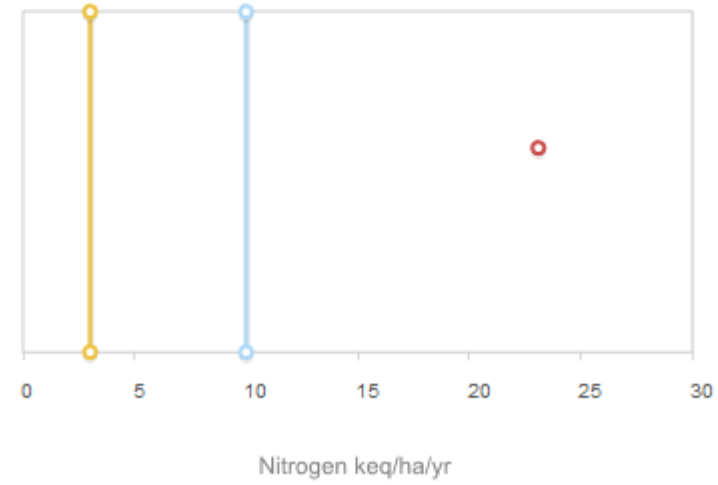


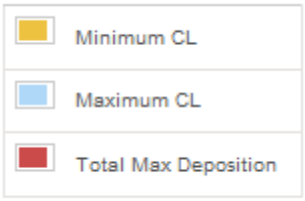
Feature: Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

Critical Loads (kg N/ha/yr): 3-10

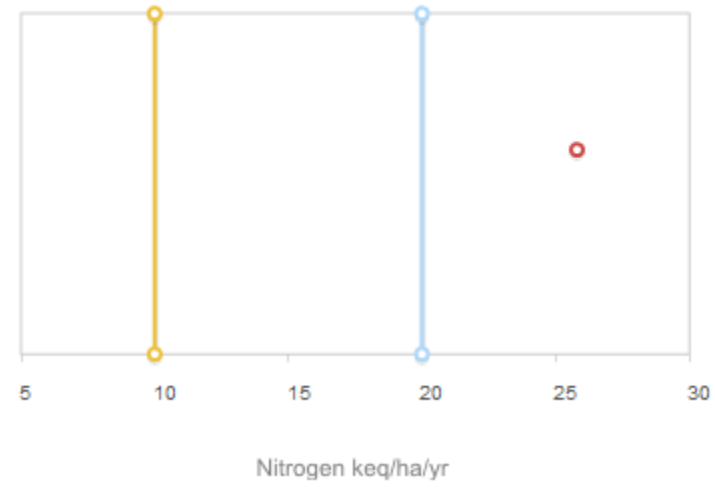
Nitrogen Deposition (kg N/ha/yr):

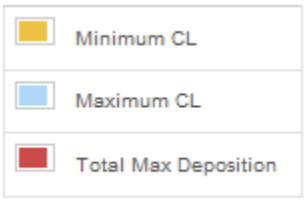
Maximum: 23.1 Minimum: 14 Average: 18.8



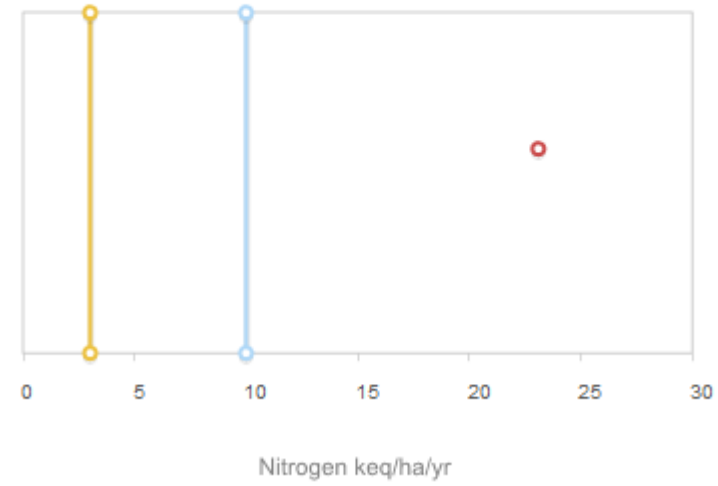


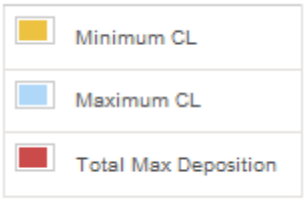
Feature: Northern Atlantic wet heaths with Erica tetralix
Critical Loads (kg N/ha/yr): 10-20
Nitrogen Deposition (kg N/ha/yr):
Maximum: 25.8 Minimum: 17.9 Average: 19.6





Feature: Natural dystrophic lakes and ponds
Critical Loads (kg N/ha/yr): 3-10
Nitrogen Deposition (kg N/ha/yr):
Maximum: 23.1 Minimum: 14 Average: 18.8



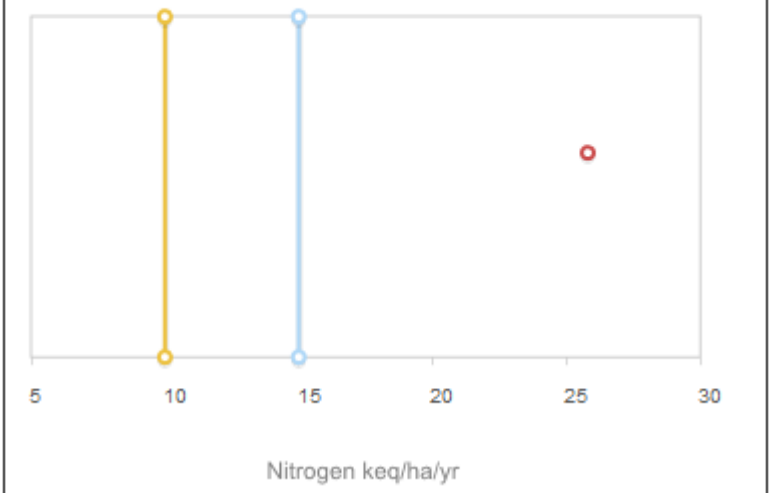


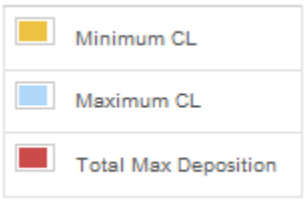
Feature: Transition mires and quaking bogs

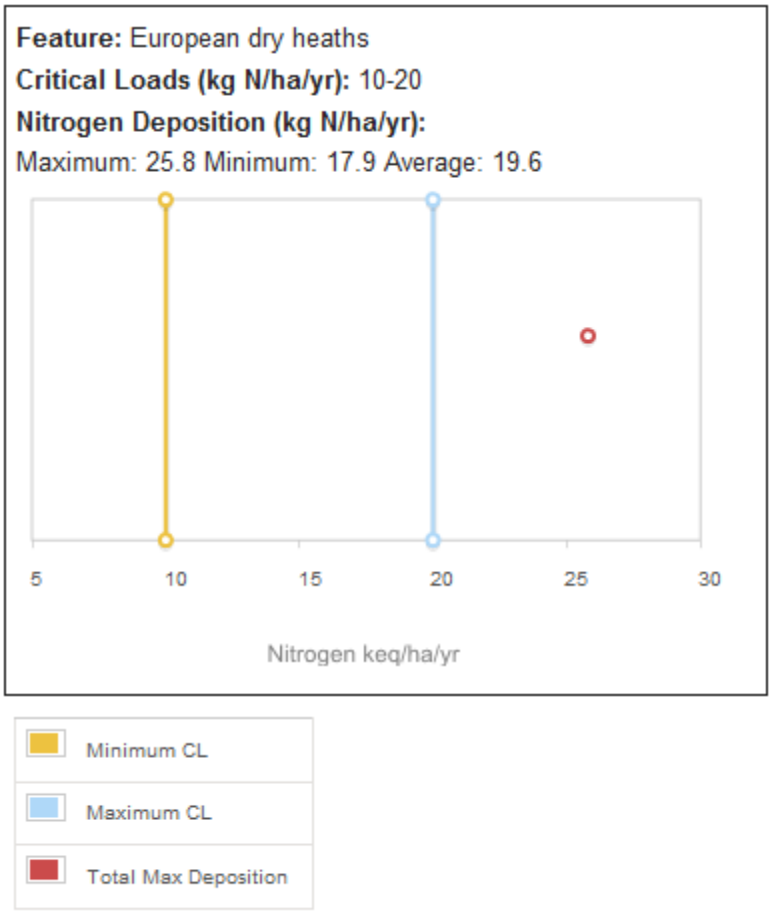
Critical Loads (kg N/ha/yr): 10-15

Nitrogen Deposition (kg N/ha/yr):

Maximum: 25.8 Minimum: 17.9 Average: 19.6







(Source: Air Pollution Information System (APIS) website- www.apis.ac.uk)

ACTION: Seek to maintain or where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant critical load.

Damaging recreational activities

Four-wheeled drive vehicles can cause localised vegetation loss, which may cause significant erosion, particularly on sloping areas. Increasing walking activity may have some detrimental affect on the heathland and blanket bog communities through path erosion. Ideally, a sustainable level of recreational activity should be established to ensure there is no adverse affect on the upland vegetation communities.

ACTION: Restricting the use of four-wheeled drive vehicles is of paramount importance. Also, ensure all steps are taken to minimise the impact of hill walking throughout the Garron Plateau SAC by promoting all recreational activities into areas that are not highly sensitive to disturbance.

Fly-tipping

Disposal of aluminium-based flocculent sludge (gibbsite) from Northern Ireland Water reservoir operations, although not containing plant nutrients in a significant quantity, can cause habitat loss or stress at the spread site. The sludge contaminants, such as labile aluminium, can accumulate in aquatic systems

which can threaten aquatic life especially at a low pH when the concentrations can reach toxic levels.
ACTION: The long term objective must be to halt this spreading of sludge onto the peatland communities adjacent to tracks within Northern Ireland Water land ownership. Negotiations with Northern Ireland Water should be initiated to decide on a suitable alternative method of sludge disposal.

Changes to surrounding land use
Any changes in local land-use e.g. drainage, road improvements, afforestation, agricultural intensification and development, may be detrimental to the SAC.
Action: Reduce the risk of surrounding agricultural intensification by encouraging the adjacent owner/occupiers to enter into agri-environment schemes. Use Habitats Regulations Assessments (HRAs), through the planning process, to minimise any development risks adjacent to the SAC.

Climate Change
Northern Ireland faces changes to its climate over the next century. Indications are that we will face hotter, drier summers, warmer winters and more frequent extreme weather events.
ACTION: When developing SAC management plans, the likely future impacts of climate change should be considered and appropriate changes made.

12. MONITORING

Monitoring of SACs takes place on using two monitoring techniques.

Site Integrity Monitoring (SIM) is carried out to ensure compliance with the ASSI/ SAC Schedule. The most likely processes of change will either be picked up by SIM (e.g. dumping, burning, turf cutting, grazing etc.) or will be comparatively slow (e.g. gradual degradation of the bog and associated habitats through desiccation).

These longer-term changes will be picked up by monitoring of the feature via **Site Condition Assessment** - this is carried out on a rolling basis to pick up subtle changes in the condition of the feature.

The method for Site Condition Assessment was agreed by the relevant JNCC-led Lead Co-ordination Network although the methodology has been modified to reflect individual site attributes in Northern Ireland.

12.1 MONITORING SUMMARY

1. *Monitor the integrity of the site (SIM or Compliance Monitoring)*
Complete boundary survey to ensure the fencing is still intact. Ensure there has been no moor gripping or other drainage activities, signs of excessive erosion,

evidence of inappropriate grazing or burning, or unauthorised peat cutting, carried out within the SAC boundary. This SIM should be carried out once a year.

2. Monitor the condition of the site (Condition Assessment)

Monitor the key attributes for each of the SAC selection features. This will detect if the features are in favourable condition or not. See Annex I.

The favourable condition table provided in Annex 1 is intended to supplement the conservation objectives only in relation to management of established and ongoing activities and future reporting requirements on monitoring condition of the site and its features. It does not by itself provide a comprehensive basis on which to assess plans and projects, but it does provide a basis to inform the scope and nature of any Habitats Regulations Assessment (HRA) that may be needed. It should be noted that completion of a HRA is a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

13. REFERENCES

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Feature 1 (SAC) – Active blanket bog (Status B)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Targets	Method of Assessment	Comments
Extent			
* Area of blanket bog and upland raised mire (ha)	Maintain the extent of the intact bog surface (at 3274 ha where known).	Visual estimate in 2x2 m plots and across the blanket bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	The blanket bog communities include M17 – *Scirpus cespitosus Eriophorum vaginatum* blanket mire, M18 – *Sphagnum papillosum* raised and blanket mire and M19 *Calluna vulgaris - Eriophorum vaginatum* blanket mire.
* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats (wet heath, dry heath, upland fen, etc)	Visual estimate across the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Repeat monitoring using condition assessment, SIM, and aerial photographs should indicate whether mosaics and associated habitats have changed or been lost.
Structure			
* Pool/hummock system extent and complexity	The extent and complexity of pool and hummock systems at least maintained. Differentiation of *Sphagnum* species should be recorded with *S. cuspidatum* or *S. auriculatum* in the pools and *S. papillosum* and *S. capillifolium* forming the lawns and hummocks.	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and SIM.	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and Condition Assessment. Within Garron Plateau SAC, there are number of complex pool systems

Dwarf-shrub Height (cm)	Average ericoid height should be 15 –30 cm.	Visual estimate in 2x2 m plots.	On some areas of blanket bog, the dwarf-shrub height will largely reflect recent management patterns. However, on largely undisturbed sites with minimal or no grazing, dwarf shrubs should display no apparent growth forms with a fairly uniform height between 15 – 30cm.
* Bare Peat, or ground covered by algal mats (%)	Bare peat etc should occupy less than 2% of the intact blanket bog surface overall.	Visual estimate in 2x2 m plots.	Bare peat, or bare ground carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of peat cutting or excessive burning and/or grazing. Bare ground here represents bare peat etc. within the blanket bog vegetation rather than naturally eroded surfaces where bare ground forms a natural part of the erosion feature.
Vegetation Composition – Positive Indicators			
**Sphagnum* Cover/Abundance (% cover and frequency)	*Sphagnum* moss species should have a minimum cover of 25% over at least 66% of the intact lowland raised bog surface.	Visual estimate in 2x2 m plots.	A constant *Sphagnum* moss cover is indicative of active peat formation and is dependent on the maintenance of a high water table. *Sphagnum* moss is therefore used to measure the hydrological integrity of the blanket bog surface.

Active Peat Formation (DAFOR)	Thick, hummock forming species of sphagnum should be at least occasional.		
* Ericaceous Cover (%)	Ericoid cover Frequent over the surface of the intact blanket bog. Dwarf-shrub cover greater than 33%. Less than 33% is only acceptable in wetter areas where *Narthecium ossifragum* or *Sphagnum* spp. are abundant and forming lawns.	Visual estimate in 2x2 m plots.	Ericoid (dwarf-shrub species) include *Calluna vulgaris*, *Erica tetralix*, *E. cinerea*, *Myrica gale*, *Vaccinium myrtillis and Empetrum nigrum*.
* Ericoid diversity (DAFOR)	At least two species of dwarf-shrub should be Widespread and Frequent. Where three or more species are present, but only one Frequent and Widespread, the abundance of the less abundant species may be combined and treated as if they are a single species.	Visual estimate in 2x2 m plots.	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – ie the water table is too low beneath the surface of the bog.
Vegetation Composition – Indicators of negative Change			
* Scrub/tree encroachment on any active peat surface (DAFOR)	Scrub/tree encroachment should be no more than Rare on the intact bog surface, or in the actively regenerating cutover areas.	Visual estimate in 2x2 m plots.	Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Invasive exotic species such as *Rhododendron ponticum* should be removed immediately.
* Erosion Features associated with human impacts	No gully erosion or bare peat associated with more concentrated human impacts (eg drainage, peat extraction, ATV tracks or recreational activities). Man	Visual estimate in 2x2 m plots.	The extent of man induced erosion should be monitored using a combination of aerial photographs and Condition Assessment. Erosion is a natural feature

(% and DAFOR)	induced/enhanced erosion should occupy less than 2% of the total area of blanket bog other than very localised instances.		of blanket bog, particularly marginal fretting on breaks of slope. However, where natural erosion is exacerbated by human activity, the bog will not be in favourable condition, except where such erosion is very limited in nature.
* Graminoid Cover (%)	Total cover of graminoids should not exceed 50%, unless dominated by *Molinia caerulea* forming even swards over waterlogged areas with *Sphagnum* moss cover greater than 25%.	Visual estimate in 2x2 m plots.	Include true grasses, sedges, and rushes in this assessment. *Eriophorum vaginatum*, *Trichophorum cespitosum*, *Deschampsia flexuosa*, *Juncus squarrosus* or other graminoids (except *Molinia* in some instances) should not dominate over other species.
* Management - Peat extraction	No evidence of unconsented active peat extraction.	Visual estimate in 2x2 m plots and across the blanket bog using a combination of aerial photographs, SIM and Condition Assessment structured walk..	In some instances areas of cut peat can re-vegetate with good blanket bog vegetation which meets the attributes for favourable condition.
* Management - Grazing (%)	Signs of moderate or heavy grazing by cattle or sheep should occupy less than 5% of the blanket bog vegetation within any grazing unit.	Visual estimate in 2x2 m plots.	The frequency of droppings, the extent of poaching and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.
Indicators of Local Distinctiveness			
Molinia caerulea Cover (%)	Where *Molinia caerulea* cover is greater than 50%, it should form an even (not tussocky) sward in waterlogged conditions	Visual estimate in 2x2 m plots.	*Molinia caerulea* only occurs as a natural component of the bog vegetation in the extreme west of Northern Ireland where

	with *Sphagnum* moss cover greater than 25%.		the climate is generally warmer and wetter ie more oceanic.
Presence of rare or scarce species specific to the site.	*Sphagnum imbricatum* and *Sphagnum fuscum*, where they have been recorded, should remain at least present along the length of each of the w-walks.	Visual estimate in 2x2 m plots.	If these species are not recorded on any one visit, it does not automatically make the SAC unfavourable.

Feature 2 (SAC) – Alkaline fen (upland) (Status B)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Targets	Method of Assessment	Comments
Extent			
* Area of Fen	Maintain the extent of fen (at 5 ha).	Visual estimate in 2x2m plots and across the extent of the fen should be monitored using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Variety within fens is determined by water supply mechanism, hydroseral succession and land management practices. Account should be taken of successional processes and management aims/priorities.
* Mire community diversity	Maintain presence of fen communities *M10* as established at base line survey.	Visual estimate in 2x2m plots.	Natural succession may lead to an increase in the area of certain communities and a decrease in others. The most likely changes are subtle shifts in species composition as a result of eutrophication or water-level changes. Repeat monitoring of plots using GPS should indicate whether fen communities have changed or been lost.
Presence of associated semi-natural habitats	Maintain existing associated semi-natural habitats (blanket bog, wet heath, dry heath etc.)	Visual estimate in 2x2m plots and across the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Repeat monitoring of plots using GPS should indicate whether mosaics and associated habitats have changed or been lost. Note: Loss of associated habitats to fen communities may be desirable in some instances.

Vegetation structure			
Vegetation height (cm)	Mean vegetation height of short calcareous and alkaline fen should be 5 – 15 cm.	Visual estimate in 2x2 m plots.	Note some short calcareous and alkaline fen communities, such as M9, may be marginally taller than 15 cm, but these can be set with more precision after the baseline survey.
* Cover of litter/thatch accumulation (% cover)	Less than 25% mean cover. Lower thresholds may be appropriate for short calcareous and alkaline fen.	Visual estimate in 2x2m plots.	More than 25% litter cover indicates insufficient removal of biomass by grazing. In short fen communities such as M9, M10, a lower threshold for thatch should be set - perhaps 10% (to be determined).
* Extent of bare mud visible without disturbing the vegetation (% cover)	Less than 10% mean cover.	Visual estimate in 2x2m plots.	A high cover of exposed substrate will usually be undesirable and may indicate over-grazing and water scour. Patches of exposed substrate are likely to be more typical/desirable for short fen communities such as M10 which is often based on unconsolidated peat exposed beneath a water film.
Vegetation composition – Positive Indicators			
* Combined cover of key indicator species as listed below. (Short calcareous and alkaline fen only)	At least 75% of the vegetation cover should be made up of key indicator species.	Visual estimate in 2x2m plots.	This is only applicable to short calcareous and alkaline fen.
* Frequency of positive indicators for calcareous and alkaline fen (DAFOR	At least six indicator species at least occasional, of which three are at least frequent	Visual estimate in 2x2m plots.	The suite of key communities to be monitored is chosen on a site specific basis.

scale) *Anagallis tenella, Briza media, Carex dioica, C. flacca, C. hostiana, C. panicea, C. pulicaris, , C. viridula, Equisetum palustre, Juncus articulatus, Linum catharticum, Parnassia palustris, Pingiucula vulgaris, Selaginella selaginoides, Triglochin palustre, Euphrasia spp., Orchid spp., Pedicularis spp., Succisa pratensis.*	throughout the sward:		
Vegetation composition – Indicators of Negative Change			
* Frequency and % cover of scrub/tree encroachment on the fen communities (DAFOR and % cover).	Scrub/tree encroachment including *Betula*, *Salix*, *Rhododendron* etc. should be no more than occasional over the fen communities. Mean cover should be less than 10 %.	Visual estimate within a 10x10 m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Scrub and woodland are integral components of many fen systems and may be particularly important for invertebrates. However, invasion by woody species, primarily Betula and Salix, and their development to maturity may indicate drying out, dereliction, disturbance and/or enrichment.

* Frequency and % cover of negative indicator species- eutrophication indicators: *Phalaris arundinacea, Glyceria maxima, Typha latifolia, Epilobium hirsutum, Urtica dioica.*	No one negative indicator species more than rare throughout the fen and/or singly or together comprising more than 5% cover.	Visual estimate in 2x2m plots.	
* Frequency and % cover of negative species – indicating lack of management/ successional changes: *Filipendula ulmaria, Phragmites australis.*	No one negative indicator species more than occasional throughout the fen and/or singly or together comprising more than 10 % cover.	Visual estimate in 2x2m plots.	
* % cover of *Juncus* spp in Group A and B Group A: jointed rushes (*Juncus acut/arti/subnod*) Group B: *J. conglomeratus, J. effusus and J. inflexus.*	All species combined less than 20% cover and less than 5% made up of species from Group B.	Visual estimate in 2x2m plots.	
* Cover of grasses (excludes *Phalaris* and *Phragmites*, but includes the rank grasses) *Arrhenatherum elatius, Deschampsia cespitosum, Brachypodium sylvaticum.*	All grass species combined less than 20% cover and less than 10% made up of rank grasses.	Visual estimate in 2x2m plots.	

Fen hydrology			
* Groundwater elevation	'Ground soft, bouncy and squelchy'.		In upland alkaline fens, the ground will be squelchy, but because the rock surface is generally just below the surface of the fen, it will not be soft and bouncy.

Feature 3 (SAC) – Marsh saxifrage *Saxifraga hirculus* L. (Status B)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Measure	Target/Limit	Comments
Population	Vegetative count of rametes	>500 (individual shoots or rosettes)	130 rametes were recorded in 1999.
Population	Visual assessment of population fitness	Frequent flowers and capsules	In 1996 3 flowers were recorded. Flowering tends to be rare when swards are grazed. Although the plant reproduces vegetatively, flowering and the setting of fertile seed is essential to the long-term population viability.
Sward Structure: Height	Visual assessment	5-25cm	Heavy grazing can be tolerated for short periods, but lack of flowering and physical damage to vegetation by livestock may lead to population and/or genetic attrition.
Sward Structure: Open flushes	Visual assessment	Requires open calcareous flushes and rills.	
Hydrology		No modification to the natural hydrological pattern is acceptable.	
Shade	Visual assessment	Trees and shrubs should be absent	

Feature 4 (SAC) Oligotrophic to mesotrophic standing water with vegetation belonging to *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* (Status C)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Measure	Target	Comment
Extent	Assessment against baseline map. Aerial photographs may be used.	No loss of extent of standing water	
Composition of macrophyte community	Characteristic species composition	No loss of characteristic species present at the site	This type of water body occurs in the majority of Member States and is abundant in the more mountainous areas of Europe. In the UK this freshwater habitat type is largely confined to the mountainous regions of the north and west and is characterised by two intergrading types: oligotrophic and mesotrophic waters. The vegetation community is characterised by amphibious short perennial vegetation, with shoreweed *Littorella uniflora* being considered a defining component. There are two distinct community types, one extremely oligotrophic with the presence of *Subularia aquatica* as the main associate, with *Littorella uniflora* and *Isoetes lacustris*. *Myriophyllum alterniflorum, Lobelia dortmanna* and *Sparganium angustifolium* occur as associates. The other community has a clinal range of species as the trophic state increases. These richer trophic states cannot support *Subularia*

			aquatica but the presence of some or all of *Nuphar lutea, Persicaria amphibia, Sparganium minimum, Potamogeton perfoliatus, P obtusifolius* is indicative of an increased trophic state. (N.B. *Subularia* may be naturally absent from some regional areas.) Two nationally scarce plants *Luronium natans* and *Pilularia globulifera* occur at the interface between oligotrophic and mesotrophic water types. **As this interest feature covers a wide range of trophic states it is essential to establish which community type represents the feature for the site in question.** The presence of high cover of *Sphagnum* species and/or *Juncus bulbosus* var. *fluitans* above 40% level for oligotrophic waters and *Myriophyllum* or *Elodea canadensis* above 40% level or presence of *Elodea nuttallii* for mesotrophic waters is indicative of a site in unfavourable condition.
	Non-native plants	Non-native species should be absent or present at low frequency. No introductions of non-native species	e.g. Presence of *Crassula helmsii* is indicative of a site moving out of favourable condition; dominance of *C. helmsii* is indicative of a site in unfavourable condition.
*Macrophyte community structure	Distribution Extent Structure	Characteristic zones of vegetation should be present Maintain at least the present maximum depth distribution of *Isoetes*	Characteristic zonation with increasing depth should be: *Littorella,* then overlapping zones of *Littorella* with *Lobelia,* then *Isoetes* ***L. uniflora*** **and** ***L. dortmanna*** **dominant in depths <1.5 m;** ***Isoetes*** **dominant > 1.5 m.** ***Isoetes*** **has been recorded in Waste Water at depths of 7 m. It is very sensitive to wave action, setting a shallow depth limit particularly in exposed sites.**

		Maintain at least the present community structure	
*Water quality	Water Chemistry	Maintain oligotrophic/mesotrophic conditions The pH/ANC, and nutrient levels (P and N) should be stable and appropriate for the interest feature	As a guide Stable nutrient levels: TP target/limit: Oligotrophic = 10 $\mu g\ L^{-1}$ Stable nutrient levels: TP target/limit: Mesotrophic = 10 $\mu g\ L^{-1}$ Stable pH values: pH – 5.5 to circumneutral Adequate dissolved O_2 (>5 $\mu g\ L^{-1}$) There is a wide clinal range of community types embraced in this feature. Water quality targets should be set for individual SACs and an acceptable range established. The acceptable range of chemical conditions (especially total P, other forms of phosphorus, pH/ANC, and where appropriate NO_3-N,) should be set for individual SACs from recent or historical water chemistry data Check for changes in catchment land-use in the catchment causing diffuse pollution and/or siltation and check point sources of pollution. Aerially applied agro-chemicals have a high potential to change plant communities, and move them out of favourable condition. Other methodologies involving trophic scoring can contribute to the assessment of favourable condition. There is a need to develop a UK-wide lake environment monitoring protocol, which includes biology, water chemistry, nutrients, aesthetic

			conditions and toxic substances.
Hydrology	Hydrological regime	No deterioration in hydrological regime compared to the baseline.	Natural flushing rate and seasonal pattern of fluctuation need to be considered. Maintain flushing rate of system. 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. *L. uniflora* can tolerate extreme inter-annual fluctuations in water level and long periods of exposure. *L. dortmanna* is tolerant of short periods of exposure but intolerant of desiccation.
Lake substrate character	Shore line and substrate	Maintain the natural shoreline of the lake. Substrate should be natural and	Substrate is typically sand, gravel, stones and boulders with low organic content but sometimes locally high peat content. Sediment quality and quantity when enriched can cause excessive growths of *Juncus bulbosus* var. *fluitans* or growths of algae.

		characteristic of lake type.	
Sediment load	Sediment load	Minimal	Increases in siltation could result from increased lake productivity, changes in catchment land-use (particularly over-grazing), lake level fluctuations, climatic fluctuations or changes in sewage treatment.

Aspects of environmental disturbance to be noted as an accompaniment to assessing favourable condition

Objective	Specified assessment method (if appropriate)	Comment
Minimal negative impact from artificial structures Minimal negative impact from recreation Direct application of lime to the water column as an acidification amelioration strategy should not be carried out No impacts from fish farming Catchment area changes affecting the lake, such as flood defences and infrastructure schemes should be considered.		Artificial structures could include boat-mooring facilities, dams, fish reefs. Negative impacts from recreational activities can include enrichment caused by ground baiting, introduction of bottom feeding fish and other organisms not characteristic of the habitat, increased disturbance to SACs from water-sports. Efforts should be directed towards reducing atmospheric emissions and implementing catchment management strategies, especially in relation to coniferous forestry.

Feature 5 - Northern Atlantic wet heath (Status C)

(* = Primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Targets	Method of Assessment	Comments
Extent			
* Area of wet heath	Maintain the extent of wet heath estimated 372 ha.	Visual estimate in 2x2 m plots and across the wet heath using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of wet heath, or fragmentation of this habitat is unacceptable. Note that it may be possible to extend wet heath communities, provided this is into degraded areas and does not encroach into other habitats of scientific interest.
* Heath community diversity	Maintain the presence of the wet heath community M15 as established at base line survey.	Visual estimate in 2x2 m plots.	Repeat monitoring of plots using GPS should indicate whether wet heath communities have changed or been lost.
* Area of mosaic communities and associated semi-natural habitats	Maintain associated mosaic communities and semi-natural habitats (dry heath, blanket bog, alkaline fen etc)	Visual estimate in 2x2 m plots and across the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Repeat monitoring of plots using GPS should indicate whether mosaics and associated habitats have changed or been lost.
Vegetation Structure			
Dwarf-shrub height	Average ericoid height should be 15 – 35 cm with at least 25% of the wet heath in the late mature/degenerate	Visual estimate in 2x2 m plots.	On some areas of wet heath (especially on gentle slopes), the ericoid age structure will largely reflect recent burning patterns. However, in wet heath, burning should only be

	growth phase (greater than 35 cm).		carried out in exceptional circumstances. Heather height reflects the age structure of the Heather.
* Bare Peat, or ground covered by algal mats (% cover)	Bare peat etc. should occupy less than 2% of the wet heath surface overall.	Visual estimate in 2x2 m plots.	Bare peat or peat carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of excessive burning and/or grazing. Bare peat here represents bare peat etc. within the wet heath vegetation.
Vegetation Composition – Positive Indicators			
* Ericaceous cover (% cover)	Dwarf-shrub cover should be maintained between 50 – 75%	Visual estimate in 2x2 m plots.	Although dominated by dwarf shrubs, the sward should be composed of a variety of higher plants and bryophytes.
* Ericoid diversity	At least two species of dwarf-shrub at least present in 90% of plots.	Visual estimate in 2x2 m plots.	Ericoid (dwarf-shrub species) include *Calluna vulgaris*, *Erica tetralix*, *Empetrum nigrum* and *Myrica gale*.
* Cover of graminoids (% cover)	Total graminoid cover should be less than 50%.	Visual estimate in 2x2 m plots.	Include true grasses, sedges, and rushes in this assessment. *Molionia caerulea, Trichophorum cespitosum, Deschampsia flexuosa*, *Juncus squarrosus* or other graminoids should not dominate over other species. Localised *Schoenus nigricans* flushes should not be included in this habitat assessment.
* Bryophyte cover and frequency of *Sphagnum* mosses.	Mean bryophyte cover (excluding *Polytrichum* spp. and *Campylopus* spp. on bare	Visual estimate in 2x2 m plots.	Bryophytes should include a range of pleurocarpus species forming patches below, or in more open swards beneath the dwarf-

(% cover and DAFOR)	ground) should be at least 25%. *Sphagnum* moss species should be at least Frequent throughout the moss layer.		shrubs as well as *Sphagnum* moss species.
Vegetation Composition – Indicators of Negative Change			
* Frequency and % cover of scrub/tree encroachment on wet heath communities. (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare over the wet heath community. Mean cover should be less than 2%.	Visual estimate within a 10x10 m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Invasive exotic species such as *Rhododendron ponticum* should be removed immediately.
* Frequency and cover of undesirable agricultural grasses and weeds (DAFOR and % cover)	None of the following should be more than rare: *Cirsium arvense, C. vulgare, Senecio jacobaea, Urtica dioica, Plantago major, Phleum pratense, Trifolium repens, Holcus lanatus* and *Lolium perenne*. Combined mean cover of agricultural grasses and weeds less than 1%.	Visual estimate in 2x2 m plot.	

* Management - Grazing (% cover)	Signs of moderate or heavy grazing should occupy less than 5% of the wet heath vegetation.	Visual estimate in 2x2 m plots.	The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs and invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing.
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the wet heath vegetation.	Visual estimate in 2x2 m plots and across the feature using a combination of aerial photographs, SIM and Condition Assessment structured walk.	
Frequency and cover of Erosion Features associated with human impacts (DAFOR and % cover)	No gully erosion, bare peat or rock associated with more concentrated human impacts (ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of wet heath other than very localised instances.	Visual estimate in 2x2 m plots.	The extent of man induced erosion should be monitored using a combination of aerial photographs and Condition Assessment. Erosion is a natural feature of high mountain slopes. However, where natural erosion is exacerbated by human activity, mainly hill walking, the heath will not be in favourable condition, except where such erosion is very limited in nature.
Indicators of Local distinctiveness			
None recorded for wet heath on the Garron Plateau to date.			

Feature 6 (SAC) – Natural dystrophic lakes and pools (Status C)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Measure	Target	Comment
Extent	Assessment against baseline map. Aerial photographs may be used.	No loss of extent of standing water	This attribute is to assess changes caused by active management, such as infilling or channel diversion. Changes due to drying out or successional change are covered under other attributes.
***Composition of macrophyte community**	Characteristic species composition	i). No loss of characteristic species present at the site (see Box 5)	In the UK dystrophic lakes are widespread in the north west and scarce in the south. These systems most often occur on blanket bog and may include isolated seasonal pools, random collections of irregularly shaped waters and ordered linear or concentric arrays of pools and small lochs. Dystrophic pools may also be found on raised bogs situated mainly on plains and valley bottoms. The water usually has a high humic acid content and is usually stained brown through exposure to peat. Some dystrophic lakes are completely devoid of all macrophytes, while others may be completely dominated by bryophytes. This does not necessarily indicate unfavourable condition. With increasing diversity the–characteristic species are usually *Drepanocladus fluitans* and/or *Juncus bulbosus* as submerged macrophytes, with *Sphagnum* communities present around the edge or in the littoral zone. *Menyanthes trifoliata, Potamogeton polygonifolius* and *Nymphaea alba* may also be present and at richer sites, *Utricularia minor* and *Nuphar lutea.* **There may be valid reasons why a characteristic species is not**

Attributes	Measure	Target	Comment
			present at a site (such as biogeographic range or isolation from source populations) which need to be considered when applying targets to an individual site. As this interest feature covers a floristic range it is essential to establish which community type represents the feature for the site in question. If algal growth is excessive, check for inputs of point or diffuse sources of pollution. If mire communities surround the site, the mire vegetation will turn green in the presence of fertilisers. Increased growth of *Sphagnum* may indicate the occurrence of artificial acidification. Turbid water conditions can also give blue-green algae a competitive advantage in the phytoplankton, where artificial nutrient enrichment is taking place. *Juncus bulbosus* var. *fluitans* can naturally grow as the dominant plant i.e. > 40% cover in depths up to 1.75 m, and is not necessarily an indicator of a site in unfavourable condition.
	Negative indicator species	Non-native species should be absent or present at low frequency	Introduced species should be identified. A number of non-natives have such invasive potential that they should be assessed separately. Species of particular concern are: *Crassula helmsii*, *Hydrocotyle ranunculoides*, *Myriophyllum aquaticum* and *Azolla filiculoides*. If any of these species are present, a water body should be considered as being in unfavourable condition. This list is not exhaustive and should be updated as new threats become apparent. Colonisation since the previous field visit by *Elodea nuttallii* or *Elodea*

Attributes	Measure	Target	Comment
			canadensis at >5% frequency is indicative of unfavourable condition, as is dominance of naturalised non-native species, such as *E. canadensis*. Occurrence of such species, at >40% frequency in unproductive waters, is indicative of unfavourable condition. Excessive growths of filamentous algae on lake substrate or macrophytes are indicative of nutrient enrichment. Increased filamentous green algae may also indicate the occurrence of artificial acidification.
***Macrophyte community structure**	Distribution Extent Structure	Characteristic zones of vegetation should be present. Maximum depth distribution should be maintained. Maintain at least the present structure.	Zonation , depth distribution and structure will be site specific. Colonisation at depth may be limited by poor light penetration or unsuitable sediment type. Where present, well defined hydroseres should be maintained.
***Water quality**	Water Chemistry	Maintain dystrophic conditions The pH/ANC, and nutrient levels (P and N) should be stable and appropriate to the lake type	As a guide Stable nutrient levels: TP target/limit: Dystrophic = 10 μg L^{-1} Stable pH values: pH < 5.0 Adequate dissolved O_2 (>5 μg L^{-1}) **Water should be acid and poor in available nutrients. It should be**

Attributes	Measure	Target	Comment
		Adequate dissolved oxygen levels for health of characteristic fauna. No excessive growth of cyanobacteria or green algae.	**stained by dissolved humic material, and will usually be visibly brown.** **As there is a wide clinal range of community types embraced by this feature, the acceptable range of chemical conditions (especially total P, other P fractions, pH/ANC, and where appropriate NO_3-N,) should be set for individual SAC lakes, from recent or historical water chemistry data. Acceptable ranges of values for each variable should be established. See main text.** Mean annual TP concentrations (based on at least quarterly measurements), or spring TP levels, should meet the targets appropriate for the lake type documented in the guidance, unless site-specific targets are available. If palaeolimnological techniques or hindcast modelling have been employed to reconstruct natural background TP 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. Where existing, site-specific 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. **Phosphorus and nitrogen values can be very variable, P is often in excess and plant development is limited by unavailability of N in the peat.** Check for changes in catchment land-use in catchment causing

Attributes	Measure	Target	Comment
			diffuse pollution and/or siltation and check point sources of pollution. Aerially applied agro-chemicals have a high potential to change plant communities, and move them out of favourable condition. Other methodologies involving trophic scoring can contribute to the assessment of favourable condition. **As a guide, pH < 5.00. Note that where water column pH is 4.5 or less, alkalinity will be 0.** Levels of dissolved oxygen should support the invertebrate and vertebrate taxa associated with this lake type. There should be no evidence of excessive blue-green or green algal blooms.
Hydrology	Hydrological regime	No deterioration in hydrological regime compared to the baseline.	**Natural flushing rate and seasonal pattern of fluctuation need to be considered.** **Maintain flushing rate of system.** Modifications of inflows and outlets (where present), the creation of outlets, or changes in hydrology from flood control regimes, abstraction, peat harvesting and gravel removal, can lead to unnatural changes in lake levels.
Lake substrate	Shore line and	Maintain the natural	Sediment quality and quantity when enriched can cause excessive

Attributes	Measure	Target	Comment
character	substrate	shoreline of the lake. Maintain natural and characteristic substrate for lake type.	growths of *Juncus bulbosus* var. *fluitans* or growths of algae.
Sediment	Sediment Load	Maintain natural sediment load	Increases in siltation could result from increased lake productivity, changes in catchment land-use (particularly over-grazing, peat harvesting), lake level fluctuations, climatic fluctuations or changes in sewage treatment.
Indicators of local distinctiveness	Maintain distinctive elements (e.g. rare plant or invertebrate species, habitat features) at current extent/levels and/or in current locations.		This attribute is intended to cover any site-specific aspects of this habitat feature (forming part of the reason for notification) which are not covered adequately by the previous attributes, or by separate guidance (e.g. for notified species features). For species of local distinctiveness, which are documented on citations, or for which records are held for individual lakes, references such as LACON (Palmer, in prep.) should be consulted for current lists of species rare in the constituent countries of GB, and in EA and SEPA areas. For "notable" species (e.g. nationally scarce plants), it is not intended that a target is set for detailed species monitoring. It is intended that a rapid indication of presence/absence and /or approximate extent should be provided. Allowing for natural fluctuations in population size. The same approach applies to "notable" habitats.

Aspects of environmental disturbance to be noted as an accompaniment to assessing condition: Natural dystrophic lakes and ponds

Objective	Specified assessment method (if appropriate)	Comment
No introduction of non-native plants Minimal negative impact from artificial structures No peat cutting within the vicinity of the water body Direct application of lime to the water column as an acidification amelioration strategy should not be carried out		 Artificial structures could include dams. Catchment area changes affecting the lake, such as land drainage and infrastructure schemes, should be considered. Efforts should be directed towards reducing atmospheric emissions and implementing catchment management strategies, especially in relation to coniferous forestry

Box 5. Characteristic species of natural dystrophic lakes and ponds

Characteristic species	Associates
Utricularia spp.	*Sparganium angustifolium*
Sphagnum spp.	*Eleogiton fluitans*
Juncus bulbosus	*Drepanocladus spp.*
Nymphaea alba	
Menyanthes trifoliata	
Potamogeton polygonifolius	

Feature 7 (SAC) – Transition mires and quaking bogs (Status C)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attributes	Measure	Target/Limit	Comments
* Extent	Number of locations for this feature, identified on the standard 'W' walks, and mire area (ha) at each location.	Maintain the 'W' walk occurrences and area of open transition mire vegetation.	Location and mire type to be noted at baseline
* Community diversity	M5, M9 and S27 communities and their variants, as established at base line survey.	Maintain presence of M5, M9 and S27 and variants, as established at base line survey.	
* Structure	* Frequency of tree/scrub spp.	No more than 5 % if in discrete stands; or no more than occasional throughout the sward	
*Vegetation composition	Combined cover of herbs and sedges and *Sphagnum* spp.	Maintain cover at least 75%	To be reviewed after baseline
	Frequency of Sphagnum spp. mosses (DAFOR scale) wherever noted	Retain at baseline DAFOR abundance	
	Frequency of either qualifying brown mosses or *Sphagnum* species (DAFOR scale)	At least Frequent	

*Vegetation composition	Frequency of positive indicators (DAFOR scale)	For any qualifying area, either: At least 2 of List 1 Frequent throughout the vegetation. **List 1** - *Angelica sylvestris, Caltha palustris, Galium palustre, Mentha aquatica, Menyanthes trifoliata, Pinguicula vulgaris, Potentilla palustris, Succisa pratensis* **OR** At least 6 of List 2 Occasional or better. **List 2** - *Calliergon* spp., *Caltha palustris*, *Carex rostrata*, *Epilobium palustre*, *Equisetum fluviatile*, *Galium palustre*, *Hydrocotyle vulgaris*, *Iris pseudacorus*, *Lychnis flos-cuculi*, *Mentha aquatica*, *Menyanthes trifoliata*, *Potentilla palustris Ranunculus flammula*	
	Frequency of negative indicators (DAFOR)	None of list 1 more than Frequent, combined cover list 1 species < 30% **List 1**- *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Holcus lanatus*, *Juncus acutiflorus J. effusus*, *J. squarrosus* None of list 2 more than Rare, even locally. **List 2** - *Trifolium* ssp*., Cirsium arvense*, *C. vulgare*, *Urtica dioica*, *Epilobium hirsutum*	
*Vegetation structure	Frequency of hoof prints and dung	No more than Occasional over any qualifying mire unit	
	Frequency of *Molinia caerulea* tussocks	No more than Rare in any qualifying mire unit	
	Bare ground visible without disturbing the vegetation	No more than 5% of any qualifying mire unit	
	Cover of litter in a more or less continuous layer	No more than 25 % of any qualifying mire unit	
*Hydrology	Level of water table	Maintain water table at or slightly above surface. Ground should be soft, bouncy & squelchy.	Possibly use a penetrometer

		No more than 10% decline using any more quantitative method.	Probably use Ellenberg F values along a given transect