Derry City & Strabane District Council

Comhairle Chathair Dhoire & Cheantar an tSratha Báin

Derry Cittie & Stràbane Destrick Cooncil

DERRY CITY & STRABANE DISTRICT COUNCIL

LOCAL DEVELOPMENT PLAN (LDP) 2032

DRAFT PLAN STRATEGY

Habitats Regulations Assessment (HRA), Annex A - June 2025

https://www.derrystrabane.com/subsites/ldp

DERRY CITY AND STRABANE DISTRICT COUNCIL

LOCAL DEVELOPMENT PLAN (LDP) 2032

Habitats Regulations Assessment (HRA)
Annex A

Conservation Objectives / Ramsar Citation
Northern Ireland Sites

June 2025

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date

Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:
12.05.2005

3. Country:
UK (Northern Ireland)

4. Name of the Ramsar site:
Ballynahone Bog

5. Map of site included:
Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**
54 49 25 N 06 39 40 W

7. General location:
Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Maghera.

Ballynahone Bog is situated in County Londonderry in the centre of Northern Ireland about 3 km south of Maghera. It is situated on low-lying ground immediately north of the Moyola River about 14 km from its mouth at Lough Neagh.

Administrative region: Northern Ireland

8. Elevation (average and/or max. & min.) (metres)**:**
Min. 0
Max. 0
Mean 257

9. Area (hectares)**:** 243.24

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Ballynahone Bog is one of the largest lowland raised bogs in Northern Ireland. The raised bog which covers most of the site exhibits the full range of characteristic vegetation and structural features associated with this type of habitat such as bog pools and hummocks. The raised bog dome is surrounded by cut-over bog with poor fen and birch woodland. The bog vegetation is characterised by a high percentage cover of *Sphagnum* mosses, ericoid dwarf-shrubs such as cross-leaved heath *Erica tetralix* and heather *Calluna vulgaris*, and other associated species such as hare's-tail cottongrass *Eriophorum vaginatum*, common cottongrass *Eriophorum angustifolium*, deergrass *Trichophorum cespitosum* and sundew species *Drosera* spp.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site is a large and relatively intact example of a lowland raised bog and one of the best examples of this habitat in the UK.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, peat, nutrient-poor, basalt
Geomorphology and landscape	lowland
Nutrient status	no information
pH	acidic, strongly acidic
Salinity	fresh
Soil	mainly organic
Water permanence	usually permanent

Summary of main climatic features	Annual averages (Aldergrove, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/aldergrove.html) Max. daily temperature: 12.5° C Min. daily temperature: 5.8° C Days of air frost: 39.1 Rainfall: 862.4 mm Hrs. of sunshine: 1313.7

General description of the Physical Features:

Ballynahone is one of the two largest intact active raised bogs in Northern Ireland with hummock and hollow pool complexes. Recently-constructed surface drains have been filled and the site is recovering.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Ballynahone is one of the two largest intact active raised bogs in Northern Ireland with hummock and hollow pool complexes. Recently-constructed surface drains have been filled and the site is recovering.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

17. Wetland types

Inland wetland

Code	Name	% Area
U	Peatlands (including peat bogs swamps, fens)	75
Xp	Forested peatland	25

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The classic domed profile of the deep peat exhibits a wide range of characteristic vegetation and structural features, with pool, hummock and lawn complexes. The bog vegetation is characterised by a high percentage cover of *Sphagnum* mosses, ericoid dwarf-shrubs and other associated species.

On the greater part of the bog plain the prominent species include heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, hare's-tail cottongrass *Eriophorum vaginatum*, common cottongrass *Eriophorum angustifolium*, and deergrass *Trichophorum cespitosum*. Additional species which are also well represented within the sward include bog asphodel *Narthecium ossifragum* and white beak-sedge *Rhynchospora alba*, with occasional patches of bog-myrtle *Myrica gale* also occurring. *Sphagnum* mosses generally form scattered hummocks throughout the area.

Flat, waterlogged 'lawns' alongside pools are characterised by the prominence of such species as cross-leaved heath *Erica tetralix*, bog asphodel *Narthecium ossifragum*, white beak-sedge *Rhynchospora alba* and common cottongrass *Eriophorum angustifolium*, over a *Sphagnum* moss carpet dominated by *S. papillosum* and *S. magellanicum*. The abundance of cranberry *Vaccinium oxycoccos* in these areas is also notable. Typically, the pools are dominated by *Sphagnum cuspidatum*, with bogbean *Menyanthes trifoliata* abundant in a number of them. Lesser bladderwort *Utricularia minor* and great

sundew *Drosera longifolia* are also frequent in some pools with the nationally rare *Sphagnum pulchrum* often occurring around the edges. Within the pool system, the main hummock-forming moss is *Sphagnum magellanicum* with *S. papillosum* and *S. subnitens* frequent. The liverwort *Pleurozia purpurea*, a species generally associated with more oceanic areas to the west, is also found occasionally.

The lagg surrounding the lowland raised bog has been extensively cut for turf, creating a mosaic of habitats which are dependent on peat depth and age of cutting. Vegetation communities vary from 'poor' fen, through purple moor-grass *Molinia caerulea* grassland and heath, to extensive areas of scrub and young woodland, mainly dominated by downy birch *Betula pubescens*.

The peatland species occurring on the site include a number of scarce species typical of lowland raised bogs such as the bog-rosemary *Andromeda polifolia* and invertebrates such as the large heath butterfly *Coenonympha tullia*.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Andromeda polifolia.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Species Information

None reported

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

No special values known

22. Land tenure/ownership:

Ownership category	On-site	Off-site
National/Crown Estate	+	
Private	+	+

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Rough or shifting grazing		+
Mineral exploration (excl. hydrocarbons)	+	

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only. What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Is the site subject to adverse ecological change? NO

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Management agreement	+	
Site management statement/plan implemented	+	
Special Area of Conservation (SAC)	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

The site was subject to detailed habitat and species surveys prior to its designation as an ASSI.
The integrity of the site is regularly monitored.
A basin profiling and hydrological survey was carried out in 1996.

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

None reported

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

Corbett, P. McM & Seymour, GR (1997) The conservation of peatland in Northern Ireland. In: *Conserving peatlands*, ed. by L Parkyn, RE Stoneman & HAP Ingram. CAB International, Wallingford, for Scottish Wildlife Trust

Environment and Heritage Service (1986) *Site survey notes for Ballynahone Bog*. Unpublished, Environment and Heritage Service, Belfast.

Environment and Heritage Service (1994) *ASSI Pilot Monitoring Ballynahone Bog Field Assessment, 1994*. Unpublished, Environment and Heritage Service, Belfast.

Frazer, JS, Cruickshank, MM & Tomlinson, RW (1988) *Northern Ireland Peatland Survey*. Unpublished report to Department of the Environment (Northern Ireland), Countryside and Wildlife Branch, Belfast

Grant, M, Tomlinson, RW & Harvey, J (1997) *Hydrological monitoring for peatlands*. Queens University of Belfast, School of Geosciences, report to Department of the Environment (Northern Ireland), Belfast

Leach, SJ & Corbett, P. McM (1987) A preliminary survey of raised bogs in Northern Ireland. *Glasra*, **10**, 57-73

McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

Milton, EJ, Hughes, PD, Anderson, K, Schulz, J, Lindsay, R, Kelday, SB & Hill, CT (2005) Remote sensing of bog surfaces. *JNCC Report*, No. **366** www.jncc.gov.uk/page-3505

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**

Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

BALLYNAHONE BOG SAC
UK0016599

CONSERVATION OBJECTIVES

Document Details

Title	*Ballynahone Bog SAC Conservation Objectives*
Prepared By	*R. McKeown*
Approved By	*P. Corbett*
Date Effective From	*01/04/2015*
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Contact	cdp@doeni.gov.uk

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Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete review	RMK

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

This document provides a statement of the Conservation Objectives for Ballynahone Bog SAC.

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 as 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: LONDONDERRY

GRID REFERENCE: IH 860980

AREA: 244 ha

5. SUMMARY SITE DESCRIPTION

Ballynahone Bog lies in the Moyola River valley 3 km south-east of Maghera and 3 km north-east of Tobermore in Magherafelt District. The peat has formed on either side of an Esker ridge, which would have impeded drainage, creating the waterlogged conditions that eventually lead to the formation of the raised bog. The active raised bog supports hummock, hollow and pool complexes, and notable peatland flora including Bog-rosemary *Andromeda polifolia* and the bog mosses *Sphagnum fuscum*, *S. austinii* and *S. pulchrum*. Some areas of the bog have been burnt in the past but these areas are now recovering.

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 of Ballynahone Bog has been demarcated to include all areas of intact lowland raised bog and associated semi-natural habitats. This includes, cutover bog, pockets of acid grassland and some fairly extensive areas of Birch

scrub and wood associated with the degraded peat bog surface. It should be noted that the intact surface of the bog extends to just over 100 ha and over half of the remaining SAC area consists of semi-natural habitats associated with the cutover bog.

The boundary around the entire site is defined as the edge of the semi-natural habitat associated with the raised bogs' hydrological unit, and is completely surrounded by improved agricultural land. The boundary consists of a complex network of ditches, banks old tracks, road verges, hedges and fences. The complex irregular boundary reflects the removal of improved fields and the addition of recovering bog areas to the site. Most of the boundaries are stock proof, but there are some notional boundaries around the edges of improved fields that have not yet been fenced and also around farm buildings and houses. In addition, Ballynahone Road forms part of the boundary along the southern edge of the bog and part of the eastern boundary follows the edge of Tobermore Road. There is no fencing along the road verges.

To the north-east of the site, two large blocks of species rich wet grassland have been included within the site, as both these areas are hydrologically connected to the raised bog.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	131 ha
Habitat	Degraded raised bog still capable of regeneration	D	111 ha
Habitat	Depressions on peat substrates of the *Rhynchosporion*	D	0.1 ha

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 Ballynahone Bog SAC.

6.1 ASSI SELECTION FEATURES

Ballynahone Bog ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	242 ha
Species	Invertebrate Assemblage	

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog 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

SAC Feature	Global Status	Component Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.
Invertebrate Assemblage	To be finalised

10. MANAGEMENT CONSIDERATIONS

Ownership

A large proportion of Ballynahone Bog ASSI (98 ha) is owned by the Northern Ireland Environment Agency (NIEA), including the sporting rights. This was the area of bog originally owned by the Bulrush Peat Company. The department of Economic Development (Minerals and Petroleum Unit) has mineral rights. The remainder of the SAC is privately owned with over 40 individuals owning various sections of the bog.

Management Agreements

In 2000, NIEA (previously Environment & Heritage Service) drew up a Management Agreement with the Ulster Wildlife Trust (UWT) to manage this area as a National Nature Reserve (NNR). In addition, the Ballynahone Management Committee comprised of UWT, Friends of Ballynahone Bog and NIEA has been established and it will ultimately be responsible for the management of the NNR. Hence the management of much of the area at Ballynahone Bog should be sympathetic.

A number of management agreements are already in place with some landowners and further acquisition or NNR management agreements are likely. It is envisaged that the entire SAC will eventually be managed as a NNR. The main management issue on the site is the removal/blockage of active drains to maintain the bogs hydrology.

Adjoining Land Use

The main adjoining land-use outside the ASSI is forestry and improved agricultural land, with areas of rough pasture and old cutover bog along the northern and south-western edges of the bog.

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 Ballynahone Bog, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, factors affecting ASSI features are also considered.

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

Peat Cutting

There has been extensive hand cutting for many years around the periphery of Ballynahone Bog. This has encroached significantly into the intact surface of the raised bog. Although many of the old hand cuttings now support actively regenerating bog vegetation, more recent mechanised peat cutting has taken place in some of them. In some instances, mechanised cutting has also encroached onto the remaining intact surface of the bog. Peat cutting at the time of designation was problematical, but has been addressed by a series of management agreements with landowners. All peat cutting now appears to have stopped.

ACTION: No peat cutting within the SAC.

Burning

Burning of the vegetation has taken place occasionally, with some areas of past burning identified. Excessive burning will tend to reduce the cover of *Sphagnum* mosses and ericaceous species, increasing the proportion of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, structural diversity will be reduced. There is evidence of a burn, 5 ha in extent, on the intact dome to the north-west of the SAC. This burn is clearly apparent on the 1996 aerial photographs. No evidence of burning was reported in the 2011 Condition Assessment report.

ACTION: No burning within the SAC.

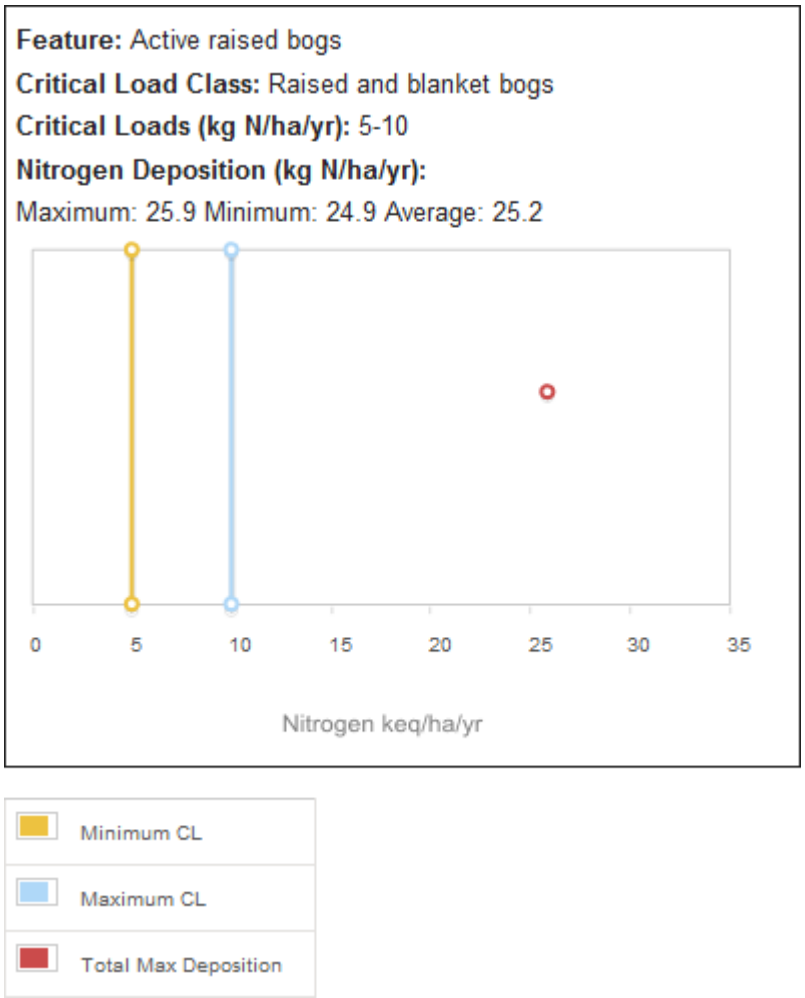
Drainage

The southern section of the main uncut dome of Ballynahone bog, i.e. the section that originally belonged to the Bulrush Peat Company and now represents the NNR, was granted planning permission to extract peat in 1988. As a consequence a series of 50 north-south drains at 25 m intervals was cut into the peat in early 1991. All of these drains were subsequently blocked after the site was declared as an ASSI in 1994. In addition, there are a series of drains associated with the cuttings around the periphery. All of these drains show up on the aerial photograph and are clearly apparent on the ground. There has also been extensive drainage within the old cutover areas. Any drains that are currently carrying water away from the peat mass should be identified and

blocked. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.
ACTION: Block active drains where appropriate.

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 Ballynahone Bog SAC.



(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.

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.

Scrub Encroachment

The intact surface of lowland raised bog at Ballynahone Bog is almost entirely surrounded by Birch-dominated scrub and wood which has colonised the old cutover bog where it is drier and there is some nutrient enrichment. Although this semi-natural habitat acts as a buffer between the intact bog surface and the improved agricultural land beyond, continued scrub encroachment into the actively regenerating cutover areas or intact bog is undesirable.
ACTION: Monitor further scrub encroachment (where it occurs) and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Grazing

Lowland raised bogs are not suitable for grazing, as the surface is fragile and easily damaged by poaching.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site.

Fly-tipping

There are some instances of localised fly-tipping occurring along the Ballynahone and Tobermore Roads. Where the ramparts extend into the cutover areas from the edge of the road, the periphery of the cutover is particularly vulnerable to fly tipping.
ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

Shooting

Historically, there was a clay pigeon shooting range in the south-east corner of Ballynahone Bog. This practice was stopped in 1980. The accumulation of large quantities of lead shot over an area of 1.75 ha has resulted in lead contamination. As a consequence, the bog vegetation has become severely degraded with the death of *Sphagnum* mosses and ericoid species. This appears to have caused the peat mass to shrink and slump around the area most severely affected. In addition, unauthorised rough shooting for Snipe etc. takes place over the site.
ACTION: Clay pigeon shooting has now been stopped. There should be no clay pigeon shooting anywhere within the SAC boundary. Unauthorised rough shooting should also be stopped where possible.

Visitor Impact

In September 2000, 98.13 ha of Ballynahone Bog SAC was declared as a NNR and is being managed by Ulster Wildlife (UW). One of the long-term objectives of the UW is to facilitate public awareness of peatland issues and biodiversity issues through Ballynahone Bog. It is imperative that any visitor impact on the site is kept to a minimum and should not affect the active lowland raised bog in any way.

ACTION: Ensure that the impact of visitors for the purpose of education etc. is carefully controlled so that there is no impact on the active raised bog vegetation.

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. Ensure that there has been no peat cutting, dumping or burning 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 the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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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ANNEX I

Feature 1 (SAC) - Active raised bog (Status B)

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

Attribute	Targets/Limits	Method of Assessment	Comments
* Area of intact surface (ha)	Maintain the extent of intact bog surface at 107.9ha.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.
* Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog. This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.

* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm.	Visual estimate in 2x2 m plots.	
* Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots	

* Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia, Menyanthes trifoliata*.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained.

* *Sphagnum* cover/abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic *Sphagnum* moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock forming species*: - S. papillosum* and *S. magellanicum* at least occasional over the surface.	Visual estimate in 2x2m plots. Visual estimate in 2x2m 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 intact bog surface.
* Ericaceous cover (%) and frequency of *Erica tetralix* (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. *Erica tetralix* should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
* Graminoid cover (%)	Graminoid cover should be maintained between 10 and 40 %.	Visual estimate in 2x2m plots	

* Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.	If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
* *Rhynchospora alba* abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots	*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
* *Myrica gale* abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas. Recent burning is represented by areas burnt within the last two years.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	

* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.	Visual estimate in 2x2 m plots.	
Indicators of Local Distinctiveness			
* Presence of rare or scarce species specific to the site. *Sphagnum austinii* *Sphagnum fuscum* *Sphagnum pulchrum* *Utricularia spp.* *Andromeda polifolia*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment If these species are not recorded on any one visit, it does not automatically make the site unfavourable. structured walk.	Visual estimate.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

BANAGHER GLEN SAC
UK0030083

CONSERVATION OBJECTIVES

Document Details

Title	*Banagher Glen SAC Conservation Objectives*
Prepared By	*R. McKeown*
Approved By	*P. Corbett*
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Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Dec 2014	Complete review	RMK

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: LONDONDERRY

GRID REFERENCE: C672045

AREA: 87.77 ha

5. SUMMARY SITE DESCRIPTION

The site consists of a complex system of river valleys with wooded areas surrounding the main Owenrigh River valley and its three tributary valleys all to the south. The site has a history of continuous woodland cover, with the present woodland being over 200 years old. Due to the underlying geology the site supports examples of both acid Oak woodland and a smaller component of base-rich Ash woodland.

The site hosts examples of the metamorphic Dart Formation, principally schists, and metamorphic basic intrusive igneous rocks. It also hosts an internationally important exposure of the Dungiven metamorphic limestones in Banagher Glen Quarry.

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 has been drawn to include the best examples of Oak and Ash woodland, in addition to other semi-natural habitats that form part of the natural transition, such as to heath. The site boundary uses permanent features where possible. However, at the upper end of the three main valleys, man made boundaries were absent and so recognisable topographical or physical features such as break in slopes, tree lines were used.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	B	60.4 ha
Habitat	Tilio-Acerion forests of slopes, screes and ravines	C	17.5 ha
Habitat	North Atlantic wet heath with *Erica tetralix*	D	4.6 ha
Species	Otter *Lutra lutra*	D	P

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 Banagher Glen SAC.

6.1 ASSI SELECTION FEATURES

Banagher Glen ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Oakwood	60.4 ha
Habitat	Mixed Ashwoods	17.5 ha
Species	Invertebrate assemblage - assemblage of woodland invertebrates; high diversity	
Species	Breeding Bird Assemblage	
Earth Science	Dalradian	

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the Old sessile oak woods with ***Ilex*** and ***Blechnum*** in the British Isles and ***Tilio-Acerion*** forests of slopes, screes and ravines 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

SAC Feature	Global Status	Component Objective
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	B	Maintain and where feasible expand the extent of existing oak woodland but not at the expense of other SAC (ABC) features. (There are area of degraded heath, wetland and damp grassland which have the potential to develop into oak woodland)
		Maintain and enhance Oak woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Tilio-Acerion forests of slopes, screes and ravines	C	Maintain and where feasible expand the extent of existing ash woodland, but not at the expense of other SAC (ABC) features (There is an area of degraded bog, wetland and damp grassland which have the potential to develop into ash woodland.
		Maintain and enhance ash woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the ash woodland, e.g. scrub, especially where these exhibit natural transition.
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.

9.1 ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Oakwood	See SAC Selection Feature Objective Requirements table.
Mixed Ashwoods	See SAC Selection Feature Objective Requirements table.
Breeding Bird Assemblage	To be Finalised
Invertebrate assemblage	Establish the status of the most important species and map locations if feasible
	Maintain abundance and distribution and if feasible enhance populations.
	If necessary, draw up further conservation priorities for these species.
Dalradian	Maintain the extent of the site.
	Maintain the extent of the feature.
	Maintain the access to the feature including retaining the potential to expose the full geological series as required.

10. MANAGEMENT CONSIDERATIONS

Ownership

Around two thirds of the wood is in private ownership, the remainder is National Nature Reserve. In total there are seventeen individuals or organisations with ownership or other rights associated with the site. The Water Service installation located on the flat valley floor has been excluded while the access roads passing up the valley are included.

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 <u>likely</u> factors that are either affecting Banagher Glen, or could affect it in the future. Although Old sessile oak woods with *Ilex* and *Blechnum*, and *Tilio-Acerion* forests of slopes, screes and ravines 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.

Grazing/Poaching/Tree barking and Browsing

Free access to some parts of the woodland by domestic stock and feral goats was causing damage to the ground flora at the time of designation. Grazing and bark-stripping could prevent regeneration and cause a detrimental change in the woodland structure and composition with time. Recent changes in management have resulted in stock exclusion, and the woodland is now recovering.
ACTION: Monitor the recovery of the woodland and if required, initiate appropriate habitat management to achieve favourable condition.

Invasion by exotics

Exotic species are localised. They vary in the degree of impact they have and the threat they pose. Very invasive species such as Sycamore *Acer pseudoplatanus* are seen as posing a current threat. Others are not seen as an immediate threat due to their limited occurrence (e.g. Horse Chestnut *Aesculus hippocastanum*) or slow rate of spread (e.g. Beech *Fagus sylvatic*a). Sycamore and Beech occur in the Mixed ashwood at the northern end of the Owenrigh Valley.
ACTION: A long-term programme for the selective, phased removal of Sycamore and Beech should be drawn up. A slow, phased compartment-based approach may be one mechanism to avoid any adverse impacts to the woodland ecology. Seed-bearing Sycamore trees should be selectively targeted to slow the spread of this species within the woodland. This may involve felling mature seed-bearing trees. Ring barking Sycamore trees as a control mechanism is generally not recommended as the species tends to seed more profusely before dying. Ring-barking of Beech on the other hand is more successful, and increases the amount of standing dead wood. It is important that seedlings and saplings are systematically removed as part of any management programme. Those species not posing a threat at present should be monitored and in the long-term controlled if required.

Slumping/Landslides/Erosion

Sudden accidental discharge of water down the valley sides from quarry sites adjacent to the valleys has resulted in a number of landslides and severe gully erosion in the past.
ACTION: Liaise with quarry owners to prevent as far as possible further accidental discharges of water that could cause erosion problems.

Dead Wood Removal

Dead wood should be left *in situ* if safe or practical to do so. This provides valuable habitat for fungi, invertebrates etc. Removal of wood for fire-wood should be discouraged.
ACTION: No removal of dead wood from the site.

Woodland Clearance/Felling

Any felling of native trees or shrubs is contrary to the ASSI schedule.
ACTION: No removal of native trees or shrubs.

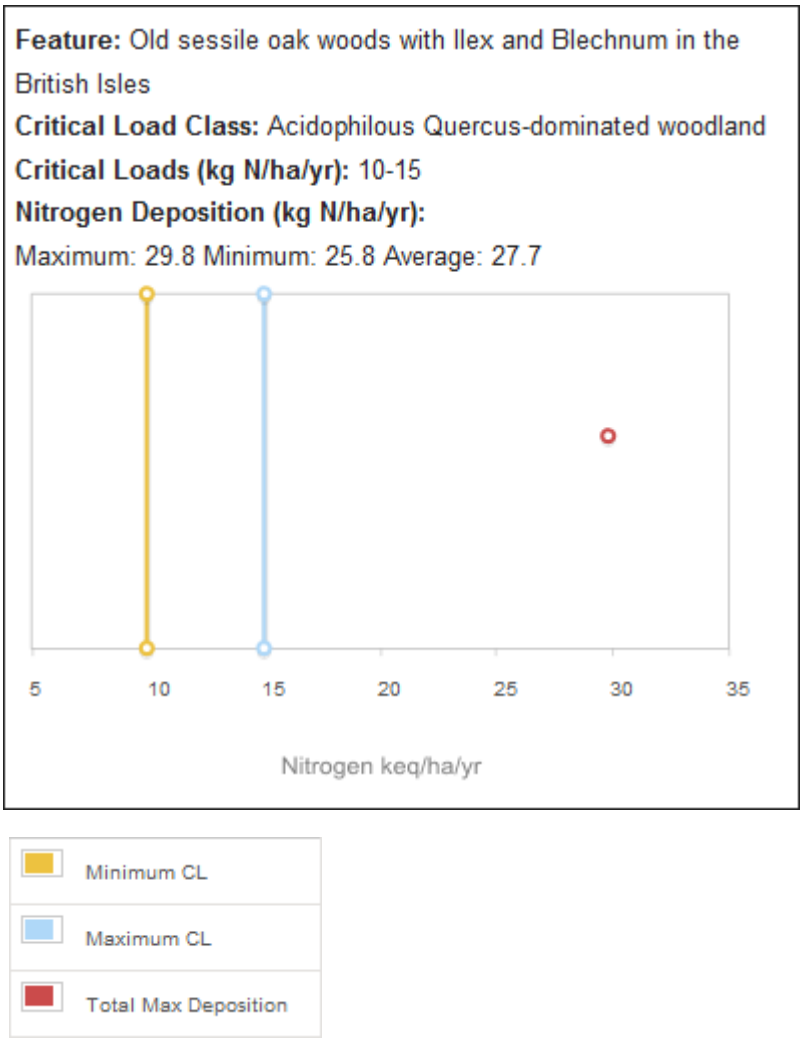
Fly-tipping

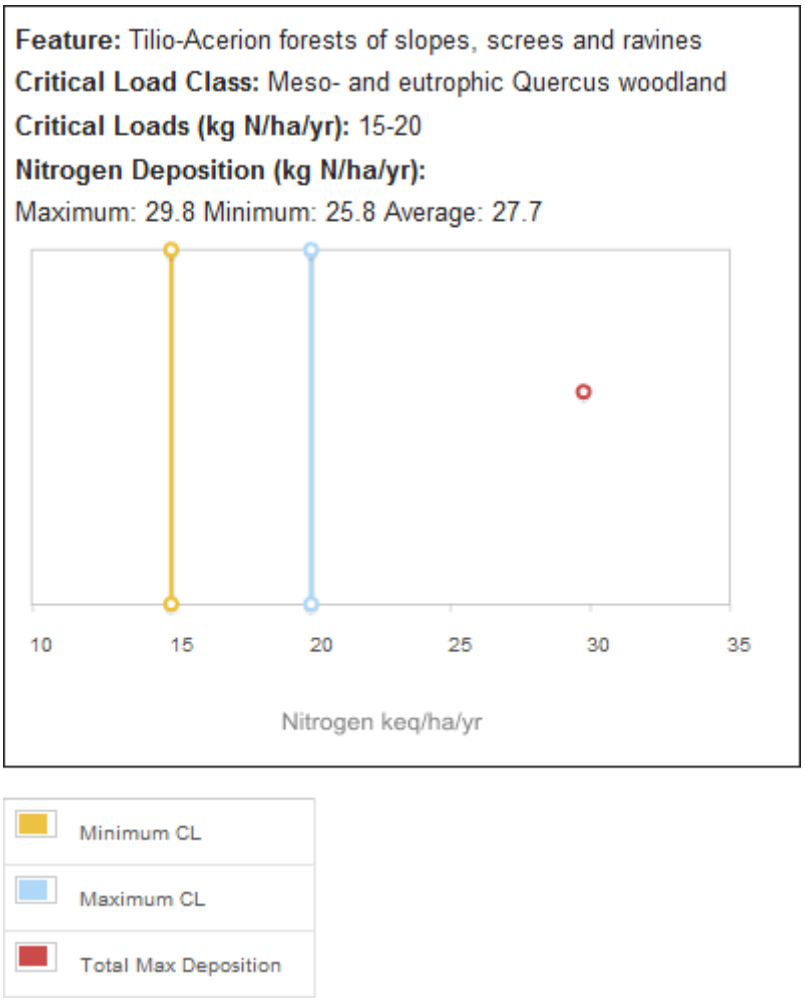
Localised fly-tipping occurs throughout the site but is extensive in a number of locations.

ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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 Banagher Glen SAC.





(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.

Changes to surrounding land use

Activities occurring outside the site (e.g. agricultural intensification, drainage works, and development) may be detrimental to the site through remote affects.
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. woodland clearance, overwintering of stock, dumping etc), or will be comparatively slow. 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 that walls and fences are still intact. Ensure that there has been no tree felling, dumping or burning carried out within the ASSI. SIM should be carried out once a year.

2. Monitor the condition of the site (Condition Assessment)
Monitor the key attributes for each selection feature. This will detect if the features are in favourable condition or not.

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 <u>not by itself</u> 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

Cooper, A., McCann, T. and Rogers, D. (2009). Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency Research and Development Series No.09/06

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Joint Nature Conservation Committee (JNCC) (2013). 3rd UK Habitats Directive Report.

ANNEX 1

Feature 1 (SAC) - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (Status B)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Oakwood	Maintain the extent of Oakwood at 60.4ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable.
Oakwood community diversity	Maintain presence of woodland communities, W11, W17, W9 & W7 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of 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 Oakwood may be desirable in some instances.

* Structural variation (% cover)	Mean canopy cover greater than 70%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.
	Mean shrub cover should be maintained between 20 - 50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover. Where present assess cover of *Luzula sylvatica*.	Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey. Note: *L. sylvatica* may be dominant in many W11 oakwood communities. The percentage cover of this species may affect Oak regeneration, but more information is required before that assumption can be made.
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
	Mean cover of bare ground should be less than 5%. Bare ground does not include boulders or rocks.	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Estimate within the visual vicinity of the monitoring plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over – mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable -
	Mature trees (20 - 75cm diameter) at least frequent in 75% of plots	Estimate within the visual vicinity of the monitoring plots.	
	Over-mature trees (>75cm diameter) at least present in 10% of plots	Estimate within the visual vicinity of the monitoring plots.	

			recovering.
* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure	Regeneration of Oak seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of Oak in particular is likely to be slow and sporadic; in some stands, there may currently not
	Regeneration of Oak saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	

of the Oak woodland.			be sufficient and/or extensive enough gaps in the canopy for oak to regenerate. This does not necessarily indicate unfavourable condition.
* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the Oak woodland should be largely comprised of Oak trees. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	

* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%.	Visual estimate in 10x10m plots.	
* Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
* Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
* Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent in less than 10% of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	

Frequency of felling/coppicing (within 6 year monitoring cycle) (DAFOR)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Felling non-native species as part of management for conservation is acceptable.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:- *Vaccinium myrtillus,* *Blechnum spicant,* *Dicranum spp.,* *Luzula pilosa,* *Rhytidiadelphus loreus*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained. However, the W11 & W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea,* *Geum urbanum,* *Polystichum setiferum,* *Aneomne nemorosa,* *Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:-	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.

	Carex remota, *Ranunculus repens,* *Chrysosplenium oppositifolium,* *Filipendula ulmaria,* *Lysimachia nemorum.*		
Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Feature 2 (SAC) - Tilio-Acerion forests of slopes, screes and ravines (Status C)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Mixed ashwood	Maintain the extent of Mixed ashwood at 17.5ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable
Mixed ashwood community diversity	Maintain presence of woodland communities, W9, W7, W11 & W17 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of 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 Mixed ashwood may be desirable in some instances.
*Structural variation (% cover)	Mean canopy cover greater than 60% Where Hazel predominates, take this as the canopy layer.	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer. However, many Mixed ashwoods in County Antrim and on very shallow soils on limestone across Northern Ireland are dominated by Hazel with very few Ash standards. It is the current belief, that even if

			optimal management practices were to be adopted, these Hazel woods will never sustain an Ash canopy. Therefore in these Hazel woods, natural processes result in the canopy and the shrub layer merging together to give one structural layer. Therefore it is acceptable to have a mean shrub cover falling outside the specified limits for all other Mixed ashwoods.
	Mean shrub cover should be maintained between 20 - 50% Note: There are no set limits for mean shrub cover in Hazel woods.	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover.	Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey.
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks	Visual estimate in 10x10m plots.	
*Age-class variation (DAFOR)	Young Trees (5- 20cm diameter) at least occasional in 25% of plots In the case of Hazel this refers to young vigorous "stools" with not to many stems.	Visual estimate in 10x10m plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over –mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable -recovering.
	Mature Trees (20 - 75cm diameter) at least frequent in 75% of plots In the case of Hazel this refers to the normal Hazel bush, i.e.	Visual estimate in 10x10m plots.	

	not falling over and no large trunks.		
	Over-mature Trees (>75cm diameter) at least present in 10% of Plots In the case of Hazel this refers to large trunks and much dead standing timber; over-mature hazel may also be partially fallen over and regenerating.	Visual estimate in 10x10m plots.	
*Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
*Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
*Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the

	30% of plots.		climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of the mixed Ash woodland.	Regeneration of Ash seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of some native species is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps for young trees to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of Ash saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	
* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the mixed Ash woodland should be largely comprised of Ash trees with associated native species. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	

*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%.	Visual estimate in 10x10m plots.	
*Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
*Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
*Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of	Visual estimate in 10x10m plots.	

	plots and frequent or more in less than 10 % of plots.		
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle) (DAFOR)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Felling non-native species as part of management for conservation is acceptable.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea,* *Geum urbanum,* *Polystichum setiferum,* *Aneomne nemorosa,* *Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Mixed ashwood, there may be pockets of acid woodland and or flushed woodland within the boundaries of the ASSI/SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:-	Visual estimate in 10x10m plots.	Within any Mixed ashwood, there may be pockets of acid woodland and or flushed woodland within the boundaries of the ASSI/SAC. The diversity of these woodland communities should be

	Vaccinium myrtillus, *Blechnum spicant,* *Dicranum spp.,* *Luzula pilosa,* *Rhytidiadelphus loreus.*		maintained. However, the W11, W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:- *Carex remota,* *Ranunculus repens,* *Chrysosplenium oppositifolium,* *Filipendula ulmaria,* *Lysimachia nemorum.*	Visual estimate in 10x10m plots.	Within any Mixed ashwood, there may be pockets of acid woodland and or flushed woodland within the boundaries of the ASSI/SAC. The diversity of these woodland communities should be maintained.
Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date

Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 14 December 1999 / Updated: May 2005

3. Country:

UK (Northern Ireland)

4. Name of the Ramsar site:

Black Bog

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**

054 40 21 N 007 01 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

In County Tyrone in the centre of Northern Ireland about 17 km west of Cookstown.

Administrative region: Cookstown; Omagh; Tyrone

8. Elevation (average and/or max. & min.) (metres)**:**

Min. 155
Max. 170
Mean No information available

9. Area (hectares)**:** 183.42

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

This site is one of the two largest intact active bogs in Northern Ireland with hummock and hollow pool complexes and represents one of the best examples of this habitat type in the UK.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1

The site is a large and relatively intact example of a lowland raised bog and one of the best examples of this habitat in the UK.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, peat, nutrient-poor, basalt
Geomorphology and landscape	lowland
Nutrient status	oligotrophic
pH	acidic, strongly acidic
Salinity	fresh
Soil	mainly organic
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Aldergrove, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/aldergrove.html) Max. daily temperature: 12.5° C Min. daily temperature: 5.8° C Days of air frost: 39.1 Rainfall: 862.4 mm Hrs. of sunshine: 1313.7

General description of the Physical Features:

No information available

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

No information available

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

17. Wetland types

Inland wetland

Code	Name	% Area
U	Peatlands (including peat bogs swamps, fens)	100

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The site is especially important for its extensive hummock-hollow complex, high cover of *Sphagnum* species and largely intact lagg. There are some very large *Sphagnum* hummocks including *S. imbricatum* and *S. fuscum*. Another feature of the bog surface is the occurrence of an unusual plant community with locally high cover of *Empetrum nigrum* and large hummocks of *Cladonia impexa*.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Internationally important species occurring on the site
Habitat:
Active raised bog

Nationally important species occurring on the site
Habitat:
Lowland raised bog

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Species Information

None reported

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

No special values known

22. Land tenure/ownership:

Ownership category	On-site	Off-site
National/Crown estate	+	+
Private		+

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Rough or shifting grazing	+	

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
SSSI / ASSI	+	
Management agreement	+	
Site management statement/plan implemented	+	
AONB	+	
SAC	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

· The site was subject to detailed habitat and species surveys prior to its designation as an ASSI
· The integrity of the site is regularly monitored
· A basin profiling and hydrological survey was carried out in 1996.

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

None reported

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

Corbett, P. McM & Seymour, GR (1997) The conservation of peatland in Northern Ireland. In: *Conserving peatlands*, ed by L Parkyn, RE Stoneman & HAP Ingram. CAB International, Wallingford, for Scottish Wildlife Trust

Frazer, JS, Cruickshank, MM & Tomlinson, RW (1988) *Northern Ireland Peatland Survey*. Unpublished report to Department of the Environment (Northern Ireland), Countryside and Wildlife Branch, Belfast

McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

BLACK BOG SAC
UK0016609

CONSERVATION OBJECTIVES

Document Details

Title	*Black Bog SAC Conservation Objectives*
Prepared By	R. McKeown
Approved By	P. Corbett
Date Effective From	01/04/2015
Version Number	V2
Next Review Date	Nov 2020
Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete Review	RMK

BLACK BOG SAC
CONSERVATION OBJECTIVES

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 as 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: TYRONE

G.R : IH 635810

AREA: 194 ha

5. SUMMARY SITE DESCRIPTION

Black Bog lies at the source of the Owenreagh River approximately equal distance between Omagh and Cookstown in Omagh District. The bog lies at a moderate elevation between 130m and 140m O.D. and displays some characteristics of transitional/intermediate bog. With an uncut dome estimated to be just over 147 ha, it represents the largest area of uncut lowland raised bog in Northern Ireland. The active raised bog supports well-developed and extensive hummock and hollow topography, and notable peatland flora including *Empetrum nigrum*, the oceanic liverwort *Pleurozia purpurea* and the bog mosses *Sphagnum fuscum* and S. *imbricatum*. One of the most important features of Black Bog is the unbroken transition through a lagg, dominated by Purple Moor-grass *Molinia caerulea*, to swamp and fen along the Owenreagh River.

5.1 BOUNDARY RATIONALE

The boundary of Black Bog has been demarcated to include all areas of intact raised bog and associated semi-natural habitats, including cutover bog, pockets of acid grassland and a fairly extensive area of lagg vegetation associated with the Owenreagh River. The boundary around the entire site is

defined as the edge of high quality semi-natural habitat associated with the raised bogs hydrological unit.

The boundary itself is rather complex incorporating a stretch of the Owenreagh River, ditches, banks old tracks, road verges, hedges and fences. The river forms the boundary along the south eastern periphery of the bog and Cashel wood, whilst a forestry plantation stretches right along the opposite bank of the river. Although some cutover bog areas have been included in the site, more severely degraded bog has been excluded from the SAC, being agriculturally improved cutover bog.

Most of the boundaries are stock proof, but there are some fences that have fallen into disrepair and stock can move across into the designated area at these points. In addition, the unfenced verge of Black Bog Road forms part of the boundary along the northern edge of the bog.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	166.2 ha
Habitat	Degraded raised bog still capable of regeneration	D	13 ha
Habitat	Depressions on peat substrates of the *Rhynchosporion*	D	0.1 ha

Table 1. List of SAC selection features. Those with 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 Black Bog SAC.

6.1 ASSI SELECTION FEATURES

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	194 ha
Species	Breeding Bird Assemblage	

Table 2. List of ASSI features

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog 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 Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.
Breeding Bird Assemblage	To be finalised.

10. MANAGEMENT CONSIDERATIONS

Ownership

Black Bog is mainly privately owned with around 7 individuals identified as owner/occupiers of the site and a number of individuals identified as having the right to cut turf on the bog for domestic use. Forest Service also own a considerable proportion of the site with 48 ha. of intact raised bog declared as a Forest Nature Reserve

The complex pattern of ownership makes a unified approach to site management more difficult.

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 Black Bog, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, factors affecting ASSI features are also considered.

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

Peat Cutting

There has been some hand cutting for turf around the periphery of Black Bog, which has encroached into the intact surface of the raised bog. However, many of the old hand cuttings now support actively regenerating bog vegetation. More recent mechanised peat cutting has taken place in some areas of the bog and in some instances encroached onto the intact surface of the bog. Peat cutting at the time of designation was problematical, but now appears to have largely stopped. During the 2005 condition assessment evidence of small-scale, hand cutting was encountered. However, no such areas of cutting were encountered in the 2011 assessment.

ACTION: No peat cutting within the SAC.

Burning

Burning of the vegetation has taken place occasionally, with some areas of past burning identified. Excessive burning will tend to reduce the cover of *Sphagnum* mosses and ericaceous species, increasing the proportion of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, structural diversity will be reduced.

ACTION: No burning within the SAC.

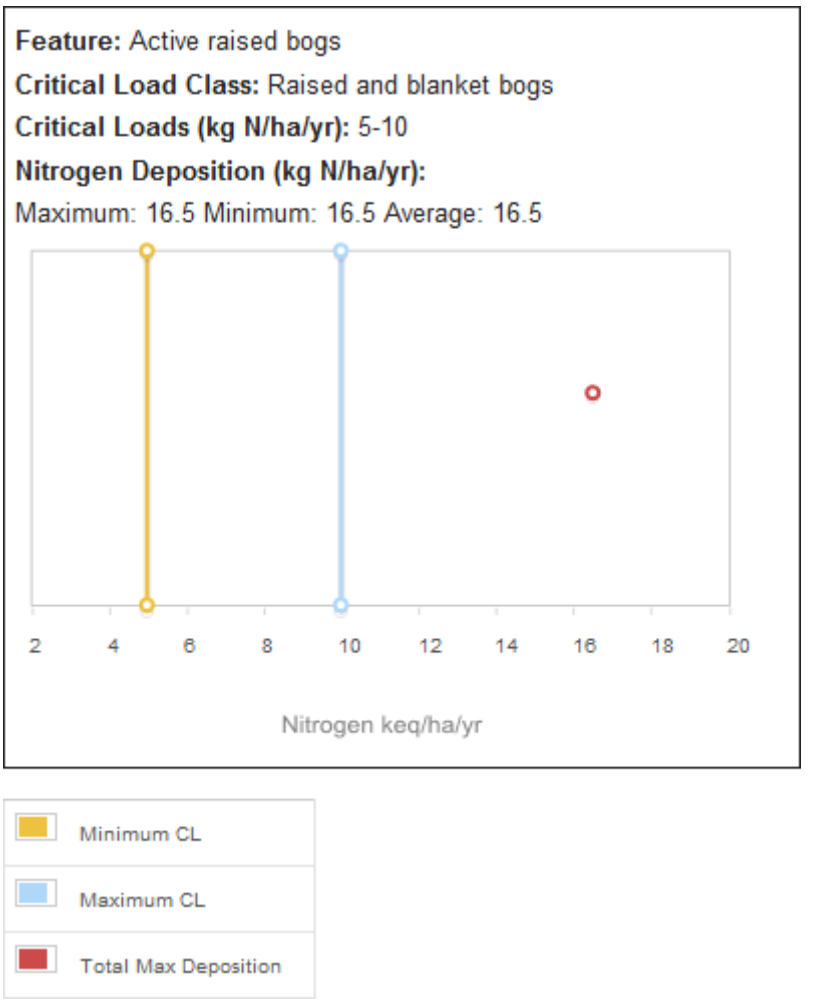
Drainage

The northern section of the main uncut dome of Black Bog, has been drained in the past by a series of about 30 north-west to south-east drains at 20 m intervals. These drains were subsequently blocked after the site was declared as an ASSI in 1987. In addition, there are several very old drains cut right across the main dome of the raised bog. All of these drains show up on the aerial photograph and are clearly apparent on the ground. Any drains that are currently carrying water away from the peat mass should be identified and blocked. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.

ACTION: Block active drains where appropriate.

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 Black Bog SAC.



(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.

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.

Scrub Encroachment

There are some pockets of trees and scrub associated with the lagg and cutover bog around the periphery of the intact surface at Black Bog. Any further scrub encroachment into the actively regenerating cutover areas, or onto the intact surface is undesirable.
ACTION: Monitor further scrub encroachment (where it occurs) and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Grazing

Lowland raised bogs are not suitable for grazing as the surface is fragile and easily damaged by poaching. The boundary is not entirely stock proof and there had been evidence of grazing in the past, however, there was no sign of any grazing on site in 2011 or 2005 or any damage caused through grazing.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site. Where there are no fences around the edges of improved agricultural land, fences should be erected.

Fly-tipping

There are some instances of localised fly-tipping occurring along the Black Bog Road. Where the ramparts extend into the cutover areas from the edge of the road, the periphery of the cutover is particularly vulnerable to fly tipping. There was no evidence of any fly-tipping noted in 2011.
ACTION: Remove all evidence of past fly-tipping. If localised dumping does reoccur, it should be removed as soon as possible to help prevent any further incidences of dumping.

Shooting

There are what appears to be old Pheasant breeding pens on the periphery of Black bog and it is apparent that there is some degree of rough shooting being carried out across the lowland raised bog. It should be noted that there should be no use of lead shot over wetlands including the surface of lowland raised bogs.
ACTION: Monitor the use of lead shot in the area and liaise with the various gun clubs in the area, to encourage the use of lead free shot.

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

12.1 MONITORING SUMMARY

- ***Monitor the integrity of the site (SIM or Compliance Monitoring)*** – Complete boundary survey. Ensure that there has been no peat cutting, dumping or burning carried out within the SAC boundary. This SIM should be carried out once a year.

- ***Monitor the condition of the site (Condition Assessment)*** – Monitor the key attributes for the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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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ANNEX 1

Feature 1 (SAC) - Active Raised Bog (Status B)

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

Attribute	Targets/Limits	Method of Assessment	Comments
* Area of intact surface (ha)	Maintain the extent of intact bog surface at 194ha.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.
* Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog. This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.

* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm.	Visual estimate in 2x2 m plots.	
* Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots	
* Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia, Menyanthes trifoliata*.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained.

* *Sphagnum* cover/abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic *Sphagnum* moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock forming species*: - S. papillosum* and *S. magellanicum* at least occasional over the surface.	Visual estimate in 2x2m plots. Visual estimate in 2x2m 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 intact bog surface.
* Ericaceous cover (%) and frequency of *Erica tetralix* (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. *Erica tetralix* should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
* Graminoid cover (%)	Graminoid cover should be maintained between 10 and 40 %.	Visual estimate in 2x2m plots	

* Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.	If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
* *Rhynchospora alba* abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots	*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
* *Myrica gale* abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas. Recent burning is represented by areas burnt within the last two years.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	

* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.	Visual estimate in 2x2 m plots.	
Indicators of Local Distinctiveness			
* Presence of rare or scarce species specific to the site. *Sphagnum austinii* *Sphagnum fuscum* *Sphagnum pulchrum* *Utricularia spp.* *Andromeda polifolia*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment structured walk. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Visual estimate.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

CARN-GLENSHANE PASS SAC

UK0030110

CONSERVATION OBJECTIVES

Document Details

Title	Carn-Glenshane Pass SAC Conservation Objectives
Prepared By	R. McKeown
Approved By	P. Corbett
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Contact	cdp@daera-ni.gov.uk

Version	Date	Summary of Changes	Initials
V1.0	June 2013	Internal working document	PC
V2.0	2015	Complete review	RMK
V2.0	01.04.2015	Effective date of Version 2	PC
V2.1	11.10.2017	Removed wording '*excluding recently burnt areas*' from bare peat target in all relevant Annex tables	PMC

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).

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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.

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- Its natural range and areas it covers within that range are stable or increasing, and
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- 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: LONDONDERRY

GRID REFERENCE: IH788075

AREA: 1938.78 ha

5. SUMMARY SITE DESCRIPTION

Carn/Glenshane Pass extends over the uplands to the north-east of the Sperrin Mountains, between Maghera and Dungiven. It falls into Coleraine and Limavady Borough Councils and Magherafelt District Council. With an area of largely intact blanket bog, estimated to be just over 1650 ha, it is one of the few remaining examples of good quality blanket bog within this region of Northern Ireland.

The peatland complex is comprised of a series of raised and flushed peat bog units within an all encompassing mantle of blanket peat. The blanket bog is somewhat degraded in places with large blocks eroded, other sections drained and still other areas overgrazed. Nevertheless, the peatland supports good *Sphagnum*-rich blanket bog vegetation with high dwarf-shrub cover. The site also includes a well-patterned hummock, hollow and pool complex. Localised pockets of wet heath occur on the steeper slopes.

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 of Carn/Glenshane Pass has been drawn to include all areas of high quality blanket bog and associated semi-natural habitats, including cutover bog, wet and dry heath, acid flushes, flushed and wet grassland and dry grassland, particularly along the streams that run through the area. It should be noted that although much of the peatland within the SAC has been modified to varying degrees, the semi-natural blanket bog vegetation remains in comparatively good condition.

The boundary around the entire SAC is defined as the edge of the high quality semi-natural blanket bog vegetation and associated habitats. However, there are no clearly defined boundaries distinguishing high quality blanket bog vegetation from degraded and semi-improved habitats. Instead there is a gradual transition from good quality blanket bog vegetation to degraded and highly impacted peatland communities on the lower slopes. Therefore it is sometimes quite difficult to find an appropriate physical boundary to mark the periphery of the interest features. Separation between areas included within the SAC boundary and those more degraded areas which are excluded depends upon the judgement of the surveyor. This separation was based on a variety of factors, such as *Sphagnum* moss cover, bare peat, grass:dwarf-shrub ratio, frequency of dung and poaching, burning and drainage.

The boundary of Carn/Glenshane Pass follows a series of ditches, banks, tracks, streams and fences which delineates the quality blanket bog and excludes severely degraded peatland vegetation and semi-improved lands. Although many of the boundaries are stock-proof fences, there are also numerous boundaries, that although clearly apparent on the ground are not completely stock proof. Note, in several instances, quite large expanses of fairly degraded wet and flushed grassland and degraded peatland has been included within the SAC boundary because there was absolutely no physical boundary with which to exclude them.

In the centre of the peatland complex an area of blanket peat has been planted with Sitka Spruce and is excluded from the SAC. This forestry plantation, estimated to cover an area of 88 ha, is excluded from the SAC using a series of fences and the Inver Burn. Note, it has been policy in Northern Ireland to exclude afforested blanket bog from all upland blanket bog ASSI/SACs.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Blanket Bog	B	1651.4 ha
Habitat	Northern Atlantic wet heaths with *Erica tetralix*	D	38.6 ha

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 Carn-Glenshane Pass SAC.

6.1 ASSI SELECTION FEATURES

Carn-Glenshane Pass ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Blanket Bog	1651.4 ha

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the Blanket Bog 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

SAC Feature	Global Status	Component Objective
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.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Blanket Bog	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.

10. MANAGEMENT CONSIDERATIONS

Ownership

Carn-Glenshane Pass is a large site which is privately owned with over 30 individuals owning various sections of the bog. An additional 59 individuals have turbary rights to cut peat for fuel within some of the management units.

The complex ownership pattern within the bog makes a unified approach to site management more difficult.

Although the SAC is in multi-ownership, very little fencing had been carried out within the SAC boundary at the time of ASSI declaration. Therefore much of the land has been grazed in common. However, at the time of ASSI declaration in March 2000, there was evidence that new fencing was being erected across vast

expanses of the open blanket bog. The entire area of the Carn-Glenshane Pass SAC lies within the Sperrins Environmentally Sensitive Area (ESA) and it is assumed that additional fencing is taking place over the site as a consequence of ESA grants to individual landowners. This may have have implications for future grazing regimes and this is clearly the main management consideration for the blanket bog vegetation

Adjoining Land Use

The main adjoining land-use outside the ASSI is semi-improved sheep pasture, degraded blanket bog and wet grasslands. These areas are more intensively grazed by sheep and have severely degraded peatland complexes as a consequence of drainage and mechanised peat extraction.

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 Carn-Glenshane Pass, or could affect it in the future. Although Blanket Bog is the qualifying SAC feature, factors affecting ASSI features are also considered.

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

Peat Cutting.

There has been extensive hand peat cutting for many years around the periphery of the Carn-Glenshane SAC which has encroached significantly into the intact surface of the blanket bog. However, many of the old hand cuttings now support actively regenerating bog vegetation. In recent times mechanised peat cutting has taken place in some areas and has encroached onto the intact surface of the blanket bog. There is still some localised mechanical peat extraction taking place within the SAC boundary.

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. However, at Crockor, to the south of the site, there appears to be some form of burning trials being carried out within the site. Excessive burning will tend to reduce the cover of *Sphagnum* mosses and ericaceous species, increasing the proportion of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, structural diversity of the vegetation can be reduced. Landowners who have entered into an ESA agreement with DARD must not burn the vegetation without prior authorisation from the Department. Burning of peatland should only be carried out under controlled conditions.

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^{0} as this may result in erosion.

ACTION : No burning within the SAC

Drainage

Many of the deeper blanket bog units throughout the SAC have been extensively drained or 'Moor-gripped'. This was a practice carried out under grant aid in the 1980s to try and improve the grazing potential of the dwarf-shrub vegetation. The shallow, often parallel drains may be widely spaced at 50 – 100 m, or close together at approximately 15 m intervals. Although there is some drying evident along each side of the drains, there is little evidence to suggest that grazing potential has been significantly enhanced. In fact many of the narrow drains have filled with water or collapsed. However, many do continue to carry water off the peat mass at an accelerated rate.

In addition, there are a series of drains associated with many of the peat cuttings around the periphery of the site. All of these drains show up on the aerial photograph and are clearly apparent on the ground. Any major drains that are currently carrying water away from the peat mass should be identified and blocked. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.

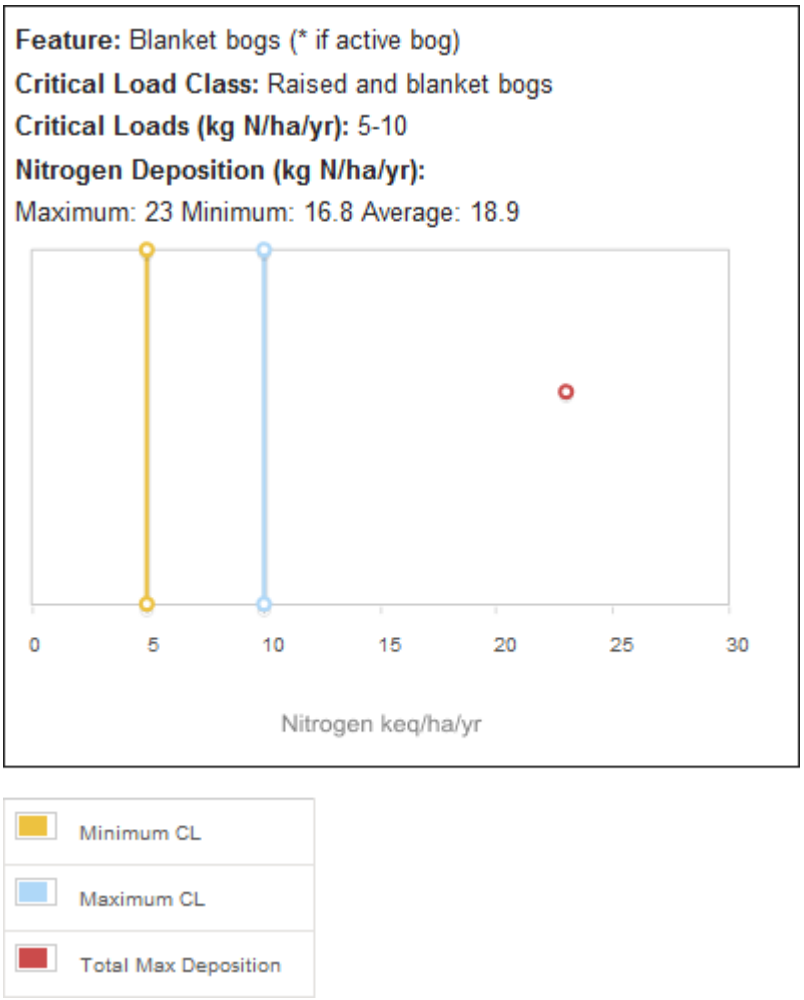
ACTION: Block active drains where appropriate.

Grazing

Stocking levels seem to be at a reasonable level whilst grazing pressure appears to be quite variable over much of the blanket bog with large areas retaining a good cover of dwarf-shrub species. However, other areas have suffered severe damage from poaching and overgrazing as the sheep tend to congregate and stay in these areas. This localised overgrazing, which leaves large areas of blanket bog ungrazed, could be prevented by appropriate shepherding.
ACTION: Where they are present, fences around the periphery of the SAC should be maintained to prevent sheep from outside the area straying into the site. Localised overgrazing should be addressed by setting appropriate grazing levels for each grazing unit and through the introduction of shepherding.

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 Carn-Glenshane Pass SAC.



(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.

Fly-tipping

There are some very localised incidences of fly-tipping around the periphery of the site and associated with past peat cutting.
ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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 that the fencing, where present is still intact. Ensure that there has been no peat cutting, moor-gripping, dumping or inappropriate burning carried out within the SAC boundary. Evaluating stocking densities would also be desirable. This SIM should be carried out once a year.

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

Monitor the key attributes for the blanket bog. This will detect if the blanket bog is 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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ANNEX 1

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

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

Attributes	Targets	Method of Assessment	Comments
* Area of blanket bog and upland raised mire (ha)	Maintain the extent of the intact bog surface at 1651.4 ha.	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 SAC 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.
* 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.*	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and Condition Assessment.

	auriculatum in the pools and *S. papillosum* and *S. capillifolium* forming the lawns and hummocks.	SIM.	
Dwarf-shrub Height (cm)	Average ericoid height should be 15-30cm.	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.
* *Sphagnum* cover/ abundance (% cover and frequency) Active Peat Formation (DAFOR)	*Sphagnum* moss species should have a minimum cover of 25% over at least 66% of the intact blanket bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock	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.

	forming species: - *S. papillosum* and *S. magellanicum* at least occasional over the surface.		
* 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 – i.e. the water table is too low beneath the surface of the bog.
* 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 (% and DAFOR)	No gully erosion or bare peat associated with more concentrated human impacts (eg drainage, peat extraction,	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 blanket bog, particularly marginal fretting

	ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of blanket bog other than very localised instances.		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.	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.
Molinia caerulea Cover (%)	Where *Molinia caerulea* cover is greater than 50%, it should form an even (not tussocky) sward in waterlogged conditions with *Sphagnum* moss cover greater than 25%.	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 the climate is generally warmer and wetter i.e. more oceanic.
Presence of rare or scarce species specific to the site.	*Sphagnum imbricatum* and *Sphagnum fuscum*, where they have been recorded, should	visual estimate in 2x2 m plots.	

	remain at least present along the length of each of the w-walks. If these species are not recorded on any one visit, it does not automatically make the SAC unfavourable.		

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

CRANNY BOGS SAC
UK0030321

CONSERVATION OBJECTIVES

Document Details

Title	*Cranny Bogs SAC Conservation Objectives*
Prepared By	*R. McKeown*
Approved By	*P. Corbett*
Date Effective From	*01/04/2015*
Version Number	*V2*
Next Review Date	Nov 2020
Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete Review	RMK

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 as 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: TYRONE

GRID REFERENCE: H 425641

AREA: 78.9 ha

FALLAGHEARN BOG	H 422645
KILLYMOONAN BOG	H 428643
CAVAN BOG	H 413636

5. SUMMARY SITE DESCRIPTION

Cranny Bogs is made up of three inter-drumlin, lowland raised bogs - Fallaghearn Bog, Killymoonan Bog and Cavan Bog. They are typical of western bogs within the drumlin belt of Northern Ireland, being elongated and/or very irregular in shape. Generally, dome structure is poorly defined. The two eastern bogs are linked together around a small drumlin, the third lies to the south-west but in close proximity. The bogs vary considerably in their microtopography, with Fallaghearn in particular displaying relatively well-developed hummock (including *Sphagnum imbricatum* and *S. fuscum*) and lawn complexes. Hummocks on Killymoonan and Cavan Bogs are generally more subdued. Shallow, temporary pools are scattered over the three bogs.

Notable species include *Sphagnum imbricatum, S. fuscum* and *S. pulchrum*, with *Vaccinium oxycoccus* and *Pleurozia purpurea*.

Disturbance to the bogs has been confined to cutting and occasional burning on both the intact core and cutover margins.

5.1 BOUNDARY RATIONALE

The boundary uses permanent man-made features where present around the periphery. The boundary has been drawn to include all areas of intact lowland raised bog and associated semi-natural habitats, including cutover bog and Birch scrub and mature woodland.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	69.12 ha
Habitat	Degraded raised bog still capable of regeneration	D	9.724 ha

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 Cranny Bogs SAC.

6.1 ASSI SELECTION FEATURES

Cranny Bogs ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	69.37 ha

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog 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

SAC Feature	Global Status	Component Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.

10. MANAGEMENT CONSIDERATIONS

Ownership
The site is owned by 23 owner/occupiers.

Adjoining Land Use
The main adjoining land-use outside the ASSI is intensively managed agricultural land in silage and grazing.

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 Cranny Bogs, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, factors affecting ASSI features are also considered.

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

Peat Cutting
There has been extensive hand cutting for many years around the periphery. This has encroached significantly into the intact surface of the raised bog. Along the edge of the intact area, the cut peat face can be as much as 2.5m high in places, resulting in local desiccation to the adjacent intact surface, most notable to the eastern half of Cavan, southern margin of Killymoon and northwest margin of Fallaghearn. Although the old hand cuttings now support either actively regenerating bog vegetation or birch wood, there has been some mechanised peat cutting carried out within the former in recent years.

In a number of instances, mechanised cutting had encroached onto the remaining intact surface of the bog, in some cases quite extensive and recent, as in the middle of both the south-east boundary of Cavan Bog and Fallaghearn's southern edge. Peat cutting at the time of designation was problematical. It is not known whether there are any extant consents for turf cutting.
ACTION: No peat cutting within the SAC.

Burning
All three bogs have been burnt – with extensive burning recorded for Fallaghearn and Killymoonan (HST survey 1995). Excessive burning will tend to reduce the cover of *Sphagnum* mosses and ericaceous species, increasing the proportion of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, structural diversity will be reduced.
ACTION :- No burning within the SAC.

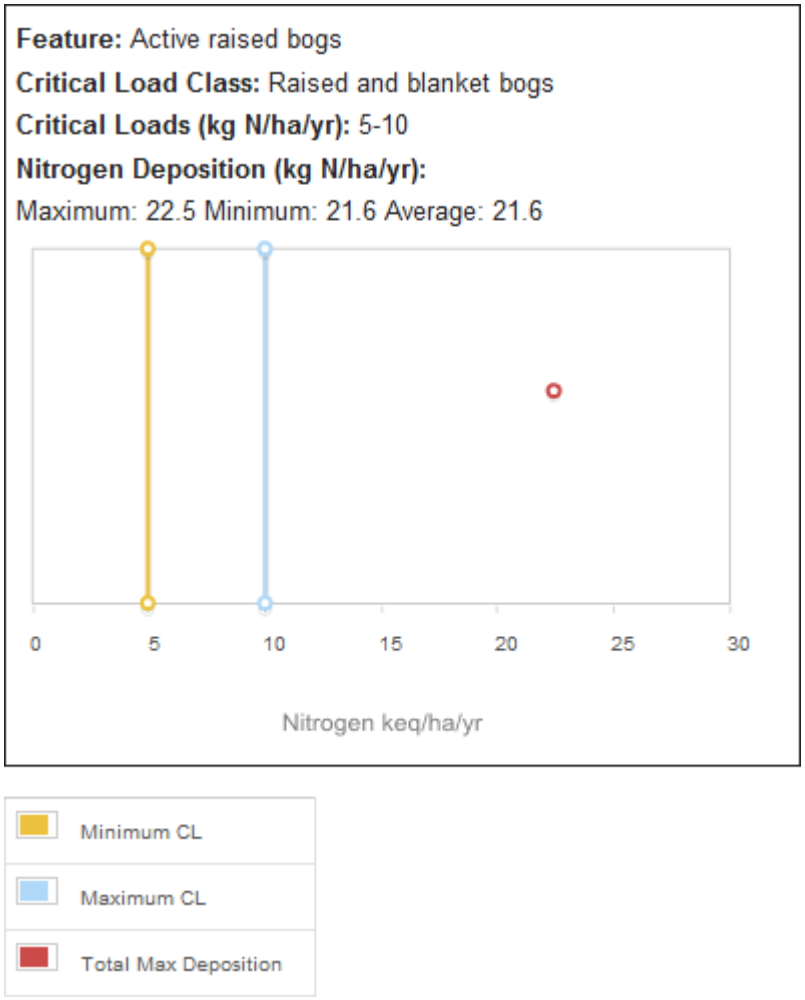
Drainage

The intact dome remains largely intact with only one active drain dissecting it. However, there are a few old drains associated with the cuttings around the periphery. Any drains that are currently carrying water away from the peat mass should be identified and blocked. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.

ACTION: Block active drains where appropriate.

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 Cranny Bogs SAC.



(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.

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.

Scrub Encroachment

Tree and scrub growth is locally extensive within the cutover bog but set back from the periphery of the intact. Any further scrub encroachment into the actively regenerating cutover areas, or onto the intact surface is undesirable.
ACTION: Monitor further scrub encroachment (where it occurs) and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Grazing

Lowland raised bogs are not suitable for grazing, as the surface is fragile and easily damaged by poaching. Grazing appears to be restricted to a small patch that is fenced off and lies to the north of the drumlin around which Fallaghearn and Killymoonan Bogs are connected. There is no evidence of any current grazing within the intact area.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site.

Fly-tipping

There was previouslyone localised incident of fly-tipping in the cutover area of the bog, but generally there is no dumping problem associated with the site.
ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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

- ***Monitor the integrity of the site (SIM or Compliance Monitoring)***
  Complete boundary survey. Ensure that there has been no peat cutting, dumping or burning carried out within the SAC boundary. This SIM should be carried out once a year.

- ***Monitor the condition of the site (Condition Assessment)***
  Monitor the key attributes for the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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 <u>not by itself</u> 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

Cooper, A., McCann, T. and Rogers, D. (2009). Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency Research and Development Series No.09/06

Cruickshank, M. M. & Tomlinson, R. W. (1988). *Northern Ireland Peatland Survey*. Department of the Environment for Northern Ireland (Countryside and Wildlife Branch). Belfast.

Department of the Environment for Northern Ireland (1993a). Conserving Peatland in Northern Ireland – A Statement of Policy.

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European Commission (2000). Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

European Commission (2014). Establishing conservation measures for Natura 2000 Sites.

Joint Nature Conservation Committee (JNCC) (2013). 3rd UK Habitats Directive Report.

ANNEX 1

Feature 1 SAC - Active raised bog

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

Attribute	Targets/Limits	Method of Assessment	Comments
* Area of intact surface (ha)	Maintain the extent of intact bog surface at 48.45ha.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.
* Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog at 20.67ha. This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.
* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm.	Visual estimate in 2x2 m plots.	

* Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots	
* Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia, Menyanthes trifoliata*.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained.

* *Sphagnum* cover/abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic *Sphagnum* moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock forming species*: - S. papillosum* and *S. magellanicum* at least occasional over the surface.	Visual estimate in 2x2m plots. Visual estimate in 2x2m 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 intact bog surface.
* Ericaceous cover (%) and frequency of *Erica tetralix* (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. *Erica tetralix* should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
* Graminoid cover (%)	Graminoid cover should be maintained between 10 and 40 %.	Visual estimate in 2x2m plots	

* Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.	If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
* *Rhynchospora alba* abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots	*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
* *Myrica gale* abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas. Recent burning is represented by areas burnt within the last two years.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	

* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.	Visual estimate in 2x2 m plots.	
Indicators of Local Distinctiveness			
* Presence of rare or scarce species specific to the site. *Sphagnum austinii* *Sphagnum fuscum* *Sphagnum pulchrum* *Utricularia spp.* *Andromeda polifolia*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment structured walk. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Visual estimate.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date

Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 14 December 1999 / Updated: May 2005

3. Country:

UK (Northern Ireland)

4. Name of the Ramsar site:

Fairy Water Bogs

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**

54 38 29 N 07 28 24 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Between 10 - 15 km north-west of Omagh, Co. Tyrone in Northern Ireland.

Administrative region: Omagh; Strabane; Tyrone

8. Elevation (average and/or max. & min.) (metres)**:**

Min. 50
Max. 80
Mean No information available

9. Area (hectares)**:** 223.7

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The area is of particular interest because it is considered to comprise the most important concentration of lowland raised bogs in Northern Ireland. As other bog complexes in Northern Ireland have suffered

much more severe exploitation, the overall extent of intact bog make this complex unique. Three examples of bogs - Bomackatall, Claragh and Kilmore Robinson - are included in this composite site.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1

The site is a large and relatively intact example of a lowland raised bog and one of the best examples of this habitat in the UK.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, peat, nutrient-poor, basalt
Geomorphology and landscape	lowland
Nutrient status	oligotrophic
pH	acidic, strongly acidic
Salinity	fresh
Soil	mainly organic
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Carmoney, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/carmoney.html) Max. daily temperature: 12.1° C Min. daily temperature: 5.9° C Days of air frost: 27.6 Rainfall: 993.0 mm Hrs. of sunshine: 1179.0

General description of the Physical Features:

No information available

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

No information available

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

17. Wetland types

Inland wetland

Code	Name	% Area
U	Peatlands (including peat bogs swamps, fens)	100

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Three examples of bogs - Bomackatall, Claragh and Kilmore Robinson - are included in this composite site.

Each bog has a classic dome structure and hummocks and hollows are also generally well developed on all three bogs, with significant pool complexes at Claragh and Bomackatall. *Sphagnum imbricatum* and *S. fuscum* are widespread, with *S. fuscum* especially abundant on Kilmore Robinson. Bryophytes typically associated with western blanket bog are well represented, with *Pleurozia purpurea* being prominent in bog pools on Kilmore Robinson and Claragh.

Annaghs Lough at the margin of Bomackatall bog shows various stages in the vegetation succession from open water to peaty swamp and fen. At North Drumnafallow this type of succession is well advanced, with the development of a schwingmoor over the site of an old pond.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Internationally important species occurring on the site
Habitat:
Active raised bog

Nationally important species occurring on the site
Habitat:
Lowland raised bog

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Species Information

None reported

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

No special values known

22. Land tenure/ownership:

Ownership category	On-site	Off-site
National/Crown estate	+	+
Private		+

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Rough or shifting grazing		+

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
No factors reported	NA				

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
SSSI / ASSI	+	
Management agreement	+	
Site management statement/plan implemented	+	
SAC	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

· The site was subject to detailed habitat and species surveys prior to its designation as an ASSI
· The integrity of the site is regularly monitored
· A basin profiling and hydrological survey was carried out in 1996

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

None reported

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

Corbett, P. McM & Seymour, GR (1997) The conservation of peatland in Northern Ireland. In: *Conserving peatlands*, ed by L Parkyn, RE Stoneman & HAP Ingram. CAB International, Wallingford, for Scottish Wildlife Trust

Frazer, JS, Cruickshank, MM & Tomlinson, RW (1988) *Northern Ireland Peatland Survey*. Unpublished report to Department of the Environment (Northern Ireland), Countryside and Wildlife Branch, Belfast

McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

FAIRY WATER BOGS SAC
UK0016611

CONSERVATION OBJECTIVES

Document Details

Title	*Fairy Water Bogs SAC Conservation Objectives*
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V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete review	RMK

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 as 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: TYRONE

GRID REFERENCE: IH340770

AREA: 223.7 ha

5. SUMMARY SITE DESCRIPTION

Fairy Water Bogs are located at an elevation below 80m in the former floodplains of the Fairy Water valley to the north of Drumquin. They are considered to be the most important concentration of lowland raised bogs in Northern Ireland. Although there has been a long history of peat extraction in the area, a large extent of intact bog remains amongst the drumlins that are generally improved farmland. The SAC is made up of three separate active raised bogs with classic dome structure – Bomackatall and North Drumnafallow, Claragh and Kilmore Robinson. Bomackatall Bog surrounds an agriculturally improved drumlin top, which is excluded from the SAC. Claragh was the subject of a study in the late 1950s of the ecology of a raised bog (Morrison, 1959).

Hummocks and hollows, with widespread bryophyte communities, are generally well developed on all four bogs and contain some notable species, including *Sphagnum fuscum* and *Sphagnum imbricatum*. At North Drumnafallow there is still some evidence of mire development over the site of an old pond.

The site has a detailed Holocene pollen record with radiocarbon dates providing a detailed vegetational history. Recent work shows this site also has a good tephra record.

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 area, particularly the drumlins, has been much developed over time for agriculture and hence the bog sites have now been interspersed with agricultural land. The boundaries are thus drawn and fenced separately for each bog.
The eastern edge of Claragh is flanked by a road, whilst the rest is generally the boundary between the semi-improved agricultural lands and the bog, excluding an area of heavily machine cut heath to the west. Some areas of peat cuttings are included to maintain the integrity of the whole unit.

Kilmore Robinson is bounded to the north and east by the Fairy Water River flood plain. The rest of the SAC boundary encloses the peat area, including the cut-over parts and some scrub woodland to maintain the integrity of the bog hydrology. Bomackatall boundary includes old cut-over areas which will recover with time whilst excluding the improved ground on the drumlin to the northwest that lies within the bog. The boundary is the river flood plain to the north and elsewhere a road and lane, with exclusions round farm buildings and improved agricultural ground.

North Drumnafallow is a small area with only 3 private owners. Its boundary follows the natural features edging the bog and a small wooded area to the northwest.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	188 ha
Habitat	Degraded raised bog still capable of regeneration	D	35 ha
Habitat	Depressions on peat substrates	D	0.1 ha
Habitat	Transition mires and fens	D	0.5 ha

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 Fairy Water Bogs SAC.

6.1 ASSI SELECTION FEATURES

Fairy Water Bogs ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	223 ha
Earth Science	Peat and related stratigraphy	50.85 ha ie the entire raised bog unit including cutover areas at Claragh Bog.

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog 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

SAC Feature	Global Status	Component Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.
Peat & Related Stratigraphy	Component Objective
	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.

10. MANAGEMENT CONSIDERATIONS

Ownership

Fairy Water Bogs are privately owned with over 70 individuals owning sections and some with turbary rights.

Adjoining Land Use

The land surrounding the site is intensively managed agricultural land in silage and grazing.

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 <u>likely</u> factors that are either affecting Fairy Water Bogs, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, 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

Any method of peat extraction is a particularly damaging activity, having very profound effects upon its ecology and hydrology. Peat cutting continues around the area of the SAC and a few consents have been issued for continued hand cutting of turf from small, specified areas within the ASSI.

ACTION: No unauthorised peat cutting within the SAC.

Burning

There has been occasional burning in the past. Excessive burning will reduce the cover of *Sphagnum* mosses and Ericaceous species, increasing the proportion of *Molinea caerulea* and *Trichophorum cespitosum*. Structural diversity will also be reduced.

ACTION: No burning within the SAC.

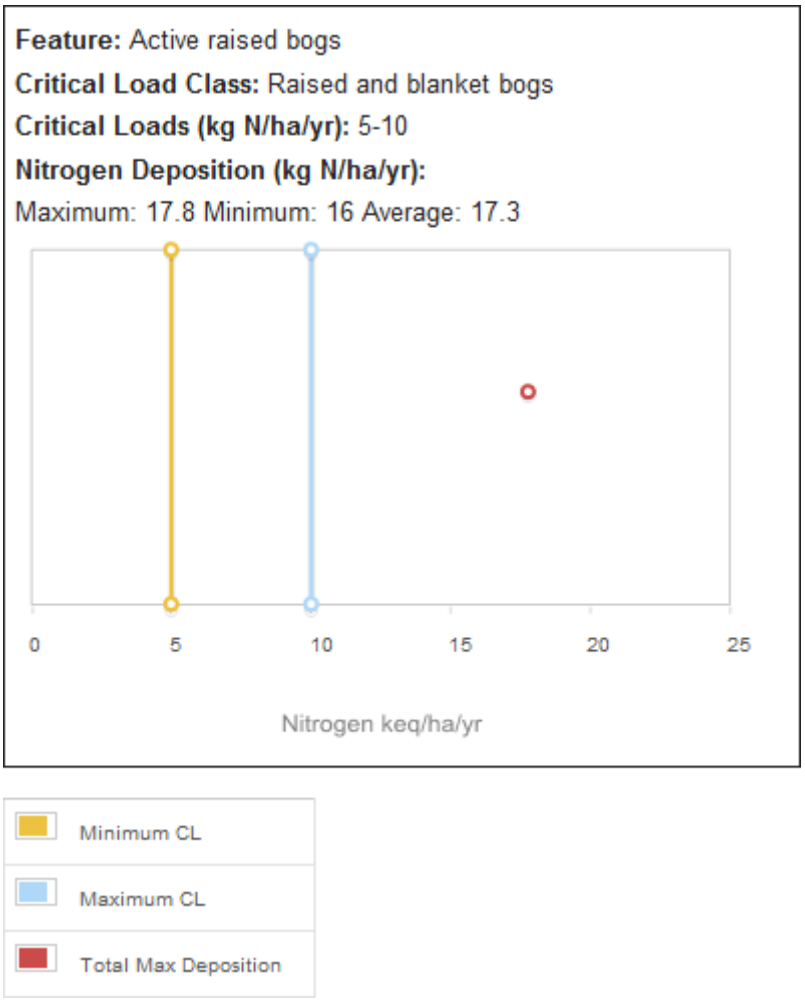
Drainage

The bogs need a relatively high water table to maintain their interest and structure. Drains that allow water to run off the bog from old cuttings should be blocked. Note that drainage works outside of the site's boundaries could potentially impact upon the bog's hydrology.

ACTION: Block active drains where appropriate.

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 Fairy Water Bogs SAC.



(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.

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.

Scrub Encroachment

There are some pockets of trees and scrub associated with the lagg and cutover bog around the periphery of the intact surface at Fairy Water Bogs. Any further scrub encroachment into the actively regenerating cut-over areas, or onto the intact surface is undesirable.

ACTION: Monitor further scrub encroachment (where it occurs) and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Tree Planting/Afforestation

Trees cause shading effects on bog vegetation and hydrological and physiological changes to the peat, such that it is not possible to reinstate a raised bog. A couple of consents have been issued for the felling and removal of timber from small parts of the edge of the ASSI.
ACTION: No unauthorised tree removal and no tree planting.

Grazing

Lowland raised bogs are not suitable for grazing, as the surface is fragile and easily damaged by poaching.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site.

Fly-tipping

Because of its widely dispersed nature and isolated location, there is always the threat of fly-tipping which is unsightly and could encourage further dumping if not removed.
ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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. MONITORING SUMMARY

- ***Monitor the integrity of the site (SIM or Compliance Monitoring)*** – Complete boundary survey. Ensure that there has been no peat cutting, dumping or burning carried out within the SAC boundary. This SIM should be carried out once a year.

- ***Monitor the condition of the site (Condition Assessment)*** – Monitor the key attributes for the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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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European Commission (2000). Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

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European Commission (2014). Establishing conservation measures for Natura 2000 Sites.

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Annex 1

Feature 1 (SAC) – Active raised bogs (Status B)

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

Attribute	Targets/Limits	Method of Assessment	Comments
* Area of intact surface (ha)	Maintain the extent of intact bog surface.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.
* Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog. This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.

* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm.	Visual estimate in 2x2 m plots.	
* Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots	
* Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia, Menyanthes trifoliata*.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained.

* *Sphagnum* cover/abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic *Sphagnum* moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock forming species*: - S. papillosum* and *S. magellanicum* at least occasional over the surface.	Visual estimate in 2x2m plots. Visual estimate in 2x2m 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 intact bog surface.
* Ericaceous cover (%) and frequency of *Erica tetralix* (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. *Erica tetralix* should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
* Graminoid cover (%)	Graminoid cover should be maintained between 10 and 40 %.	Visual estimate in 2x2m plots	

* Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.	If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
* *Rhynchospora alba* abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots	*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
* *Myrica gale* abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas. Recent burning is represented by areas burnt within the last two years.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	

* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas.	Visual estimate in 2x2 m plots.	The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.
Indicators of Local Distinctiveness			
* Presence of rare or scarce species specific to the site. *Sphagnum austinii* *Sphagnum fuscum* *Sphagnum pulchrum* *Utricularia spp.* *Andromeda polifolia*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment structured walk. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Visual estimate.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:

Designated: 02 February 1999 / updated 12 May 2005

3. Country:

UK (Northern Ireland)

4. Name of the Ramsar site:

Lough Foyle

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**

55 05 24 N 07 01 37 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Londonderry

Lough Foyle is situated on the north coast of Northern Ireland immediately downstream and extending to the north-east of the city of Londonderry.

Administrative region: Derry; Derry City; Limavady

8. Elevation (average and/or max. & min.) (metres)**:**

Min. 0
Max. 10
Mean 0

9. Area (hectares)**:** 2204.36

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The site is comprised of a large shallow sea lough which includes the estuaries of the rivers Foyle, Faughan and Roe. The site contains extensive intertidal areas of mudflats and sandflats, saltmarsh and associated brackish ditches.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 3, 5, 6

Secretariat comment: The RIS provides information requiring the application of Criterion 4. This needs to be included in the next update.

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

This is a particularly good representative example of a wetland complex including intertidal sand and mudflats with extensive seagrass beds, saltmarsh, estuaries and associated brackish ditches.

This is a particularly good representative example of a wetland, which plays a substantial hydrological, biological and ecological system role in the natural functioning of a major river basin which is located in a trans-border position.

Ramsar criterion 2

The site supports an appreciable assemblage of rare, vulnerable or endangered species or sub-species of plant and animal. A range of notable fish species have been recorded for the Lough Foyle estuary and the lower reaches of some of its tributary rivers. These include allis shad *Alosa alosa*, twaite shad *A. fallax fallax*, smelt *Osmerus eperlanus* and sea lamprey *Petromyzon marinus*, all of which are Irish Red Data Book species. In addition, important populations of Atlantic salmon *Salmo salar* migrate through the system to and from their spawning grounds.

Ramsar criterion 3

The site supports a diverse assemblage of wintering waterfowl which are indicative of wetland values, productivity and diversity. These include internationally important populations of Whooper Swan *Cygnus cygnus*, Light-bellied Brent Goose *Branta bernicla hrota* and Bar-tailed Godwit *Limosa lapponica*. Additional wildfowl species which are nationally important in an all-Ireland context are Red-throated Diver *Gavia stellata*, Great crested Grebe *Podiceps cristatus*, mute swan *Cygnus olor*, Bewick's Swan *C. columbianus*, Greylag Geese *Anser anser*, Shelduck *Tadorna tadorna*, Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Wigeon *A. penelope*, Eider *Somateria mollissima*, and Red-breasted Merganser *Mergus serrator*. Nationally important wader species are Oystercatcher *Haematopus ostralegus*. Golden Plover *Pluvialis apricaria*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Dunlin *C. aplina*, Curlew *Numenius arquata*, Redshank *Tringa tetanus* and Greenshank *T. nebilaria*.

Ramsar criterion 5

The site supports about 29000 migrating birds.
Species and numbers are listed in section 20

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

Whooper swan , *Cygnus cygnus*, Iceland/UK/Ireland	882 individuals, representing an average of 4.2% of the population (5 year peak mean 1998/9-2002/3)
Light-bellied brent goose, *Branta bernicla hrota*, East Canada/Ireland	2270 individuals, representing an average of 11.3% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Bar-tailed godwit , *Limosa lapponica lapponica*, W Palearctic	2028 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.
See Sections 19/20 for details of noteworthy species
Details of bird species occuring at levels of National importance are given in Section 20

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13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation)**:**

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

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14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	sand, mud
Geomorphology and landscape	intertidal sediments (including sandflat/mudflat), estuary, lagoon
Nutrient status	no information
pH	no information
Salinity	brackish / mixosaline, saline / euhaline
Soil	no information
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Carmoney, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/carmoney.html) Max. daily temperature: 12.1° C Min. daily temperature: 5.9° C Days of air frost: 27.6 Rainfall: 993.0 mm Hrs. of sunshine: 1179.0

General description of the Physical Features:

Lough Foyle comprises a large, shallow sea lough that includes the estuaries of the rivers Foyle, Faughan and Roe. The site contains extensive intertidal mudflats and sandflats (with mussel *Mytilus edulis* beds), saltmarsh and associated brackish ditches.

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15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Lough Foyle comprises a large, shallow sea lough that includes the estuaries of the rivers Foyle, Faughan and Roe. The site contains extensive intertidal mudflats and sandflats (with mussel *Mytilus edulis* beds), saltmarsh and associated brackish ditches.

The Foyle Basin comprises eastern Co. Donegal from Inishowen Head to Lough Derg, western Co. Derry from Binevenagh through to Fintona in West Co. Tyrone.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

17. Wetland types

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	94.4
H	Salt marshes	3.6
J	Coastal brackish / saline lagoons	2

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The littoral communities found in Lough Foyle reflect the dominance of intertidal sands and muds. While rocky substrate is very limited, the extensive beds of common mussel *Mytilus edulis* provide a stable surface for acorn barnacle *Semibalanus balanoides* and edible periwinkle *Littorina littorea*. The polychaete green leaf worm *Eulalia viridis* is a common associate. The soft shores hold a range of invertebrates typical of mud and sand shores, with a number of species, such as the polychaete worm *Hediste diversicolor*, indicative of reduced salinity conditions. Balls Point has the highest diversity of sediment and community types in Lough Foyle and holds large populations of the bivalves sand gaper *Mya arenaria* and peppery furrow shell *Scrobicularia plana*.

The intertidal area consists of extensive mudflats, which support large beds of both common mussel *Mytilus edulis* and eelgrass *Zostera* spp. The latter are amongst the largest colonies of this vegetation type in Northern Ireland and includes two species, narrow-leaved eelgrass *Zostera angustifolia* and dwarf eelgrass *Z. noltei*. Large stands of saltmarsh vegetation occur along the foreshore, displaying a transitional sequence of community types. The lower colonising saltmarsh consists of a community dominated by common saltmarsh-grass *Puccinellia maritima*. As tidal influence declines up the shore, this is replaced by a 'middle-marsh' community, characterised by red fescue *Festuca rubra* and mud rush *Juncus gerardii*. Localised stands of sea club-rush *Bolboschoenus maritimus* and common reed *Phragmites australis* also occur. The uppermost saltmarsh features a community dominated by common couch *Elytrigia repens*. Just west of the Ballykelly Bank, on the large intertidal mudflats which form part of a larger creek network, the lower saltmarsh communities are replaced by extensive stands of common cord-grass *Spartina anglica*. Brackish dykes behind the shore support a maritime aquatic and swamp vegetation, including the rare reflexed saltmarsh-grass *Puccinellia distans* and spiral tasselweed *Ruppia cirrhosa*.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

None reported

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species with peak counts in spring/autumn:

Great crested grebe , *Podiceps cristatus cristatus*, NW Europe	179 individuals, representing an average of 5.1% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Great cormorant , *Phalacrocorax carbo carbo*, NW Europe	102 individuals, representing an average of 2% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Eurasian wigeon , *Anas penelope*, NW Europe	7259 individuals, representing an average of 5.8% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Eurasian teal , *Anas crecca*, NW Europe	1232 individuals, representing an average of 1.8% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Mallard , *Anas platyrhynchos platyrhynchos*, NW Europe	1214 individuals, representing an average of 2.4% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Common eider , *Somateria mollissima mollissima*, NW Europe	231 individuals, representing an average of 11.5% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa	199 individuals, representing an average of 1.5% of the all-Ireland population (5 year peak mean 1998/9-2002/3 - spring peak)
Ruff , *Philomachus pugnax*, Europe/W Africa	5 individuals, representing an average of 25% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Whimbrel , *Numenius phaeopus*, Europe/Western Africa	6 individuals, representing an average of 40% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	44 individuals, representing an average of 4.8% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Mew gull , *Larus canus canus*, Europe to N Africa	3760 individuals, representing an average of 5.5% of the all-Ireland population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Red-throated diver , *Gavia stellata*, NW Europe	14 individuals, representing an average of 1.4% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Slavonian grebe , *Podiceps auritus*, Northwest Europe	6 individuals, representing an average of 20% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Greylag goose , *Anser anser anser*, Iceland/UK, Ireland	67 individuals, representing an average of 1.7% of the all-Ireland population (5 year peak mean 1991/92-1995/96)
Common shelduck , *Tadorna tadorna*, NW Europe	382 individuals, representing an average of 5.4% of the all-Ireland population (5 year peak mean 1998/9-2002/3)

Red-breasted merganser , *Mergus serrator*, NW & C Europe	36 individuals, representing an average of 1.8% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Eurasian oystercatcher , *Haematopus ostralegus ostralegus*, Europe & NW Africa -wintering	2809 individuals, representing an average of 5.6% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Northern lapwing , *Vanellus vanellus*, Europe - breeding	3430 individuals, representing an average of 1.3% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Dunlin , *Calidris alpina alpina*, W Siberia/W Europe	4595 individuals, representing an average of 3.6% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Eurasian curlew , *Numenius arquata arquata*, N. a. arquata Europe (breeding)	2162 individuals, representing an average of 2.4% of the all-Ireland population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	1286 individuals, representing an average of 5.2% of the all-Ireland population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Fish.

Alosa alosa, Alosa fallax, Osmerus eperlanus, Petromyzon marinus

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Environmental education/ interpretation
Fisheries production
Livestock grazing
Scientific research
Sport hunting
Tourism

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	
Local authority, municipality etc.	+	
National/Crown Estate	+	
Private	+	+
Public/communal	+	

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism		+
Recreation	+	
Current scientific research	+	
Gathering of shellfish	+	

Bait collection	+	
Hunting: recreational/sport	+	
Industrial water supply	+	
Sewage treatment/disposal	+	
Harbour/port		+
Flood control	+	
Transport route		+
Urban development		+

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Introduction/invasion of non-native plant species	2		+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Introduction/invasion of non-native plant species - Conservation Objectives for the site have been developed. These highlight the need for addressing the *Spartina* issue. Extent of *Spartina* extent being monitored. Future trials of selective herbicides to be undertaken ASAP.
Site to be assessed to determine effectiveness of *Spartina* spraying. Rotovating techniques may be trialed.

Is the site subject to adverse ecological change? YES

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	

Management agreement	+	
Site management statement/plan implemented	+	
Other		+
Area of Outstanding National Beauty (AONB)	+	
Special Area of Conservation (SAC)	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

The site is occassionally used by local academic institutions.

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

A small education centre at Magilligan occasionally uses the Lough for study and research.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities.

Magilligan Point is a popular recreation venue for bathing.

Facilities provided.

Discussions regarding a passenger ferry from Magilligan Point to Greencastle on the Southern Irish shores of the Lough have been on-going.

Seasonality.

During the summer months

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Department of the Environment (Northern Ireland), Environment and Heritage Service, Commonwealth House, Castle Street, Belfast, Northern Ireland, BT1 1GU

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

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Weighell, AJ, Donnelly, AP & Calder, K (eds.) (2000) *Directory of the Celtic coasts and seas*. Joint Nature Conservation Committee, Peterborough

Wilkinson, M, Fuller, IWA, Telfer, TC, Moore, CG & Kingston, PF (1988) *Northern Ireland Littoral Survey: A conservation-orientated survey of the intertidal seashore of Northern Ireland*. Institute of Offshore Engineering, Heriot-Watt University, Edinburgh

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

LOUGH FOYLE-
SPECIAL PROTECTION AREA (SPA)

UK9020031

CONSERVATION OBJECTIVES

Document Details

Title	Lough Foyle SPA Conservation Objectives
Prepared By	***Ian Enlander***
Approved By	***Mark Wright***
Date Effective From	***01/04/2015***
Version Number	***V4***
Next Review Date	January 2020
Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials	Changes Marked
V1	02/02/1999	Internal working document	IE	
V1.1	August 2013	Review	IE	
V2.0	February 2015	Draft	IE	Complete review

Site relationship

To fully understand the site conservation requirements for this site it may be necessary to also refer to other site Conservation Objectives

This SPA partially overlaps or adjoins with the following SACs
Magilligan
River Roe and Tributaries
River Faughan and Tributaries

The SPA also matches the boundary of the Lough Foyle Ramsar site.

See also Boundary Rationale

The SPA is also close to, or adjoins, European designations in the Republic of Ireland. This is Lough Foyle SPA

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, terrestrial/inter-tidal 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).

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.

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

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 GENERAL INFORMATION

COUNTY: Londonderry

G.R. C621 273 AREA: 2204.36 ha.

5 SUMMARY SITE DESCRIPTION

This major sea lough is remarkably shallow, with extensive mud and sand flats exposed at low tide. Though considerably diminished by historical reclamation schemes, notably around Myroe, Ballykelly and Longfield, it hosts the second largest area of inter-tidal habitat in Northern Ireland. The shoreline is generally engineered except around the Roe Estuary and northwards. Adjoining agricultural land is of importance as high tide roosts and in supporting wintering geese and swans.

5.1 BOUNDARY RATIONALE

The site principally includes the inter-tidal habitats within Lough Foyle, taking in all of the Lough Foyle ASSI and the adjoining coastal section of Magilligan ASSI/SAC north to Magilligan Point. Landward, the site is delimited by coastal defences. Sections of minor river estuaries have been included as they contain natural/semi-natural habitat of importance as bird roosts and feeding areas. Roost sites occurring outside the extent of natural or semi-natural habitat, together with those agriculturally improved areas utilised by swans and geese, have not been included but their importance must not be underestimated.

6 SPA SELECTION FEATURES

Feature Type	Feature	Population (5 year average 1995-2000)	Population at time of designation (ASSI)	Population at time of designation (SPA)	SPA Review population	Common Standards Monitoring baseline
Species	Bewick's Swan wintering population [b]	43	74	New (78)	78	10
Species	Whooper Swan wintering population [a]	811	905	890	890	566
Species	Golden Plover wintering population [b]	4511	4614	New	4891	2960
Species	Bar-tailed Godwit wintering population [a]	2059	2097	1896	1896	1535
Species	Light-bellied Brent Goose wintering population [a]	3765	3603	3730	3730	1765
Assemblage species	Great Crested Grebe wintering population	148	278	220	220	28
Assemblage species	Cormorant wintering population	106	120	Not listed	118	67
Assemblage species	Greylag Goose wintering population	391	85	67	67	22
Assemblage species	Shelduck wintering population	468	321	287	287	174
Assemblage species	Wigeon wintering population	9011	6153	8107	8107	3513
Assemblage species	Teal wintering population	660	718	751	751	403
Assemblage species	Mallard wintering population	1606	1802	1694	1694	1154
Assemblage species	Eider wintering population	143	154	50	50	8
Assemblage species	Red-breasted Merganser wintering population	135	96	73	73	26
Assemblage species	Oystercatcher wintering population	3101	2335	2045	2028	1683
Assemblage species	Lapwing wintering population	4024	3601	3084	3084	1078
Assemblage species	Knot wintering population	499	433	412	441	135
Assemblag	Dunlin wintering	4991	5606	4847	5606	3666

e species	population					
Assemblage species	Curlew wintering population	2263	2079	2152	2038	1710
Assemblage species	Redshank wintering population	988	811	791	812	386
Waterfowl assemblage	Waterfowl Assemblage wintering population [a] (Component species: Bewick's Swan, Whooper Swan, Golden Plover, Bar-tailed Godwit, Light-bellied Brent Goose, Great Crested Grebe, Cormorant, Greylag Goose, Shelduck, Wigeon, Teal, Mallard, Eider, Red-breasted Merganser, Oystercatcher, Lapwing, Knot, Dunlin, Curlew, Redshank)	24952	36416	36599	37310	14905
Habitat[1]	Habitat extent					
Habitat[1]	Roost site locations					

Table 1. List of SPA selection features.

[1] Habitat is not a selection feature but is a factor and is more easily treated as if it were a feature.

Notes on SPA features – may not be applicable to all SPAs

The above table lists all relevant qualifying species for this site. As the identification of SPA features has and continues to evolve, species may have different status but all should be considered in the context of any HRA process. Ultimately all SPAs will be renotified to formalise species features.

[a] – species cited in current SPA citation and listed on current N2K dataform

[b] – species selected post SPA designation through UK SPA Review 2001

[c] – species highlighted as additional qualifying features through the UK SPA Review 2015 or the UK marine SPA programmes.

6.1 ADDITIONAL ASSI SELECTION FEATURES -

Feature Type (i.e. habitat, species or earth science)	**Feature**	**Size/ extent/ pop.**
Habitat	Coastal saltmarsh	
Habitat	Saline lagoon	
Earth Science	Coastal processes	
Species	Great Crested Grebe wintering population	
Species	Cormorant wintering population	
Species	Greylag Goose wintering population	
Species	Shelduck wintering population	
Species	Wigeon wintering population	
Species	Teal wintering population	
Species	Mallard wintering population	
Species	Eider wintering population	
Species	Red-breasted Merganser wintering population	
Species	Oystercatcher wintering population	
Species	Lapwing wintering population	
Species	Knot wintering population	
Species	Dunlin wintering population	
Species	Curlew wintering population	
Species	Redshank wintering population	
Species	Mute Swan	

Table 2. List of ASSI features, additional to those that form all or part of SPA selection features. These will be referred to in ANNEX II.
[1] These species are selected as they contribute to the waterfowl assemblage feature. They are not SPA features in their own right. All exceed national population threshold and so are of ASSI significance.

7 CONSERVATION OBJECTIVES

The Conservation Objectives for this site are:

To maintain each feature in favourable condition.
For each feature there are a number of component objectives which are outlined in the tables below. Component objectives for Additional ASSI Selection Features are not yet complete. For each feature there are a series of attributes and measures which form the basis of *Condition Assessment*. The results of this will determine whether a feature is in favourable condition, or not. The feature attributes and measures are found in the attached annexes.

8 LOUGH FOYLE SPA CONDITION ASSESSMENT 2014

Species	2005/06	2006/07	2007/08	2008/09	2009/10	CSM	5 yr mean	% CSM	Status
Golden Plover	7640	9534	9211	8486	5091	2960	7992.40	**270.01**	Favourable
Bewick`s Swan	18	0	0	0	0	10	3.60	**36.00**	Unfavourable
Whooper Swan	1030	1042	1167	1240	2033	566	1302.40	**230.11**	Favourable
Bar-tailed Godwit	1133	2672	2300	2789	1501	1535	2079.00	**135.44**	Favourable
Light-bellied Brent Goose	3641	1778	3251	2550	3875	1765	3019.00	**171.05**	Favourable
Waterbird assemblage	38372	35032	33155	37562	28535	28494	34531.20	**121.19**	Favourable

9 SPA SELECTION FEATURE OBJECTIVES

To maintain or enhance the population of the qualifying species
To maintain or enhance the range of habitats utilised by the qualifying species
To ensure that the integrity of the site is maintained;
To ensure there is no significant disturbance of the species and
To ensure that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species

Feature	Component Objective
Bewick's Swan wintering population	As above
Whooper Swan wintering population	As above

Golden Plover wintering population	As above
Bar-tailed Godwit wintering population	As above
Light-bellied Brent Goose wintering population	As above
Great Crested Grebe wintering population	As above
Cormorant wintering population	As above
Greylag Goose wintering population	As above
Shelduck wintering population	As above
Wigeon wintering population	As above
Teal wintering population	As above
Mallard wintering population	As above
Eider wintering population	As above
Red-breasted Merganser wintering population	As above
Oystercatcher wintering population	As above
Lapwing wintering population	As above
Knot wintering population	As above
Dunlin wintering population	As above
Curlew wintering population	As above
Redshank wintering population	As above
Waterfowl Assemblage wintering population	As above
Waterfowl Assemblage wintering population	Maintain species diversity contributing to the Waterfowl Assemblage
Habitat Extent	Maintain or enhance the area of natural and semi-natural habitats used or potentially usable by Feature bird species. (2056.13 ha intertidal area) subject to natural processes
Habitat Extent	Maintain the extent of main habitat components subject to natural processes
Roost sites wintering population	Maintain or enhance sites utilised as roosts

Table 4. SPA Component objectives

9.1 ADDITIONAL ASSI SELECTION FEATURE OBJECTIVES

Feature	Component Objective
Coastal saltmarsh	To maintain or extend, as appropriate, the area of saltmarsh, subject to natural processes
	To maintain or enhance, as appropriate, the composition of the saltmarsh communities
	To maintain transitions between saltmarsh communities and to other adjoining habitats
	To permit the continued operation of formative and controlling natural processes acting on the saltmarsh communities
Brackish lake	To maintain or enhance, as appropriate, the composition of the brackish water communities
Coastal processes	Permit the continued operation of formative and controlling natural processes acting on the inter-tidal system. Maintain natural site morphology subject to natural processes.

Table 5. ASSI Component objectives

10 MANAGEMENT CONSIDERATIONS

See also Views About Management for relevant ASSIs

Owner/Occupier's **–** (to be used to identify any key management considerations arising from ownership e.g. owners/organisations having an obvious bearing on conservation matters or from management agreements).

Approximately 58 individuals/organisations own land within the SPA. Major landowners and leasees within the SPA, relevant to the site management, include Crown Estate Commissioners, NIEA RSPB and Private Individuals. There may be conflicts of interest between the requirements of individual/organisations, both within and adjacent to the SPA, and the site management needs.

Adjacent commercial operations which may impact upon the SPA include Derry City Airport, Derry City Port and Du Pont. Specifically, ongoing works associated with the runway facility at Derry City Airport, may lead to further loss of the intertidal area within the SPA. Other threats include unregulated sea defence works by individual landowners and the potential expansion of the port facilities. Du Pont a chemical and synthetic fibre manufacturing company sited close to Lough Foyle SPA, is a Part A Process under the Industrial Pollution Control Order. Du Pont also own land within the SPA.

11. MAIN THREATS, PRESSURES, ACTIVITES WITH IMPACTS ON THE SITE OR SITE FEATURES

Notifiable Operations **-** Carrying out <u>any</u> of the Notifiable Operations listed in the schedule could affect the site. The list below is not exhaustive, but deals with the most <u>likely</u> factors that are either affecting Lough Foyle SPA, or could affect it in the future. Although, features 1, 2, 3, 4 etc, are the qualifying SPA features, factors affecting ASSI features are also considered.

<u>Generic site/feature issues</u>

These principally relate to the SPA features – the list may be extended to take account of additional ASSI features on the site.

No	Issue	Threat/comments	Local considerations	Action
1	Adjoining habitat	Particularly important for swans and geese as well as providing high tide roost locations. Significant changes in land management and disturbance are key considerations. Such areas lie without the site making effective management of developments other than those for which planning permission is required, difficult.	Extensive areas of arable land with varying crop type means field usage varies.	Assess planning applications. Identify key areas and promote site management schemes. Review use of Wildfowl Refuges. Consider the collective impact.
2	Aquaculture	Disturbance is a minor consideration unless carried out deliberately to minimise losses to shell-feeding waterfowl. Alteration of natural littoral and sub-littoral communities through seeding, tray/trestle cultivation,	Lough Foyle has been identified as having substantial additional potential for aquaculture development. Major mussel beds at Longfield	Liaise with DARD Fisheries Division. Assess all license applications individually. Consider the collective impact.

		dredging/control of pest species. Naturalisation of introduced species – both the shellfish themselves and associated species e.g. algae and disease vectors.	Point coincide with areas of considerable waterfowl importance.	
3	Bait digging – commercial or 'recreational' and shellfish gathering.	Disturbance and impact on sediment and invertebrate fauna – may be positive through making deeper prey items available on surface. Shellfish gathering represents a net loss to the system in terms of biomass. Generally unregulated.	Unclear as to extent of activity in this area.	Monitor scale of activity. Consider the collective impact.
5	Beach sand and gravel extraction.	Disturbance issue together with loss of biologically active upper sediments. Most beach systems are sedimentalogically closed thus material removed may not be renewed making the activity unsustainable. May lead to changed sediment character of beach ultimately impacting on birds.	Unclear as to extent of activity in this area. The coastline north of Balls Point could be particularly adversely affected by significant extraction.	'Permitted' extraction of beach sand and gravel should be halted through management agreements. Ad hoc removal should be addressed in conjunction with local authorities.
6	Boating activity – commercial	Disturbance and potential for impact from high-speed liners.	Commercial shipping is limited to the main channel. The Magilligan ferry is functional No high-speed boats currently operate.	Formal consultation likely relating to new schemes. Consider the collective impact.
7	Boating activity – recreational	Disturbance and potential for impact especially from jet skis. Generally relevant to particularly sensitive areas within site.	Not thought to be an issue here. Most boating activity is on the ROI side of the Lough.	Liaise with appropriate authority with codes of good practice, zoning and use of by-laws as necessary. Consider the collective impact.
8	Coastal protection schemes	Where there is no history of this, it impacts on natural beach systems with loss of habitat.	Major problem between Balls Point and Point Road, Magilligan.	Liaise with Planning Service and other parties with an involvement in coastal management.
11	Drainage	Potential impact on water flooding regime. Potentially significant in relation to adjoining habitat if it leads to reduction in traditional areas of flooding.	Extent of potential impact unknown – swans and geese mainly use improved arable and pasture land.	Identify key areas and promote site management schemes to protect and enhance site features. Consider the collective impact.
12	Dredging	Generally only an issue in relation to commercial shipping channels. Issues include disturbance, loss of sediment from the system, remobilisation of contaminated sediment and spoil dumping zones.	Routine annual dredging occurs to Derry Port. Spoil is currently dumped outside of Lough Foyle. Ideally dredged spoil should be retained within the system.	Liaise with port authority and Environmental Protection as required with regard to water quality issues and pollution incidents.
13	Enhanced bird competition	Activities onsite or offsite that influences or results in a shift in balance of species utilising a site.	The main tip at Culmore is now closed. This was a major gull roost/feeding site.	Liaise with Planning Service. Review wider countryside changes.
14	Fishing – commercial or recreational	Minimal disturbance consideration but may represent 'competition' for piscivorous birds. Represents a net loss to the system in terms of biomass.	Limited commercial fishing within the Lough.	Liaise with DARD and fishing authority as required. Liaise with angling clubs as required.
15	Habitat	Loss of habitats through development,	'Approved' losses through	Assess planning

	extent – inter-tidal	changes in coastal processes. Loss of inter-tidal habitat is a critical issue as this is the feeding zone for the majority (numbers and species) of birds.	City of Derry runway extension, DARD sea defences and Magilligan ferry development have all resulted in some degree of loss of inter-tidal habitat. Further losses must be carefully assessed.	applications. Monitor using aerial photography.
16	Habitat extent – open water	Loss likely to be limited, but expansion of commercial port facilities can impact on key localities.	Minimal impact from Magilligan ferry development. Not likely to be a significant issue.	Assess planning applications. Consider the collective impact.
17	Habitat quality – inter-tidal	Alteration of habitat quality through diminution of water quality, invasive species or changes in coastal processes.	Principle threat is through spread of Spartina. Chemical and other industries in Derry area may present a threat through build-up of routine discharges or accidental spillage.	Assess planning applications. Deal with invasive alien species by preventing their spread or reducing their impact. Liaise with Environmental Protection as required with regard to water quality issues and pollution incidents. Consider the collective impact.
18	Habitat quality – open water	Alteration of habitat quality through diminution of water quality or invasive species.	Chemical and other industries in Derry area may present a threat through accidental spillage.	Assess planning applications. Deal with invasive alien species by preventing their spread or reducing their impact. Liaise with Environmental Protection as required with regard to water quality issues and pollution incidents. Consider the collective impact.
20	High tide roosts	An essential component of sites hosting waders. Development of adjoining ground or actual traditional roost localities may adversely impact on the sites carrying capacity. Many such sites lie without the site making effective management of developments, other than those for which planning permission is required, difficult.	Localities should be mapped.	Assess planning applications. Identify key areas and promote site management schemes. Review use of Wildfowl Refuges. Consider the collective impact.
21	Introduced species	Range of threats from loss of habitat, feeding competition, disease, hosting species presenting a threat outside of the site.	Spartina is the main issue with unrestricted spread resulting in loss of more significant inter-tidal and saltmarsh habitats.	Liaise with appropriate authority. Consider feasibility of elimination. Participate in national/international initiatives.
22	Power cables	Specifically a problem in relation to swans and geese. Threat is through impact. Need to consider flight lines, as well as feeding and loafing areas, which ideally should be avoided.	Review line marking.	Liaise with NIE. Minimum need is for line marking based on best current practice. Consider the collective impact.
24	Recreational activities.	Disturbance is the main consideration although vehicle access may also lead to beach compaction and impacts on beachhead habitats.	Cumulative disturbance impacts (e.g. boating, wildfowlers, walkers, dogs etc) may be a significant	Liaise with local authorities and other managing parties.

			factor for wintering bird populations impacting on both feeding (inter-tidal) and roosting birds Not currently thought to be a problem.	
25	Research activities.	Census and ringing activities especially have the potential to impact on bird populations, particularly at breeding sites.	Routine winter WEBS counts.	Census and ringing activities to be undertaken by competent individuals, appropriately trained. In case of ringers, appropriate license must be held.
28	System dynamics	Cuts across many other issues. Dynamic systems, especially coastal, can be affected by many factors especially engineered structures and significant changes in dominant wind direction or storm frequency. Many systems may indeed still be undergoing responses to historical developments e.g. partial reclamation, seawall construction. Changes may include alteration in sediment grade, shifts in patterns of erosion and deposition etc. Consequences for habitat and species utilisation of the site can be profound.	Extensive historical reclamation along much of the shore together with coastal engineering works from the Roe towards Derry. New developments include the ferry at Magilligan and the runway extension at Longfield. Aquaculture developments may be significant.	Human induced change should be minimised. Assess planning applications and liaise with other relevant authorities. Ad hoc dumping and removal of natural materials should be managed. Major natural shifts in system behaviour may be identified through analysis of aerial photographs and site monitoring. Major and consistent changes to patterns of habitat distribution and bird utilisation of the site should be noted.
30	Wildfowling	Has direct effect through bag sizes/bag species and wider disturbance issue. Issue of regulated (through recognised shooting clubs) and ad hoc shooters. Lead shot on grazing lands.	Shooting is concentrated over Ballykelly, Longfield and Roe areas. Urgent review of wildfowling required over existing Nature Reserves.	Liaise with relevant shooting bodies (BASC especially) to define areas for wildfowling, the development of Wildfowlers Codes of Good Practice and encourage bag returns. Support pressure to stop use of lead shot. Review use of Wildfowl Refuges. Consider the collective impact.

Table 3. List of site/feature management issues

12. MONITORING

Monitoring of our Special Protection Areas takes place at a number of levels, using a variety of methods. Methods for both Site Integrity Monitoring and Condition Assessment can be found in the Monitoring Handbook (To be written).

Maintain the integrity of the site. Undertake Site Integrity Monitoring (SIM) at least annually to ensure compliance with the SPA/ASSI schedule. The most likely processes of change (e.g. dumping, infilling, gross pollution) will either be picked up by Site Integrity Monitoring, or will be comparatively slow (e.g. change in habitat such as growth of mussel

beds). More detailed monitoring of site features should therefore be carried out by Site Condition Assessment on a less frequent basis (every 6 years initially to pick up long-term or more subtle changes). A baseline survey will be necessary to establish the full extent of the communities present together with the current condition of the features, against which all further condition assessments will be compared.

In addition, detailed quality monitoring or verification monitoring may be carried out from time to time to check whether condition assessment is adequate to detect long-term changes that could affect the site. This type of quality monitoring may involve assessment of aerial photographs to determine site morphological changes. Methodology for this is being developed.

12.1 MONITORING SUMMARY

1. Monitor the integrity of the site (Site Integrity Monitoring or SIM) – Complete boundary survey to ensure integrity of site and that any fencing is still intact. Ensure that no sand extraction or dumping has been 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 selection feature (dune, saltmarsh, species). This will detect if the features are in favourable condition or not. See Annexes I and II for SAC and Additional ASSI Features respectively.

   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 appropriate assessment that may be needed. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

12.2. ADDITIONAL MONITORING ACTIONS UNDERTAKEN FOR SITES IN UNFAVOURABLE CONDITION

Monitoring actions set out in section 6 and Annex 1 will use, amongst other attributes, bird population data to determine site condition. In the event of a significant population decline being detected, a series of subsequent actions will be initiated. The following list is not exhaustive, actions will be site dependant, but the order of these points IS hierarchical i.e. consider point 1, then 2, etc.

1. Assess the site population in a wider geographical context – Northern Ireland, Ireland, UK, world. Refer to BTO ALERT limits etc. Liaise with other competent bodies to meaningfully assess wider pattern. No site action if site decline mirrors regional pattern the cause of which is not related to the site. Action may be required at regional or larger scale. If the cause of the regional population decline (e.g. eutrophication) is found at the site then action may be necessary, but this may

need to form part of a network of strategic species action. Further research may be required.

2. Assess the site population in a wider geographical context – Northern Ireland, Ireland, UK, Europe, world. Determine if site losses are balanced by gains elsewhere e.g. breeding terns. Review site condition to determine if losses are due to site deterioration. Determine if possible whether population has relocated within SPA series (national, biogeographical, European). Note that the reasons for such locational changes may not be readily identifiable. Further research may be required.
3. For passage/wintering species assess breeding information. No site action if site decline is due to breeding ground failure, unless breeding ground failure is related to poor adult condition resulting from factors affecting wintering / passage birds.
4. Determine whether a major incident has affected the site e.g. toxic impact on prey items, predation event or geographical shift in available prey. Ability to respond to impacts may be limited.
5. Assess condition of principal site habitats e.g. vegetational composition and structure, change in habitat balance e.g. mudflats reduced by encroaching mussel beds.
6. Assess prey availability. Issues to consider are both within site e.g. water quality, broad site management, and without site e.g. climatically driven factors.
7. Assess whether there have been any changes in any other site features or management practices (see Table 3) that may have affected populations of site selection features.
8. Long-term site value must be considered even when it is found to be in unfavourable condition for a number of reporting cycles. This is particularly important for breeding seabird and wader sites where ongoing appropriate management may ultimately encourage re-establishment of a favourable population.

13 SELECTION FEATURE POPULATION TRENDS

Site trends are reported using running 5 year means of annual maximum count (WeBS and other data). Long term trends in index values have been used to assess changes in overall wintering populations for Northern Ireland and UK (WeBS data). Caution is always necessary in the interpretation and application of waterfowl counts given the limitations of these data. The lower number of both sites and birds in Northern Ireland, result in a greater degree of fluctuation. Trends for Ireland are based on five years of data 1994-1999 (I-WeBS data). Consequently short-term fluctuations apparent in the data series may reflect changes not indicative of actual population change.

SPECIES	SITE TREND	NI TREND	ROI TREND	UK TREND	COMMENTS
Bewick's Swan	Declining	Declining	Large Fluctuation	Fluctuating	High Alert for NI
Whooper Swan	Stable	Declining	Moderate Fluctuation	Increasing	Moderate Alert for NI
Golden Plover	Stable		Slight Fluctuation		Golden Plover is not included in the indexing proce
Bar-tailed Godwit	Stable	Declining	Large Fluctuation	Stable/Declining	High Alert for NI
Light-bellied Brent Goose	Stable	Fluctuating	Slight Fluctuation		
Great Crested Grebe	Fluctuating	Increasing	Moderate Fluctuation	Increasing/Stable	
Cormorant	Fluctuating	Increasing	Stable	Increasing/Stable	
Greylag Goose	Fluctuating		Moderate Fluctuation	Increasing/Stable	
Shelduck	Increasing	Fluctuating/Increasing	Slight Fluctuation	Stable	
Wigeon	Fluctuating	Fluctuating	Stable	Stable	In the early 1980s in NI, counts of over 20,000 birds were regular. Numbers now peak well below this level.
Teal	Fluctuating	Fluctuating	Increasing	Increasing	
Mallard	Declining	Stable	Stable	Stable	Declining since 1990 in UK. Moderate Alert for UK.
Eider	Fluctuating	+/- Stable		Stable	
Red-breasted Merganser	Increasing	Stable	Stable	Fluctuating/Increasing	
Oystercatcher	Increasing	Increasing	Stable	Stable	
Lapwing	Increasing		Slight Fluctuation		Lapwing is not included in the indexing processes.
Knot	Stable	Fluctuating	Large Fluctuation	Stable	High Alert for NI. Moderate Alert for UK.
Dunlin	Stable	Stable	Slight Fluctuation	Fluctuating	Moderate Alert for UK
Curlew	Stable	Stable	Slight Fluctuation	Stable	
Redshank	Fluctuating	Fluctuating/Increasing	Stable	Stable/Fluctuating	
Waterfowl Assemblage	Fluctuating				

ANNEX I

Feature (SPA) – Wintering waterfowl

* = primary attribute. One failure among primary attribute = unfavourable condition
# = optional factors – these can be in unfavourable condition without the site being in unfavourable condition

Attribute	Measure	Targets	Comments
* Bewick's Swan wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
* Whooper Swan wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
* Golden Plover wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
* Bar-tailed Godwit wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
* Light-bellied Brent Goose wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Great Crested Grebe wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.

Attribute	Measure	Targets	Comments
# Cormorant wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Greylag Goose wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Shelduck wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Wigeon wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Teal wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Mallard wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Eider wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.

Attribute	Measure	Targets	Comments
# Red-breasted Merganser wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Oystercatcher wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Lapwing wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Knot wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Dunlin wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Curlew wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Redshank wintering population	Bird numbers	No significant decrease in population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.

* Waterfowl Assemblage wintering population	Bird numbers	No significant decrease in Waterfowl Assemblage population against national trends	Five year running averages will be used to monitor population trends through WeBs data. Decline to a level below the Common Standards Monitoring baseline over a five year period may indicate unfavourable condition of the site.
# Waterfowl Assemblage wintering population	Species diversity	Maintain species diversity contributing to the Waterfowl Assemblage	

Feature (SPA) - Non-avian factors

Attribute	Measure	Targets	Comments
* Habitat extent	Area of natural and semi-natural habitat	Maintain the area of natural and semi-natural habitats used by notified species, within the SPA, subject to natural processes.	Monitor once every reporting cycle by aerial photography.
# Extent of different habitats	Extent of different habitats	Maintain the extent of main habitat components subject to natural processes	Evaluate habitat quality should bird populations decline due to on site factors. Map any changes in area. This may include mapping areas with different vegetation structures where this would lead to different usage by notified species.
# Roost sites	Location and number of roost sites	Maintain or enhance sites utilised as roosts	Map roost site locations. Visit once every reporting cycle to ensure sites are available.

ANNEX II

Feature (ASSI)

* = primary attribute. One failure among primary attribute = unfavourable condition
# = optional factors – these can be in unfavourable condition without the site being in unfavourable condition

Attribute	Measure	Targets	Comments
Coastal saltmarsh			
Brackish Lake			

Coastal processes			

MONEYGAL BOG SAC
UK0030211

CONSERVATION OBJECTIVES

Document Details

Title	*Moneygal Bog SAC Conservation Objectives*
Prepared By	*R. McKeown*
Approved By	*P. Corbett*
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Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete review	RMK

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 as 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: TYRONE

GRID REFERENCE: H 238883

AREA: 155.79 ha

Moneygal Bog ASSI	G.R : H 238883
Moneygal Bog ASSI Part II	G.R : H 254884

5. SUMMARY SITE DESCRIPTION

Moneygal Bog lies in a basin surrounded by low hills directly north of Castlederg and represents the most north-westerly lowland raised bog in Northern Ireland. The bog lies at a moderate elevation between 130m and 140m O.D. and displays some characteristics of transitional/ intermediate bog. It is set within a landscape which has largely been improved for agricultural use.

A bog burst that occurred in 1910 has resulted in a soak surrounded by a large pool system which extends to the centre of the bog. The pools are arranged concentrically around the site of the soak and represent one of the best raised bog pool systems in Northern Ireland. In addition, a number of notable plant species have been recorded including *Sphagnum imbricatum* and *S. fuscum*.

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 SAC takes in two ASSIs, Moneygal Bog and Moneygal Bog Part II, in their entirety. The boundaries have been drawn to include all areas of intact lowland raised bog and associated semi-natural habitats, including cutover bog and small pockets of Birch scrub, in addition to a small block of forestry plantation.
It should be noted that during the original survey, an extensive area of cutover bog to the east of the site was not included within the ASSI boundary because it was actively being cut for turf at the time and consequently was in a very degraded state. In addition, the small forestry plantation was also excluded.

During a more recent visit to the site, it was established that all peat cutting had ceased and that much of the cutover originally excluded from the Moneygal ASSI was actively regenerating. With the aid of recent colour aerial photographs, it was clear that the original boundary of the ASSI was too constrained and further visits confirmed that the cutover bog and the forestry plantation provided a valuable area of associated habitat. This review of Moneygal Bog confirmed that the exclusion of a significant part of the hydrological unit from the site was an anomaly in the boundary (i.e. it was not conducive to the long term hydrological integrity of the raised bog unit and was not consistent with the boundary rationale of other lowland bog ASSIs). Moneygal Bog Part II was designated to rectify this anomaly.

The SAC boundary around the site encompasses both ASSIs and clearly defines the edge of the hydrological unit. The edge of Moneygal Road forms part of the boundary along the southern edge of the bog and along a strip to the north-west. Another stretch of the boundary to the north-west of the site is marked by a series of ditches and banks, but is not stock proof. Along the north-eastern side of the site, the ASSI boundary follows the international border between Northern Ireland and the Republic of Ireland. Again, this boundary is partially fenced and is stock proof, while the remaining boundary is marked only by a shallow ditch, barely visible on the ground. The boundary to the extreme east of the site is marked by a stream, which is partially fenced, although parts of the stream are not stock proof. The remaining boundary to the south-east around the small forestry block and along the south-western edge is fenced and appears to be stock proof. There is some evidence that where the boundary is not stock proof, livestock – mainly cattle - have been grazing around the periphery of the cutover bog.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	114.2 ha
Habitat	Degraded raised bog still capable of regeneration	D	38 ha
Habitat	Depressions on peat substrates of the *Rhynchosporium*	D	0.1 ha

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 Moneygal Bog SAC.

6.1 ASSI SELECTION FEATURES

Moneygal Bog ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	152.3 ha

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog 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

SAC Feature	Global Status	Component Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.

10. MANAGEMENT CONSIDERATIONS

Ownership

Forest Service owns all of the site, including Turbary Rights, except for one small parcel of land to the north. With Forest Service the major landowner, there should be no significant management constraints.

The intact surface of the bog has been declared as a Forest Nature Reserve, thus acknowledging the conservation status of this site. The majority of lands around the periphery of the site are grazed by cattle and in some instances sheep. In a few instances, there is no stock-proof boundary between the ASSI and surrounding rough pasture. As a consequence, some stock does graze around the periphery of the ASSI.

Adjoining Land Use

The main adjoining land-use outside the ASSI is rough pasture and coniferous forestry plantation.

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 <u>likely</u> factors that are either affecting Moneygal Bog, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, 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

Extensive peat cutting has been carried out within the SAC boundary in the past. Over many years these cuttings have encroached significantly into the intact surface of the raised bog. The majority of the peat cutting is old hand cutting and is regenerating well. However, there has been some mechanised peat extraction in more recent years in places. This has been mostly within the old cuttings and there does not appear to have been any significant encroachment onto the intact surface of the bog.

Forest Service owns the turbary rights bog and have terminated all turbary leases. It is possible that occasional plots have been mechanically cut in some years.
ACTION: No peat cutting within the SAC.

Burning

Burning of the vegetation has taken place occasionally, with some areas of past burning being clearly identified. Excessive burning will tend to reduce the cover of

Sphagnum mosses and ericaceous species, increasing the % of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, burning can reduce vegetation structural diversity.
ACTION: No burning within the SAC.

Drainage

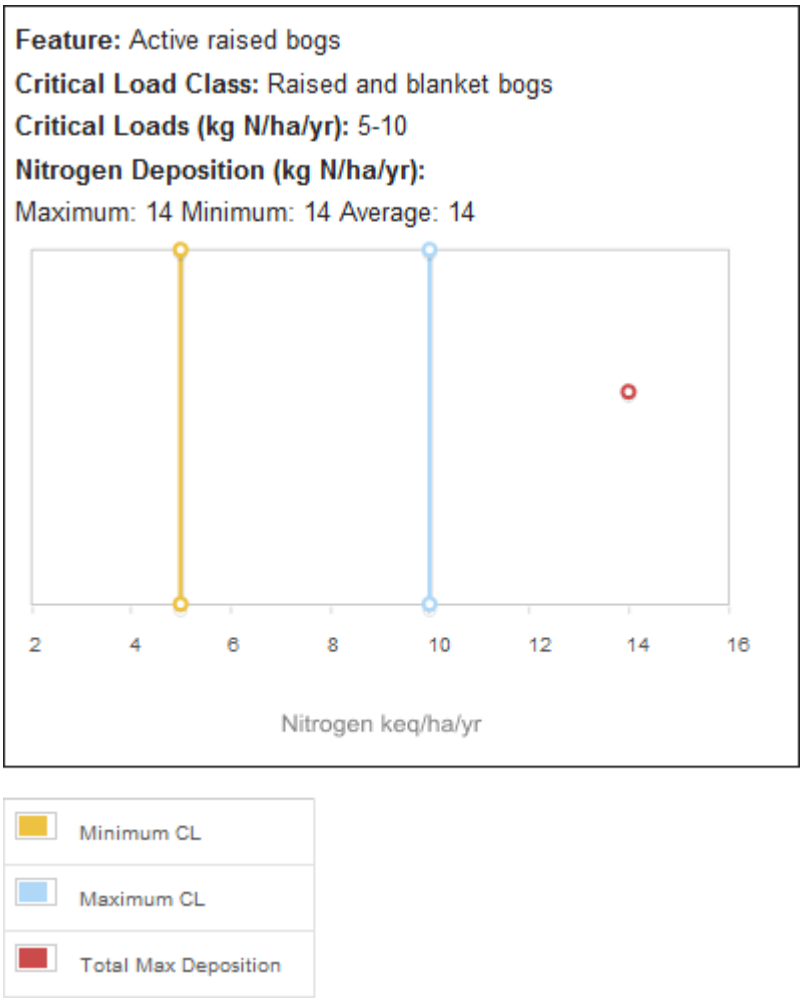
On the intact surface there are a few very old drains shown faintly on the aerial photograph. They are not apparent on the ground and appear to have little effect on the hydrology of the intact dome. Old drains in the cutover do not appear to be taking water from the dome at the present time. The only area which has been extensively drained in recent years and which could have some impact on the surrounding bog is the afforested area to the south-east of the site. Prior to planting, an extensive drainage network was installed to give the trees a more suitable substrate on which to grow. Despite these drainage attempts, the trees have not flourished, probably because the peat remains much too wet. Note that drainage works outside the site's boundaries could potentially impact upon the bog's hydrology.
ACTION: Block active drains where appropriate.

Grazing

Lowland raised bogs are not suitable for grazing, as the surface is fragile and easily damaged by poaching. Although Forest Service do not lease any part of the site for grazing, there is evidence that some grazing has taken place within the SAC boundary, although all grazing is restricted to the periphery, along the north-western edge of the site. As the boundary along the border between the Republic of Ireland and the SAC is not stock proof, cattle move into peripheral areas of the cutover bog and graze the grassy areas, sometimes moving up onto the ramparts which extend out into the bog. However, the cattle do not appear to graze the regenerating cutover bog and there is no evidence that they have ever moved out onto the intact surface. Although not an immediate threat to the scientific interest of the bog, grazing of the peripheral peats of the site should be phased out through adequate fencing.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site.

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 Moneygal Bog SAC.



(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.

Scrub Encroachment

There are some pockets of trees and scrub on the cutover bog situated around the periphery of the intact surface of Moneygal Bog. Any further scrub encroachment into the actively regenerating cutover areas, or onto the intact surface is undesirable.
ACTION: Monitor scrub encroachment and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Afforestation

Moneygal Bog is one of the few protected lowland raised bogs which has an afforested area within the site boundaries. In the south-eastern corner (within Moneygal Bog Part II ASSI) there are c 14 ha of forestry plantation. Although it is showing very poor growth. The area has been included as part of the hydrological unit and NIEA would like to see the plantation removed as part of a restoration

programme to rehabilitate the cutover bog, and to prevent the adjacent intact surface from drying out.
ACTION: Negotiate with Forest Service for the medium- to long-term removal of trees from within the SAC, in association with the blocking of active drains that are carrying water from the site.

Fly-tipping
There has been some localised fly tipping along the side of the road. Although this is not particularly damaging to the interest of the site, it is unsightly and could encourage others to continue the practice.
ACTION: Remove all evidence of past fly-tipping. If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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

- ***Monitor the integrity of the site (SIM or Compliance Monitoring)*** – Complete boundary survey. Ensure that there has been no peat cutting, dumping or burning carried out within the SAC boundary. This SIM should be carried out once a year.

- ***Monitor the condition of the site (Condition Assessment)*** – Monitor the key attributes for the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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.

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Annex 1

SAC Feature – Active raised bog (Status B)

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

Attribute	Targets/Limits	Method of Assessment	Comments
* Area of intact surface (ha)	Maintain the extent of intact bog surface at 54.5 ha. The active raised bog communities include predominantly M18 *Sphagnum papillosum* raised and blanket mire with M1 *Sphagnum auriculatum,* M2 *Sphagnum cuspidatum/recurvum* and M3 *Eriophorum angustifolium* bog pool communities.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.
* Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog. This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.

* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm.	Visual estimate in 2x2 m plots.	
* Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots	
* Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia, Menyanthes trifoliata*.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained.

* *Sphagnum* cover/abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic *Sphagnum* moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock forming species*: - S. papillosum* and *S. magellanicum* at least occasional over the surface.	Visual estimate in 2x2m plots. Visual estimate in 2x2m 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 intact bog surface.
* Ericaceous cover (%) and frequency of *Erica tetralix* (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. *Erica tetralix* should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots	A mono-dominant sward of *Calluna vulgaris* may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
* Graminoid cover (%)	Graminoid cover should be maintained between 10 and 40 %.	Visual estimate in 2x2m plots	

* Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.	If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
* *Rhynchospora alba* abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots	*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
* *Myrica gale* abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas. Recent burning is represented by areas burnt within the last two years.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	

* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.	Visual estimate in 2x2 m plots.	
Indicators of Local Distinctiveness			
* Presence of rare or scarce species specific to the site. *Sphagnum austinii* *Sphagnum fuscum* *Sphagnum pulchrum* *Utricularia spp.* *Andromeda polifolia*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment structured walk. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Visual estimate.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
Norlin Airlan Environment Agency
www.daera-ni.gov.uk

OWENKILLEW RIVER SPECIAL AREA OF CONSERVATION

Site Code: UK0030233

SITE CONSERVATION OBJECTIVES

& Supporting advice

Version 4
6 September 2024

Sustainability *at the heart of a living, working, active landscape valued by everyone.*

Document Details

Owenkillew River SAC Conservation Objectives
V2 Published November 2015
Approved by Paul Corbett

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Approved by Richard Gray, Sara McGuckin
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Contact: BCSGeneral@daera-ni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Edit and minor correction	PC
V4	July 2024	Complete review of supporting advice at Annex A - freshwater features, additional minor updates.	AD, RG, LS

Site Relationships

The Owenkillew River SAC boundary adjoins the boundary of the River Foyle and Tributaries SAC.

1. INTRODUCTION

There is a clear responsibility under the Habitats and Birds Directives[1] and associated domestic legislation, namely the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended)[2], hereafter referred to as the Habitats Regulations, to ensure that all habitats and species listed in Annexes I and II of the Habitats Directive, are maintained or restored to Favourable Conservation Status (FCS).

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) also contribute to meeting UK international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

The UK national site network of European sites, formerly known as Natura 2000 sites, have a crucial role to play in achieving the overall objective of FCS 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 UK.

To ensure that each 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 national site network, countries 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 the national site network over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, national site network 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] Updated through the Conservation (Natural Habitats &c.) (Amendment)(Northern Ireland)(EU Exit) Regulations 2019.

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.

The site-level conservation objectives, the supporting advice (at Annex A) and any case-specific advice given by NIEA Natural Environment Division, should be used when developing, proposing or assessing an activity, plan or project that may affect this site.

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

SITE: Owenkillew River SAC

COUNTY: TYRONE

GRID REFERENCE: IH 553868

LOWER GR: IH 409863 UPPER GR: IH 699862

AREA: 213.46 ha

5. SUMMARY SITE DESCRIPTION

The SAC includes the river (42 km stretch) and its associated riverine flora and fauna and adjacent semi-natural vegetation, primarily woodland flora and fauna. The river rises at an altitude of 415m and flows into the Strule at an altitude of 35m. It is a fast-flowing spate river; notable for the physical diversity and naturalness of the bank and channel, the richness and naturalness of its plant and animal communities, which includes extensive beds of Stream Water Crowfoot *Ranunculus penicillatus* var. *penicillatus* and the largest Northern Ireland population of the now rare Fresh Water Pearl Mussel *Margaritifera margaritifera*. In addition, the river is important for Otter *Lutra lutra* and Atlantic Salmon *Salmo salar*.

Guidance and literature: https://www.daera-ni.gov.uk/protected-areas/owenkillew-river-sac

Adjacent woodlands which form part of the SAC include Drumlea and Mullan Woods ASSI and the Owenkillew and Glenelly Woods ASSI, two of the largest stands of Oak woodland in Northern Ireland. An area of localised waterlogging in the former woodland has resulted in the development of Bog Woodland.

Further details of the site are contained in the relevant ASSI Citations and Views About Management statements, which are available on the DAERA website (https://www.daera-ni.gov.uk/protected-areas).

5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:-

(1) whole catchments

(2) main river stem from source to mouth, tributaries and upland catchment

(3) main river stem from source to mouth and tributaries

(4) main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature. In the case of the Owenkillew River, the main SAC qualifying features are *Margaritifera margaritifera* and *Ranunculus* communities, which are confined to the main channel.

The upper limits of the site have been determined by the restricted size of the channel. Downstream limit is at the confluence with the Strule, where the site joins with the adjacent River Foyle and Tributaries SAC.

The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the SAC has limited adjacent habitat. Therefore, the boundary is frequently restricted to the top of the riverbank. However, in places, there is significant adjoining woodland interest, and this is generally included. In addition, the SAC includes both Drumlea and Mullan Woods ASSI and the Owenkillew and Glenelly Woods ASSI.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

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

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Freshwater Pearl Mussel Margaritifera margaritifera	B	10,000
Habitat	Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	83% of channel length
Habitat	Old Sessile Oak woods with Ilex and Blechnum in the British Isles	B	79ha
Habitat	Bog Woodland	C	1.5ha
Species	Otter Lutra lutra	C	
Species	Atlantic Salmon Salmo salar	C	2,700*
Species	Brook Lamprey *Lampetra planeri*	D	P

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex A feature. 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 threshold for 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 Standard Data Form for Owenkillew River SAC (UK national site network of European sites).

6.1 ASSI SELECTION FEATURES

Owenkillew River ASSI

Table 2. List of ASSI features.

Feature Type	Feature	Size/ extent/ pop~
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, to mesotrophic types.	
Habitat	Oak Woodland	79 ha
Habitat	Wet Woodland	1.5 ha
Species	Freshwater Pearl Mussel *Margaritifera margaritifera*	
Species	Otter *Lutra lutra*	
Species	Atlantic Salmon *Salmo salar*	

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

- Fresh Water Pearl Mussel Margaritifera margaritifera
- Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation
- Old Sessile Oak woods with Ilex and Blechnum in the British Isles
- Bog Woodland
- Otter Lutra lutra
- Atlantic Salmon Salmo salar

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	Grade	Objective
Freshwater Pearl Mussel Margaritifera margartifera	B	Maintain and if feasible enhance population numbers through natural recruitment.
		Improve age structure of population.
		Improve water quality.
		Improve channel substrate quality by reducing siltation.
		Ensure host fish population is adequate for recruitment.
		Increase the amount of shading through marginal tree cover along those sections of river currently supporting this species.
Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	Maintain and if feasible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Old Sessile Oak woods with Ilex and Blechnum in the British Isles	B	Maintain and expand the extent of existing oak woodland. (There is an area of degraded bog, wetland and damp grassland which have the potential to develop into oak woodland
		Maintain and enhance Oak woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.

Bog Woodland	C	Maintain and expand the extent of existing bog woodland. (There is an area of degraded bog, wetland and damp grassland that have the potential to develop into bog woodland.
		Maintain and enhance bog woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the bog woodland, e.g. fen, swamp, especially where these exhibit natural transition to swamp woodland.
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter Lutra lutra	C	Population numbers and distribution to be maintained and if possible, expanded.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water, and all associated wetland habitats
Atlantic Salmon Salmo salar	C	Maintain and if possible, expand existing population numbers and distribution
		Maintain and where possible, enhance the extent and quality of suitable Salmon habitat, in particular the chemical and biological quality of the water

9 ADDITIONAL ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, to mesotrophic types.	Maintain and if feasible enhance extent and composition of community.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if feasible enhance the river morphology
	Maintain the diversity and quality of habitats associated with the river e.g. bog, wet grasslands, scrub, swamp and oak woodland.
Oak Woodland	See SAC Selection Feature Objective Requirements table.
Wet Woodland	See SAC Selection Feature Objective Requirements table.
Freshwater Pearl Mussel *Margaritifera margaritifera*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table.
Atlantic Salmon *Salmo salar*	See SAC Selection Feature Objective Requirements table.

10. MANAGEMENT CONSIDERATIONS

Ownership

There are a total of 206 individuals or organisations with ownership or other rights associated with this site.

Adjoining Land Use

In the upper reaches, the river flows through a predominantly upland peatland landscape used for rough grazing. The river channel is generally unenclosed. Along its mid-reaches, the surrounding landscape is improved or semi-improved pasture used for silage and grazing, and is generally fenced from the surrounding land at least along one bank top. In the lower reaches, the main adjacent agricultural uses include tilled land and silage production as well as stock grazing. Here, a significant proportion of the river is bounded by woodland either as discrete woodland blocks along the valley side or as a thin bank top belt. The river channel and adjacent woodlands are only partially fenced.

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 Owenkillew River or could affect it in the future.

Although Fresh Water Pearl Mussel Margaritifera margaritifera, Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation, Old Sessile Oak woods with Ilex and Blechnum in the British Isles, Bog Woodland, Otter Lutra lutra and Atlantic Salmon Salmo salar are the qualifying SAC features, factors affecting ASSI features are also considered.

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

RIVER HABITATS AND SPECIES

Water Quality/Eutrophication

Water quality is probably the most important single factor for the SAC and ASSI selection features, with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river is 45,469ha and consists of seven sub-catchment areas. The designation only includes the main channel of the Owenkillew and has excluded 36 minor tributaries (<=2.5m wide) and 6 major tributaries (>2.5m wide).

A significant portion of the upper catchment of this river and some of its tributaries are afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

Stock have open access to the channel in many sections and have caused poaching of the bank and channel. This represents another possible source of enrichment.
ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage landowners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Restrict stock access to less sensitive watering points.

Channel & Bank Modification

The Owenkillew River has been extensively altered by man in the past, especially along the upper reach of the river, resulting in a reduction of the natural channel area available to *M. margaritifera* and macrophyte communities. The river has recovered somewhat from the effects of re-sectioning. Several fisheries weirs and

one fish counter have been recently created in the lower reach of the river. These modifications have changed the natural flow regime of the river.
The river is a designated watercourse, which requires the Rivers Agency to undertake regular maintenance under their statutory requirements.
ACTION: Future in-river works should be minimised as they reduce habitat and species diversity and threaten vulnerable shellfish populations. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole.

Habitat enhancement schemes, such as the 'Salmonid Enhancement Programme' should be thoughtfully planned. Properly executed enhancement schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. In the past, the construction of weirs by fishing clubs as part of the programme has locally altered the morphology of the river. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.
ACTION: Initiate discussions with Loughs Agency/DAERA Marine and Fisheries Division and NIEA Water Management Unit to co-ordinate action.

Substrate Siltation

A significant portion of the area is afforested (especially the upper catchments), with a potential risk of sediment release during forestry operations, especially clear-felling.
ACTION: Liaise with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).

Sand wash from a number of commercial sandpits in the upper reaches of the river has resulted in siltation of the riverbed downstream.
ACTION: Monitor and control sediment input levels immediately downstream of sandpits.

Where the bank and channel of the river are accessible to stock, damage to *Margaritifera* beds, Salmon spawning grounds and the macrophyte community may occur. Trampling has an obvious direct impact but in some sections of the river, trampling and poaching of the river bank and channel have caused erosion, resulting in siltation of the riverbed downstream.

ACTION: Restrict livestock access to drinking areas only.

Sand Extraction

Small-scale sand extraction from the riverbed has been an ongoing practice by farmers, particularly in the lower reaches of the river. This disturbance results in

damage to the river morphology and increase in sediment loading, thus directly and indirectly affecting spawning beds and the macrophyte community.
ACTION: Under the Notifiable Operations, this activity is prohibited; ensure compliance with the ASSI Schedule.

Fish Farms

Fish farms can have a very serious impact on rivers. Fish farms normally abstract water from the river and release effluent downstream. Where the abstraction is large relative to streamflow, the channel between points of abstraction and release may have a much reduced discharge and water velocity. The effect can be so extreme that the upstream movement of migrating fish and other water-borne wildlife is obstructed.

In addition, effluents from intensive fish farms may have a modified temperature and pH, may be contaminated with toxic materials and may carry waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and hence a low oxygen concentration in the water), increased suspended solids and enrichment of the recipient stream.

Proposals for fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that that the effluent is adequately treated.
ACTION: Review existing Water Order consents.

Water Extraction

A natural flow regime is essential for the maintenance of many of the selection features. Proposals for water extraction in the area will require very careful environmental assessment.

ACTION: Review existing Water Order consents.

Fly-tipping

Small-scale fly tipping has occurred along the river banks and in the river channel as well as in adjacent woodland.
ACTION: Removal of dumped material from the banks and channel and removal of any rubbish from the woodland, to prevent the build-up of debris and so discourage further tipping.

Alien species

At present Giant Hogweed *Heracleum mantegazzianum* and Himalayan Balsam *Impatiens glandulifera* are present along the riverbanks only in limited sections of the lower river reaches.

ACTION: Monitor and if necessary control the spread of alien species.

WOODLAND HABITATS AND SPECIES

Grazing/Poaching/Tree barking and Browsing

Free access to some woodland by domestic stock and feral goats is causing direct damage to the ground flora community by poaching and trampling. Grazing, barking and browsing can prevent regeneration leading to profound changes in woodland structure and composition. Information on current grazing levels of domestic stock within privately owned woodland is not readily available. No information of the current population of feral goats is available.
ACTION: Investigate current grazing practices. Where necessary, reduce stocking pressure in woods to sustainable levels or exclude stock altogether by fencing off woodland under MOSS agreements. Undertake census of the current feral goat population. If necessary, initiate control measures to reduce numbers to acceptable levels.

Invasion by exotics

Exotic species are widespread in the Owenkillew Woodland. They vary in the degree of impact they have and the threats they pose – for example, species such as Sycamore *Acer pseudoplatanus*, Himalayan Balsam *Impatiens glandulifera*, Salmon Berry *Rubus spectabilis* can be very invasive, while some are not seen as an immediate threat due to their limited occurrence (e.g. Rhododendron *Rhododendron ponticum*), or slow rate of spread (e.g. Beech *Fagus sylvatica*).

The most invasive species require management to control their spread – i.e. removal of seed sources. This is impractical with species such as Himalayan Balsam *Impatiens glandulifera* whose seed supply is partly recruited annually from water- borne seeds – indeed, it may be impossible to control the spread of this species, so research needs to be carried out to identify the effect it may have on the woodland community.
ACTION: Control invasive species where appropriate (e.g. Remove seeding Sycamore). Monitor other exotic species.

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. Critical levels and critical loads have been calculated for protected site features.

Please refer to the UK Air Pollution Information System (APIS) for site relevant critical loads and levels at 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 levels and loads.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works 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. CONSERVATION MANAGEMENT PLAN

The Owenkillew SAC Conservation Management Plan can be viewed at -

Owenkillew River SAC (arcgis.com)

13. MONITORING

Monitoring of SACs takes place 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 habitat).

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.

13.1 MONITORING SUMMARY

1. Monitor the integrity of the site (SIM or Compliance Monitoring)

Complete boundary survey to ensure that the boundary features, where present, are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC

boundary. Evaluating stocking densities would also be desirable, whilst a check for feral goat damage should be carried out throughout the site. Inspection of river reaches with Pearl Mussel colonies should be undertaken once a year to ensure there has not been any pearl fishing. The 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 A.

The favourable condition table provided in Annex A 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

14. REFERENCES

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ANNEX A – Supporting advice

Feature 1 (SAC) – Freshwater Pearl Mussel Margaritifera margaritifera (Status B)

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

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Visual survey of riverbed	Population distribution should be close to that expected under near-natural conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations. The target is to secure a sustainable population of mussels that is able to utilise all naturally suitable habitat within the river
b. Population density	≥ 5 mussels per m² within sample transects	Visual survey of riverbed.	The density data from all transects within each monitoring unit should be aggregated and the resulting figure assessed against the target. In smaller rivers where 50m transects have not been surveyed, density data from all quadrats should be aggregated and assessed against the target.
c. Age structure	i. At least 20% of population ≤65mm ii. At least 5% of population ≤ 30mm.	Length measurement of mussels recorded in quadrats within 50m transects.	Population profiles should not be attempted where mussel beds are vulnerable to damage. In this case, the target is to find at least one pearl mussel ≤65mm. This results in a lower degree of confidence that the population is reproductively viable but should protect it from potential adverse disturbance during survey. A threshold of at least one mussel is required in order to confirm recent recruitment and minimise disturbance of a population during survey.

d. Dead shells	<1% of population per year and scattered distribution.	Counting within 50m transects.	1% (based on a 100-year life span) considered to be indicative of natural losses for survey sites and for the entire river population per year. Where >1% dead shells are found, an investigation into the cause should be carried out to assess whether it may be an exceptional natural event or an indication of an unnatural kill. The dead shells should be examined for freshness (by checking the colour of the nacre) to help assess the likelihood of a problem.

Attribute	Target	Method of Assessment	Comments
Water Quality			
For freshwater pearl mussel, organic pollution, reactive phosphorous, acidification, and other nutrients are particularly important. Nutrient concentrations should be near natural.	See sub-attributes below. Targets included in the CSM guidance for Rivers should be used. These targets are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. Some more stringent chemical targets for pearl mussel are listed below.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Water quality should not be injurious to any life stage. All classified reaches within the designated site that contain, or should contain, freshwater pearl mussel should comply with targets given. Data from the last 3 years should be used. All water quality data should be available on request from NIEA.
a. Phosphorus	In locations where annual mean soluble reactive phosphorous (SRP) levels are <5 µg L^{-1}, the target should be 5 µg L^{-1}. For rivers that exceed this, the target is	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	The SRP target value should not be set for a river without first checking the baseline P levels and any historical data available for the that river.

	the more stringent value of either: high status values for SRP under the WFD, or the SRP target for CSM river habitat.		Undetectable levels of SRP are not necessarily a guarantee of good health, particularly if the local analysis equipment is unable to perform at low concentrations. If all the available phosphorus is being transferred into filamentous algae, then it will not be detectable as SRP in open water. A combination of very low SRP with the absence of filamentous algae is considered to indicate nutrient levels conducive to *Margaritifera* populations in favourable condition.
b. Nitrogen	Nitrate annual median value of <0.125 mg L^{-1} N	Standard monitoring protocols in CSM guidance for Rivers (Data from NIEA).	This threshold is based on a study of 560 sites in 126 rivers: 0.125mg L^{-1} N for Ireland (Moorkens, 2006). Like phosphorous, nitrate levels are a measure of the naturalness of the surrounding catchment, and limits should be set at those natural for that catchment. Where nutrient levels are too high to sustain pearl mussel populations, levels of all nutrients should be reduced until sustainability is achieved.
c. BOD	Mean BOD <1.0 mg L^{-1}	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Rivers with reproducing populations in the UK, Ireland and Spain have BOD levels consistently<1.0 mg L^{-1}

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met. River flow rates should be as natural as possible throughout the site, avoiding human induced high and low extremes.	Gauging stations (Data from Dfi Rivers).	River flow affects a range of habitat factors of critical importance to FPM, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and base flows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	Assess using RHAT methodology for river habitat or species-specific methods if available and appropriate. River Hydromorphology Assessment Technique - Training Manual | Department of	The river's natural form and function should support all of the habitat features necessary for pearl mussels to thrive, in characteristic proportions. Widening or deepening of channels, and extensive artificial

		Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	reinforcement of banks, are indicators of unfavourable condition. Further information on the importance of physical habitat to pearl mussels is available in published CEN guidance. Information on in-channel structures is available in CSM Guidance for Rivers.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment (redox)	There should be no pronounced difference in redox potential (typically <20%) between open water and interstitial water at 5cm depth.	Redox measurements collected in open water and riverbed, at or around population transect locations.	Excessive delivery of fine sediment, from the catchment or artificially enhanced bank erosion, may lead to a range of problems relating to surface siltation, the compaction or concretion of riverbeds and to the infilling of substrate interstices. This affects oxygen supply and exchange within the substrate as well as the ability of juvenile mussels to burrow. Infiltration by fine sediments is one of the main causes of decline in juvenile recruitment for pearl mussel populations. *Infiltration of high loads of fine sediment typically results in low oxygen supply to interstices of the substrate. Redox measurements provide a reliable estimate as a surrogate for the oxygen level within the interstices of the substrate compared with the open water.
b. Fine sediment (siltation) and Suspended Solids	No unnaturally high levels of siltation indicated by: 'silt on substrate' highlighted in	Field observations and site-specific information derived from RHAT.	Direct measurement of turbidity is not recommended, because values vary naturally in response to

	section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids target is under further review by NIEA: Annual mean <10mg L^{-1}		changes in flows with no clear understanding of a suitable reference value.
c. Filamentous algae	<5% cover across assessment units	Visual assessment during mussel survey and relevant metrics collected during LEAFPACS survey by NIEA.	Filamentous algal cover should be measured during the pearl mussel survey. In oligotrophic conditions nutrient levels should never be high enough to allow dense mats of filamentous algae growth. The persistence of filamentous algae is an indication that nutrient levels may be too high for sustainable *Margaritifera* populations but may also indicate low flow problems. Using the LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys.
d. Fish host populations: native juvenile salmonid densities (0+ and 1+ year classes)	1. Should be abundant: >0.1 native juvenile host salmonids per m^2. 2. Should be able to find fish infected with glochidia between September and May.	Standard electrofishing protocols. Visual inspection of gills, particularly later in glochidia incubation period.	An abundant supply of native juvenile salmonids is vital to the survival of the larval stage. The relative importance of salmon and migratory and non-migratory brown trout populations to pearl mussels will vary between rivers. Physical and chemical conditions need to be suitable for the well-being of all life stages of salmonids, including free access up the river and conditions in the estuary and lower

			river where the juveniles of migratory salmonids are present. It is important to determine the species of host fish that a mussel population needs in a particular river as local pearl mussel populations can use salmon, trout or both species. Electrofishing should be carried out twice using standard methods, once in early autumn to establish the presence and density of suitable fish hosts as a proportion of the fish population just downstream of mussel beds, and again in late spring to establish the presence of 1+ fish in the vicinity of permanent mussel habitat. This does not adversely affect pearl mussels. The fish in the second survey should be checked for encystment of glochidia on the gills which are visible on the live fish. More detailed studies of fish numbers and glochidial encystment (e.g. number of glochidia per fish) can be undertaken but the above should be considered as a minimum requirement.
e. Alien/locally non-native species	No non-native species likely to cause impairment of freshwater pearl mussel populations	Survey data collected and analysed by NIEA.	Non-native species constitute a major threat to many river systems. Impacts may be on the river 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. Assessment of non-native species is based on the principles used in assessing high ecological

			status under the WFD, and applies to species on the banks and in the riparian zone as well as species of the channel and the margins. alien species	wfd uktag. Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies); this list contains only high-impact species.
f. Stocking transfers of other species	No inappropriate stocking/translocation of fish species.	Fishery stocking consents. Impact assessments of stocking consents on a catchment scale may be required to determine an acceptable level.	Rainbow trout and brook trout are resistant to glochidial infection and are not, therefore, suitable host species. Stocking of these species will create competition with native salmonids and is likely to reduce host opportunities for glochidia. Any stocking of native salmonids must take account of the genetic diversity of resident salmonids. The host fish/mussel relationship seems likely to have a genetic component, which could be affected by inappropriate stocking.
g. Introduction/transfers of freshwater pearl mussel	No introduction/transfers of freshwater pearl mussel unless agreed to be in the best interest of the population	Knowledge of site management	Translocation is not generally recommended as a conservation tool. It is a technique that has been little used and must still be considered experimental. Translocation (if feasible) should therefore be seen as a last resort. In GB and Northern Ireland, genetically distinct freshwater pearl mussel populations have been found to exist in separate catchments (Cauwelier, 2009). Any translocations or transfers of FPM must follow IUCN and other local guidelines.

h. Pearl Fishing	No evidence of pearl fishing	Standard survey protocol	Pearl mussel fishing is prohibited under the Wildlife (NI) Order 1985.
i. in-stream activities	No evidence of damage of existing mussel beds	NIEA monitoring/consenting programmes and standard survey protocol.	Engineering works that disturb riverbeds can be disastrous for mussel populations, so every effort needs to be made to leave them undisturbed. Other relevant activities include fishing (wading in the river) and canoeing (at access points to the river) particularly for vulnerable populations. As a minimum, existing areas should be safeguarded, whilst habitat lost through engineering works should be reinstated.

Feature 2 (SAC) – Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation (Status B)

Attribute	Measure	Targets	Comments
Water quantity	Flow	The natural flow regime of the river should be protected. Daily flows should be close to what would be expected in the absence of abstractions and discharges (the naturalized flow). Flow targets for WFD high ecological status should be used to avoid deterioration and for restoration if this is technically feasible. These are: <5% deviation at <On95 and <10% at >On95 based on 'natural' water (i.e. water that has not been abstracted and returned). There should be no obvious problems with water availability within the assessment unit. Springs in aquifer-fed rivers should be maintained.	The principal flow targets given in Table 3 of CSM Guidance for Rivers should be taken as the minimum expected for an SAC river where appropriate and locally agreed targets are not already in place. Flow data is available at Search Data | National River Flow Archive (ceh.ac.uk)
Water Quality	Organic pollution	Organic pollution is assessed using a combination of physico-chemical and biological attributes. Targets apply throughout the assessment unit, not just at sparsely distributed monitoring sites. Targets: 10%ile DO (% saturation) = 85 Mean BOD (mg L^{-1}) = 1.5 90%ile total ammonia (NH_3-N, mg L^{-1}) = 0.25 95%ile un-ionised ammonia (NH_3-N, mg L^{-1}) = 0.025	Chemical data from all routine monitoring sites should be obtained from NIEA for the 3 years preceding the time of condition assessment. The statistics in the table should be calculated using all samples within that 3-year period.
	Reactive phosphorus	Compliance with these two targets is mandatory as an annual mean and March-September growing season mean. See tables 5 and 6 of CSM Guidance for Rivers for targets.	Table 5 of CSM Guidance for Rivers has targets for phosphorus (ug L^{-1} SRP) for near-natural examples of ASSI/SAC river habitat and Table 6 of CSM Guidance for Rivers has targets for maximum phosphorus concentrations (ug L^{-1} SRP) consistent with favourable condition of ASSI/SAC river habitat.
	Trophic Diatom Index	The target using the Trophic Diatom Index (TDI) Ecological Quality Ratio should be a normalized EQR of ≥ 0.8, equivalent to high ecological status (WFD-UKTAG, 2014a). This target should be used as an adjunct to nutrient targets proposed in Tables 5 and 6	Environment agencies typically take two or three diatom samples each year at routine monitoring sites. Any sample failing to comply with the relevant biological target within the 3-year period at any sampling site in the assessment unit should be regarded as non-

	Acidification Other pollutants	respectively. The targets proposed here are the same as the high/good boundary proposed for the WFD (WFD-UKTAG, 2012a). Targets: pH (Clear waters with DOC<10mg L^{-1}) : mean > 6.54 pH (Humic waters with DOC>10mg L^{-1}) : mean > 5.1 Good chemical status is the target for any pollutant listed on Annex X of the WFD and not specifically considered above.	compliant. This target applies only to assessment units whose WFD water body type is classified as siliceous or peat. Other types have buffering capacity and are therefore will not be affected by acidification. Analysis of water chemistry data from NIEA. At least 3 years of data are required, which must include winter samples. Data on the chemical status of individual water bodies are available from NIEA.
Habitat Structure	Assess using River Habitat Assessment Tool (RHAT)	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI - River Hydromorphology Assessment Technique - Training Manual	Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The minimum frequency should be a 10% coverage (i.e. 1 site every 5km), coincident with macrophyte monitoring sites where this is done. The location of each RHAT assessment unit (and macrophyte monitoring) should be marked on a map of the site. It is recommended that GPS and site photographs are used to facilitate accurate relocation of sites on future visits.
Fine Sediment	Siltation	No unnaturally high levels of siltation indicated by: silt on substrate highlighted in section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as the predominant channel substrate where not expected from local geology.	Direct measurement of turbidity is not recommended, because values vary naturally in response to changes in flows with no clear understanding of a suitable reference value. Field observations and site-specific information derived from RHAT.
Negative Indicators	Alien/locally absent species	No high-impact alien species established (i.e. self-sustaining populations). Standard checklists of species are based on those used for WFD assessments[1]. A site will be assessed as unfavourable when there is good evidence that any non-native species or locally absent species is causing an impact on site integrity.	Where a macrophyte survey has been carried out, the presence of alien species in the UKTAG lists[1] should be noted. Where there are no macrophyte survey data, and for other organisms (e.g. invertebrates, mink), contact NIEA for local reports on alien or locally absent species.

Biological Assemblages	Plant community Macroinvertebrates	LEAFPACS tool should give a result of high ecological status for the assessment unit. WHPT tool should give a result of high ecological status for the assessment unit.	LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys. * See Box 3.0 of CSM Guidance for Rivers Version 2016 for further info on LEAFPACS method. RICT macroinvertebrate data, collected by NIEA. See – RICT & RIVPACS User Guides — Freshwater Biological Association (fba.org.uk)
Indicators of local distinctiveness	Targets for local distinctiveness (discretionary)	Maintain distinctive elements (e.g. rare species, habitat features) at current extent/levels and/or in current locations.	As appropriate.
Direct human disturbance	Fish stocking Exploitation Weed cutting	Fish introductions should not interfere with the ability of the river to support self-sustaining populations of characteristic species. Exploitation (e.g. netting or angling) should not interfere with the ability of the river to support self-sustaining populations of characteristic species. A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices.	Use stocking consents. Assessed through recorded exploitation and status of target species. Field observations during macrophyte survey.

[1] http://www.wfduk.org/tagged/alien-species# Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies), this list contains only high-impact species.

Feature 3 (SAC) - Old sessile oak woods with Ilex and Blechnum in the British Isles (Status B)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Oakwood	Maintain the extent of Oakwood at 79.3ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable.
Oakwood community diversity	Maintain presence of woodland communities, W11, W17, W9 & W7 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of 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 Oakwood may be desirable in some instances.

* Structural variation (% cover)	Mean canopy cover greater than 70%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.
	Mean shrub cover should be maintained between 20 - 50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover. Where present assess cover of *Luzula sylvatica*.	Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey. Note: *L. sylvatica* may be dominant in many W11 oakwood communities. The percentage cover of this species may affect Oak regeneration, but more information is required before that assumption can be made.
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks.	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Estimate within the visual vicinity of the monitoring plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over –mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable - recovering.
	Mature trees (20 - 75cm diameter) at least frequent in 75% of plots	Estimate within the visual vicinity of the monitoring plots.	
	Over-mature trees (>75cm diameter) at least present in 10% of plots	Estimate within the visual vicinity of the monitoring plots.	

* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of the Oak woodland.	Regeneration of Oak seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of Oak in particular is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps in the canopy for oak to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of Oak saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	

* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the Oak woodland should be largely comprised of Oak trees. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%	Visual estimate in 10x10m plots.	

* Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
* Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
* Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent in less than 10% of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a	Felling non-native species as part of management for conservation is acceptable.

(DAFOR)		combination of aerial photographs, SIM and Condition Assessment structured walk.	
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:- *Vaccinium myrtillus, Blechnum spicant, Dicranum spp., Luzula pilosa, Rhytidiadelphus loreus*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained. However, the W11 & W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea, Geum urbanum, Polystichum setiferum, Aneomne nemorosa, Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:- *Carex remota, Ranunculus repens, Chrysosplenium oppositifolium, Filipendula ulmaria, Lysimachia nemorum.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.

Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

Feature 4 (SAC) – Bog woodland (Status C)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Bog woodland	Maintain the extent of Bog woodland at 1.5ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable
Wet woodland community diversity	Maintain presence of the woodland communities W4 and W2 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats.	Visual estimate in 10x10m plots and across the extent of 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 Bog woodland may be desirable in some instances.
Vegetation structure			
* Structural Variation (% cover)	Mean canopy cover greater than 60%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.

	Mean shrub cover should be maintained between 10-50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb cover and moss cover. In addition record the cover of *Molinia caerulea* and the cover of *Sphagnum* mosses.	Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover.
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Visual estimate in 10x10m plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. Note that definition of young, mature and over-mature differs from drier woodland types, reflecting the fact that Birch will generally be the dominant species.
	Mature trees (20 - 75cm diameter) at least frequent in 50% of plots	Visual estimate in 10x10m plots.	
	Over-mature trees (>75cm diameter) at least present in 5% of plots	Visual estimate in 10x10m plots.	
* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	In wet woodland, dead wood is often abundant but because there tend to be fewer big trees the size of the fallen wood is often small.
	Fallen dead wood at least	Visual estimate in 10x10m	

	occasional in 70% of plots and at least frequent in 30% of plots.	plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least frequent in 10% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, they are less of a feature in Bog Woodlands than in other woodland types.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least frequent in 75% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands, especially Bog woodlands.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of Bog woodland.	Regeneration of native seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of some native species is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps for young trees to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of native saplings.	Visual estimate in 10x10m plots.	
* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of Bog Woodland should be largely comprised of Birch and Willow trees with associated native species. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore.
	Non–native invasive shrub species should be present in less than 20% of plots, but	Visual estimate in 10x10m plots.	

	never frequent.		In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
* Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%.	Visual estimate in 10x10m plots.	
* Cover of grasses (excluding *Molinia* and woodland species) (% cover)	The mean cover of undesirable grass species for the wood should be less than 10%.	Visual estimate in 10x10m plots.	W4 *Betula pubescens-Molinia caerulea* woodland is the main bog woodland community in Northern Ireland and has a naturally high *Molinia* component of the ground flora. However, where *Molinia* is not predominant, a high grass component other than woodland species indicates past and/or

			present grazing and is undesirable. Nevertheless, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
*Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
*Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent or more in less than 10 % of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle) (DAFOR)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Felling non-native species as part of management for conservation is acceptable.

Indicators of Local Distinctiveness			
Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

Feature 5 (SAC) – Otter Lutra lutra (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use available data from other surveys or CeDAR.
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	WFD Chemical and Ecological status	Water quality should be at least 'Good' status, with no pollution incidents	Refer to NIEA Water Management Unit for data
Food Sources	Assessment of fish stocks and other food sources (e.g., amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Loughs Agency/ AFBI for monitoring data where available. (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant development	

Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency/NIEA Water Management Unit if available
Site integrity	Total area	No reduction or fragmentation of area	

Feature 6 (SAC) – Atlantic Salmon (Salmo salar) (Status C)

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Electrofishing	Juvenile Atlantic salmon should be present in all areas of the catchment to which they have natural access. This does not include areas above naturally impassable barriers, but areas where access has been limited by man-made obstructions should be identified. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
b. Population density - Juveniles	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	Quantitative, semi-quantitative and timed electrofishing	Juvenile densities vary naturally between rivers and between survey sites on rivers, depending on the productivity and natural habitat character of the system. Observed densities therefore need to be assessed in relation to the expectation for each river and each river reach. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
c. Population density: adult run size	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component.	Fish counters where available. Rod catch data	The numbers of returning salmon should be sufficient to ensure that all naturally available spawning and nursery habitats is utilised. Different rivers have different seasonal patterns of adult migration associated with the environmental characteristics of the catchment and river system.

			Multi-sea winter fish are an important component of natural salmon run and have declined considerably in recent years. The data available to assess this attribute may vary. See the associated AFBI/ Loughs Agency monitoring protocol.

Attribute	Target	Method of Assessment	Comments
Water Quality			
Organic pollution, reactive phosphorus, acidification, other pollutants	Targets included in the CSM Guidance for Rivers should be used as follows: - 10%ile DO (% saturation) 85 - Mean BOD (mg L^{-1}) 1.5 - 90%ile total ammonia (NH3-N, mg L^{-1}) 0.25 - 95%ile un-ionised ammonia (NH3-N, mg L^{-1}) 0.025 - Mean pH >6.54 (clear waters)/ >5.1 (humic waters) Nutrient concentrations should be near-natural. SRP may vary depending upon river size, site altitude and alkalinity. Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Atlantic salmon are susceptible to a range of water quality impacts, particularly juvenile life stages (egg, fry, parr and smolt). Generally, water quality should not be injurious to any life stage. All reaches within the designated site that contain, or should contain, Atlantic salmon should comply with the targets given. Data from the last 3 years should be used.

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met.	Gauging stations (Data from DfI Rivers).	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigation of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered. Headwater sections are particularly vulnerable to abstraction, and this may affect the survival of juvenile fish and prevent the upstream migration of adult fish to key habitats.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	RHAT scoring system - River Hydromorphology Assessment Technique - Training Manual	Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The characteristic channel morphology provides the diversity of water depths, current velocities, and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of Atlantic Salmon. The proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this effect are not acceptable within an SAC, while restoration may be needed in some reaches. There should be no artificial barriers preventing unimpeded migration to natural spawning areas. Where barriers exist, they should be removed wherever possible, or at least made passable. Spawning habitat: defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256mm) but with the majority being <150mm. Water depth during the spawning and incubation periods should be 15-75 cm. Coarse woody debris should not be removed from rivers as it plays a significant role in the

			formation of new gravel beds, except where infrastructure, human life or property is under threat. Fry habitat; indicated by water of <20cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40cm deep and similar substrate. Holding areas: defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects, and surface turbulence. Bankside tree cover: overhanging trees provide valuable shade and food sources, while tree root systems provide important cover and flow refuge for juveniles.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment and Suspended Solids	No unnaturally high levels of siltation indicated by: "silt on substrate" highlighted in section K of the RHAT form ("Bank and channel features") OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as	Field observations and site-specific information derived from RHAT.	Elevated levels of suspended solids can clog the respiratory structures of Atlantic Salmon. Siltation can also prevent the flow of dissolved oxygen to eggs and prevent the movement of waste products from redds.

	the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids targets is under further review by NIEA:- Annual mean <10mg L^{-1} (spawning and nursery grounds) Annual mean <25mg L^{-1} (migratory passage)		
b. Alien/locally non-native species	No non-native species likely to cause impairment of Atlantic Salmon Populations	various sources, including ad hoc observations, specific site investigations and data collected by the environment agencies.	Refer to the WFD list of alien/locally absent species (but not to be used exclusively). Be aware that Pacific Pink Salmon has occurred in NI.
c. Stocking/transfers of Atlantic Salmon	No stocking/transfers of Atlantic Salmon unless agreed to be in the best interests of the population.	Knowledge of site management	Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocks and naturally produced individuals, disease introduction and genetic alterations to the population. There is a large body of evidence indicating that rearing locally sourced juveniles for release has a long-term impact on salmon populations by removing natural selection mechanisms in the juvenile phase of life. The

			management objective for sites notified for Atlantic Salmon is to attain naturally self-sustaining populations. Stocking of Atlantic Salmon should not be routinely used as a management measure. The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection or restoration and the control of exploitation as necessary.
d. Stocking/ transfers of other species	No stocking/ transfers of fish species at excessively high densities	Fishery stocking consents. Impact assessments of stocking consents at catchment scale may be required to determine an acceptable level.	Excessively high densities of other fish species may cause unacceptably high predation pressure and competitive interactions. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.
e. Abstraction intakes and discharges	Effective screening on all intakes and discharges.	Environment agencies monitoring/consenting programmes.	The entrainment of juvenile and adult fish into hydropower intakes or even fish farms can lead to a loss of fish. This can be avoided through the use of screening at appropriate locations. Guidance on screening is available through regulatory bodies such as the NIEA. It is important that screens are also used to prevent the escape of fish from fish farms and fisheries connected to rivers.

			Escapes from fish farms are a form of uncontrolled introduction and should be prevented.
f. Exploitation	All exploitation should be undertaken sustainably without compromising any components of the population	Loughs Agency/ DAERA data on licences and catch statistics.	Exploitation controls should be applied to all areas where Atlantic Salmon migrate to designated sites, within territorial waters. This should include estuarine and coastal net fisheries, as well as exploitation within the ASSI/SAC from rod fisheries.
g. Weed-cutting	Should not interfere with the provision of juvenile habitat in river types naturally supporting submerged vascular plants	Evaluation of conditions on land drainage consents and knowledge of adherence to them.	Areas of submerged and marginal plants: juvenile salmon in chalk rivers use submerged and marginal vegetation as cover. Cutting operations should aim to leave at least 50% of the vegetation uncut.

Ramsar Information Sheet

Published on 7 March 2023
Update version, previously published on : 31 July 1986

Ireland

Pettigo Plateau

Designation date	31 July 1986
Site number	334
Coordinates	54°36'58"N 07°56'44"W
Area	900,00 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

Pettigo Plateau Ramsar site is located in the north west of Ireland in county Donegal, to the east of the village of Laghy and west of Lough Derg. The Site comprises a remote and extensive complex of blanket bog with wet heath, lakes and pools in an area of low hills and broad basins. It lies at a height c. 150m height and rises to several higher points between 190 and 300m. The bog is mostly undisturbed and has a good range of vegetation communities and microtopographical features, e.g. hummocks, inter-connecting pools and flushes. The principal lakes within the site are the Dunragh Loughs, Lough Barderg and the eastern half of Lough Golagh. The site is bounded by extensive conifer plantations and areas of turbary, with further bog to the north and west. The area is underlain by metamorphic gneiss and schist. Along with plant communities characteristic of blanket bog habitat the site and wider area supports a number of bird (Red Grouse, Merlin, Hen Harrier, Greenland White-fronted Geese) and mammal (Otter) species in the summer and/or winter months. The Ramsar Site is part of one of the few remaining extensive intact bogs in Donegal, with the Ramsar Site and wider area being listed as the second largest intact blanket bog system in the region.

The Ramsar Site overlaps entirely with the Pettigo Plateau Nature Reserve SPA which was designated for the presence of wintering Greenland White-fronted Goose. The Site sits within the boundaries of the larger Dunragh Loughs/Pettigo Plateau Special Area of Conservation (SAC), designated under the EU Habitats Directive, as it contains representative and unique examples of natural wetland types within the Atlantic biogeographic region - Wet Heath and Blanket Bogs (Active). The main body of the SAC is comprised of non forested peatlands, while permanent rivers and streams and permanent freshwater lakes form a significant component of it. The blanket bog, which forms a mosaic with wet heath and supports vegetation communities representative of both lowland and upland blanket bog. Part of the Dunragh Loughs/Pettigo Plateau Special Area of Conservation (SAC) which lies adjacent to Lough Golagh and the Ramsar Site is a Coillte Life Bog Restoration site. This was an afforested site which is being restored to blanket bog through removal of conifers and drain blocking.

The invasive Rhododendron ponticum is spreading on blanket bog in the general area and is a likely to threaten the Ramsar Site.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
Postal address	National Parks and Wildlife Service, 90 North King Street, Smithfield, Dublin, Ireland D07 N7CV

National Ramsar Administrative Authority

Institution/agency	National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
Postal address	National Parks and Wildlife Service, 90 North King Street, Smithfield, Dublin, Ireland D07 N7CV

2.1.2 - Period of collection of data and information used to compile the RIS

From year	2004
To year	2019

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Pettigo Plateau

2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes ○ No ◉
(Update) B. Changes to Site area	the area has decreased
(Update) The Site area has been calculated more accurately	☑
(Update) The Site has been delineated more accurately	☐
(Update) The Site area has increased because of a boundary extension	☐
(Update) The Site area has decreased because of a boundary restriction	☐
(Update) For secretariat only: This update is an extension	☐

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?	Not evaluated

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<2 file(s) uploaded>

Former maps	0

Boundaries description

The boundaries for this site were defined using the boundary of the Pettigo Plateau Nature Reserve which was established in 1984 and later became the EU Birds Directive (2009/147/EC) Pettigo Plateau Nature Reserve Special Protection Area (SPA). The Ramsar Site (Nature Reserve and SPA) lies within and is integral to the larger peatland complex of the EU Habitats Directive (92/43/EEC) Dunragh Loughs/Pettigo Plateau Special Area of Conservation (SAC). Details of the SAC/SPA can be found on the NPWS website at: https://www.npws.ie/protected-sites. Within this area a number of GIS data layers were used to define the Ramsar habitats within the site. These included:
• NPWS data (Site-Specific Conservation Objectives)
• CORINE (Co-Ordinated Information on the Environment) land cover data sets (2012).
• Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC © 2017 Intermap Earthstar Geographics SIO © 2017 Microsoft Corporation.
• Environmental Protection Agency of Ireland Rivers and Lakes layers data layers.

The mapped layers were subsequently inspected by a site visit to confirm the presence of the habitats. Habitat areas were subsequently estimated by reference to the available imagery and layers and should be considered representative but approximate.

The mapped area, as calculated from the GIS boundary, differs from the official boundary of the Ramsar site. This is due to historic mapping issues.

2.2.2 - General location

a) In which large administrative region does the site lie? Border (NUTTS 3)

b) What is the nearest town or population centre? Donegal Town

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes ○ No ◉

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes ○ No ◉

2.2.4 - Area of the Site

Official area, in hectares (ha): 900

Area, in hectares (ha) as calculated from GIS boundaries: 691.528

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Marine Ecoregions of the World (MEOW)	Atlantic
EU biogeographic regionalization	Atlantic

Other biogeographic regionalisation scheme

British Isles
Palearctic (WWF Terrestrial Ecoregions), Northern British Isles (FEOW).

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

☑ Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided	Blanket bogs cover approximately 13% of Ireland, contain in excess of 90% water and act as vast water reservoirs. The blanket bog habitat with associated pool systems and connected lake and river habitats which are present at this Ramsar site (and in the wider SAC) provide a number of key ecosystem and hydrological services. In terms of hydrological services blanket bogs host high status water bodies, regulate stream flow and act as source areas for high quality drinking water. An Environmental Protection Agency (EPA) funded study “Quantification of blanket bog ecosystem services to water”, was carried out jointly by researchers from Queen’s University Belfast and University College Dublin, and sought to raise awareness of the wider contributions provided by healthy blanket bog ecosystems to society and the environment, while also examining the wider cost of their degradation. The study found that habitat condition influences stream flow and water quality, with more intact areas of blanket bog having more stable flow and water quality regimes, and with more stable hydrogeological regimes in peat ensuring more consistent contributions of bog water to stream flow, while maintaining terrestrial biodiversity (EPA, 2021). See also https://www.catchments.ie/blanket-bogs-hydrology-ecosystem-services-water/ The nature of a bog is controlled by hydrological processes, its existence depends upon retaining water and its characteristics depend upon the origin, volume, chemical quality and variability of water supply.
Other ecosystem services provided	Blanket bogs provide a range of ecosystem services (in addition to hydrological). • they provide a refuge for a rich biodiversity of species including several rare plants, birds and invertebrate species. • are commonly used as rough grazing land for sheep and cattle, grouse shooting, deer stalking and fishing. • they preserve prehistoric farming landscapes beneath the peat as well as a diverse range of artefacts within the peat mass. • the patterns of pools on the flatter areas of blanket bog is of particular conservation significance. The pools support a specialised range of mosses (especially species of Sphagnum) and plants and they provide essential feeding habitats for wetland birds. • within their peat layers, blanket bogs preserve a record of their own growth and development and on a larger scale, they provide insights into regional vegetation change, climate change, atmospheric pollution and act as chronometers for other events such as volcanic eruptions. • they accumulate and store millions of tonnes of carbon and have a vital function in controlling the green house gases that cause climate change. • their utilisation for recreation can have positive benefits on the health of people. See http://www.ipcc.ie/a-to-z-peatlands/blanket-bogs/ https://www.wildatlanticnature.ie/
Other reasons	In their natural state peatlands act as long-term sinks for atmospheric carbon dioxide. A persistently high water table is necessary for this function. Peatlands are the most important long-term carbon store in the terrestrial biosphere. It is highly likely that continued global warming will impact this habitat in the future. In Ireland the long-term carbon storage function of 47% of our original peatland area has been severely diminished through domestic and mechanical peat extraction (Irish Peatland Conservation Council).

☑ Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information	Includes bird species that are: - Red listed in Ireland's national Red List (Birds of Conservation Concern in Ireland (BoCCI) published by Colhoun and Cummins (2013) - Classified as VU or higher in IUCN Global and European regional list - Listed in Annex I of the European Union Birds Directive

3.2 - Plant species whose presence relates to the international importance of the site

While no internationally rare or threatened plant species have been recorded at this site it supports a diverse range of plant communities with characteristic species of the habitats present. In addition there are a number of regionally scarce plants are found in association with bog, heath and lakes on the site, e.g. Cranberry (Vaccinium oxycoccos), Cowberry (Vaccinium vitisidaea) and the bog mosses, S. fuscum and S. imbricatum.

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
Others																	
CHORDATA / MAMMALIA	*Lutra lutra*	☑	☐	☐	☐	☐	☐	☐	☐				NT	☑	☐	Annex II (Habitats Directive)	Annex II listing
Birds																	
CHORDATA / AVES	*Anser albifrons flavirostris*	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Annex I (Birds Directive), Amber listed (Birds of Conservation Concern in Ireland)	Annex listing, small flock wintering on traditional blanket bog habitat.
CHORDATA / AVES	*Circus cyaneus*	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Annex I (Birds Directive), Amber listed (Birds of Conservation Concern in Ireland)	Annex listing
CHORDATA / AVES	*Falco columbarius*	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Annex I (Birds Directive), Amber listed (Birds of Conservation Concern in Ireland)	Annex listing
CHORDATA / AVES	*Falco peregrinus peregrinus*	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Annex I (Birds Directive)	Annex I listing
CHORDATA / AVES	*Lagopus lagopus*	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Red listed (Birds of Conservation Concern in Ireland)	National BoCCI list
CHORDATA / AVES	*Pluvialis apricaria*	☑	☐	☐	☐	☐	☐	☐	☐				LC	☐	☐	Annex I (Birds Directive)	Annex listing

1) Percentage of the total biogeographic population at the site

Pettigo Plateau Ramsar Site is a designated Special Protection Area due to the presence of wintering Greenland White-fronted Goose (Anser albifrons flavirostris) which is an Annex I species (EU Birds Directive). At the time this site was designated it was being utilised by a Greenland White-fronted Goose population. In the 1980s, the Greenland White-fronted Goose flock utilising this site largely deserted the bogs in favour of coastal grassland sites, e.g. Durnesh Lough SPA. Greenland White-fronted Goose still occurs within this site and it is one of the few places where this species continues to utilise peatland habitats.

Several other Annex I EU Birds Directive species use the site, including the Golden Plover (Pluvialis apricaria), Merlin (Falco columbarius), Peregrine Falcon (Falco peregrinus) and Hen Harrier (Circus cyaneus) (DELHG 2005). According to NPWS (2013) Merlin and Golden Plover breed here, other typical bogland birds which breed here include Red Grouse (Lagopus lagopus) and Snipe (Gallinago gallinago). Red Grouse has declined in Ireland in recent years and is now a Red-listed species.

3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Northern Atlantic wet heaths with Erica tetralix [4010]	☑	Wet heath	Annex I (Habitats Directive)
Blanket bogs (* if active bog) [7130]	☑	Blanket bog	Annex I (Habitats Directive)

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

Pettigo Plateau Ramsar Site is one of the few remaining extensive intact blanket bogs in Donegal, and is part of a wider blanket bog complex which is listed as the second largest in this region. The site contains a mosaic of upland and lowland non - forested peatlands, a habitat of very limited extent within the Atlantic biogeographic region, and which provides a representative and unique example of this near - natural wetland type.The lakes at this site are of the oligotrophic (naturally nutrient-poor) type and contain a typical flora of Oligotrophic lakes which also listed in the E.U. Habitats Directive. A number of regionally scarce plants are found in association with bog, heath and lakes on the site.

Pettigo Plateau Ramsar Site supports populations of a number of species which are vulnerable. Several Annex I EU Birds Directive species use the site, including Greenland White-fronted Geese (Anser albifrons flavirostris), Golden Plover (Pluvialis apricaria), Merlin (Falco columbarius), Peregrine Falcon (Falco peregrinus) and Hen Harrier (Circus cyaneus). According to NPWS (2013) Merlin and Golden Plover breed here, other typical bogland birds which breed here include Red Grouse (Lagopus lagopus) and Snipe (Gallinago gallinago). Red Grouse has declined in Ireland in recent years and is now a Red-listed species.

The site supports the following species which are protected under national and/or European protected species legislation: Otter (Lutra lutra), Common Frog (Rana temporaria), Common Lizard (Zootoca vivipara), Badger (Meles meles) and Irish Hare (Lepus timidus). All the above species are protected under the Irish Wildlife Act (1976). The Otter, while widespread in Ireland, is declining internationally. It is listed as a near threatened with a decreasing population trend on the IUCN Red List. Red Deer (Cervus elaphus) have moved onto the site in the last 20 years although the numbers of this species are low (approx. 10 - 20 individuals) which reflects the fact that this species prefers the cover provided by the forestry. The Red Squirrel (Sciurus vulgaris) has been recently recorded in the area of commercial forestry adjoining the eastern boundary of the site (Ralph Sheppard, Pers comm.) and the Pine Martin (Martes martes) has been recorded from the same area.

The Site is surrounded on by extensive conifer plantations and areas of turf cutting. Rhododendron ponticum and invasive exotic shrub is abundant in the wider area and threatens the site.

The site is located within the Dunragh Loughs/Pettigo Plateau SAC, designated as a EU Natura 2000 site (Special Area of Conservation) due to the presence of representative and unique examples of near - natural wetland type within the biogeographic region i.e. Northern Atlantic wet heaths with Erica tetralix and Blanket bogs (Active). The latter is a priority habitat under the Habitats Directive.

4.2 - What wetland type(s) are in the site?

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools	Lakes	2	25	Representative
Fresh water > Marshes on peat soils >> U: Permanent Non-forested peatlands	Blanket bog and wet heath	1	666	Unique

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
BRYOPHYTA/SPHAGNOPSIDA	*Sphagnum fuscum*	
BRYOPHYTA/SPHAGNOPSIDA	*Sphagnum imbricatum*	
TRACHEOPHYTA/MAGNOLIOPSIDA	*Vaccinium oxycoccos*	
TRACHEOPHYTA/MAGNOLIOPSIDA	*Vaccinium vitis-idaea*	

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTA/MAGNOLIOPSIDA	*Rhododendron ponticum*	Actual (minor impacts)	increase

Optional text box to provide further information

A number of regionally scarce plants are found in association with bog, heath and lakes on the site, e.g. Cranberry (Vaccinium oxycoccos), Cowberry (Vaccinium vitisidaea) and the bog mosses, S. fuscum and S. imbricatum.

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/MAMMALIA	*Cervus elaphus*				
CHORDATA/AVES	*Gallinago gallinago*				
CHORDATA/MAMMALIA	*Lepus timidus hibernicus*				
CHORDATA/MAMMALIA	*Martes martes*				
CHORDATA/MAMMALIA	*Meles meles*				
CHORDATA/MAMMALIA	*Sciurus vulgaris*				
CHORDATA/REPTILIA	*Zootoca vivipara*				

Optional text box to provide further information

According to NPWS (2013) other typical bogland birds which breed here include Snipe (Gallinago gallinago).

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfb: Marine west coast (Mild with no dry season, warm summer)

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 150

a) Maximum elevation above sea level (in metres): 325

Entire river basin ☐
Upper part of river basin ☑
Middle part of river basin ☐
Lower part of river basin ☐
More than one river basin ☐

Not in river basin ☐
Coastal ☐

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

The Derg and Oughtcarn river waterbodies drain the Ramsar site and are part of the LeaghanyRiver_SC_010 sub catchment and the Foyle catchment. These rivers eventually reach Lough Foyle. The Bridgetown waterbody drains along its southern boundary and this river eventually reaches Donegal Bay.

4.4.3 - Soil

Organic ☑

(Update) Changes at RIS update: No change | Increase | Decrease | Unknown

No available information ☐

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes ○ No ◉

Please provide further information on the soil (optional)

The soils on the site are mainly ombrotrophic acid peats, with small areas of peaty podzols and Lithosols. The cool wet climate of Ireland gives rise to Podzol formation by leaching of exchangeable base ions, reducing chemical weathering and inhibited humus decomposition. This has resulted in the relatively poor nutrient status of the subsoil's.

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from surface water	☐	No change
Water inputs from groundwater	☐	No change
Water inputs from precipitation	☑	No change

Water destination

Presence?	Changes at RIS update
Marine	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels largely stable	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology:

The site is characterised by numerous small to medium sized Oligotrophic lakes including Dunragh Lough, Lough Boyle and Lough Golagh, with interconnecting and out flowing streams. The northern half of the site drains to Lough Derg and eventually Lough Foyle while the southern half drains west into Donegal Bay via a number of small streams which feed into a number of larger river systems. The plateau acts as a significant reservoir for maintaining flow in a number of downstream river systems.

4.4.5 - Sediment regime

Sediment regime unknown ☑

4.4.6 - Water pH

Acid (pH<5.5) ☑

(Update) Changes at RIS update No change ◉ Increase ○ Decrease ○ Unknown ○

Unknown ☐

4.4.7 - Water salinity

Fresh (<0.5 g/l) ☑

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown ☐

4.4.8 - Dissolved or suspended nutrients in water

Oligotrophic ☑

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown ☐

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself: i) broadly similar ○ ii) significantly different ◉

Surrounding area has greater urbanisation or development ☐

Surrounding area has higher human population density ☐

Surrounding area has more intensive agricultural use ☑

Surrounding area has significantly different land cover or habitat types ☑

Please describe other ways in which the surrounding area is different:

The site is largely surrounded by commercial conifer plantations. There is forestry to the north, south and west of the site. Sheep grazing occurs on some of the land adjoining the site. Lough Derg which adjoins the eastern boundary of the site is a popular pilgrimage retreat.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Wetland non-food products	Peat	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	Low
Pollution control and detoxification	Water purification/waste treatment or dilution	Low
Climate regulation	Local climate regulation/buffering of change	Medium
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climactic processes	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	Medium
Spiritual and inspirational	Inspiration	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Spiritual and inspirational	Contemporary cultural significance, including for arts and creative inspiration, and including existence values	High
Spiritual and inspirational	Spiritual and religious values	High
Spiritual and inspirational	Aesthetic and sense of place values	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium
Scientific and educational	Long-term monitoring site	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	Medium
Soil formation	Sediment retention	Low
Soil formation	Accumulation of organic matter	Low
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Medium
Nutrient cycling	Carbon storage/sequestration	Medium

Within the site: 100s

Outside the site: 10 000s

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes ○ No ○ Unknown ◉

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland ☐

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☐

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples ☐

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland ☐

<no data available>

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
National/Federal government	☑	☑

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	☑	☑

Other

Category	Within the Ramsar Site	In the surrounding area
Commoners/customary rights	☑	☑

Provide further information on the land tenure / ownership regime (optional):

The site is a statutory Nature Reserve (Pettigo Plateau) and is owned by the state and managed by the National Parks and Wildlife Service. A further 66 ha adjacent to the site and within the Dunragh Loughs/Pettigo Plateau SAC is owned by the state forestry company (Coillte).

A small area to the north and outside of the site in the townland of Croaghnameal is under forestry. This land is owned by Green Belt. A small area on Dunragh Hill to the east of Dunragh Lough is forested. This land is owned by Coillte, the Irish state owned forestry service. Most of the remainder of the site is owned by private landowners. Some of this may be held in commonage
The surrounding area is owned by both Coillte, the Irish state owned forestry service and by multiple private owners.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

National Parks & Wildlife Service (NPWS), Department of Housing, Local Government and Heritage
Donegal County Council.
Environmental Protection Agency (EPA).
Department of Communications, Climate Action and Environment.

Provide the name and/or title of the person or people with responsibility for the wetland:

Maurice Eakin

Postal address:

National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
90 North King Street,
Smithfield, Dublin,
Ireland
D07 N7CV

E-mail address:

maurice.eakin@housing.gov.ie

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Livestock farming and ranching	Low impact	Medium impact	☑	No change	☑	No change

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Logging and wood harvesting	Medium impact	High impact	☐	No change	☑	No change

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	Low impact		☑	No change	☑	No change

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/ alien species	Medium impact		☑	No change	☑	increase

Please describe any other threats (optional):

Threats are taken from NPWS (2015a, 2015b).
There is serious invasion of Rhododendron (Rhododendron ponticum). The most established areas of the Rhododendron are to the south of the site and the shrubs are spreading northwards along the streams and lower ground where there is some shelter. The spread of this species can be observed on a regional scale.
Peat extraction and drainage may be a threat to the site.

5.2.2 - Legal conservation status

Regional (international) legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
EU Natura 2000	Dunragh Loughs/Pettigo Plateau SAC Site Code: 001125.	https://www.npws.ie/protected-sites/sac/001125	whole
EU Natura 2000	PETTIGO PLATEAU NATURE RESERVE SPA: SITE CODE 004099	https://www.npws.ie/protected-sites/spa/004099	whole
Other international designation	Biogenetic Reserve		whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Nature Reserve	Pettigo Plateau Nature Reserve	https://www.npws.ie/nature-reserves/Donegal	whole

5.2.3 - IUCN protected areas categories (2008)

Ia Strict Nature Reserve ☐

Ib Wilderness Area: protected area managed mainly for wilderness protection ☐

II National Park: protected area managed mainly for ecosystem protection and recreation ☐

III Natural Monument: protected area managed mainly for conservation of specific natural features ☐

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention ☑

V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation ☐

VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems ☐

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Habitat manipulation/enhancement	Implemented
Hydrology management/restoration	Implemented
Land conversion controls	Implemented

Human Activities

Measures	Status
Regulation/management of wastes	Implemented
Regulation/management of recreational activities	Implemented
Research	Implemented
Harvest controls/poaching enforcement	Implemented
Livestock management/exclusion (excluding fisheries)	Implemented

Other:

The Pettigo Plateau Ramsar site lies within the Dunragh Loughs/Pettigo Plateau SAC and Pettigo Plateau SPA. Under European and national legislation, Ireland must maintain at favourable conservation status areas designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites. Conservation objectives of this site have been set for the SAC and SPA and are listed below; these can be accessed on NPWS.ie.
• To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected at favourable conservation status i.e. Northern Atlantic wet heaths with Erica tetralix; Blanket bogs (* if active bog).
• To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: Greenland White-fronted Goose Anser albifrons flavirostris

Legislation in the Republic of Ireland affords protection to bird species outside of designated sites e.g. all wild bird species are afforded protection by The Wildlife Act 1976. Waterfowl shooting is under license only, managed by the National Parks & Wildlife Service. It is Departmental policy that no hunting occurs on State-owned lands.

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes ○ No ◉

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes ○ No ◉

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No, but restoration is needed

Further information

The site is part of the Wild Atlantic Nature Project (https://www.wildatlanticnature.ie/) which works with farmers, local communities and land owners to add value to the wide range of services provided from our Special Area of Conservation (SAC) network of blanket bogs and associated areas. These peatlands provide clean drinking water, store carbon, support biodiversity, produce high quality food and support resilient rural economies and livelihoods through farming, tourism, recreation and other activities. As part of the project, a pilot voluntary Results Based Payment Scheme (RBPS) will be linked to the quality of the habitat, thereby putting landowners and their skills, expertise and knowledge of their land central to the development of this project.

Coillte, the state owned forestry service has carried out restoration work adjacent to the site where commercial forestry had previously existed. This work has included the felling and windrowing of coniferous trees and the blocking of drains in an attempt to restore the blanket bog habitat. This work which commenced approximately 13 years ago (c 2004) was funded under an EU LIFE project. The site is currently monitored every 5 years to asses regeneration and it is actively managed to remove any natural regeneration of coniferous trees.

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water regime monitoring	Implemented
Water quality	Implemented
Plant community	Implemented
Plant species	Implemented
Birds	Implemented

A requirement of the Water Framework Directive is that macro-invertebrates must be sampled in lake and river water bodies at least twice within a river basin cycle (6 years) in order to classify these water bodies. The site is sampled and monitored under this programme.

As a EU Natura 2000 site, it is required under Article 12 and 17 of the EU Birds and Habitats Directives respectively, that the status and trends of the conservation objectives within the site are monitored and reported on every 6 years.
.
The site is regularly inspected by the National Parks and Wildlife Service Conservation Rangers for the area.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Colhoun, K. and Cummins, S. 2013. Birds of conservation concern in Ireland 2014-2019. Irish Birds 9: 523-544.
DEH LG (2005) National Parks and Wildlife Conservation Plan for 2005-2010 Dunragh Loughs & Pettigo Plateau cSAC, SPA & NR Site Code 1125 & 4099 Co. Donegal.
NPWS (2017a) Conservation Objectives: Dunragh Loughs/Pettigo Plateau SAC 001125. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
NPWS (2013). Site Synopsis for Dunragh Loughs/Pettigo Plateau SAC 001125. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
NPWS (2015a) Dunragh Loughs/Pettigo Plateau SAC 001125 Natura 2000 Form. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
NPWS (2017b) Dunragh Loughs/Pettigo Plateau SAC (site code 001125) Conservation objectives supporting document - blanket bogs and associated habitats. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
NPWS (2016) Conservation objectives for Pettigo Plateau Nature Reserve SPA [004099]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
NPWS (2012). Site Synopsis for Pettigo Plateau Nature Reserve SPA [004099]. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
NPWS (2015b) Pettigo Plateau Nature Reserve SPA [004099]. Natura 2000 Form. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)
<no file available>

iii. a description of the site in a national or regional wetland inventory
<no file available>

iv. relevant Article 3.2 reports
<no file available>

v. site management plan
<no file available>

vi. other published literature
<no file available>

<no data available>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

Pettigo Plateau (*NPWS, 2017*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 1986-07-31

PETTIGOE PLATEAU SAC

UK0016607

CONSERVATION OBJECTIVES

Document Details

Title	Pettigoe Plateau SAC Conservation Objectives
Prepared By	R. McKeown
Approved By	P. Corbett
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Contact	cdp@daera-ni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1.0	June 2013	Internal working document	PC
V2.0	2015	Complete review	RMK
V2.0	01.04.2015	Effective date of Version 2	PC
V2.1	11.10.2017	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 Pettigoe Plateau SPA.

Pettigoe Plateau SAC boundary is identical to the boundary for Pettigoe Plateau SPA.

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 Directive79/409/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: FERMANAGH

GRID REFERENCE: IH010650

AREA: 1,270 ha (in 2 blocks)

5. SUMMARY SITE DESCRIPTION

Pettigoe Plateau lies between Belleek and Pettigoe to the north of the western tip of Lower Lough Erne in Co. Fermanagh. The Plateau, with its mosaic of lakes peatlands and forests extends across the border into Co. Donegal. Within Northern Ireland Pettigoe Plateau occurs in a gently rolling landscape bearing much evidence of glaciation, with ridges, knolls and circular drumlins interspersed with flat plains and hollows, mostly below 150 m. A thin layer of boulder clay underlies the blanketing peat over most of the area. In contrast to the rolling terrain are the rocky peaks of Croagh and Mallybreen that rise above the surrounding land to more than 180 m. Topography is variable, although most slopes tend to be moderate or gentle and altitude does not vary a great deal.

The area around Croagh Mountain contains outcrops displaying a wide variety of lithologies and structures typical of the Lough Derg Group. This is a series of mainly siliceous psammitic rocks containing minor intrusive basic igneous components. Late-phase feldspar-rich pegmatite veins are represented.

The area of blanket bog has a wide range of the structural features associated with this habitat: including a large number of well-developed pool complexes, frequent acid flushes, basin mires, ladder fens and bog plains. The bog vegetation is characterised by luxuriant *Sphagnum* mosses, dwarf-shrubs with associated species demonstrating a strong oceanic influence. Amongst the lakes included in the designation, several are clean soft-water types supporting a well-developed isoetid component in their aquatic vegetation.

The site contains a number of other notably scarce plant species and is also important for birds. It provides breeding habitat for a number of species and is especially important as the Irish stronghold for breeding Golden Plover *Pluvialis apricaria*. In addition, amongst the over-wintering birds, Pettigoe Plateau frequently supports Greenland White-fronted Geese *Anser albifrons flavirostris*.

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 of The Pettigoe Plateau site has been drawn to include all areas of high quality blanket bog and associated semi-natural habitats, including cutover bog, wet and dry heath, acid flushes, flushed and wet grassland and dry grassland. Some of the peatland within the SAC has been modified to varying degrees, the semi-natural blanket bog vegetation remains in comparatively good condition.

The border between Co. Donegal and Co. Fermanagh demarcates about one third of the boundary of Pettigoe Plateau SAC. The remaining two thirds of the boundary is generally marked by the edge of the enclosed land that surrounds the open peatland. However, sometimes the peatland edge loses quality and does not justify inclusion within the SAC boundary. Separation between areas included within the SAC and those more degraded areas that are excluded depends upon the judgement of the surveyor. This was based on a variety of factors, such as *Sphagnum* moss cover, bare peat, and grass: dwarf-shrub ratio, frequency of dung and poaching, burning and drainage.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active blanket bog	B	804 ha
Habitat	Natural dystrophic lakes and ponds	B	pool complexes (c10 ha)
Habitat	European dry heath	C	123 ha
Habitat	Northern Atlantic wet heaths with Erica tetralix	C	117 ha
Habitat	Oligotrophic to mesotrophic standing water with vegetation belonging to Littorelletea uniflorae and/or of the Isoüto-Nanojuncetea	C	8 lakes = 133 ha (inc. that in the Republic) (c62.7 ha in N.I.)
Habitat	Transition mires and quaking bogs	D	5.0 ha
Habitat	Depressions on peat substrates *(Rhynchosporion)*	D	0.1 ha

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 Pettigoe Plateau SAC.

6.1 ASSI SELECTION FEATURES

Pettigoe Plateau ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Blanket Bog	804 ha
Habitat	Dystrophic Lakes	10 ha
Habitat	Dry Heath	123 ha
Habitat	Wet Heath	117 ha
Habitat	Oligotrophic Lakes	62.7 ha
Species	Breeding Golden Plover	
Species	Breeding Bird Assemblage	
Earth Science	Dalradian	

Table 2. List of ASSI features.

6.2 ADDITIONAL ASSI FEATURES (subsequent ASSI standard features)

Feature Type	Feature	Size/ extent/ population
Earth science	Precambrian stratigraphy – psammites, intrusive basic igneous components, pegmatite veins.	Croagh Mountain
Species	Invertebrate assemblage	

Table 3. List of Additional ASSI Features

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

- Active Blanket Bog
- Natural dystrophic lakes and ponds
- European dry heath
- Northern Atlantic wet heaths with Erica tetralix
- Oligotrophic to mesotrophic standing water with vegetation belonging to Littorelletea uniflorae and/or of the Isoüto-Nanojuncetea

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.
Natural dystrophic lakes and ponds	B	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.
Oligotrophic to mesotrophic standing water with vegetation belonging to	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.

Littorelletea uniflorae and/or of the IsoUto-Nanojuncetea		Characteristic aquatic vegetation to remain present.
European dry heath	C	Maintain the extent of existing European dry Heath vegetation. Maintain and enhance the quality of the European dry heath community types. 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 dry heath. Seek nature conservation management over suitable areas immediately outside the SAC where there may be the potential for dry heath rehabilitation.
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.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Blanket Bog	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
Wet Heath	See SAC Selection Feature Objective Requirements Table
Oligotrophic Lakes	See SAC Selection Feature Objective Requirements Table
Breeding Golden Plover	Breeding numbers stable or increasing
	Chick mortality due to trampling by livestock to be minimised
	Disturbance of nesting pairs minimised
	A suitable nest site available for each summer resident pair of adult or sub-adult plovers.
Breeding Bird Assemblage	To be finalised
Dalradian	To be finalised

9.1 ADDITIONAL FEATURE (subsequent ASSI standard features) OBJECTIVES

Feature	Component Objective
Precambrian stratigraphy at Croagh	Maintain extent and quality of exposure, together with access to the feature subject to natural processes - psammites, intrusive basic igneous components, pegmatite veins.
Invertebrate assemblage	Maintain abundance and distribution and if feasible, enhance population.
	Establish the status of these species and if appropriate, draw up further conservation priorities.

10. MANAGEMENT CONSIDERATIONS

Ownership

The ownership of the designated area is complex with some of the site in public ownership, under three different Agencies, and the remainder under private ownership much in commonage and even some of the publicly or solely owned areas have multiple turbary or grazing rights. Turbary rights extend to about 10%

of the area, and a small amount of hand-cutting for private use has been consented.

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 Pettigoe Plateau, or could affect it in the future.

Although Active Blanket Bog, Natural Dystrophic Lakes and Ponds, Oligotrophic to mesotrophic standing water with vegetation belonging to Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea, European Dry Heath and Northern Atlantic Wet Heath with Erica tetralix are the qualifying SAC features, factors affecting ASSI features are also considered.

NOTE - Carrying out any 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 Pettigoe 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 may be some localised peat still taking place within the boundary. 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 > 25º as this may result in erosion.

If burning is practised, 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

There are a series of drains associated with many of the peat cuttings around the periphery of the SAC and many continue to carry water off the peat mass at an accelerated rate. In addition, extensive areas of the deeper peats have also been moor-gripped. All of these drains show up on the aerial photograph and are clearly apparent on the ground.

Many of the lakes on the plateau are very nutrient-poor and thus very vulnerable to nutrient accumulation. Without a hydrological assessment of water movement through the peat, it would be difficult to predict the lakes exact catchment, so artificial drainage could also lead to their eutrophication, where it is associated with afforestation etc. Any major drains that are currently carrying water away from or within the peat mass should be identified and blocked. 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

Inappropriate grazing, particularly over-wintering 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 seasons 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 over-stocking. Other areas however, particularly blanket bog communities, have suffered severe damage from poaching and overgrazing by cattle. Ideally, cattle should not be permitted on blanket bog because of the trampling damage caused.

Under-grazing, or the cessation of grazing, may result in the prevalence of over-mature and degenerate Ling heather *Calluna vulgaris*.
ACTION: Fences around the periphery of the SAC should be maintained to prevent sheep and cattle from outside the area straying into the SAC. Ideally, all other sections of the boundary should be fenced and stock proof, particularly, the north - south border. Current management units should be identified and current grazing levels established. Where it occurs, overgrazing and poaching should be addressed by setting more appropriate grazing levels, excluding all grazing in the winter months between November and February inclusive. Active shepherding of stock onto the drier heathland communities may be appropriate in some instances. There will be a need to carefully monitor the blanket bog and

heathland communities to establish if the set grazing prescriptions are permitting the peatland communities to recover towards favourable condition.

Supplementary stock feeding

Supplementary stock 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 avoiding denuded sloping areas and pockets of deeper level peat which are vulnerable to counter wind and gully erosion.

Land Reclamation

Reclamation of peatland involves drainage, liming and fertilisation, which will always damage a functioning peatland. Peatlands around the periphery of Pettigoe Plateau are particularly impacted by reclamation with the obtrusive bright green rectangles of re-seeded grass are commonly found adjacent to blanket bog and heathland landscapes throughout the area.

ACTION: There should be no reclamation of any lands within the SAC boundary. Any reclamation outside the boundary should be monitored to ensure the hydrology of the peatland habitats within the site is not affected.

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 that has been subject to these forestry operations has little potential to recover after harvesting.

Action: Afforestation is highly unlikely as Forest Service guidelines would preclude direct planting or grant-aid for planting within the SAC.

Damaging recreational activities

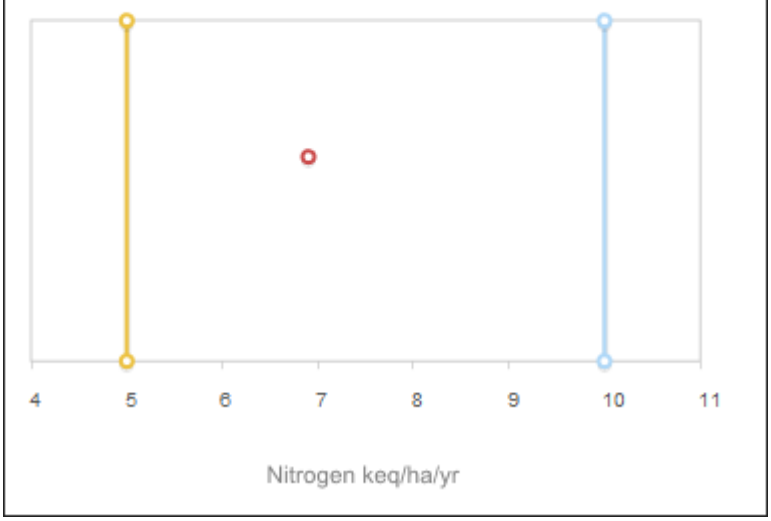
Four wheel drive access, can cause vegetation local loss which may lead to the cause significant erosion, particularly on sloping areas.

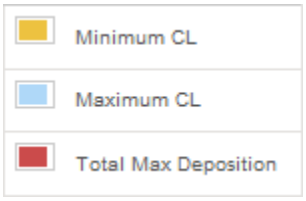
ACTION: No damaging recreational activities to take place within the site.

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 Pettigoe Plateau SAC habitats.

Feature: Blanket bogs (* if active bog)
Critical Loads (kg N/ha/yr): 5-10
Nitrogen Deposition (kg N/ha/yr):
Maximum: 6.9 Minimum: 5.5 Average: 6.2



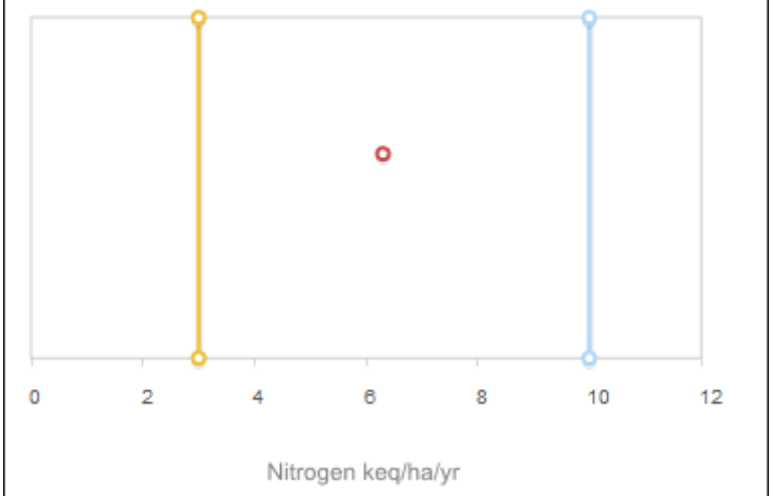


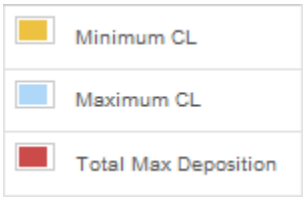
Feature: Natural dystrophic lakes and ponds

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

Nitrogen Deposition (kg N/ha/yr):

Maximum: 6.3 Minimum: 5.2 Average: 5.8



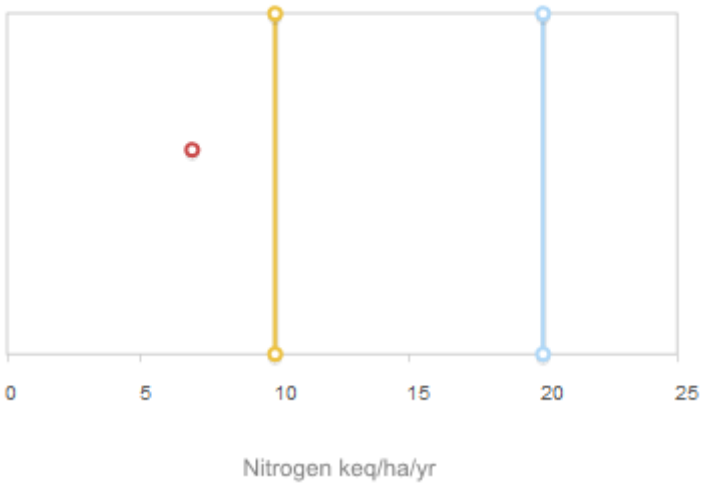


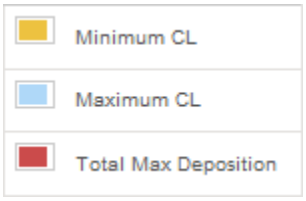
Feature: European dry heaths

Critical Loads (kg N/ha/yr): 10-20

Nitrogen Deposition (kg N/ha/yr):

Maximum: 6.9 Minimum: 5.5 Average: 6.2



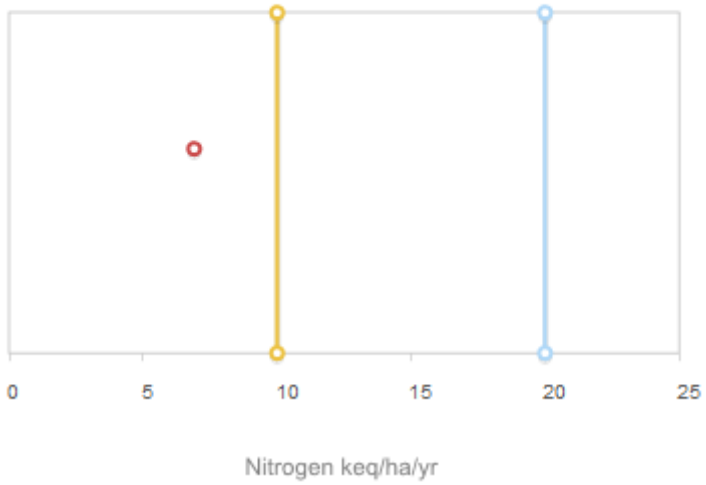


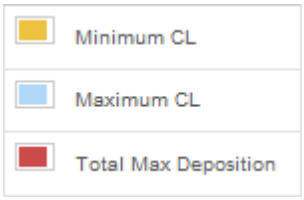
Feature: Northern Atlantic wet heaths with Erica tetralix

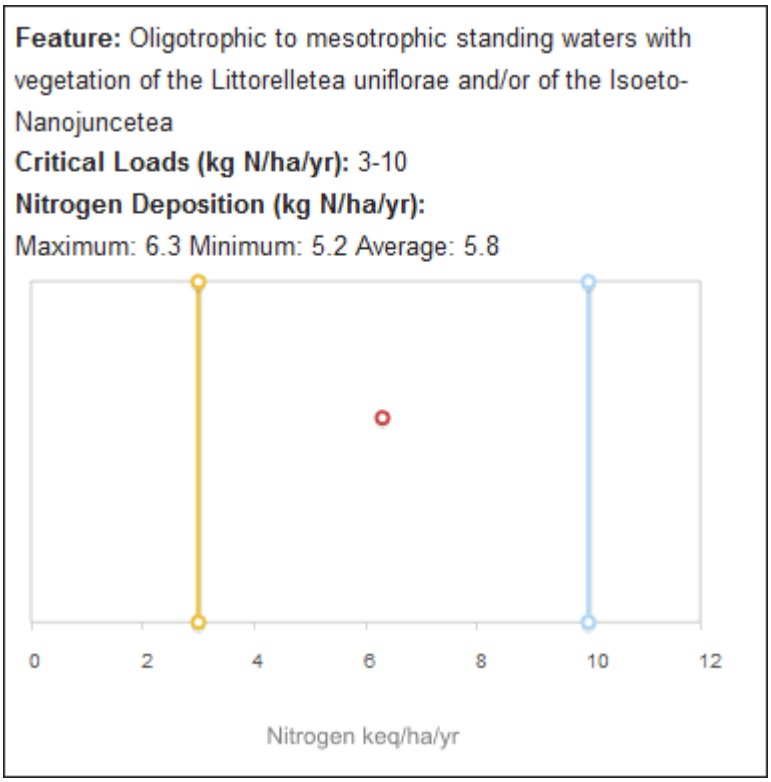
Critical Loads (kg N/ha/yr): 10-20

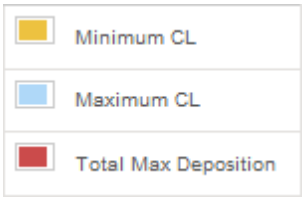
Nitrogen Deposition (kg N/ha/yr):

Maximum: 6.9 Minimum: 5.5 Average: 6.2









(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.

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 that the fencing, where present is still intact. Ensure that there has been no peat cutting, moor-gripping, dumping or inappropriate burning carried out within the SAC boundary. Evaluating stocking densities would also be desirable. This SIM should be carried out once a year.

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

Monitor the key attributes for all the SAC 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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Joint Nature Conservation Committee (JNCC) (2013). 3rd UK Habitats Directive Report.

ANNEX 1

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

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

Attributes	Targets	Method of Assessment	Comments
* Area of blanket bog and upland raised mire (ha)	Maintain the extent of the intact bog surface.	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 SAC 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.
* 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.*	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.

	papillosum and *S. capillifolium* forming the lawns and hummocks.		
Dwarf-shrub Height (cm)	Average ericoid height should be 15-30cm.	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.
* *Sphagnum* cover/ abundance (% cover and frequency) Active Peat Formation (DAFOR)	*Sphagnum* moss species should have a minimum cover of 25% over at least 66% of the intact blanket bog surface. Thick, hummock forming species of sphagnum should be at least occasional. Species present should include a mixture of both thin species: - *S. capillifolium* and *S. tenellum* and the thick hummock	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.

	forming species: - *S. papillosum* and *S. magellanicum* at least occasional over the surface.		
* 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 – i.e. the water table is too low beneath the surface of the bog.
* 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 (% and DAFOR)	No gully erosion or bare peat associated with more concentrated human impacts (eg drainage, peat extraction,	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 blanket bog, particularly marginal fretting

	ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of blanket bog other than very localised instances.		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.	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.
Molinia caerulea Cover (%)	Where *Molinia caerulea* cover is greater than 50%, it should form an even (not tussocky) sward in waterlogged conditions with *Sphagnum* moss cover greater than 25%.	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 the climate is generally warmer and wetter i.e. more oceanic.
Presence of rare or scarce species specific to the site.	*Sphagnum imbricatum* and *Sphagnum fuscum*, where they have been recorded, should	visual estimate in 2x2 m plots.	

	remain at least present along the length of each of the w-walks. If these species are not recorded on any one visit, it does not automatically make the SAC unfavourable.		

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

ANNEX I

Feature 2 (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.*
Attributes	Measure	Target	Comment

			There may be valid reasons why a characteristic species is not 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
Attributes	Measure	Target	Comment

			apparent. Colonisation since the previous field visit by *Elodea nuttallii* or *Elodea 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)	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})
Attributes	Measure	Target	Comment

		should be staple and appropriate to the lake type Adequate dissolved oxygen levels for health of characteristic fauna. No excessive growth of cyanobacteria or green algae.	Water should be acid and poor in available nutrients. It should be 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
Attributes	Measure	Target	Comment

			excess and plant development is limited by unavailability of N in the peat. Check for changes in catchment land-use in 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. 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
Attributes	Measure	Target	Comment

			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 character	Shore line and substrate	Maintain the natural shoreline of the lake. Maintain natural and characteristic substrate for lake type.	Sediment quality and quantity when enriched can cause excessive 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
Attributes	Measure	Target	Comment

			“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	

ANNEX I

Feature 3 (SAC) – European dry heaths (Status C)

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

Attributes	Targets	Method of Assessment	Comments
* Area of dry heath	Maintain the extent of dry heath.	Visual estimate in 2x2 m plots and across the dry heath using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Note that it may be possible to extend dry 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 dry heath communities H7, H8, H10 etc. as established at base line survey.	Visual estimate in 2x2 m plots.	Repeat monitoring of plots using GPS should indicate whether dry heath communities have changed or been lost.
* Area of mosaic communities and associated semi-natural habitats	Maintain associated mosaic communities and semi-natural habitats.	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.

Dwarf-shrub height	Average ericoid height should be 15–35cm with at least 25% of the dry heath in the late mature/degenerate growth phase (greater than 35cm).	Visual estimate in 2x2 m plots.	On some areas of dry heath (especially on gentle slopes), the ericoid age structure will largely reflect recent burning patterns. However, in dry heath, burning should only be carried out occasionally under carefully controlled and monitored circumstances. A varied heather age structure is reflected in the height of heather.
* Bare peat, or ground covered by algal mats (% cover)	Bare peat etc. should occupy less than 2% of the dry heath surface overall.	Visual estimate in 2x2 m plots.	Bare peat (NOT exposed rock) or peat carpeted by *Polytrichum* spp., *Campylopus* spp. crust forming lichens or algal mats can occur as a consequence of constant burning and/or grazing. Bare peat here represents bare peat etc. within the dry vegetation rather than naturally eroded surfaces where exposed rock can form a natural part of the dry heath community.
* Ericaceous cover (% cover)	Dwarf-shrub cover should be greater than 75% over at least 75% of the dry heath community; and Mean dwarf-shrub cover should be greater than 75%	Visual estimate in 2x2 m plots.	
* 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*, *E. cinerea*, *Vaccinium myrtillis*, *Erica tetralix*, *Ulex gallii*, *Empetrum nigrum* and *Myrica gale*.
* Cover of *Ulex gallii* (% cover)	*Ulex gallii* cover should be less than 50% in plots within H8 stands.	Visual estimate in 2x2 m plots.	Mean percentage cover should be assessed for stands of H8 only – i.e. exclude plots in other heath communities from the calculations.

			Stands of H8 are generally restricted to the south-east of Northern Ireland.
* Cover of graminoids (% cover)	Total graminoid cover should be less than 33%.	Visual estimate in 2x2 m plots.	Include true grasses, sedges, and rushes in this assessment. *Nardus stricta, Deschampsia flexuosa*, *Juncus squarrosus* or other graminoids should not dominate over other species.
* Frequency and % cover of bryophytes and bushy lichens (esp *Cladonia* spp.) (DAFOR and % cover)	Bryophytes (excluding *Polytrichum* spp. and *Campylopus* spp. on bare ground) and/or Cladonia species should be at least frequent. At least frequent is equivalent to greater than 41% occurrence in recorded plots. Combined mean cover should be greater than 5%.	Visual estimate in 2x2 m plots.	Generally only bryophytes (mosses and liverworts) figure in this assessment, but occasionally bushy lichens can also be a prominent feature of the dry heath vegetation.
* Frequency and % cover of scrub/tree encroachment on dry heath communities (DAFOR and % cover)	Scrub/tree encroachment should be no more than occasional over the dry heath community. No more than occasional is equivalent to less than 40% occurrence in recoded plots.	Visual estimate within a 10 m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment	Scrub encroachment should be checked using a combination of aerial photographs and Condition Assessment. Include invasive alien species in addition to *Betula pubescens, Prunus spinosa, Rubus* spp.. Invasive exotic species such as *Rhododendron ponticum* should be removed immediately. Exclude *Ulex europaeus* (see below)

	Mean cover should be less than 5%.	structured walk.	
* Cover of Gorse *Ulex europaeus* (% cover)	Gorse (*Ulex europaeus)* cover should be less than 5%. During repeat surveys, Gorse cover should not exceed that of the baseline survey.	visual estimate in 2x2 m plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Although a natural component of heath communities, Gorse can become invasive under both low and high grazing pressures. It is important to assess whether the relative quantities present in the site are increasing.
* Cover of Bracken (*Pteridium aquilinum*) encroachment (% cover)	Bracken cover less than 10% in dense canopy. During repeat surveys, Bracken cover should not exceed that of the baseline survey.	visual estimate in 2x2 m plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	Although a natural component of heath communities, Bracken can become invasive under both low and high grazing pressures. It is important to assess whether the relative quantities present in the site are increasing.
* 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* No more than rare is equivalent to less than 20% occurrence in	visual estimate in 2x2 m plot.	

	recorded plots. Combined mean cover of agricultural grasses and weeds less than 1%.		
* Management - Grazing (% cover)	Signs of moderate or heavy grazing should occupy less than 5% of the dry heath vegetation. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs and invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.	visual estimate in 2x2 m plots.	
* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the dry heath vegetation. Recent burning is represented by areas burnt within the last two years.	visual estimate in 2x2 m plots and across feature using a combination of aerial photographs, SIM and Condition Assessment structured walk.	
Frequency and cover of erosion features associated with human impacts.	No gully erosion or bare rock associated with more concentrated human impacts (ATV tracks or recreational	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,

(DAFOR and % cover)	activities). Man induced/enhanced erosion should occupy less than 2% of the total area of dry heath other than very localised instances.		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.
Herb diversity	Herbs (excluding negative indicators) at least frequent. At least frequent is equivalent to greater than 41% occurrence in recorded plots.	visual estimate in 2x2 m plots.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

Feature 4 (SAC) – Northern Atlantic wet heath with Erica tetralix (Status C)

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

Attributes	Targets	Method of Assessment	Comments
* Area of wet heath	Maintain the extent of wet heath.	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.	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.
Dwarf-shrub height	Average ericoid height should be 15–35cm with at least 25%	Visual estimate in 2x2 m plots.	On some areas of wet heath (especially on gentle slopes), the ericoid age structure will largely reflect

	of the wet heath in the late mature/degenerate growth phase (greater than 35cm).		recent burning patterns. However, in wet heath burning should only be 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.
* 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. *Molinia 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 (% cover and DAFOR)	Mean bryophyte cover (excluding *Polytrichum* spp. and *Campylopus* spp. on bare ground) should be at least 25%. *Sphagnum* moss species	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-shrubs as well as *Sphagnum* moss species.

	should be at least frequent throughout the moss layer. At least frequent is equivalent to greater than 41% occurrence in recorded plots.		
* 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. No more than rare is equivalent to less than 20% occurrence in recorded plots. Mean cover should be less than 2%.	Visual estimate within a ~10 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*. No more than rare is equivalent to less than 20% occurrence in recorded plots.	Visual estimate in 2x2 m plot.	

	Combined mean cover of agricultural grasses and weeds less than 1%.		
^ Management - Grazing (% cover)	Signs of moderate or heavy grazing should occupy less than 5% of the wet heath vegetation. The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs and invasion by *Juncus squarrosus* etc. indicate moderate and heavy grazing where any one of the above is recorded as more than occasional.	visual estimate in 2x2 m plots.	
^ Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the wet heath vegetation. Recent burning is represented by areas burnt within the last two years.	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	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,

	induced/enhanced erosion should occupy less than 2% of the total area of wet heath other than very localised instances.		mainly hill walking, the heath will not be in favourable condition, except where such erosion is very limited in nature.
Herb diversity	Herbs (excluding negative indicators) at least frequent. At least frequent is equivalent to greater than 41% occurrence in recorded plots.	visual estimate in 2x2 m plots.	Wet heaths tend to be dominated by dwarf-shrubs and graminoids; however, some herbs should be present in most plots (albeit at a low cover).

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

ANNEX I

Feature 5 (SAC) - Oligotrophic to mesotrophic standing water with vegetation belonging to Littorelletea uniflorae and/or of the IsoUto-Nanojuncetea

(* = 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,*

	Non-native plants	Non-native species should be absent or present at low frequency. No introductions of non-native species	*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. 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* Maintain at least the present community structure	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.
*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 µg L^{-1} Stable nutrient levels: TP target/limit: Mesotrophic = 10 µg L^{-1} Stable pH values: pH – 5.5 to circumneutral Adequate dissolved O_2 (>5 µg 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	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

		natural and characteristic of lake type.	*Juncus bulbosus* var. *fluitans* or growths of algae.
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		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.
Catchment area changes affecting the lake, such as flood defences and infrastructure schemes should be considered.		

PETTIGOE PLATEAU - SPECIAL PROTECTION AREA (SPA)

UK9020051

CONSERVATION OBJECTIVES

Document Details

Title	Pettigoe Plateau SPA Conservation Objectives
Prepared By	Ian Enlander
Approved By	Mark Wright
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Next Review Date	January 2020
Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials	Changes Marked
V1	19/11/1996	Internal working document	IE	
V1.1	August 2013	Review	IE	
V2.0	February 2015	Draft	IE	Complete review

Site relationship

To fully understand the site conservation requirements for this site it may be necessary to also refer to other site Conservation Objectives

This SPA overlaps with Pettigoe Plateau SAC

The SPA also matches the boundary of the Pettigoe Plateau Ramsar site.

See also Boundary Rationale

The SPA is also close to, or adjoins, European designations in the Republic of Ireland. These are Lough Golagh and Breesy Hill SAC and Tamur Bog SAC.

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, terrestrial/inter-tidal 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).

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.

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

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 GENERAL INFORMATION

COUNTY: Fermanagh

G.R. H010 650 AREA: 1270 ha.

5 SUMMARY SITE DESCRIPTION

Pettigoe Plateau lies between Beleek and Pettigoe to the north of the western tip of Lower Lough Erne, Co. Fermanagh. The Plateau, with its mosaic of lakes, peatlands and forests extends across the border into Co. Donegal. The area of blanket bog has a wide range of the structural features associated with this habitat including pool complexes, acid flushes, basin mires, ladder fens and bog plains. A number of notable lakes are also present.

5.1 BOUNDARY RATIONALE

The SPA boundary is coincident with that of the ASSI, SAC and Ramsar boundaries. The boundary of Pettigoe Plateau has been determined on the basis of habitat and has been drawn to include all areas of high quality blanket bog and associated semi-natural habitats, including cutover bog, wet and dry heath, acid flushes, flushed and wet grassland and dry grassland. Some of the peatland within the SAC has been modified to varying degrees, the semi-natural blanket bog vegetation remains in comparatively good condition.

The border between Co. Donegal and Co. Fermanagh demarcates about one third of the boundary of Pettigoe Plateau SAC. The remaining two thirds of the boundary is generally marked by the edge of the enclosed land that surrounds the open peatland. However, sometimes the peatland edge loses quality and does not justify inclusion within the SAC boundary. Separation between areas included within the SAC and those more degraded areas that are excluded depends upon the judgment of the surveyor. This was based on a variety of factors, such as Sphagnum moss cover, bare peat, and grass: dwarf-shrub ratio, frequency of dung and poaching, burning and drainage.

6 SPA SELECTION FEATURES

Feature Type (i.e. habitat or species)	**Feature**	**Designation Population**[1]	**Population at time of designation (ASSI)**	**Population at time of designation (SPA)**	**SPA Review population**
Species	Golden Plover breeding population [a]	12 pairs	12	12	12
Habitat[2]	Habitat extent				
Habitat[2]	Habitat quality[3]				

Table 1. List of SPA selection features.

[1] Designation population given as mean of survey totals 1987 and 1995

[2] Habitat is not a selection feature but is a factor and is more easily treated as if it were a feature.

[3] Habitat quality will be assessed in the context of the Pettigoe Plateau cSAC

Notes on SPA features – may not be applicable to all SPAs

The above table lists all relevant qualifying species for this site. As the identification of SPA features has and continues to evolve, species may have different status but all should be considered in the context of any HRA process. Ultimately all SPAs will be renotified to formalise species features.

[a] – species cited in current SPA citation and listed on current N2K dataform

[b] – species selected post SPA designation through UK SPA Review 2001

[c] – species highlighted as additional qualifying features through the UK SPA Review 2015 or the UK marine SPA programmes.

6.1 ADDITIONAL ASSI SELECTION FEATURES

Feature Type (i.e. habitat, species or earth science)	**Feature**	**Size/ extent/ pop·**
See SAC conservation objectives for ASSI feature details		

Table 2. List of ASSI features, additional to those that form all or part of SPA selection features. These will be referred to in ANNEX II.

7. CONSERVATION OBJECTIVES

The Conservation Objectives for this site are:

To maintain each feature in favourable condition.

For each feature there are a number of component objectives which are outlined in the tables below. Component objectives for Additional ASSI Selection Features are not yet complete. For each feature there are a series of attributes and measures which form the basis of *Condition Assessment*. The results of this will determine whether a feature is in favourable condition, or not. The feature attributes and measures are found in the attached annexes.

8 PETTIGOE PLATEAU SPA CONDITION ASSESSMENT 2014

Species	2006	CSM	5 yr mean	% CSM	Status
Golden plover	4	12	4	33.33	Unfavourable

9 SPA SELECTION FEATURE OBJECTIVES

To maintain or enhance the population of the qualifying species
To maintain or enhance the range of habitats utilised by the qualifying species
To ensure that the integrity of the site is maintained;
To ensure there is no significant disturbance of the species and
To ensure that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species

9 SPA SELECTION FEATURE OBJECTIVES

Feature	Component Objective
Golden Plover breeding population	As above
Golden Plover breeding population	Fledging success sufficient to maintain or enhance population
Habitat	Maintain the area of natural and semi-natural habitats used or potentially usable by notified species, within the SPA, subject to natural processes.

Table 3. List of SPA Selection Feature Component Objectives

9.1 ADDITIONAL ASSI SELECTION FEATURE OBJECTIVES

Feature	Component Objective
See SAC conservation objectives for ASSI feature details	

Table 4. List of Additional ASSI Selection Feature Objectives

10. MANAGEMENT CONSIDERATIONS

See also Views About Management for relevant ASSI

Owner/Occupier's **–** As of October 1995 there were a total of 20 landowners within the site boundary. Landowners include the Department of Agriculture for Northern Ireland (DANI) Forest Service, the Department of Environment for Northern Ireland (DoE (NI)) Environment and Heritage Service (NIEA) and a number of private individuals. Grazing rights generally lie with the land as do Turbary rights which account for approximately 10% of the total area of the site. Sporting rights have not been established within the site boundary. DoE (NI) owns a small section of the site which is proposed as the Tullywannia National Nature Reserve (NNR), and, although the site has not been designated as yet, it is managed by NIEA as an NNR.

11. MAIN THREATS, PRESSURES, ACTIVITES WITH IMPACTS ON THE SITE OR SITE FEATURES

Notifiable Operations **-** Carrying out any of the Notifiable Operations listed in the schedule could affect the site. The list below is not exhaustive, but deals with the most likely factors that are either affecting Pettigoe Plateau SPA, or could affect it in the future. Although, features 1, 2, 3, 4 etc, are the qualifying SPA features, factors affecting ASSI features are also considered.

Site/feature management issues

No	Issue	Threat/comments	Local considerations	Action
19	Habitat extent and quality-breeding	Alteration of habitat area or quality through inappropriate use or absence of site management.	Site is SAC so management will seek to achieve appropriate peatland vegetation community structure. Evidence suggests Golden Plover favour cut-over areas within the site.	Assess needs of breeding species. Liaise with owner or appropriate authority to adjust or introduce site management if necessary.
23	Predation.	Mainly of concern on bird breeding sites.	Thought to be a major factor for breeding wader success.	Must be dealt with as part of wider countryside management considerations. Carry out appropriate site management.
24	Recreational activities.	Disturbance is the main consideration. Apart from disturbance of birds themselves, breeding birds are vulnerable to disturbance as absence of adults can often result in predation or chilling of young with a reduction/loss in fledging success.	Informal walking undertaken. Not thought to be significant.	Liaise with local authorities and other managing parties.
25	Research	Census and ringing activities	Assessed as part of	Census and ringing

No	Issue	Threat/comments	Local considerations	Action
	activities.	especially have the potential to impact on bird populations, particularly at breeding sites.	breeding wader and rare breeding bird surveys.	activities to be undertaken by competent individuals, appropriately trained. In case of ringers, appropriate license must be held.

Table 5. List of site/feature management issues

12. MONITORING

Monitoring of our Special Protection Areas takes place at a number of levels, using a variety of methods. Methods for both Site Integrity Monitoring and Condition Assessment can be found in the Monitoring Handbook (To be written).

In addition, detailed quality monitoring or verification monitoring may be carried out from time to time to check whether condition assessment is adequate to detect long-term changes that could affect the site. This type of quality monitoring may involve assessment of aerial photographs to determine site morphological changes. Methodology for this is being developed.

12.1 MONITORING SUMMARY

1. Monitor the integrity of the site (Site Integrity Monitoring or SIM) – to ensure compliance with the SPA/ASSI schedule and identify likely processes of change (e.g., changes to grazing regime, afforestation, peat-cutting). This SIM should be carried out once a year.

2. Monitor the condition of the site (Condition Assessment) - Monitor the key attributes for each selection feature (species, assemblage, habitat, etc). This will detect if the features are in favourable condition or not. See Annexes I and II for SPA and Additional ASSI Features respectively.

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 appropriate assessment that may be needed. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

13. ADDITIONAL MONITORING ACTIONS UNDERTAKEN FOR SITES IN UNFAVOURABLE CONDITION

Monitoring actions set out in section 6 and Annex 1 will use, amongst other attributes, bird population data to determine site condition. In the event of a significant population decline being detected, a series of subsequent actions will be initiated. The

following list is not exhaustive, actions will be site dependant, but the order of these points IS hierarchical i.e. consider point 1, then 2, etc.

1. Assess the site population in a wider geographical context – Northern Ireland, Ireland, UK, world. Refer to BTO ALERT limits etc. Liaise with other competent bodies to meaningfully assess wider pattern. No site action if site decline mirrors regional pattern the cause of which is not related to the site. Action may be required at regional or larger scale. If the cause of the regional population decline (e.g. eutrophication) is found at the site then action may be necessary, but this may need to form part of a network of strategic species action. Further research may be required.
2. Assess the site population in a wider geographical context – Northern Ireland, Ireland, UK, Europe, world. Determine if site losses are balanced by gains elsewhere e.g. breeding terns. Review site condition to determine if losses are due to site deterioration. Determine if possible whether population has relocated within SPA series (national, biogeographical, European). Note that the reasons for such locational changes may not be readily identifiable. Further research may be required.
3. For passage/wintering species assess breeding information. No site action if site decline is due to breeding ground failure, unless breeding ground failure is related to poor adult condition resulting from factors affecting wintering / passage birds.
4. Determine whether a major incident has affected the site e.g. toxic impact on prey items, predation event or geographical shift in available prey. Ability to respond to impacts may be limited.
5. Assess condition of principal site habitats e.g. vegetational composition and structure, change in habitat balance e.g. mudflats reduced by encroaching mussel beds.
6. Assess prey availability. Issues to consider are both within site e.g. water quality, broad site management, and without site e.g. climatically driven factors.
7. Assess whether there have been any changes in any other site features or management practices (see Table 3) that may have affected populations of site selection features.
8. Long-term site value must be considered even when it is found to be in unfavourable condition for a number of reporting cycles. This is particularly important for breeding seabird and wader sites where ongoing appropriate management may ultimately encourage re-establishment of a favourable population.

8. SELECTION FEATURE POPULATION TRENDS

A summary statement of site population trends, together with wider geographical trends. Date of completion is given as well as information sources used. Due to a lack of data site trends are generally limited to terms such as 'consistent increase/decline', 'variable with overall increase/decline', 'no discernable trend'. Other trends are also generally limited to terms such as 'consistent increase/decline', 'variable with overall increase/decline', 'no discernable trend'.

SPECIES	SITE TREND	NI TREND	IRISH TREND	UK TREND	COMMENTS
Golden Plover (breeding)	No discernible trend (due principally to lack of data)	Data unavailable	Data unavailable	No discernible trend (1994-99 Breeding Bird Survey)	

ANNEX I
Feature (SPA) – Breeding waders

* = primary attribute. One failure among primary attribute = unfavourable condition
# = optional factors – these can be in unfavourable condition without the site being in unfavourable condition

Attribute	Measure	Targets	Comments
* Golden Plover breeding population	Survey using Brown & Shepherd Method (see Gilbert *et al*., 1998) – 2002 onwards. Determine number of breeding pairs. Calculate new population mean.	No significant decrease in breeding population against national trends	Requirement that data is collected once every reporting cycle. Ideally the population will be maintained above 1% of the national population. Mean population greater than 6 pairs (i.e. within 50% of designation population) or above minimum historical count
# Golden Plover fledging success	Determine number of fledglings raised and add to total number of fledglings raised over previous four years and divide by five to obtain average. This should remove variation from season to season, e.g. in response to bad weather.	>1 fledgling per pair successfully raised per year over five year period	Appropriate level of fledgling survival to be determined

NB 1. Whilst monitoring of breeding productivity is desirable, it is likely to be very difficult to carry out as the young of Golden Plover are both very elusive and nidifugous. The high intensity of surveys required to estimate productivity might also have detrimental disturbance impacts on the breeding population.
NB 2. The Brown & Shepherd Method is recommended for population surveys despite the use of a slightly different method previously. The Brown & Shepherd method is more efficient and is now the standard method for the survey of upland breeding waders in the UK (and will therefore allow better comparison with other sites).

Non-Avian Factors – habitat

Attribute	Measure	Targets	Comments
* Habitat extent	Area of natural and semi-natural habitat	Maintain the area of natural and semi-natural habitats used by notified species, within the SPA, subject to natural processes.	Monitor once every reporting cycle by aerial photography.
# Habitat quality	To be assessed as part of SAC monitoring		Evaluate habitat quality should bird populations decline due to on site factors. Map any changes in area. This may include mapping areas with different vegetation structures where this would lead to different usage by notified species.

ANNEX II

Feature (ASSI) –
See SAC conservation objetives

Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
Norlin Airlan Environment Agency
www.daera-ni.gov.uk

RIVER FAUGHAN & TRIBUTARIES SPECIAL AREA OF CONSERVATION

UK0030361

SITE CONSERVATION OBJECTIVES
& Supporting advice

Version 4
6 September 2024

Sustainability *at the heart of a living, working, active landscape valued by everyone.*

Document Details

River Faughan and Tributaries SAC Conservation Objectives
V2 Published January 2015
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Approved by Richard Gray, Sara McGuckin
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Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Edit and minor correction	PC
V4	July 2024	Complete review of supporting advice at Annex A - freshwater features, additional minor updates.	AD, RG, LS

Site relationships

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

The River Faughan & Tributaries SAC boundary adjoins the boundary of Lough Foyle SPA and Ramsar.

1. INTRODUCTION

There is a clear responsibility under the Habitats and Birds Directives[1] and associated domestic legislation, namely the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended)[2], hereafter referred to as the Habitats Regulations to ensure that all habitats and species listed in Annexes I and II of the Habitats Directive, are maintained or restored to Favourable Conservation Status (FCS).

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) also contribute to meeting UK international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

The UK national site network of European sites, formerly known as Natura 2000 sites, have a crucial role to play in achieving the overall objective of FCS 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 UK.

To ensure that each 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 national site network, countries 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 the national site network over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, national site network 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] Updated through the Conservation (Natural Habitats &c.) (Amendment)(Northern Ireland)(EU Exit) Regulations 2019.

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.

The site-level conservation objectives, the supporting advice (at Annex A) and any case-specific advice given by NIEA Natural Environment Division, should be used when developing, proposing or assessing an activity, plan or project that may affect this site.

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 National Site network.

4. SITE INFORMATION

SITE: River Faughan & Tributaries SAC

COUNTY: LONDONDERRY

GRID REFERENCE: IC 51660776

UPPER G.R.: IC 53580099
IC 54300028
IC 60600062
IC 58690085
IC 48570631
IC 56621256

LOWER G.R.: IC 48892002

AREA: 293.27 ha

LENGTH: 62 km

5. SUMMARY SITE DESCRIPTION

The area is of interest because of the physical features of the river and its associated riverine flora and fauna. The River Faughan and Tributaries SAC includes the River Faughan and its tributaries the Burntollet River, Bonds Glen and the Glenrandal River (and its tributary the Inver River).

In total, the area encompasses approximately 60km of watercourse and is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities, in particular the population of Atlantic Salmon *Salmo salar*, which is of international importance and the widespread and common occurrence of Otter *Lutra lutra* in the catchment. Upland Oak Woodland is also well-developed in places along the valley sides of the River Faughan and its tributaries.

Further details of the site are contained in the relevant ASSI Citations and Views About Management statements, which are available on the DAERA website (https://www.daera-ni.gov.uk/protected-areas).

5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:

1. whole catchments
2. main river stem from source to mouth, tributaries and upland catchment
3. main river stem from source to mouth and tributaries
4. main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature.

In the case of the River Faughan and Tributaries, the qualifying SAC/ASSI features are its nationally important population of Salmon, and its regionally important Otter population.

The upper limits for all the tributaries and sub-tributaries are currently generally determined by the known limits of good spawning and nursery habitat or woodland. The upper limit is typically indicated on the ground by a physical feature such as a bridge. The downstream limit of the site is determined by the tidal limit which is also the boundary of Lough Foyle SPA.

The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the ASSI has limited adjacent habitat. Therefore, the boundary is often restricted to the top of the riverbank.

Although fragmented, semi-natural woodland is present throughout the site, with the main blocks found at Ness and Ervey Woods, both Country Parks on the Burntollet River, and Bonds Glen Wood on the Bonds Glen. These woodlands were previously designated as ASSIs for their woodland interest and have been included within the River Faughan and Tributaries SAC. Other significant stands of woodland occur along the valley sides of the Faughan and Glenrandal Rivers. These woodlands and the interconnecting woodland strips which run along the river banks vary in the extent that they are fenced.

Due to the size of the area, the boundary was largely derived from ortho-rectified colour aerial photographs. Some information on adjacent habitats was derived from previous surveys.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

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

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Atlantic Salmon Salmo salar	B	1,000-10,000
Habitat	Old sessile oak woods with Ilex and Blechnum in the British Isles	C	96ha
Species	Otter Lutra lutra	C	C
Species	Sea Lamprey *Petromyzon marinus*	D	P
Species	Brook Lamprey *Lampetra planeri*	D	P
Species	River Lamprey *Lampetra fluviatilis*	D	P

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 threshold for 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 River Faughan & Tributaries SAC.

Guidance and literature: https://www.daera-ni.gov.uk/protected-areas/river-faughan-and-tributaries-sac

6.1 ASSI SELECTION FEATURES

River Faughan & Tributaries ASSI

Table 2. List of ASSI features.

Feature Type	Feature	Size/ extent/population
Habitat	Oakwood	96 ha
Species	Atlantic Salmon *Salmo salar*	
Species	Otter *Lutra lutra*	
Earth Science	Dalradian series	

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

- Atlantic Salmon Salmo salar,
- Old sessile oak woods with Ilex and Blechnum in the British Isles,
- Otter Lutra lutra;

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	Grade	Objective
Atlantic Salmon Salmo salar	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population.
		Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Old Sessile Oak Woodlands with Ilex and Blechnum in the British Isles	C	Maintain and where feasible expand the extent of existing oak woodland but not at the expense of other SAC (ABC) features. (There are areas of degraded heath, wetland and damp grassland which have the potential to develop into Oak woodland)
		Maintain and enhance Oak woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter Lutra lutra	C	Maintain and if possible increase population numbers and distribution.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Oakwood	See SAC Selection Feature Objective Requirements table.
Atlantic Salmon *Salmo salar*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table.
Earth Science – Daldarian series	Maintain extent and quality of exposure, together with access to the feature subject to natural processes.

10. MANAGEMENT CONSIDERATIONS

Ownership

There are several hundred individuals or organisations with ownership or other rights associated with the area.

Adjoining Land Use

The River Faughan and its tributaries, in the main, flow through improved or semi-improved pasture used for silage and grazing with the channel generally fenced from the surrounding land at least along one bank top. Along the lower reach of the River Faughan below Derry City the main adjacent agricultural uses include tilled land and silage production, in addition to stock grazing. A number of large commercial sand quarries are also located along this lower reach on the eastern side of the river.

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 River Faughan & Tributaries or could affect it in the future. Although Salmon Salmon salar, Old sessile oak woods with Ilex and Blechnum in the British Isles and Otter Lutra lutra are the qualifying SAC features, factors affecting ASSI features are also considered.

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

River

Water Quality/Eutrophication:

Water quality is probably the most important single factor for the SAC/ASSI selection features with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river system is 28,271ha and consists of 6 sub-catchments. The designation only includes the main channels of the River Faughan and its tributaries, the Burntollet River, Bonds Glen and the Glenrandal River (and its tributaries the Inver River) but has excluded several other tributaries.

Analysis of biological water quality monitoring data from 2003 to 2006 indicates that water quality is good to very good on most rivers although there does seem to be a fluctuation in quality over this period in the middle and lower reaches of the River Faughan while the Burngibbagh and Foreglen Rivers are a cause for concern. Chemical water quality monitoring data however indicates that water quality is good to very good on all rivers.

A significant portion of the upper catchments of the Burntollet River is afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

There are at least 7 sewage works within the catchment varying in size and the degree of treatment they provide. There are also numerous septic tanks.

Stock have open access to the channel along many sections of the River Faughan and its tributaries and have caused poaching of the bank and channel. This represents another possible source of enrichment.

ACTION: Review Water Order consents

ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage land owners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Reassess occurrence of consented and unconsented discharges to establish extent and significance of impacts and therefore focus actions for reducing such impacts. Restrict stock access to less sensitive watering points, introduce buffer strips (where currently absent) and extend elsewhere. Increase the amount of fencing along riverbanks.

Channel & Bank Modification:

The River Faughan was originally designated for drainage in 1947. A total length of 11.25km was designated at this time. Further designation was required in 1963 covering a total of 19.75km of the river. This was primarily to improve flood defences to existing commercial properties. The limit of designation is upstream of Killycor Bridge (C570 057). Upstream of this point, there has been no in-channel works and the channel and banks are presumed to be natural.

The work that has been carried out on the River Faughan has been mainly floodbanking, though there has been some resectioning in the middle reaches.
ACTION: Future in-river and bankside works should be minimised as they reduce habitat and species diversity. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole. Initiate discussions with Rivers Agency to co-ordinate action.

The River Faughan and some of its tributaries have undergone fisheries modifications with the installation of weirs and deflectors as part of habitat enhancement schemes, resulting from the 'Salmonid Enhancement Programme'. Such enhancement schemes should be thoughtfully planned as properly executed schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.
ACTION: Initiate discussions with Loughs Agency/DAERA Marine and Fisheries Division and NIEA to co-ordinate action.

Substrate Siltation

A portion of the catchment is afforested (especially the upper catchment of the Burntollet River), with a potential risk of sediment release during forestry operations, especially clear-felling.
ACTION: Liaise with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).

A number of large commercial sand and gravel pits located near to the main river channel and some of its tributary rivers are potential polluters to water quality with escape or release of sand wash resulting in siltation of the riverbed downstream.
ACTION: Monitor and control sediment input levels in tributaries and immediately downstream of sandpits.

Where the bank and channel of the river are accessible to stock, damage to both the Salmon spawning grounds and the macrophyte community may occur.

Trampling has an obvious direct impact but in some sections of the river,

trampling and poaching of the riverbank and channel have caused erosion, resulting in siltation of the riverbed downstream.
ACTION: Restrict livestock access to drinking areas only, introduce buffer strips (where currently absent) and extend elsewhere. Increase the amount of fencing along riverbanks.

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Water Abstraction

A natural flow regime is essential for the maintenance of main selection features. There are several extraction sites along the river. Proposals for further water extraction in the area will require very careful environmental assessment.

ACTION: Review existing Water abstraction consents.

Fly-tipping

Small-scale fly tipping has occurred in places along the riverbanks and in the river channel, as well as in adjacent woodland.
ACTION: Where practical, remove dumped material from the banks, channel and adjoining woodland to prevent the build-up of debris and discourage further tipping.

Alien species

Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum* and Indian Balsam *Impatiens glandulifera* are present along the riverbanks of the major rivers.
ACTION: Eradication of these is recommended in the lower Faughan area to reduce influence and prevent spread throughout catchment.

WOODLAND

Grazing/Poaching/Tree barking and Browsing

Free access to some parts of the woodland by domestic stock and feral goats is causing direct damage to the ground flora community by poaching and trampling. Grazing and bark-stripping is preventing regeneration and will increasingly cause a detrimental change in the woodland structure and composition with time. Information on current grazing levels of domestic stock within privately owned woodland is not readily available. No information on the current population of goats is available.
ACTION: Evaluate the current domestic stocking levels of the wood and reduce numbers to a sustainable level. In some cases, it may be necessary, under a management agreement, to exclude stock altogether by fencing off woodland. Undertake a census of the current feral goat populations and if necessary, initiate control measures to reduce numbers to acceptable levels.

Invasion by exotics

Exotic species are localised. They vary in the degree of impact they have and the threat they pose. Very invasive species such as Sycamore *Acer pseudoplatanus* are seen as posing a current threat. Others are not seen as an immediate threat

due to their limited occurrence (e.g. Horse Chestnut *Aesculus hippocastanum*) or slow rate of spread (e.g. Beech *Fagus sylvatica*).
ACTION: The most invasive species require management to control their spread, which in most cases will require the current seed source to be removed from site. Those species not posing a threat at present should be monitored and in the long-term controlled if required.

Dead Wood Removal

Dead wood should be left *in situ* if safe or practical to do so. This provides valuable habitat for fungi, invertebrates etc. Removal of wood for firewood should be discouraged.
ACTION: Through liaison and monitoring ensure there is no removal of dead wood from the site.

Woodland Clearance/Felling

Prevented by Notifiable Operations schedule.
ACTION: Undertake Site Integrity Monitoring (SIM) to ensure compliance with Notifiable Operations schedule.

Fly-tipping

Localised fly-tipping occurs throughout the site but is extensive in a number of locations.
ACTION: Ensure removal of dumped material from the woods to prevent the build-up of debris and discourage further fly-tipping. If fly-tipping persists, woodland areas adjacent to roads should be fenced off to prevent further occurrences.

Geological sampling.

The extent of the feature means that the site is unlikely to be damaged by responsible geological sampling.

ACTION: to be assessed during SIM exercises.

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. Critical levels and critical loads have been calculated for protected site features.

Please refer to the UK Air Pollution Information System (APIS) for site relevant critical loads and levels at 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 levels and loads.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works 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. CONSERVATION MANAGEMENT PLAN

The River Faughan and Tributaries SAC Conservation Management Plan can be viewed at River Faughan and Tributaries SAC (arcgis.com)

13. MONITORING

Monitoring of SACs takes place 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 habitat).

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.

13.1 MONITORING SUMMARY

1. Monitor the integrity of the site (SIM or Compliance Monitoring)

Complete boundary survey to ensure that the boundary features, where present are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC boundary. Evaluating stocking densities would also be desirable, whilst a check for feral goat damage should be carried out throughout the site. The 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 A.

The favourable condition table provided in Annex A 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.

14. REFERENCES

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ANNEX A – Supporting advice

Feature 1 (SAC) – Atlantic Salmon (Salmo salar) (Status B)

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Electrofishing	Juvenile Atlantic salmon should be present in all areas of the catchment to which they have natural access. This does not include areas above naturally impassable barriers, but areas where access has been limited by man-made obstructions should be identified. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
b. Population density - Juveniles	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	Quantitative, semi-quantitative and timed electrofishing	Juvenile densities vary naturally between rivers and between survey sites on rivers, depending on the productivity and natural habitat character of the system. Observed densities therefore need to be assessed in relation to the expectation for each river and each river reach. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
c. Population density: adult run size	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river, and maintenance of the multi-sea-winter component.	Fish counters where available. Rod catch data	The numbers of returning salmon should be sufficient to ensure that all naturally available spawning and nursery habitats is utilised. Different rivers have different seasonal patterns of adult migration associated with the environmental characteristics of the catchment and river system. Multi-sea winter fish are an important component of natural salmon run and have declined considerably in recent years. The

			data available to assess this attribute may vary. See the associated AFBI/ Loughs Agency monitoring protocol.

Attribute	Target	Method of Assessment	Comments
Water Quality			
Organic pollution, reactive phosphorus, acidification, other pollutants	Targets included in the CSM Guidance for Rivers should be used as follows: - 10%ile DO (% saturation) 85 - Mean BOD (mg L^{-1}) 1.5 - 90%ile total ammonia (NH3-N, mg L^{-1}) 0.25 - 95%ile un-ionised ammonia (NH3-N, mg L^{-1}) 0.025 - Mean pH >6.54 (clear waters)/ >5.1 (humic waters) Nutrient concentrations should be near-natural. SRP may vary depending upon river size, site altitude and alkalinity. Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Atlantic salmon are susceptible to a range of water quality impacts, particularly juvenile life stages (egg, fry, parr and smolt). Generally, water quality should not be injurious to any life stage. All reaches within the designated site that contain, or should contain, Atlantic salmon should comply with the targets given. Data from the last 3 years should be used.

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met.	Gauging stations (Data from DfI Rivers).	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigation of habitat-flow relationships may indicate

			that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered. Headwater sections are particularly vulnerable to abstraction, and this may affect the survival of juvenile fish and prevent the upstream migration of adult fish to key habitats.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	RHAT scoring system - River Hydromorphology Assessment Technique - Training Manual	Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The characteristic channel morphology provides the diversity of water depths, current velocities, and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of Atlantic Salmon. The proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this effect are not acceptable within an SAC, while restoration may be

			needed in some reaches. There should be no artificial barriers preventing unimpeded migration to natural spawning areas. Where barriers exist, they should be removed wherever possible, or at least made passable. Spawning habitat; defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256mm) but with the majority being <150mm. Water depth during the spawning and incubation periods should be 15-75 cm. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, except where infrastructure, human life or property is under threat. Fry habitat; indicated by water of <20cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40cm deep and similar substrate. Holding areas; defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects, and surface turbulence. Bankside tree cover; overhanging trees provide valuable shade and food sources, while tree root systems provide important cover and flow refuge for juveniles.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment and Suspended Solids	No unnaturally high levels of siltation indicated by: 'silt on substrate' highlighted in section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids targets is under further review by NIEA - Annual mean <10mg L^{-1} (spawning and nursery grounds) Annual mean <25mg L^{-1} (migratory passage)	Field observations and site-specific information derived from RHAT.	Elevated levels of suspended solids can clog the respiratory structures of Atlantic Salmon. Siltation can also prevent the flow of dissolved oxygen to eggs and prevent the movement of waste products from redds.
b. Alien/locally non-native species	No non-native species likely to cause impairment of Atlantic Salmon Populations	Various sources, including ad hoc observations, specific site investigations and data collected by the environment agencies.	Refer to the WFD list of alien/locally absent species (but not to be used exclusively). Be aware that Pacific Pink Salmon has occurred in NI.
c. Stocking/transfers of Atlantic Salmon	No stocking/transfers of Atlantic Salmon unless agreed to be in the best interests of the population.	Knowledge of site management	Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocks and naturally produced individuals, disease introduction and genetic alterations to the population. There is a large body of evidence indicating that rearing locally sourced juveniles for release has a

			long-term impact on salmon populations by removing natural selection mechanisms in the juvenile phase of life. The management objective for sites notified for Atlantic Salmon is to attain naturally self-sustaining populations. Stocking of Atlantic Salmon should not be routinely used as a management measure. The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection or restoration and the control of exploitation as necessary.
d. Stocking/transfers of other species	No stocking/transfers of fish species at excessively high densities	Fishery stocking consents. Impact assessments of stocking consents at catchment scale may be required to determine an acceptable level.	Excessively high densities of other fish species may cause unacceptably high predation pressure and competitive interactions. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.
e. Abstraction intakes and discharges	Effective screening on all intakes and discharges.	Environment Agencies monitoring/consenting programmes.	The entrainment of juvenile and adult fish into hydropower intakes or even fish farms can lead to a loss of fish. This can be avoided through the use of screening at appropriate locations. Guidance on screening is available through regulatory bodies such as the NIEA. It is important that screens are also used to prevent the escape of fish from fish farms and fisheries connected to rivers. Escapes from fish farms are a form of uncontrolled introduction and should be prevented.

f. Exploitation	All exploitation should be undertaken sustainably without compromising any components of the population	Loughs Agency/ DAERA data on licences and catch statistics.	Exploitation controls should be applied to all areas where Atlantic Salmon migrate to designated sites, within territorial waters. This should include estuarine and coastal net fisheries, as well as exploitation within the ASSI/ SAC from rod fisheries.
g. Weed-cutting	Should not interfere with the provision of juvenile habitat in river types naturally supporting submerged vascular plants	Evaluation of conditions on land drainage consents and knowledge of adherence to them.	Areas of submerged and marginal plants: juvenile salmon in chalk rivers use submerged and marginal vegetation as cover. Cutting operations should aim to leave at least 50% of the vegetation uncut.

Feature 2 (SAC) - Old sessile oak woods with Ilex and Blechnum in the British Isles (Status B)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Oakwood	Maintain the extent of Oakwood at 79.3ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable.
Oakwood community diversity	Maintain presence of woodland communities, W11, W17, W9 & W7 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of 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 Oakwood may be desirable in some instances.

* Structural variation (% cover)	Mean canopy cover greater than 70%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.
	Mean shrub cover should be maintained between 20 - 50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover. Where present assess cover of *Luzula sylvatica*.	Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey. Note: *L. sylvatica* may be dominant in many W11 oakwood communities. The percentage cover of this species may affect Oak regeneration, but more information is required before that assumption can be made.
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks.	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Estimate within the visual vicinity of the monitoring plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable - recovering.
	Mature trees (20 - 75cm diameter) at least frequent in 75% of plots	Estimate within the visual vicinity of the monitoring plots.	
	Over-mature trees (>75cm diameter) at least present in 10% of plots	Estimate within the visual vicinity of the monitoring plots.	

* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of the Oak woodland.	Regeneration of Oak seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of Oak in particular is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps in the canopy for oak to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of Oak saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	

* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the Oak woodland should be largely comprised of Oak trees. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%	Visual estimate in 10x10m plots.	

* Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
* Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
* Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent in less than 10% of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a	Felling non-native species as part of management for conservation is acceptable.

(DAFOR)		combination of aerial photographs, SIM and Condition Assessment structured walk.	
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:- *Vaccinium myrtillus, Blechnum spicant, Dicranum spp., Luzula pilosa, Rhytidiadelphus loreus*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained. However, the W11 & W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea, Geum urbanum, Polystichum setiferum, Aneomne nemorosa, Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:- *Carex remota, Ranunculus repens, Chrysosplenium oppositifolium, Filipendula ulmaria, Lysimachia nemorum.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.

Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

Feature 3 (SAC) – Otter Lutra lutra (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use available data from other surveys or CEDaR.
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	WFD Chemical and Ecological status	Water quality should be at least 'Good' status, with no pollution incidents	Refer to NIEA Water Management Unit for data
Food Sources	Assessment of fish stocks and other food sources (e.g., amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Loughs Agency/ AFBI for monitoring data where available. (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant development	

Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency/NIEA Water Management Unit if available
Site integrity	Total area	No reduction or fragmentation of area	

Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
Norlin Airlan Environment Agency
www.daera-ni.gov.uk

RIVER FOYLE & TRIBUTARIES SAC
UK0030320

SITE CONSERVATION OBJECTIVES
& Supporting advice

Version 4
6 September 2024

***Sustainability** at the heart of a living, working, active landscape valued by everyone.*

Document Details

River Foyle and Tributaries SAC Conservation Objectives
V2 Published January 2015
Approved by Paul Corbett

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Approved by Richard Gray, Sara McGuckin
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Contact: BCSGeneral@daera-ni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Minor edit	PC
V4	July 2024	Complete review of supporting advice at Annex A - freshwater features, additional minor updates.	AD, RG, LS

Site Relationships

The River Foyle and Tributaries SAC boundary adjoins the boundary of the Owenkillew River SAC and is hydrologically linked to Lough Foyle SPA and Ramsar.

1. INTRODUCTION

There is a clear responsibility under the Habitats and Birds Directives[1] and associated domestic legislation, namely the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended)[2], hereafter referred to as the Habitats Regulations to ensure that all habitats and species listed in Annexes I and II of the Habitats Directive, are maintained or restored to Favourable Conservation Status (FCS).

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) also contribute to meeting UK international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

The UK national site network of European sites, formerly known as Natura 2000 sites, have a crucial role to play in achieving the overall objective of FCS 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 UK.

To ensure that each 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 national site network, countries 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 the national site network over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, national site network 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] Updated through the Conservation (Natural Habitats &c.) (Amendment)(Northern Ireland)(EU Exit) Regulations 2019.

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.

The site-level conservation objectives, the supporting advice (at Annex A) and any case-specific advice given by NIEA Natural Environment Division, should be used when developing, proposing or assessing an activity, plan or project that may affect this site.

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:

a. Its natural range and areas it covers within that range are stable or increasing, and
b. 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
c. 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:

d. 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;
e. the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and;
f. 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 National Site Network.

4. SITE INFORMATION

SITE: River Foyle & Tributaries SAC

COUNTY: TYRONE

GRID REFERENCE: IH 36768792

Upper G.R. IH07938403 Lower G.R. IC39091103
IH09497610
IH10738760
IH29048358
IH40968624

AREA: 773 ha LENGTH: 120 km

5. SUMMARY SITE DESCRIPTION

The SAC includes the River Foyle and its tributaries i.e. that part of the River Finn which lies within Northern Ireland, the River Mourne and its tributary the River Strule (up to its confluence with the Owenkillew River) and the River Derg, along with two of its sub-tributaries, the Mourne Beg River and the Glendergan River. In total, the area encompasses 120km of watercourse and is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities. Of particular importance is the population of Atlantic Salmon *Salmo salar*, which is one of the largest in Europe. Research has indicated that each sub-catchment within the system supports genetically distinct populations.

The area is also important as a river habitat. In their upper catchments, the rivers are all fast-flowing spate rivers with dynamic flow regimes characterised by sequences of rapid, riffle and run. Although the banks may have been modified in the past, the channels are natural and composed of large cobble substrate with scattered boulders and sandy marginal deposits, while cobble side and point bars and discrete sand

deposits are common features. At the top end of the River Derg and its two tributaries, the aquatic flora reflect the highly acidic character of the water, with mosses and liverworts dominant. Beds of Stream Water Crowfoot *Ranunculus penicillatus* var. *penicillatus* occur where the flow is less dynamic.

The River Foyle below Strabane is slow-flowing and is influenced by a tidal regime, rising and falling with the tidal cycle. Aquatic plants in the channel are extremely limited, particularly in the more saline areas; here, fucoids make up the main component.

Otter *Lutra lutra* is found throughout the system.

A small population of the now rare Freshwater Pearl Mussel *Margaritifera margaritifera* was still present in the Mourne River in the mid-nineties.

Further details of the site are contained in the ASSI Citation and Views About Management statement, which are available on the DAERA website (https://www.daera-ni.gov.uk/protected-areas).

5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:-

1. whole catchments
2. main river stem from source to mouth, tributaries and upland catchment
3. main river stem from source to mouth and tributaries
4. main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature.

In the case of the Foyle, the qualifying features are its internationally important population of Atlantic Salmon and its *Ranunculus* community, which is found in lower sections of the River Derg and Mourne Beg River and along the Strule and Mourne Rivers down to Strabane. The River Foyle is included downstream to provide a linkage to the sea.

Much of the River Finn system occurs within the Republic of Ireland and will be included within the Republic of Ireland SAC series.

Within Northern Ireland, the upper limits for all the tributaries and sub-tributaries are determined by the international border, except for the Strule where it joins with the Owenkillew River SAC. The downstream limit of the site is largely determined by the limit of saline influence (Directive refers to Salmon *in freshwater only*) but includes a small part of the migration corridor on the River Foyle.

The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the SAC has limited adjacent habitat. Therefore, the boundary is frequently restricted to the top of the riverbank.

Due to the size of the area, the boundary was largely derived from video footage acquired during a helicopter flight. Some information on adjacent habitats was derived from previous surveys.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

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

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Atlantic Salmon Salmo salar	B	10,001-100,000
Habitat	Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	16.44 ha
Species	Otter Lutra lutra	C	C
Species	Sea Lamprey	D	P
Species	River Lamprey	D	P
Species	Brook Lamprey *Lampetra planeri*	D	P
Species	Freshwater Pearl Mussel *Margaritifera margaritifera*	D	R

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 threshold for 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 River Foyle & Tributaries SAC.

Guidance and literature: https://www.daera-ni.gov.uk/protected-areas/river-foyle-and-tributaries-sac

6.1 ASSI SELECTION FEATURES

River Foyle & Tributaries ASSI

Table 2. List of ASSI features.

Feature Type	Feature	Size/ extent/
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, mesotrophic to estuarine types.	120km
Species	Atlantic Salmon *Salmo salar*	
Species	Otter *Lutra lutra*	

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

- Atlantic Salmon Salmo salar
- Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation
- Otter Lutra lutra

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 A.

8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Grade	Objective
Atlantic Salmon Salmo salar	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population.
		Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	Maintain and if possible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Otter Lutra lutra	C	Maintain and if possible increase population numbers and distribution.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic to eutrophic and brackish types.	Maintain and if possible enhance extent and composition of communities.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if possible enhance the river morphology
	Maintain the diversity and quality of habitats associated with the river, e.g. bog, wet grasslands, scrub and oak woodland.
Atlantic Salmon *Salmo salar*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table

10. MANAGEMENT CONSIDERATIONS

Ownership

There are several hundred individuals or organisations with ownership or other rights associated with the area.

Adjoining Land Use

The Glendergan and upper reaches of the Derg and Mourne Beg rivers are generally unenclosed and flow through a predominantly upland peatland landscape used for rough grazing or commercial forestry. Along the mid and lower reaches of the Derg and Mourne Beg, the rivers flow through improved or semi- improved pasture used for silage and grazing.

The river is generally fenced from the surrounding land at least along one bank top. Along the Mourne and Strule, the main adjacent agricultural uses include tilled land and silage production, in addition to stock grazing. Here, a significant proportion of the river is bounded by woodland, either as discrete woodland blocks along the valley side or as a thin bank-top belt. The river channel or the adjacent woodlands are only partially fenced.

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 River Foyle & Tributaries, or could affect it in the future.

Although Atlantic Salmon Salmo salar, Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation and Otter Lutra lutra are the qualifying SAC features, factors affecting ASSI features are also considered.

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

Water Quality/Eutrophication

Water quality is probably the most important single factor for the SAC and ASSI selection features, with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river system is 300,000ha, 78,000ha of which fall within the Republic of Ireland and consists of 27 sub-catchment areas in Northern Ireland. The designation only includes the main channels of the Strule, Mourne, Derg, Mourne Beg, Glendergan, Finn and Foyle rivers and has excluded several tributaries.

Analysis of biological water quality monitoring data from 1991 to 1998 indicates that water quality is good to very good on all rivers and there has been no deterioration in quality over this period. Chemical water quality monitoring data indicates that water quality is moderate in the Derg and its tributaries but varies from moderate to poor in the Mourne and Strule.

A significant portion of the upper catchments of the tributaries are afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

Stock have open access to the channel in many sections and have caused poaching of the bank and channel. This represents another possible source of enrichment.
ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage land owners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Restrict stock access to less sensitive watering points.

Channel & Bank Modification

A number of sections of the river channels have been extensively altered by man in the past. These modifications have changed the natural flow regime of the river, resulting in a reduction of the natural channel area available to aquatic vegetation or for spawning Atlantic Salmon. However, the river continues to recover from the effects of re-sectioning.
ACTION: Future in-river works should be minimised as they reduce habitat and species diversity. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole. Initiate discussions with Rivers Agency to co-ordinate action.

Habitat enhancement schemes, such as the ‘Salmonid Enhancement Programme’

should be thoughtfully planned. Properly executed enhancement schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. In the past, the construction of weirs by fishing clubs as part of the programme has locally altered the morphology of the river. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.
ACTION: Initiate discussions with Loughs Agency/ DAERA Marine and Fisheries Division and NIEA to co-ordinate action.

Substrate Siltation

A significant portion of the area is afforested (especially the upper catchments), with a potential risk of sediment release during forestry operations, especially clear-felling.
ACTION: Liaise with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).

Sand wash from a number of commercial sandpits in the upper reaches of the tributary rivers has resulted in siltation of the riverbed downstream.
ACTION: Monitor and control sediment input levels in tributaries and immediately downstream of sandpits.

Where the bank and channel of the river are accessible to stock, damage to both the Atlantic Salmon spawning grounds and the macrophyte community may occur. Trampling has an obvious direct impact but in some sections of the river, trampling and poaching of the river bank and channel have caused erosion, resulting in siltation of the riverbed downstream.

ACTION: Restrict livestock access to drinking areas only.

Sand Extraction

Small-scale sand extraction from the riverbed has been an ongoing practice by farmers, particularly in the lower reaches of the river. This disturbance results in damage to the river morphology and increase in sediment loading, thus directly and indirectly affecting spawning beds and the macrophyte community.
ACTION: Under the Notifiable Operations, this activity is prohibited - ensure compliance with the ASSI Schedule.

Fish Farms

Fish farms can have a very serious impact on rivers. Fish farms normally abstract water from the river and release effluent downstream. Where the abstraction is large relative to streamflow, the channel between points of abstraction and release may have a much reduced discharge and water velocity. The effect can be so extreme that the upstream movement of migrating fish and other water- borne wildlife is obstructed. In addition, effluents from intensive fish farms may have a modified temperature and pH, may be contaminated with toxic materials and may carry waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and

hence a low oxygen concentration in the water), increased suspended solids and enrichment of the recipient stream.

NIEA is aware of two fish farms in the area, but they do not appear to be having any damaging effects on the river or the Atlantic Salmon population. Proposals for any further fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that that the effluent is adequately treated. ACTION: Review existing Water Order consents.

Water Extraction

A natural flow regime is essential for the maintenance of many of the selection features. There are several extraction sites along the river. Proposals for further water extraction in the area will require very careful environmental assessment.

ACTION: Review existing abstraction licences.

Fly-tipping

Small-scale fly tipping has occurred in places along the river banks and in the river channel, as well as in adjacent woodland.
ACTION: Where practical, remove dumped material from the banks, channel and adjoining woodland to prevent the build-up of debris and discourage further tipping.

Alien species

Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum* and Indian Balsam *Impatiens glandulifera* are present along the riverbanks of the major rivers.

ACTION: Monitor and if necessary, control the spread of alien species.

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. Critical levels and critical loads have been calculated for protected site features.

Please refer to the UK Air Pollution Information System (APIS) for site relevant critical loads and levels at 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 levels and loads.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works 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. CONSERVATION MANAGEMENT PLAN

The River Foyle and Tributaries SAC Conservation Management Plan can be viewed at - River Foyle and Tributaries SAC (arcgis.com)

13. MONITORING

Monitoring of SACs takes place 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 habitat).

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.

13.1 MONITORING SUMMARY

i. Monitor the integrity of the site (SIM or Compliance Monitoring) Complete boundary survey to ensure that the boundary features, where present are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC boundary. Evaluation of stocking densities would also be desirable, whilst a check for feral goat damage

should be carried out throughout the site. Inspection of river reaches with Freshwater Pearl Mussel colonies should be undertaken to ensure there has not been any pearl fishing. The SIM should be carried out once a year.

ii. 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 A.

The favourable condition table provided in Annex A 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.

14. REFERENCES

Cooper, A., McCann, T. and Rogers, D. (2009). Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency Research and Development Series No.09/06

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ANNEX A – Supporting advice

Feature 1 (SAC) – Atlantic Salmon (Salmo salar) (Status C)

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Electrofishing	Juvenile Atlantic salmon should be present in all areas of the catchment to which they have natural access. This does not include areas above naturally impassable barriers, but areas where access has been limited by man-made obstructions should be identified. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
b. Population density - Juveniles	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	Quantitative, semi-quantitative and timed electrofishing	Juvenile densities vary naturally between rivers and between survey sites on rivers, depending on the productivity and natural habitat character of the system. Observed densities therefore need to be assessed in relation to the expectation for each river and each river reach. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
c. Population density: adult run size	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river, and maintenance of the multi-sea-winter component.	Fish counters where available. Rod catch data	The numbers of returning salmon should be sufficient to ensure that all naturally available spawning and nursery habitats is utilised. Different rivers have different seasonal patterns of adult migration associated with the environmental characteristics of the catchment and river system. Multi-sea winter fish are an important component of natural salmon run and have declined considerably in recent years. The

			data available to assess this attribute may vary. See the associated AFBI/ Loughs Agency monitoring protocol.

Attribute	Target	Method of Assessment	Comments
Water Quality			
Organic pollution, reactive phosphorus, acidification, other pollutants	Targets included in the CSM Guidance for Rivers should be used as follows: - 10%ile DO (% saturation) 85 - Mean BOD (mg L^{-1}) 1.5 - 90%ile total ammonia (NH3-N, mg L^{-1}) 0.25 - 95%ile un-ionised ammonia (NH3-N, mg L^{-1}) 0.025 - Mean pH >6.54 (clear waters)/ >5.1 (humic waters) Nutrient concentrations should be near-natural. SRP may vary depending upon river size, site altitude and alkalinity. Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Atlantic salmon are susceptible to a range of water quality impacts, particularly juvenile life stages (egg, fry, parr and smolt). Generally, water quality should not be injurious to any life stage. All reaches within the designated site that contain, or should contain, Atlantic salmon should comply with the targets given. Data from the last 3 years should be used.

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG	Gauging stations (Data from DfI Rivers).	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural

	standards for GES under the WFD should be met.		hydrological processes, is vital. Detailed investigation of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered. Headwater sections are particularly vulnerable to abstraction, and this may affect the survival of juvenile fish and prevent the upstream migration of adult fish to key habitats.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	RHAT scoring system - River Hydromorphology Assessment Technique - Training Manual	Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The characteristic channel morphology provides the diversity of water depths, current velocities, and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of Atlantic Salmon. The proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen

			and/or straighten the channel reduce variations in habitat. New operations that would have this effect are not acceptable within an SAC, while restoration may be needed in some reaches. There should be no artificial barriers preventing unimpeded migration to natural spawning areas. Where barriers exist, they should be removed wherever possible, or at least made passable. Spawning habitat; defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256mm) but with the majority being <150mm. Water depth during the spawning and incubation periods should be 15-75 cm. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, except where infrastructure, human life or property is under threat. Fry habitat; indicated by water of <20cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40cm deep and similar substrate. Holding areas; defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects, and surface turbulence.

			Bankside tree cover: overhanging trees provide valuable shade and food sources, while tree root systems provide important cover and flow refuge for juveniles.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment and Suspended Solids	No unnaturally high levels of siltation indicated by 'silt on substrate' highlighted in section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (Si) as the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids targets is under further review by NIEA:- Annual mean <10mg L^{-1} (spawning and nursery grounds) Annual mean <25mg L^{-1} (migratory passage)	Field observations and site-specific information derived from RHAT.	Elevated levels of suspended solids can clog the respiratory structures of Atlantic Salmon. Siltation can also prevent the flow of dissolved oxygen to eggs and prevent the movement of waste products from redds.
b. Alien/locally non-native species	No non-native species likely to cause impairment of Atlantic Salmon Populations	Various sources, including ad hoc observations, specific site investigations and data collected by the environment agencies.	Refer to the WFD list of alien/locally absent species (but not to be used exclusively). Be aware that Pacific Pink Salmon has occurred in NI.
c. Stocking/ transfers of Atlantic Salmon	No stocking/ transfers of Atlantic Salmon unless agreed to be in the best interests of the population.	Knowledge of site management	Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks,

			including the loss of natural spawning from broodstock, competition between stocks and naturally produced individuals, disease introduction and genetic alterations to the population. There is a large body of evidence indicating that rearing locally sourced juveniles for release has a long-term impact on salmon populations by removing natural selection mechanisms in the juvenile phase of life. The management objective for sites notified for Atlantic Salmon is to attain naturally self-sustaining populations. Stocking of Atlantic Salmon should not be routinely used as a management measure. The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection or restoration and the control of exploitation as necessary.
d. Stocking/ transfers of other species	No stocking/ transfers of fish species at excessively high densities	Fishery stocking consents. Impact assessments of stocking consents at catchment scale may be required to determine an acceptable level.	Excessively high densities of other fish species may cause unacceptably high predation pressure and competitive interactions. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.
e. Abstraction intakes and discharges	Effective screening on all intakes and discharges.	Environment Agencies monitoring/consenting programmes.	The entrainment of juvenile and adult fish into hydropower intakes or even fish farms can lead to a loss of fish. This can be avoided through the use of screening at appropriate locations. Guidance on screening is available through

			regulatory bodies such as the NIEA. It is important that screens are also used to prevent the escape of fish from fish farms and fisheries connected to rivers. Escapes from fish farms are a form of uncontrolled introduction and should be prevented.
f. Exploitation	All exploitation should be undertaken sustainably without compromising any components of the population	Loughs Agency/ DAERA data on licences and catch statistics.	Exploitation controls should be applied to all areas where Atlantic Salmon migrate to designated sites, within territorial waters. This should include estuarine and coastal net fisheries, as well as exploitation within the ASSI/SAC from rod fisheries.
g. Weed-cutting	Should not interfere with the provision of juvenile habitat in river types naturally supporting submerged vascular plants	Evaluation of conditions on land drainage consents and knowledge of adherence to them.	Areas of submerged and marginal plants: juvenile salmon in chalk rivers use submerged and marginal vegetation as cover. Cutting operations should aim to leave at least 50% of the vegetation uncut.

Feature 2 (SAC) – Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation (Status B)

Attribute	Measure	Targets	Comments
Water quantity	Flow	The natural flow regime of the river should be protected. Daily flows should be close to what would be expected in the absence of abstractions and discharges (the naturalized flow). Flow targets for WFD high ecological status should be used to avoid deterioration and for restoration if this is technically feasible. These are: <5% deviation at <Qn95 and <10% at >Qn95 based on 'natural' water (i.e. water that has not been abstracted and returned). There should be no obvious problems with water availability within the assessment unit. Springs in aquifer-fed rivers should be maintained.	The principal flow targets given in Table 3 of CSM Guidance for Rivers should be taken as the minimum expected for an SAC river where appropriate and locally agreed targets are not already in place. Flow data is available at Search Data | National River Flow Archive (ceh.ac.uk)
Water Quality	Organic pollution	Organic pollution is assessed using a combination of physico-chemical and biological attributes. Targets apply throughout the assessment unit, not just at sparsely distributed monitoring sites. Targets: 10%ile DO (% saturation) = 85 Mean BOD (mg L^{-1}) = 1.5 90%ile total ammonia (NH_3-N, mg L^{-1}) = 0.25 95%ile un-ionised ammonia (NH_3-N, mg L^{-1}) = 0.025	Chemical data from all routine monitoring sites should be obtained from NIEA for the 3 years preceding the time of condition assessment. The statistics in the table should be calculated using all samples within that 3-year period.
	Reactive phosphorus	Compliance with these two targets is mandatory as an annual mean and March-September growing season mean. See tables 5 and 6 of CSM Guidance for Rivers for targets.	Table 5 of CSM Guidance for Rivers has targets for phosphorus (ug L^{-1} SRP) for near-natural examples of ASSI/SAC river habitat and Table 6 of CSM Guidance for Rivers has targets for maximum phosphorus concentrations (ug L^{-1} SRP) consistent with favourable condition of ASSI/SAC river habitat.
	Trophic Diatom Index	The target using the Trophic Diatom Index (TDI) Ecological Quality Ratio should be a normalized EQR of ≥ 0.8, equivalent to high ecological status (WFD-	Environment agencies typically take two or three diatom samples each year at routine monitoring sites. Any sample failing to comply with the relevant biological

	Acidification Other pollutants	UKTAG, 2014a). This target should be used as an adjunct to nutrient targets proposed in Tables 5 and 6 respectively. The targets proposed here are the same as the high/good boundary proposed for the WFD (WFD-UKTAG, 2012a). Targets: pH (Clear waters with DOC≤10mg L^{-1}) : mean > 6.54 pH (Humic waters with DOC>10mg L^{-1}) : mean > 5.1 Good chemical status is the target for any pollutant listed on Annex X of the WFD and not specifically considered above.	target within the 3-year period at any sampling site in the assessment unit should be regarded as non-compliant. This target applies only to assessment units whose WFD water body type is classified as siliceous or peat. Other types have buffering capacity and are therefore will not be affected by acidification. Analysis of water chemistry data from NIEA. At least 3 years of data are required, which must include winter samples. Data on the chemical status of individual water bodies are available from NIEA.
Habitat Structure	Assess using River Habitat Assessment Tool (RHAT)	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI - River Hydromorphology Assessment Technique - Training Manual | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The minimum frequency should be a 10% coverage (i.e. 1 site every 5km), coincident with macrophyte monitoring sites where this is done. The location of each RHAT assessment unit (and macrophyte monitoring) should be marked on a map of the site. It is recommended that GPS and site photographs are used to facilitate accurate relocation of sites on future visits.
Fine Sediment	Siltation	No unnaturally high levels of siltation indicated by: silt on substrate highlighted in section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (Si) as the predominant channel substrate where not expected from local geology.	Direct measurement of turbidity is not recommended, because values vary naturally in response to changes in flows with no clear understanding of a suitable reference value. Field observations and site-specific information derived from RHAT.
Negative Indicators	Alien/locally absent species	No high-impact alien species established (i.e. self-sustaining populations). Standard checklists of species are based on those used for WFD assessments[1]. A site will be assessed as unfavourable when there is good evidence that any non-native species or locally	Where a macrophyte survey has been carried out, the presence of alien species in the UKTAG lists[1] should be noted. Where there are no macrophyte survey data, and for other organisms (e.g. invertebrates, mink), contact NIEA for local reports on alien or locally absent species.

		absent species is causing an impact on site integrity.	
Biological Assemblages	Plant community	LEAFPACS tool should give a result of high ecological status for the assessment unit.	LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys. *See Box 3.0 of CSM Guidance for Rivers Version 2016 for further info on LEAFPACS method.
	Macroinvertebrates	WHPT tool should give a result of high ecological status for the assessment unit.	RICT macroinvertebrate data, collected by NIEA. See – RICT & RIVPACS User Guides — Freshwater Biological Association (fba.org.uk)
Indicators of local distinctiveness	Targets for local distinctiveness (discretionary)	Maintain distinctive elements (e.g. rare species, habitat features) at current extent/levels and/or in current locations.	As appropriate.
Direct human disturbance	Fish stocking	Fish introductions should not interfere with the ability of the river to support self-sustaining populations of characteristic species.	Use stocking consents.
	Exploitation	Exploitation (e.g. netting or angling) should not interfere with the ability of the river to support self-sustaining populations of characteristic species.	Assessed through recorded exploitation and status of target species.
	Weed cutting	A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices.	Field observations during macrophyte survey.

[1] http://www.wfduk.org/tagged/alien-species# Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies); this list contains only high-impact species.

Feature 3 (SAC) – Otter Lutra lutra (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use available data from other surveys or CEDaR.
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	WFD Chemical and Ecological status	Water quality should be at least 'Good' status, with no pollution incidents	Refer to NIEA Water Management Unit for data
Food Sources	Assessment of fish stocks and other food sources (e.g., amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Loughs Agency/ AFBI for monitoring data where available. (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant development	

Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency/NIEA Water Management Unit if available
Site integrity	Total area	No reduction or fragmentation of area	

Northern Ireland Environment Agency
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RIVER ROE & TRIBUTARIES SPECIAL AREA OF CONSERVATION

SITE CODE: UK0030360

SITE CONSERVATION OBJECTIVES

& Supporting advice

Version 4
6 September 2024

Sustainability *at the heart of a living, working, active landscape valued by everyone*

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Document Details

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Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Minor edit	PC
V4	July 2024	Complete review of supporting advice at Annex A - freshwater features, additional minor updates.	AD, RG, LS

Site Relationships

The River Roe and Tributaries SAC boundary adjoins the boundary of the Lough Foyle SPA and Ramsar.

1. INTRODUCTION

There is a clear responsibility under the Habitats and Birds Directives[1] and associated domestic legislation, namely the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended)[2], hereafter referred to as the Habitats Regulations to ensure that all habitats and species listed in Annexes I and II of the Habitats Directive, are maintained or restored to Favourable Conservation Status (FCS).

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) also contribute to meeting UK international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

The UK national site network of European sites, formerly known as Natura 2000 sites, have a crucial role to play in achieving the overall objective of FCS 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 UK.

To ensure that each 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 national site network, countries 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 the national site network over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, national site network 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] Updated through the Conservation (Natural Habitats &c.) (Amendment)(Northern Ireland)(EU Exit) Regulations 2019.

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.

The site-level conservation objectives, the supporting advice (at Annex A) and any case-specific advice given by NIEA Natural Environment Division, should be used when developing, proposing or assessing an activity, plan or project that may affect this site.

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 National Site Network.

4. SITE INFORMATION

SITE: River Roe & Tributaries SAC

COUNTY: LONDONDERRY

GRID REFERENCE: IC687159

Upper G.R.:

IC 77320426 Lower G.R.: IC 67022964

IC 75122702

IC 74371310

IC 64771430

IC 64751383

IC 66841206

IC 65790233

IC 62720257

IC 68830620

IC 70249638

IC 70620873

IC 72160964

AREA: 408 ha LENGTH: 87 km

5. SUMMARY SITE DESCRIPTION

The area is of special scientific interest because of the physical features of the river and its associated riverine flora and fauna. The River Roe and Tributaries ASSI includes the River Roe and its tributaries the Curly River, the Gelvin River, the Boveagh River (and its tributary the Altahullion Burn), the Wood Burn, the Owenbeg (and is tributary the Clogherna Burn), the Owenrigh River, the Black Burn (and its tributary the Currawable Burn) and the Owenalena River. In total, the area encompasses approximately 87km of watercourse and is notable for the physical diversity and naturalness of the banks and channels, especially in the upper reaches, and the richness and naturalness of its plant and animal communities, in particular the population of Atlantic Salmon *Salmo salar*, which is of international importance and in the extent of Upland Oakwood present.

Further details of the site are contained in the ASSI Citation and Views About Management statement, which are available on the DAERA website (https://www.daera-ni.gov.uk/protected-areas).

5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:

(1) whole catchments
(2) main river stem from source to mouth, tributaries and upland catchment
(3) main river stem from source to mouth and tributaries
(4) main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature.

In the case of the Roe, the qualifying features are its internationally important population of Atlantic Salmon *Salmo salar*, its *Ranunculus* community, which is found in middle and lower reaches of the River Roe and its regionally important old sessile oak woodland.

The upper limits for all the tributaries and sub-tributaries are determined by the known limits of good spawning and nursery habitat or woodland, except for the Owenrigh River which starts at the lower end of Banagher Glen SAC. The upper limit is indicated on the ground by a physical feature such as a bridge or where two tributaries meet. The downstream limit of the site is determined by the tidal limit which is also the boundary of Lough Foyle SPA.

The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the SAC has limited adjacent habitat. Therefore, the boundary is frequently restricted to the top of the riverbank.

Due to the size of the area, the boundary was largely derived from auto-rectified colour aerial photographs. Some information on adjacent habitats was derived from previous surveys.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Atlantic Salmon Salmo salar	B	1,000-10,000
Habitat	Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	C	20km or 20% of channel length
Habitat	Old sessile oak woods with Ilex and Blechnum in the British Isles	C	145.45ha
Species	Otter Lutra lutra	C	C
Species	Sea Lamprey	D	P
Species	Brook/River Lamprey	D	P

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

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex A 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 threshold for 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 River Roe & Tributaries SAC.

Guidance and Literature: https://www.daera-ni.gov.uk/protected-areas/river-roe-tributaries-sac

6.1 ASSI SELECTION FEATURES

River Roe & Tributaries ASSI

Table 2. List of ASSI features.

Feature Type	Feature	Size/ extent
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, mesotrophic to estuarine types.	98km
Habitat	Oakwood	145.45 ha
Species	Atlantic Salmon *Salmo salar*	
Species	Otter *Lutra lutra*	

7. CONSERVATION OBJECTIVES

The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

a. Atlantic Salmon *Salmo salar*
b. Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation
c. Old sessile oak woods with Ilex and Blechnum in the British Isles
d. Otter Lutra lutra 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	Grade	Objective
Atlantic Salmon Salmo salar	B	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population.
		Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate.
Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	C	Maintain and if possible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Old Sessile Oak Woodlands with Ilex and Blechnum in the British Isles	C	Maintain and where feasible <u>expand</u> the extent of existing oak woodland but not at the expense of other SAC (ABC) features. (There are areas of degraded heath, wetland and damp grassland which have the potential to develop into Oak woodland)
		Maintain and enhance Oak woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter Lutra lutra	C	Maintain and if possible increase population numbers and distribution.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats

9 ADDITIONAL ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic to eutrophic and brackish types.	Maintain and if possible enhance extent and composition of communities.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if possible enhance the river morphology
	Maintain the diversity and quality of habitats associated with the river, e.g. bog, wet grasslands, scrub and oak woodland.
Oakwood	See SAC Selection Feature Objective Requirements table.
Atlantic Salmon *Salmo salar*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table.

10. MANAGEMENT CONSIDERATIONS

Ownership

There are several hundred individuals or organisations with ownership or other rights associated with the area.

Adjoining Land Use

The upper reaches of the River Roe, Curly River, Owenbeg River and Clogherna Burn are generally unenclosed and flow through a predominantly upland peatland landscape used for rough grazing or commercial forestry. Along the Owenrigh River, the Gelvin River, the Bovevagh River (and its tributary the Altahullion Burn), the Black Burn (and its tributary the Currawable Burn), along the middle reaches of the River Roe and along the middle and lower reaches of the Curly River, Owenbeg River and Clogherna Burn, the rivers flow through improved or semi-improved pasture used for silage and grazing. The river is generally fenced from the surrounding land at least along one bank top. Along the lower reaches of the River Roe the main adjacent agricultural uses include tilled land and silage production, in addition to stock grazing.

Woodland is fragmented throughout the site with the main block found at the Roe Valley Country Park. Other significant stands occur along the valley sides of the Curly River, the Bovevagh River (and its tributary the Altahullion Burn), the Black Burn (and its tributary the Currawable Burn) and the upper reach of the Owenbeg River. These woodlands and the interconnecting woodland strips which run along the river-banks vary in the extent that they are fenced.

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 River Roe & Tributaries or could affect it in the future.

Although Atlantic Salmon Salmo salar, Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation, Old Sessile Oak Woodlands with Ilex and Blechnum in the British Isles and Otter Lutra lutra are the qualifying SAC features, factors affecting ASSI features are also considered.

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

RIVER

Water Quality/Eutrophication

Water quality is probably the most important single factor for the SAC and ASSI selection features, with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river system is 38,532ha, and consists of 8 sub-catchments. The designation only includes the main channels of the River Roe and its tributaries the Curley River, the Gelvin River, the Bovevagh River (and its tributary the Altahullion Burn), the Owenbeg (and its tributary the Clogherna Burn), the Owenright River, the Black Burn (and its tributary the Currawable Burn) and the Owenalena River but has excluded several other tributaries.

Analysis of biological water quality monitoring data from 1999 to 2002 indicated that water quality was good to very good on all rivers although there did seem to be deterioration in quality over this period in the middle and lower reaches of the River Roe and in the Owenbeg River. Chemical water quality monitoring data indicates that water quality is generally good although again there has been a moderate deterioration in quality in the lower reaches of the River Roe.

A significant portion of the upper catchments of the River Roe and its tributaries are afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

There are at least 10 sewage works within the catchment varying in size and the degree of treatment they provide. There are also numerous septic tanks.

Stock have open access to the channel along many sections in the upper reaches of the River Roe and its tributaries and have caused poaching of the bank and channel.

This represents another possible source of enrichment.

ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage land-owners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Restrict stock access to less sensitive watering points.

Channel & Bank Modification

The River Roe was originally designated to be managed for drainage in 1947. A total length of 30.5km was designated at this time. The limits of designation are upstream of the junction of the Owenrigh River with the River Roe south of Dungiven and downstream of Lough Foyle, 5 miles north-west of Limavady. The work that has been carried out on the River Roe has been mainly flood banking for a large percentage of its designated length, though there has been some re-sectioning around the Dungiven area and regrading the middle and lower reaches of the river.

Some of these modifications have changed the natural flow regime of the river, resulting in a reduction of the natural channel area available to aquatic vegetation or for spawning Atlantic Salmon. However, the river continues to recover from the effects of re-sectioning.

ACTION: Future in-river works should be minimised as they reduce habitat and species diversity. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole. Initiate discussions with Rivers Agency to co-ordinate action.

The River Roe and many of its tributaries have undergone fisheries modifications with the installation of weirs and deflectors as part of habitat enhancement schemes, resulting from the 'Salmonid Enhancement Programme'. Such enhancement schemes should be thoughtfully planned as properly executed schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.

ACTION: Initiate discussions with DAERA Marine & Fisheries Division and NIEA to co-ordinate action.

Substrate Siltation

A significant portion of the catchment is afforested (especially the upper catchments), with a potential risk of sediment release during forestry operations, especially clear-felling.

ACTION: Liase with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).

Sand wash from a number of commercial sandpits in the upper reaches of the tributary rivers has resulted in siltation of the riverbed downstream.

ACTION: Monitor and control sediment input levels in tributaries and immediately downstream of sandpits.

Where the bank and channel of the river are accessible to stock, damage to both the Atlantic Salmon spawning grounds and the macrophyte community may occur. Trampling has an obvious direct impact but in some sections of the river, trampling and poaching of the river-bank and channel have caused erosion, resulting in siltation of the riverbed downstream.

ACTION: Restrict livestock access to drinking areas only.

Sand Extraction

Small-scale sand extraction from the riverbed has been an ongoing practice by farmers, particularly in the lower reaches of the river. This disturbance results in damage to the river morphology and increase in sediment loading, thus directly and indirectly affecting spawning beds and the macrophyte community.

ACTION: Under the Notifiable Operations, this activity is prohibited; ensure compliance with the ASSI Schedule.

Fish Farms

Fish farms can have a very serious impact on rivers. Fish farms normally abstract water from the river and release effluent downstream. Where the abstraction is large relative to stream flow, the channel between points of abstraction and release may have a much-reduced discharge and water velocity. The effect can be so extreme that the upstream movement of migrating fish and other water- borne wildlife is obstructed. In addition, effluents from intensive fish farms may have a modified temperature and pH, may be contaminated with toxic materials and may carry waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and hence a low oxygen concentration in the water), increased suspended solids and enrichment of the recipient stream.

Proposals for any fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that that the effluent is adequately treated.

ACTION: Review existing Water Order consents.

Water Extraction

A natural flow regime is essential for the maintenance of many of the selection features. There are several extraction sites along the river. Proposals for further water extraction in the area will require very careful environmental assessment.

ACTION: Review existing abstraction licences.

Fly-tipping

Small-scale fly tipping has occurred in places along the river-banks and in the river channel, as well as in adjacent woodland.

ACTION: Where practical, remove dumped material from the banks, channel and adjoining woodland to prevent the build-up of debris and discourage further tipping.

Alien species

Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum* and Indian Balsam *Impatiens glandulifera* are present along the riverbanks of the major rivers.

ACTION: Monitor and if necessary, control the spread of alien species.

WOODLAND

Grazing/Poaching/Tree barking and Browsing

Free access to some parts of the woodland by domestic stock and feral goats is causing direct damage to the ground flora community by poaching and trampling. Grazing and bark-stripping is preventing regeneration and will increasingly cause a detrimental change in the woodland structure and composition with time. Information on current grazing levels of domestic stock within privately owned woodland is not readily available. No information on the current population of goats is available.

ACTION: Evaluate the current domestic stocking levels of the wood and reduce numbers to a sustainable level. In some cases it may be necessary, under a management agreement, to exclude stock altogether by fencing off woodland. Undertake a census of the current feral goat populations and if necessary initiate control measures to reduce numbers to acceptable levels.

Invasion by exotics

Exotic species are localised. They vary in the degree of impact they have and the threat they pose. Very invasive species such as Sycamore *Acer pseudoplatanus* are seen as posing a current threat. Others are not seen as an immediate threat due to their limited occurrence (e.g. Horse Chestnut *Aesculus hippocastanum*) or slow rate of spread (e.g. Beech *Fagus sylvatica*).

ACTION: The most invasive species require management to control their spread, which in most cases will require the current seed source to be removed from site. Those species not posing a threat at present should be monitored and in the long-term controlled if required.

Slumping/Landslides/Erosion

Sudden accidental discharge of water down the valley sides from Quarry sites adjacent to the valleys has resulted in a number of landslides and severe gully erosion in the past.

ACTION: Liaise with quarry owners to ensure there is no further accidental discharges of water that could cause erosion problems.

Dead Wood Removal

Dead wood should be left *in situ* if safe or practical to do so. This provides valuable habitat for fungi, invertebrates etc. Removal of wood for fire-wood should be discouraged.

ACTION: Through liaison and monitoring ensure there is no removal of dead wood from the site.

Woodland Clearance/Felling

Prevented by Notifiable Operations schedule.
ACTION: Undertake Site Integrity Monitoring to ensure compliance with Notifiable Operations schedule.

Fly-tipping

Localised fly-tipping occurs throughout the site but is extensive in a number of locations.
ACTION: Ensure removal of dumped material from the woods when practical to prevent the build up of debris and discourage further fly-tipping.
If fly-tipping persists, woodland areas adjacent to roads should be fenced off to prevent further occurrences.

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. Critical levels and critical loads have been calculated for protected site features.

Please refer to the UK Air Pollution Information System (APIS) for site relevant critical loads and levels at 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 levels and loads.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works 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. CONSERVATION MANAGEMENT PLAN

The River Roe and Tributaries SAC Conservation Management Plan can be viewed at –

River Roe and Tributaries SAC (arcgis.com)

13. MONITORING

Monitoring of SACs takes place 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 habitat).

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.

13.1 MONITORING SUMMARY

1. Monitor the integrity of the site (SIM or Compliance Monitoring)

   Complete boundary survey to ensure that the boundary features, where present are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC boundary. Evaluation of stocking densities would also be desirable, whilst a check for feral goat damage should be carried out throughout the site. The 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 A.

The favourable condition table provided in Annex A 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.

14. REFERENCES

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ANNEX A – Supporting advice

Feature 1 (SAC) – Atlantic salmon (Salmo salar) (Status B)

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

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Electrofishing	Juvenile Atlantic salmon should be present in all areas of the catchment to which they have natural access. This does not include areas above naturally impassable barriers, but areas where access has been limited by man-made obstructions should be identified. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
b. Population density - Juveniles	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	Quantitative, semi-quantitative and timed electrofishing	Juvenile densities vary naturally between rivers and between survey sites on rivers, depending on the productivity and natural habitat character of the system. Observed densities therefore need to be assessed in relation to the expectation for each river and each river reach. See the associated AFBI/ Loughs Agency monitoring protocol for further details.
c. Population density: adult run size	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component.	Fish counters where available. Rod catch data	The numbers of returning salmon should be sufficient to ensure that all naturally available spawning and nursery habitats is utilised. Different rivers have different seasonal patterns of adult migration associated with the environmental characteristics of the catchment and river system. Multi-sea winter fish are an

			important component of natural salmon run and have declined considerably in recent years. The data available to assess this attribute may vary. See the associated AFBI/ Loughs Agency monitoring protocol.

Attribute	Target	Method of Assessment	Comments
Water Quality			
Organic pollution, reactive phosphorus, acidification, other pollutants	Targets included in the CSM Guidance for Rivers should be used as follows: - 10%ile DO (% saturation) 85 - Mean BOD (mg L^{-1}) 1.5 - 90%ile total ammonia (NH3-N, mg L^{-1}) 0.25 - 95%ile un-ionised ammonia (NH3-N, mg L^{-1}) 0.025 - Mean pH >6.54 (clear waters)/ >5.1 (humic waters) Nutrient concentrations should be near-natural. SRP may vary depending upon river size, site altitude and alkalinity. Given that the SAC covers a large catchment and each of these elements varies throughout the site, it is not appropriate to set one SAC-wide target for SRP.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Atlantic salmon are susceptible to a range of water quality impacts, particularly juvenile life stages (egg, fry, parr and smolt). Generally, water quality should not be injurious to any life stage. All reaches within the designated site that contain, or should contain, Atlantic salmon should comply with the targets given. Data from the last 3 years should be used.

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD	Gauging stations (Data from DfI Rivers).	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital.

	should be met.		Detailed investigation of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered. Headwater sections are particularly vulnerable to abstraction, and this may affect the survival of juvenile fish and prevent the upstream migration of adult fish to key habitats.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	RHAT scoring system - River Hydromorphology Assessment Technique - Training Manual	Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The characteristic channel morphology provides the diversity of water depths, current velocities, and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of Atlantic Salmon. The proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this effect are not acceptable within an

			SAC, while restoration may be needed in some reaches. There should be no artificial barriers preventing unimpeded migration to natural spawning areas. Where barriers exist, they should be removed wherever possible, or at least made passable. Spawning habitat; defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256mm) but with the majority being <150mm. Water depth during the spawning and incubation periods should be 15-75 cm. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, except where infrastructure, human life or property is under threat. Fry habitat; indicated by water of <20cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40cm deep and similar substrate. Holding areas; defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects, and surface turbulence. Bankside tree cover; overhanging trees provide valuable shade and food sources, while tree root systems provide important cover

			and flow refuge for juveniles.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment and Suspended Solids	No unnaturally high levels of siltation indicated by: "silt on substrate" highlighted in section K of the RHAT form ("Bank and channel features") OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids targets is under further review by NIEA:- Annual mean <10mg L^{-1} (spawning and nursery grounds) Annual mean <25mg L^{-1} (migratory passage)	Field observations and site-specific information derived from RHAT.	Elevated levels of suspended solids can clog the respiratory structures of Atlantic Salmon. Siltation can also prevent the flow of dissolved oxygen to eggs and prevent the movement of waste products from redds.
b. Alien/locally non-native species	No non-native species likely to cause impairment of Atlantic Salmon Populations	Various sources, including ad hoc observations, specific site investigations and data collected by the environment agencies.	Refer to the WFD list of alien/locally absent species (but not to be used exclusively). Be aware that Pacific Pink Salmon has occurred in NI.
c. Stocking/transfers of Atlantic Salmon	No stocking/transfers of Atlantic Salmon unless agreed to be in the best interests of the population.	Knowledge of site management	Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocks and naturally produced individuals, disease introduction and genetic alterations to the population. There is a large body of evidence indicating that rearing locally

			sourced juveniles for release has a long-term impact on salmon populations by removing natural selection mechanisms in the juvenile phase of life. The management objective for sites notified for Atlantic Salmon is to attain naturally self-sustaining populations. Stocking of Atlantic Salmon should not be routinely used as a management measure. The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection or restoration and the control of exploitation as necessary.
d. Stocking/ transfers of other species	No stocking/ transfers of fish species at excessively high densities	Fishery stocking consents. Impact assessments of stocking consents at catchment scale may be required to determine an acceptable level.	Excessively high densities of other fish species may cause unacceptably high predation pressure and competitive interactions. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.
e. Abstraction intakes and discharges	Effective screening on all intakes and discharges.	Environment Agencies monitoring/consenting programmes.	The entrainment of juvenile and adult fish into hydropower intakes or even fish farms can lead to a loss of fish. This can be avoided through the use of screening at appropriate locations. Guidance on screening is available through regulatory bodies such as the NIEA. It is important that screens are also used to prevent the escape of fish from fish farms and fisheries connected to rivers. Escapes from fish farms are a form of uncontrolled introduction and should be prevented.

f. Exploitation	All exploitation should be undertaken sustainably without compromising any components of the population	Loughs Agency/ DAERA data on licences and catch statistics.	Exploitation controls should be applied to all areas where Atlantic Salmon migrate to designated sites within territorial waters. This should include estuarine and coastal net fisheries, as well as exploitation within the ASSI/SAC from rod fisheries.
g. Weed-cutting	Should not interfere with the provision of juvenile habitat in river types naturally supporting submerged vascular plants	Evaluation of conditions on land drainage consents and knowledge of adherence to them.	Areas of submerged and marginal plants: juvenile salmon in chalk rivers use submerged and marginal vegetation as cover. Cutting operations should aim to leave at least 50% of the vegetation uncut.

Feature 2 (SAC) – Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation (Status C)

Attribute	Measure	Targets	Comments
Water quantity	Flow	The natural flow regime of the river should be protected. Daily flows should be close to what would be expected in the absence of abstractions and discharges (the naturalized flow). Flow targets for WFD high ecological status should be used to avoid deterioration and for restoration if this is technically feasible. These are: <5% deviation at <On95 and <10% at >On95 based on 'natural' water (i.e. water that has not been abstracted and returned). There should be no obvious problems with water availability within the assessment unit. Springs in aquifer-fed rivers should be maintained.	The principal flow targets given in Table 3 of CSM Guidance for Rivers should be taken as the minimum expected for an SAC river where appropriate and locally agreed targets are not already in place. Flow data is available at Search Data | National River Flow Archive (ceh.ac.uk)
Water Quality	Organic pollution	Organic pollution is assessed using a combination of physico-chemical and biological attributes. Targets apply throughout the assessment unit, not just at sparsely distributed monitoring sites. Targets: 10%ile DO (% saturation) = 85 Mean BOD (mg L^{-1}) = 1.3 90%ile total ammonia (NH_3-N, mg L^{-1}) = 0.25 95%ile un-ionised ammonia (NH_3-N, mg L^{-1}) = 0.025	Chemical data from all routine monitoring sites should be obtained from NIEA for the 3 years preceding the time of condition assessment. The statistics in the table should be calculated using all samples within that 3-year period.
	Reactive phosphorus	Compliance with these two targets is mandatory as an annual mean and March-September growing season mean. See tables 5 and 6 of CSM Guidance for Rivers for targets.	Table 5 of CSM Guidance for Rivers has targets for phosphorus (ug L^{-1} SRP) for near-natural examples of ASSI/SAC river habitat and Table 6 of CSM Guidance for Rivers has targets for maximum phosphorus concentrations (ug L^{-1} SRP) consistent with favourable condition of ASSI/SAC river habitat.
	Trophic Diatom Index	The target using the Trophic Diatom Index (TDI) Ecological Quality Ratio should be a normalized EQR of ≥ 0.8, equivalent to high ecological status (WFD-UKTAG, 2014a). This target should be used as an adjunct to nutrient targets proposed in Tables 5 and 6	Environment agencies typically take two or three diatom samples each year at routine monitoring sites. Any sample failing to comply with the relevant biological target within the 3-year period at any sampling site in the assessment unit should be regarded as non-

	Acidification Other pollutants	respectively. The targets proposed here are the same as the high/good boundary proposed for the WFD (WFD-UKTAG, 2012a). Targets: pH (Clear waters with DOC<10mg L^{-1}) : mean > 6.54 pH (Humic waters with DOC>10mg L^{-1}) : mean > 5.1 Good chemical status is the target for any pollutant listed on Annex X of the WFD and not specifically considered above.	compliant. This target applies only to assessment units whose WFD water body type is classified as siliceous or peat. Other types have buffering capacity and are therefore will not be affected by acidification. Analysis of water chemistry data from NIEA. At least 3 years of data are required, which must include winter samples. Data on the chemical status of individual water bodies are available from NIEA.
Habitat Structure	Assess using River Habitat Assessment Tool (RHAT)	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI - River Hydromorphology Assessment Technique - Training Manual | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The minimum frequency should be a 10% coverage (i.e. 1 site every 5km), coincident with macrophyte monitoring sites where this is done. The location of each RHAT assessment unit (and macrophyte monitoring) should be marked on a map of the site. It is recommended that GPS and site photographs are used to facilitate accurate relocation of sites on futre visits.
Fine Sediment	Siltation	No unnaturally high levels of siltation indicated by: 'silt on substrate' highlighted in section K of the RHAT form ('Bank and channel features') OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (Si) as the predominant channel substrate where not expected from local geology.	Direct measurement of turbidity is not recommended, because values vary naturally in response to changes in flows with no clear understanding of a suitable reference value. Field observations and site-specific information derived from RHAT.
Negative Indicators	Alien/locally absent species	No high-impact alien species established (i.e. self-sustaining populations). Standard checklists of species are based on those used for WFD assessments[1]. A site will be assessed as unfavourable when there is good evidence that any non-native species or locally absent species is causing an impact on site integrity.	Where a macrophyte survey has been carried out, the presence of alien species in the UKTAG lists[1] should be noted. Where there are no macrophyte survey data, and for other organisms (e.g. invertebrates, mink), contact NIEA for local reports on alien or locally absent species.

Biological Assemblages	Plant community Macroinvertebrates	LEAFPACS tool should give a result of high ecological status for the assessment unit. WHPT tool should give a result of high ecological status for the assessment unit.	LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys. * See Box 3.0 of CSM Guidance for Rivers Version 2016 for further info on LEAFPACS method. RICT macroinvertebrate data, collected by NIEA. See – RICT & RIVPACS User Guides — Freshwater Biological Association (fba.org.uk)
Indicators of local distinctiveness	Targets for local distinctiveness (discretionary)	Maintain distinctive elements (e.g. rare species, habitat features) at current extent/levels and/or in current locations.	As appropriate.
Direct human disturbance	Fish stocking Exploitation Weed cutting	Fish introductions should not interfere with the ability of the river to support self-sustaining populations of characteristic species. Exploitation (e.g. netting or angling) should not interfere with the ability of the river to support self-sustaining populations of characteristic species. A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices.	Use stocking consents. Assessed through recorded exploitation and status of target species. Field observations during macrophyte survey.

[1] http://www.wfduk.org/tagged/alien-species# Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies), this list contains only high-impact species.

Feature 3 (SAC) - Old sessile oak woods with Ilex and Blechnum in the British Isles (Status C)

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

Attribute	Targets	Method of Assessment	Comments
* Area of Oakwood	Maintain the extent of Oakwood at 79.3ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable.
Oakwood community diversity	Maintain presence of woodland communities W11, W17, W9 & W7 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of 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 Oakwood may be desirable in some instances.

* Structural variation (% cover)	Mean canopy cover greater than 70%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.
	Mean shrub cover should be maintained between 20 - 50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover. Where present assess cover of *Luzula sylvatica*.	Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots. Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey. Note: *L. sylvatica* may be dominant in many W11 oakwood communities. The percentage cover of this species may affect Oak regeneration, but more information is required before that assumption can be made.
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks.	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Estimate within the visual vicinity of the monitoring plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable - recovering.
	Mature trees (20 - 75cm diameter) at least frequent in 75% of plots	Estimate within the visual vicinity of the monitoring plots.	
	Over-mature trees (>75cm diameter) at least present in 10% of plots	Estimate within the visual vicinity of the monitoring plots.	

* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of the Oak woodland.	Regeneration of Oak seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of Oak in particular is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps in the canopy for oak to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of Oak saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	

* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the Oak woodland should be largely comprised of Oak trees. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%	Visual estimate in 10x10m plots.	

* Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
* Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
* Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent in less than 10% of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a	Felling non-native species as part of management for conservation is acceptable.

(DAFOR)		combination of aerial photographs, SIM and Condition Assessment structured walk.	
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:- *Vaccinium myrtillus, Blechnum spicant, Dicranum spp., Luzula pilosa, Rhytidiadelphus loreus*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained. However, the W11 & W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea, Geum urbanum, Polystichum setiferum, Aneomne nemorosa, Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:- *Carex remota, Ranunculus repens, Chrysosplenium oppositifolium, Filipendula ulmaria, Lysimachia nemorum.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.

Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

Feature 4 (SAC) – Otter Lutra lutra (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use available data from other surveys or CeDAR.
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	WFD Chemical and Ecological status	Water quality should be at least 'Good' status, with no pollution incidents	Refer to NIEA Water Management Unit for data
Food Sources	Assessment of fish stocks and other food sources (e.g., amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Loughs Agency/ AFBI for monitoring data where available. (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant development	

Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency/NIEA Water Management Unit if available

SKERRIES AND CAUSEWAY SAC
UK0030383

CONSERVATION OBJECTIVES

Document Details

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INVESTORS IN PEOPLE

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). However, the Environment Order only extends to the Mean Low Water (jurisdictional limit of local authorities); therefore, some marine Natura 2000 sites are not underpinned by ASSI designations.

[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

REFERENCE COORDINATES: 55.2425 -6.5967

AREA: 10,862 ha

5. SUMMARY SITE DESCRIPTION

Skerries and Causeway proposed SAC is sited on the north coast of Northern Ireland. It is the eastern part of a 30km wide embayment that has the Inishowen peninsular to its west and Benbane Head to its east. The site is influenced oceanographically and biologically both by the warming gulf stream and by the strong tidal currents that flow through the North Channel to and from the Irish Sea. It is subject to considerable wave action being open to the Atlantic to the northwest, but is relatively sheltered from other prevailing swells and includes areas of relative shelter such as behind the Skerries islands. The site is predominantly marine although there are significant influxes of freshwater, from the River Bann to the west and the River Bush to the east, which can influence the immediate coastal areas.

The Skerries and Causeway site is located adjacent to the coastline of Portstewart, Portrush, Bushmills and the Giant's Causeway World Heritage Site (which lends part of its name to the SAC site; the other half of the SAC name comes from the Skerries islands and rocks off Portrush). The site contains the qualifying Features: Annex I *Reef*; Annex I *Sandbanks which are slightly covered by seawater at all times*; Annex I *Submerged or partially submerged sea caves;* and Annex II *Harbour porpoise.* It also contains non-qualifying Annex II species, *grey seal, common seal, and bottlenose dolphin*.

Much of the reef in this area is sand scoured reef (which is an unusual type of reef in a Northern Ireland context). This produces a close relationship between the

reef and the adjacent sediments: as well as the sand scoured areas of reef and stony reef, there are also large areas of bedrock reef that have a thick veneer of sediment, but still support bedrock epifauna (attached to the bedrock but growing up through the sediment); and conversely, there are also areas of coarse and mixed sediments that support epifauna communities more reminiscent of the reef habitat.

The Annex I *Reef* is noted for its southern species, rare and priority species, and a number of species first described from the Skerries and Causeway area, including one nudibranch species that has not yet been found elsewhere. As well as the coarse and mixed sediments noted above, the Annex I *Sandbanks which are slightly covered by sea water all the time* also contains areas of subtidal eel grass *Zostera marina* (sheltered behind the Skerries) and varied and dramatic sand waves, some over 30m high. There are also many Annex I *Submerged and partially submerged sea caves* that can be found in a range of rock types including the basalts of the Giant's Causeway and the metamorphosed chalk of the Ulster White Limestone series.

Harbour porpoise (*Phocoena phocoena*) have been consistently recorded during more than 140 dedicated effort watches at six sites within the proposed boundary. These records span every month of the year, including months outside of the breeding and calving seasons and confirm the continuous presence of harbour porpoise within this area. Continuous or regular presence is graded A (excellent conservation).

Non-qualifying habitats and species

Up to 35 adult Grey Seal (*Halichoerus grypus*) and three adult Common seal (*Phoca vitulina*) have been recorded on surveys carried out by the Department (2006-2009). Both species have been graded as D, non-significant presence. Bottlenose dolphin (*Tursiops truncatus*) was recorded during two effort watches in 2009 but due to low numbers this species has been graded as D, non-significant presence.

Further details of the site are available on the DAERA website (https://www.daera-ni.gov.uk/publications/reasons-designation-special-area-conservation-skerries-and-causeway).

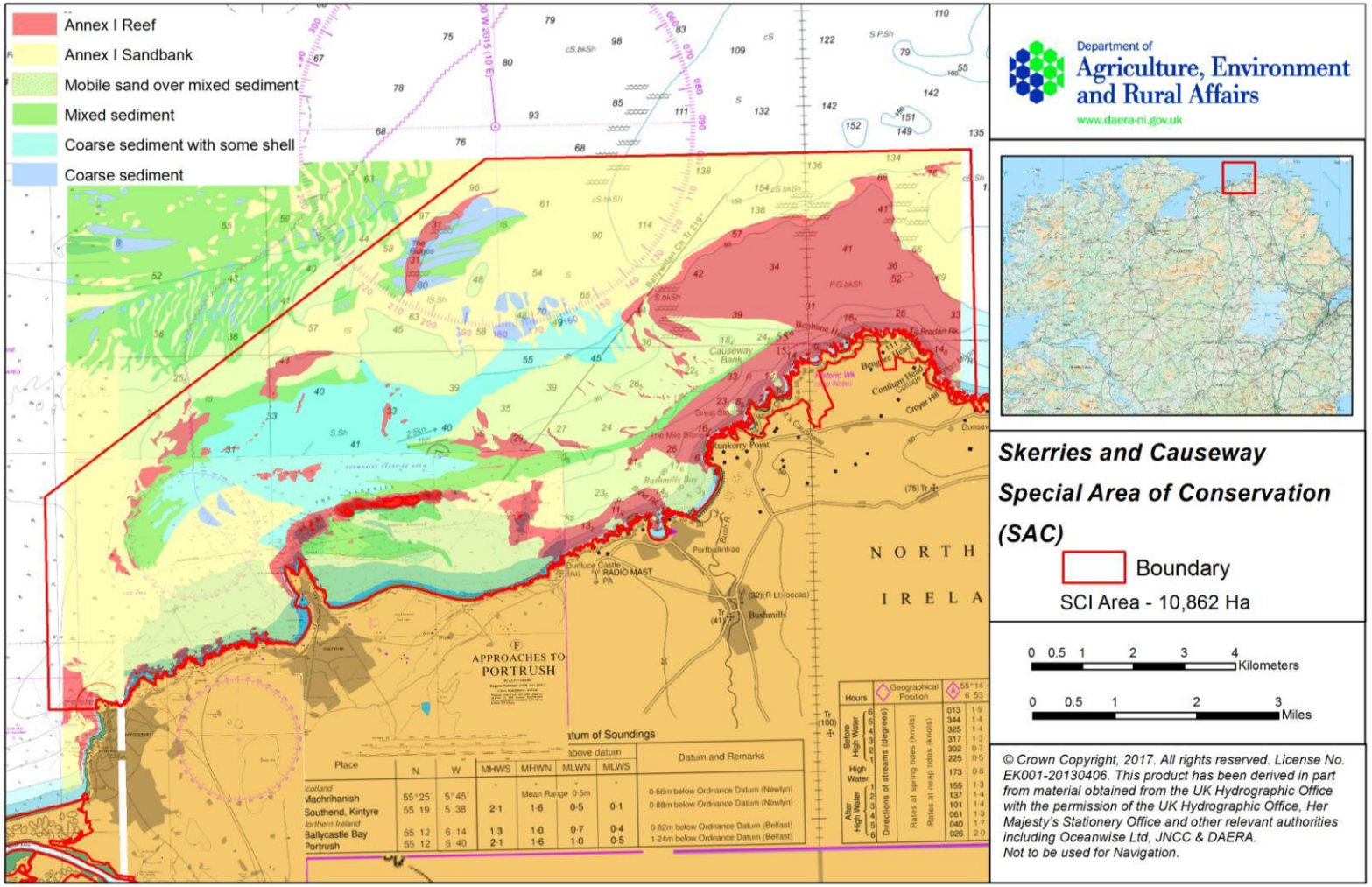
5.1 BOUNDARY RATIONALE

This area was first identified as being of marine conservation interest in the Northern Ireland Sub-littoral Survey (NISS), (Erwin *et al*. 1986). More recent dive surveys to determine the extent of its conservation interest (2006-2008 as part of the Sub-littoral Survey of Northern Ireland (SSNI) and 2009-2010 as part of the

Nationally Important Marine Features (NIMF) project) were completed by the Northern Ireland Environment Agency/National Museums Northern Ireland partnership (NIEA/NMNI) (Goodwin *et al.,* 2012; Goodwin *et al.*, 2011). The dive surveys of 2009-2010 also targeted the survey of reefs that had been identified for the first time from the multi-beam mapping of the Joint Irish Bathymetric Survey (JIBS, 2008). The JIBS work also allowed the first sight of the many sand waves and the dramatic submerged cliff of the Benbane Reef Complex. In 2010, the Department contracted the University of Ulster to provide a habitat map of the Causeway Coast (Clements *et al*., 2010). This habitat map was based on the bathymetric and backscatter data acquired as part of the JIBS work with ground-truthing provided by various surveys (NIEA dive and ROV surveys, AFBI surveys, NISS and any other relevant sources). Map 1 shows the results of this work, detailing the boundary of the SAC and seabed habitat map.

The boundary around the Skerries and Causeway site has been drawn using the guidance provided by the Joint Nature Conservation Committee (JNCC) (2004, amended by Aish *et al*. 2008), and was defined through GIS modelling using data from the mapping survey and considered against the guidelines. The key parts of this guidance are that the boundary should be restricted to only include Annex I habitat or that which is required for the maintenance of that habitat and the boundary line defined in whole degrees and minutes and seconds where possible. NIEA have used minutes to two decimal places as an equivalence of seconds as it is more commonly displayed on vessel Global Positioning System (GPS)/Chartplotter systems. The guidance also states that the boundary should include as little non-Annex I habitat as possible and should also be sufficient to allow for elimination of potential damage to the area from activities such as trawling and dredging.

The seaward boundary of the Skerries and Causeway site conforms to the guidance of JNCC in Aish *et al.* (2008) in being "drawn as straight lines to ensure ease of identification on charts and at sea" (Brown *et al*. 1997, McLeod *et al.* 2002). The northern limit of the site is therefore based on a line of latitude that allows inclusion of the Benbane Reef Scarp Complex and the reef marked on the Admiralty Charts as The Ridges. The eastern boundary is a line of longitude that allows the inclusion of the deep reef to the east of the Benbane Reef Scarp Complex. The western boundary is a line to allow the inclusion of a part of the Portstewart stony reef and the outlying reefs north-west of the Skerries. The southern boundary is the coastal Mean Low Water mark which permits a clearly defined 'real' boundary; while the rocks and islands of the Skerries have a boundary of Mean High Water to include seal haul-out areas, an area already designated in national legislation as an Area of Special Scientific Interest (ASSI).



Map 1 Skerries and Causeway SAC with Annex I habitats 'Reef' and 'Sandbanks which are slightly covered by seawater all the time' and other ground types as provided under contract by the University of Ulster (Clements *et al., 2010*)

SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ pop~
Habitat	Reefs	B	2280 ha
Habitat	Sandbanks which are slightly covered by sea water all the time	B	1601 ha
Habitat	Submerged and partially submerged sea caves	B	Approximately 30
Species	Harbour porpoise *Phocoena phocoena*	C	
Species	Common Seal *Phoca vitulina*	D	
Species	Grey Seal *Halichoerus grypus*	D	
Species	Bottlenose Dolphin *Tursiops truncatus*	D	

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 threshold for 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 the Skerries and Causeway SAC.

6. *CONSERVATION OBJECTIVES*

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the

- ***Reefs***
- ***Sandbanks which are slightly covered by sea water all the time, and***
- ***Submerged and partially submerged sea caves***
- ***Harbour porpoise (Phocoena phocoena)***

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.

7. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Global Status	Component Objective
Reefs	B	Maintain and enhance, as appropriate the extent of the reefs.
		Allow the natural processes which determine the development, structure, function and distribution of the habitats associated with the reefs, to operate appropriately.
		Maintain and enhance, as appropriate, the viability, distribution and diversity of typical species within this habitat.
Sandbanks which are slightly covered by sea water	B	Maintain the extent and volume of sandbanks which are slightly covered by sea water all the time, subject to natural processes.
		Allow the natural processes which determine the development, structure and extent of sandbanks which are slightly covered by sea water all the time, to operate appropriately.
		Maintain and enhance, as appropriate, the viability, distribution and diversity of typical species within this habitat.

Submerged and partially submerged sea caves	**B**	Maintain and enhance, as appropriate the extent of the sea caves.
		Allow the natural processes which determine the development, structure, function and distribution of habitats associated with the sea caves, to operate appropriately.
		Maintain and enhance, as appropriate, the viability, distribution and diversity of typical species within this habitat.
Harbour Porpoise (*Phocoena phocoena*)	**C**	Ensure the species is a viable component of the site.
		Ensure there is no significant disturbance of the species.
		Ensure the supporting habitats and processes relevant to harbour porpoises and their prey are maintained.

8. MANAGEMENT CONSIDERATIONS

The Skerries is a fairly natural open coast SAC with few significant issues which are not currently being managed successfully. The exception to this the potential for impact on reef features by vessels without knowledge of the exact location of the sensitive low-lying reefs. The current voluntary measure has been shown to be ineffective and will be replaced with a fisheries regulation which manages what type of fishing gear can be used within specific zones in the SAC boundary. Enforcement of this activity will require the use of enhanced vessel tracking. The Department is currently developing a scheme of management for the site which will go out for consultation in 2017. The following issues relate to many marine sites and in certain circumstances may have some bearing on the management of the Skerries and Causeway SAC.

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

Both on-site and off-site activities can potentially affect SAC features. The list below is not exhaustive, but deals with the most likely factors that are either affecting the Skerries and Causeway SAC, or could affect it in the future.

Aggregate extraction/Maerl extraction

Extraction of aggregates or extraction of maerl, either within or adjacent to the SAC, have the potential to cause direct loss or deterioration of qualifying habitats

and communities; including the deterioration of qualifying habitats and communities by smothering and increased turbidity from re-suspended material.

Agriculture and Forestry

Diffuse run-off from agriculture and forestry practices has the potential to cause deterioration of qualifying habitats and communities, primarily through the deterioration of water quality due to organic or inorganic pollutants. Changes in agricultural or forestry practices or changes of land use have the potential to cause deterioration of qualifying habitats and communities through changes in the nature and loading of sediments in rivers that discharge to coastal areas.

Aquaculture – finfish farming

Finfish farming has the potential to cause deterioration of qualifying habitats and communities through changes in water quality, smothering from waste material and physical disturbance from mooring systems. There is potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals which are already widely distributed in the UK. Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Aquaculture – shellfish farming

Shellfish farming has the potential to cause deterioration of the qualifying habitats and communities through physical damage (e.g. installation of mooring blocks and continued scouring by riser chains) and changes in community structure caused by smothering from pseudo-faeces (undigested waste products) and debris (including dead shells) falling from the farm. There is also potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals through importation or translocation of shellfish stocks. Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Diving

The study of the seabed by divers is in harmony with conservation interests provided no damage is done. Over collection of marine life could, however, prove damaging to the populations of certain species.

Coastal and Marine Development

The construction and maintenance of structures, both within and adjacent to the sea, have the potential to cause direct loss or deterioration of qualifying habitats and communities. An example is coastal defence or harbour/marina structures that may change local patterns of sediment suspension or deposition. Other examples include: renewable and other energy installations (including offshore wind, tide and wave energy and oil and gas installations); pipelines and cables; and marina and harbour developments and maintenance including the dredging of harbours, marinas and navigation channels. In many of these cases

disturbance of the seabed may cause increased turbidity and smothering in adjacent areas as well as the direct impact in the area of operation.

Discharge of commercial effluent or sewage
Commercial effluent has the potential to cause deterioration of qualifying habitats and communities, through pollution or nutrient enrichment, which may cause subsequent changes in community structure. Pollution is considered a significant threat to harbour porpoises and may result in suppression immune function and reduction in breeding success.

Disposal of dredge spoil
The disposal of either capital or maintenance dredge spoil, either within or adjacent to the SAC, has the potential to cause deterioration of qualifying habitats and communities, through smothering, increased turbidity, or re-suspension of pollutants.

Marine litter
Discarded inorganic debris such as plastic bags, bottles and fishing gear may become ingested, resulting in death through starvation or internal injury. Accidental entanglement in package wrap and fishing debris may result in external injury and asphyxiation. Sources of marine litter include commercial and recreational vessels, land-based sources, and offshore installations.

Commercial Fishing – Mobile gear (dredging and bottom trawling)
Benthic dredging and bottom trawling have the potential to cause deterioration and damage to qualifying habitats and communities (particularly maerl, Hall-Spencer, 2000) through direct contact with the dredge/trawl gear, and sedimentation when dredging/trawling occurs close to the qualifying interest. Loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities. The Department is currently engaging with the fishing community and other stakeholders to gather detailed evidence and to identify the areas which are sensitive to specific types of fishing gear in order to introduce fisheries regulations to ensure the long term protection of those features. This includes full analysis of all known fishing activities gathered over recent years.

Commercial Fishing – Mobile gear (pelagic mid-water trawling)
Pelagic mid-water trawling has minimal potential to cause deterioration of qualifying habitats and communities through direct contact, as the trawl gear is mostly well above the seabed (except occasionally for vessel turning in shallow water). However loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities.

Commercial Fishing – Static gear (creel/pot fishing)
The use of creels and / or pots in a localised area has the potential to cause deterioration of qualifying habitats and communities through direct contact,

particularly during their deployment and / or recovery. Loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities.

Marine Traffic – Boat anchorages and moorings

Anchors and moorings have the potential to cause deterioration of qualifying habitats and communities through the direct impact of riser chains. The Department is currently working with the Harbour Authority to identify a specific mooring site for visiting cruise ships. The management scheme will also inform boat users of the exact location of sensitive habitats such as seagrass beds in which mooring and anchoring will be managed.

Marine Traffic – Boat maintenance and antifoulant use

Most antifoulant products are designed to kill or discourage naturally occurring organisms and, as such, cause damage to the water environment if used carelessly. Under such circumstances use of antifoulant has the potential to cause deterioration of qualifying habitats and communities within this site.

Marine Traffic – Commercial and recreational vessels

The majority of large commercial shipping passes well to the North of The Skerries and Causeway SAC. However, smaller coastal vessels on-route to The River Bann and/or Lough Foyle pass through the SAC boundary. It should also be noted that the area inshore of The Skerries is a designated anchorage for ships sheltering from adverse weather. The pumping of bilges, discharge of ballast water, accidental grounding, or accidental oil (or other chemical) spillage from commercial vessels could therefore all occur close to the SAC. Such incidents have the potential to cause deterioration of qualifying habitats and communities through direct or indirect impacts. Emergency and oil spillage contingency plans should take into account specific qualifying interests and recognise the importance of marine SACs should such incidents occur. Smaller recreational and fishing vessels also have the potential to cause deterioration of qualifying habitats and communities through fuel spillage and grounding.

There is also potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals through bilge or ballast water, sea chests, and bio-fouling on hulls (identified as a particular risk on vessels for sale that are in the water for some time before being moved to a new location). Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Physical disturbance from recreational activity and vessel strikes can also be an issue in coastal areas where high densities of porpoises coincide with high densities of boat traffic, particularly during the summer season.

Marine Renewables

The Strategic Environmental Assessment (SEA) of Offshore Wind and Marine Renewable Energy by the Department of Energy, Trade and Investment (DETI, 2009) assessed the potential for commercial and test/demonstration sites in NI waters. This assessment identified potential impacts of such developments and related mitigating actions to be considered at the project developments stage. A possible commercial scale Tidal Resource Zone was identified off the North Coast within which the Crown Estate as managers of the seabed has offered development rights to two consortia, Tidal Ventures Ltd and Fair Head Tidal. However there are no tidal energy developments in this area at present and the Department is engaging with the developers in considering their respective marine licence applications.

The UK's Department of Business, Energy and Industrial Strategy (UK BEIS) administers marine environmental regulations associated with oil and gas exploration and production and the decommissioning of marine installations, wells, pipelines and associated infrastructure in the UK marine area (excluding internal waters). At present there is no oil or gas exploration licence for the 5 offshore blocks in the Antrim Coast (the Skerries and Causeway SAC lies partly within this area).

The development of marine renewables has the potential to cause deterioration of qualifying habitats and communities through direct alteration, removal or manipulation of these qualifying interests and their associated species. Furthermore, deterioration of qualifying habitats and disturbance of species may occur through the use of pile driving or powerful sonar required for surveys or construction phases as these may directly harm cetaceans or act as a barrier to cetaceans using the area.

Scientific Research, Geological surveys and Military exercises

Research activities, Geological surveys and Military exercises have the potential to cause deterioration of qualifying habitats and communities through direct alteration, removal or manipulation of these qualifying interests and their associated species. Furthermore, deterioration of qualifying habitats and disturbance of species may occur through the use of seismic surveys or powerful sonar that may directly harm cetaceans or act as a barrier to cetaceans using the area. These activities should be communicated to the Department for specific advice about the potential of impact and subsequent mitigation.

Wildlife watching trips

Wildlife watching trips (boat and land based) have the potential to cause disturbance to species if operators are not appropriately trained in how to approach species while minimising potential disturbance. In addition, damage to sensitive habitats may occur through lack of knowledge of their location. Various wildlife training courses are available which teach best practice when dealing with wildlife.

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. The Northern Ireland Climate Change Adaptation Programme was published in January 2014. This contains the Northern Ireland Executive's response to the risks and opportunities identified in the Climate Change Risk Assessment for Northern Ireland (published January 2012) as part of the overall UK Climate Change Risk Assessment. The Adaptation Programme provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each department will meet these objectives and the timescales associated with the proposals and policies identified in the period up to 2019.

10. MONITORING

The SACs are surveyed using two forms of monitoring:

Site Integrity Monitoring (SIM) is carried out to ensure compliance with the SAC conservation objectives. Potentially damaging activities may be picked up through the active marine ranger programme or by members of the public raising concerns with the Department. These reports are followed up through consultation with the relevant competent authorities.

Site Condition Assessment of the designated features is carried out on a rolling 6 year basis to pick up subtle changes in the condition of the feature and to ensure that the conservation objectives are being met.

Site condition assessments include a variety of techniques such as diving, remote cameras, sediment sampling and acoustic seabed mapping. Marine mammal monitoring programmes also contribute.

10.1 MONITORING SUMMARY

1. Monitor the integrity of the site (SIM or Compliance Monitoring)

This SIM should be carried out at least once every 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. Refer to Annex I.

The favourable condition table provided in Annex I 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 <u>not by itself</u> 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.

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ANNEX I

The marine Annex I habitats are very broadly defined habitats that are often represented by large and complex sites. To effectively describe, monitor and manage such complex features, it has been necessary to divide some of them into smaller units called *sub-features*. Sub-features are distinctive biological communities (e.g. eelgrass beds, maerl beds, horse-mussel reefs), or particular structural or geographical elements of the feature. Due to the broad nature of marine Annex I features, it has often proved helpful, both in the development of conservation objectives, and of monitoring programs, to separate the feature into a number of constituent sub-features, and then to identify attributes and targets for the sub-features. The use of sub-features has been found to be particularly helpful for those marine Annex I features that represent whole physiographic units and permits a level of flexibility in the application of the UK's Common Standards Monitoring which has been found necessary when applying the standards at the site level.

Feature 1 (SAC) - Sandbanks which are slightly covered by sea water all the time (status B)

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

Feature	Sub-feature	Attribute	Measure	Target	Comments
Subtidal sandbanks		* Extent	Area (ha) of the subtidal sandbanks to be measured periodically (frequency to be determined).	Ensure that quality and extent of sandbank are not threatened by aggregate removal.	Currently there is no licensed aggregate removal activity within or near to this SAC.

Feature	Sub-feature	Attribute	Measure	Target	Comments
		* Sediment character	Particle size analysis (PSA). Parameters include percentage sand/silt/gravel, mean and median grain size, and sorting coefficient, used to characterise sediment type. Sediment character to be measured once during the reporting cycle.	Average PSA parameters should not deviate significantly from an established baseline subject to natural change.	Sediment character defined by PSA is key to the structure of the feature, and reflects all of the physical processes acting on it. Particle size composition varies across the feature and can be used to indicate spatial distribution of sediment types thus reflecting the stability of the feature and the processes supporting it. This is currently addressed through WFD monitoring programme.

Feature	Sub-feature	Attribute	Measure	Target	Comments
		* Topography	Depth distribution of sandbanks from selected sites, measured periodically (frequency to be determined).	Depth distribution should not deviate significantly from an established baseline, subject to natural change.	Depth and distribution of the sandbank reflects the energy conditions and stability of the sediment, which is key to the structure of the feature. Depth of the feature is a major influence on the distribution of communities throughout. The baseline for this feature was delivered through the JIBS programme. It is not envisaged that this will be repeated in the near future, however, marine license requirements for site specific projects may result in local bathymetric charts being produced for comparison against baseline data.

Feature	Sub-feature	Attribute	Measure	Target	Comments
		Water density	Average temperature/salinity in the subtidal measured periodically throughout the reporting cycle (frequency to be determined).	Average temperature/salinity should not deviate significantly from an established baseline, subject to natural change.	Temperature and salinity are characteristic of the overall hydrography of the area. Changes in temperature and salinity influence the presence and distribution of species (along with recruitment processes and spawning behaviour) including those at the edge of their geographic ranges and non-natives. This is delivered through the AFBI coastal buoy monitoring network.
	Eelgrass bed communities (*Zostera marina*)	Extent	Area (ha) of eelgrass beds, measured during peak growth period twice during the reporting cycle.	No decrease in extent from an established baseline subject to natural change.	The extent and distribution eelgrass beds provide a long-term integrated measure of environmental conditions. Location of a single seagrass bed is known but the exact extent and boundary has not yet been accurately mapped. This is due to be carried out as part of the ongoing monitoring programme.

Feature	Sub-feature	Attribute	Measure	Target	Comments
	Subtidal Sand and Gravel Communities Subtidal Fine Sand and Mud Communities	*Characteristic biotopes at sites chosen so as to provide some indication of the distribution and extent of the Sub-Feature.	Presence of the selected biotopes as identified by the NI Sublittoral survey at selected sites measured once during the reporting cycle. This was further refined by the University of Ulster in the production of a broadscale habitat map for the designation of the SAC (http://www.tandfonline.com/doi/pdf/10.1080/17445647.2012.661957).	Results should not deviate significantly from the established baseline, subject to natural change.	Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
		* Species composition of selected biotopes at monitoring sites.	Species composition of the selected biotopes as identified by the NI Sublittoral survey measured once during the reporting cycle.	Composite species of selected biotopes should not deviate significantly from the established baseline, subject to natural change.	Species composition will be used to determine the biotope classification. The species composition of some biotopes may provide further information on changes/trends in these communities. A list of selected indicator species identified by field surveys will be utilised to determine the achievement of the conservation objectives through presence/absence at monitoring sites.

Feature 2 (SAC) Reefs (status B)

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

Feature	Sub-feature	Attribute	Measure	Targets	Comments
Reef	Subtidal Rock and Boulder Communities Subtidal Rocky Reef Communities	* Characteristic biotopes at sites chosen so as to provide some indication of the distribution and extent of the Sub-feature.	Presence of the selected biotopes at selected sites measured once sure the reporting cycle. This was further refined by the University of Ulster in the production of a broadscale habitat map for the designation of the SAC (http://www.tandfonline.com/doi/pdf/10.1080/17445647.2012.661957).	Results should not deviate significantly from the established baseline, subject to natural change.	Changes in extent and distribution may indicate long term changes in the physical conditions at the site. Some of the reefs in the SAC are unique in that they are sand scoured and low profile in nature and may be subject to natural burial. This will present problems in monitoring due to the fact the temporary absence of the reef through burial may be entirely natural cyclical process.
		* Species composition of selected biotopes at monitoring sites.	Species composition of the selected biotopes measured once during the reporting cycle.	Composite species of selected biotopes should not deviate significantly from the established baseline, subject to natural change.	Species composition will be used to determine the biotope classification. The species composition of some biotopes may provide further information on changes/trends in these communities. A list of selected indicator species identified by field surveys will be utilised to determine the achievement of the conservation objectives through presence/absence at monitoring sites.

Feature 3 (SAC) Submerged and partially submerged sea caves (status B)

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

Feature	Sub-feature	Attribute	Measure	Targets	Comments
Sea caves		* Extent	Number and location, measured once during the reporting cycle.	No decrease in extent from a baseline to be established, subject to natural change.	Extent is an attribute on which reporting is required by the Habitats Directive. The extent may alter as a result of natural erosion and collapses as well as a result of human activity, hence the need for periodic measurement.
		* Distribution of characteristic sea cave communities	Distribution of intertidal cave biotopes. Measured during summer, once during reporting cycle. This will only be delivered for a representative number of the caves. Access to these caves given their exposed Atlantic location is problematic and subject to comprehensive risk assessment.	Baseline yet to be established. Distribution should not deviate significantly from a baseline to be established, subject to natural change.	Distributions of certain biotopes are an important structural component of the sea caves of the Skerries and Causeway. Changes in extent and distribution may indicate long term changes in physical conditions at the site

Feature 4 (SAC) Harbour Porpoise (status C)

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

Attribute	Measure	Targets	Comments
Mean abundance of adults within the SAC	* Maintain and enhance the population as appropriate.	Sightings rate from land based watches not less than 0.314 harbour porpoise per hour (based at Ramore Head).	Data generated by ongoing DAERA Marine and Fisheries Division survey. A recent report (Nykanen *et al*., 2017) examining the land based Harbour porpoise watch data for Northern Ireland suggested that an effort watch of 11 watches per month (130/year) is required to detect a 57% change in the HP population.
Presence/absence of young	* Maintain and enhance the population as appropriate.		At the time of designation approximately 30.6% of the total numbers counted were young (all ages i.e. young, juveniles and calves).

Ramsar Convention on Wetlands of Importance Especially as Waterfowl Habitat

Name: Teal Lough

Unitary Authority/County: Mid Ulster District Council / Counties Tyrone and Londonderry

Consultation proposal: Teal Lough has been selected for designation as a Ramsar site because of its important wetland habitats and associated species.

Site description: Teal Lough Bog lies some 10 km north-west of Cookstown beyond Lough Fea at an elevation of 220 m. This is one of the largest and least disturbed upland blanket peat and raised bog habitats in Northern Ireland. The features of interest are all hydrologically linked, with actively developing upland raised bog surrounded by active blanket peat, and with an oligotrophic lake to the north. Teal Lough has one of the finest hummock and pool complexes of any peatland complex in Northern Ireland.

The boundary of the Ramsar site is entirely coincident with the Teal Lough Special Area of Conservation (SAC) area, incorporating part of Teal Lough and Slaghtfreeden Bogs Area of Special Scientific Interest (ASSI) (Teal Lough part only), and all of Teal Lough Part II ASSI. The county boundary bisects the Ramsar site.

Size of Ramsar site: 198.22 ha.

International importance of Ramsar site: The Ramsar site is a Wetland of International Importance because (The Ramsar Sites Criteria, 2014):

(a) the site contains a representative, rare, or unique example of a natural or near-natural wetland type found within the Atlantic biogeographic region. (Ramsar site selection Criterion 1):

- Teal Lough contains one of the most extensive and least disturbed examples of upland blanket peat and raised bog habitats in Northern Ireland, including one of the finest hummock and pool complexes of any raised bog in Northern Ireland.

Status of Ramsar site:

Teal Lough Ramsar site was designated on date (day, month, year).

TEAL LOUGH SAC

UK0016608

CONSERVATION OBJECTIVES

Document Details

Title	Teal Lough SAC Conservation Objectives
Prepared By	R. McKeown
Approved By	P. Corbett
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Next Review Date	Nov 2020
Contact	cdp@daera-ni.gov.uk

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	11.10.2017	Removed wording '*excluding recently burnt areas*' from bare peat target in all relevant Annex tables	PMC

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 Directive79/409/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: TYRONE, LONDONDERRY

GRID REFERENCE: IH737880

AREA: 198.22 ha

5. SUMMARY SITE DESCRIPTION

Teal Lough Bog lies to the north-west of Cookstown beyond Lough Fea at an elevation of 220m. It is bisected by the county boundary, which runs through Teal Lough itself. This is one of the largest and least disturbed upland blanket peat and raised bog habitats in Northern Ireland. The features of interest are all hydrologically linked; being four actively developing upland raised bogs surrounded by active blanket peat with an oligotrophic lake to the north.

The pool and hummock complexes display rich bryophyte communities (including *Sphagnum imbricatum* and *Mylia taylorii*), a limited but notable range of upland invertebrates (including *Salda muelleri* and *Agabus arcticus*) and a vascular flora uncommon in Northern Ireland (*Drosera intermedia* and *Utricularia minor*). The underlying Pleistocene sand and gravel fluvioglacial outwash series, together with the ridge series, are important, being related to a major deglaciation phase of the South Sperrins.

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 SAC is comprised of the major part of two ASSIs: Teal Lough and Slaghtreeden Bogs ASSI designated in 1987 and Teal Lough Part II designated in 1995. The original ASSI boundary included the minimum area of highest conservation value, excluding the partially disturbed bog to the south. Teal Lough Part II included this previously excluded cut-over but regenerating area as well as the base-poor lake to the north because of their hydrological links with the main Teal Lough bogs.

Two separate parcels of bog lying within the edge of Davagh Forest were included within the original ASSI but are not included in the SAC because the adverse impacts of adjacent trees has adversely affected these bog areas. However, these two ASSI areas excluded from the SAC will be subject to the same objectives and management as the rest of the SAC, and may undergo restoration in the future once the trees are felled.

The SAC boundary encompasses a single hydrological unit bounded by Tullybrick Road to the east. The rest of the boundary follows several topographical features, particularly associated with the hydrology of the site e.g. streams and esker bases, as well as some man-made features such as ditches and tracks. It is all well fenced.

6. SAC SELECTION FEATURES

Feature Type	Feature	Global Status	Size/ extent/ population
Habitat	Active blanket bog	B	155.5 ha
Habitat	Northern Atlantic wet heaths with *Erica tetralix*	D	9.5 ha
Habitat	Natural dystrophic lakes and ponds	D	1.45 ha
Habitat	Depressions on peat substrates of the Rhynchosporion	D	0.1 ha
Habitat	European dry heaths	D	26.0 ha

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 Teal Lough SAC.

6.1 ASSI SELECTION FEATURES

Teal Lough ASSI

Feature Type	Feature	Size/extent/ population
Habitat	Blanket Bog	155.5 ha
Species	Invertebrate Assemblage	
Earth Science	Pleistocene glacial depositional series – underlies the entire Teal Lough SAC peatland complex	

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 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.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Blanket Bog	See SAC Selection Feature Objective Requirements table.
Invertebrate Assemblage	To be finalised.
Pleistocene glacial depositional series	Maintain extent of the sand and gravel series.
	No disturbance of the sand and gravel series.

10. MANAGEMENT CONSIDERATIONS

Ownership

Most of the area is owned by Forest Service, with the remaining area owned by 3 private landowners.

Part of the SAC area (85.14ha), including the 40ha of Teal Lough Forest Nature Reserve, is currently managed by Ulster Wildlife as a Nature Reserve, to which UW members have access by arrangement. The county boundary acts as the northern edge of this Reserve, which is important for nesting teal and black headed gulls and winter visitors such as Greylag Geese.

Adjoining Land Use

The main adjoining land-use outside the SAC is afforestation and degraded blanket bog/wet grasslands that are more intensively grazed by cattle and in some instances sheep. There are also surrounding areas of severely degraded peatland complexes as a consequence of drainage and mechanised peat extraction.

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 Teal Lough, or could affect it in the future. Although Active Blanket Bog is the qualifying SAC feature, 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.

Mineral extraction

Any removal of minerals, e.g. peat or sand, from the site will destroy that part of the site and may have consequential effects on the rest of the area due to its fragile, integrated structure and hydrology.

ACTION: No extraction of minerals from the SAC.

Burning

Excessive burning will reduce the cover of *Sphagnum* mosses and Ericaceous species, increasing the proportion of *Trichophorum cespitosum* and grasses. Structural diversity may also be reduced. Blanket bog should not be burnt.

ACTION : No burning within the SAC

Reclamation of heathland

This always causes permanent damage to the ecology and hydrology of the bog, because of the drainage, cultivation, fertilising, liming, re-seeding and management changes involved. The obtrusive bright green rectangles of re-seeded grassland are a common adjunct to heathland landscapes throughout the country, and unless very intensively managed these revert to poor quality, rush-dominated land with little agricultural or ecological interest.
ACTION:- Ensure there are no reclamation works within the SAC through liaison and management agreements with owner/occupiers. Maintain any existing blockages of drains.

Grazing

Under-grazing, or the cessation of grazing, results in vegetation change on heathland, with the prevalence of over-mature and degenerate *Calluna vulgaris*. Over-grazing leads to poaching, trampling and, at worst vegetation removal which can result in soil exposure and eventual erosion. Less dramatic change is in the range and proportions of plant species e.g. a decline in dwarf shrubs. The timing of grazing can also cause potential problems – winter sheep grazing is most likely to result in erosion effects, whilst autumn grazing can cause great damage to *Calluna vulgaris*.
ACTION: Liaise with local landowners and DARD to set grazing intensity for the SAC at an appropriate level. Ensure fencing is maintained.

Supplementary stock feeding

This can cause localised overgrazing and poaching damage and should ideally be avoided. If this not an option, it should be confined to less sensitive areas, e.g. tracks.

ACTION: Liase with local landowners to avoid using feeding areas within the SAC.

Application of fertiliser/slurry/manure

The whole site is very nutrient-poor and and so very vulnerable to nutrient enrichment. Eutrophication would be particularly damaging to the nutrient poor pool system and lake. As the hydrology of the whole site is linked any type of fertiliser application to a part of the SAC area will be affect other parts.
ACTION: Ensure there is no nutrient enrichment of any kind. Liase with local landowners to prevent the discharge of slurry onto the site.

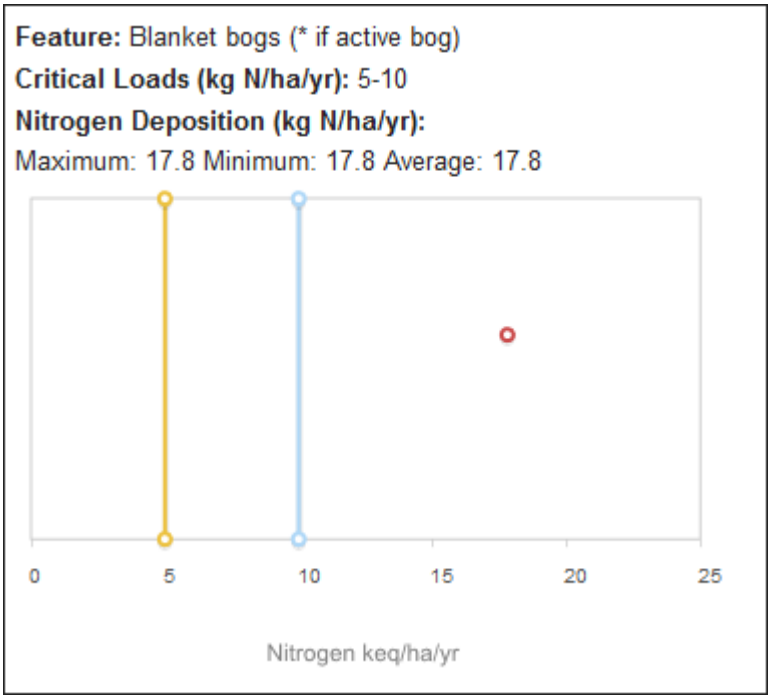
Afforestation

Trees cause hydrological and physiological changes to the peat and shading effects on heathland vegetation. Peatland subjected to afforestation has little potential to recover after tree harvesting, due both to the direct effect of the trees and the indirect effect of the operations involved.

ACTION: No tree planting within the SAC.

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 Teal Lough SAC.



(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.

Recreational activities

Regular use of any part of the area, by walking but especially by four-wheel drive vehicles, can cause local vegetation loss and structural damage to the peat which may lead to significant erosion, particularly on slopes. Wet moss hummocks are also vulnerable to more than occasional treading so over-use of the site should be avoided.

ACTION: Liase with local landowners to ensure minimal use of ATVs for checking and gathering livestock and no recreational use within the SAC. Maintain fences to prevent unauthorised vehicular access.

Fly-tipping

Due to the sites close proximity to a country road, there is always the threat of fly-tipping or the disposal of slurry onto part of the area, which could adversely affect its nutrient poor trophic status.
ACTION: Remove all waste materials in and around site regularly, and report any large-scale dumping to the local Council. Liase with local landowners in an effort to prevent dumping on or around the site.

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 1.

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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ANNEX 1

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

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

Attributes	Targets	Method of Assessment	Comments
* Area of blanket bog and upland raised mire (ha)	Maintain the extent of the intact bog surface at 196 ha. 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.	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 SAC 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.
* Pool/hummock system extent and complexity	The extent and complexity of pool and hummock systems at least maintained. Differentiation of *Sphagnum*	The extent of pool and hummock systems should be monitored using a	The extent of pool and hummock systems should be monitored using a combination of aerial photographs and Condition Assessment.

	species should be recorded with *S. cuspidatum* or *S. auriculatum* in the pools and *S. papillosum* and *S. capillifolium* forming the lawns and hummocks.	combination of aerial photographs and SIM.	
Dwarf-shrub Height (cm)	Average ericoid height should be 15-30cm.	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.
* *Sphagnum* cover/ abundance (% cover and frequency) Active Peat Formation (DAFOR)	*Sphagnum* moss species should have a minimum cover of 25% over at least 66% of the intact blanket bog surface. Thick, hummock forming species of sphagnum should be at least occasional.	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.

	Species present should include a mixture of both thin species: - *S. capilliifolium* and *S. tenellum* and the thick hummock forming species: - *S. papillosum* and *S. magellanicum* at least occasional over the surface.		
* 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 – i.e. the water table is too low beneath the surface of the bog.
* Scrub/tree encroachment on any active peat surface	Scrub/tree encroachment should be no more than rare on the intact bog surface, or in	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

(DAFOR)	the actively regenerating cutover areas.		*Rhododendron ponticum* should be removed immediately.
* Erosion Features associated with human impacts (% and DAFOR)	No gully erosion or bare peat associated with more concentrated human impacts (eg drainage, peat extraction, ATV tracks or recreational activities). Man induced/enhanced erosion should occupy less than 2% of the total area of blanket bog 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 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.	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.

Molinia caerulea Cover (%)	Where *Molinia caerulea* cover is greater than 50%, it should form an even (not tussocky) sward in waterlogged conditions with *Sphagnum* moss cover greater than 25%.	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 the climate is generally warmer and wetter i.e. 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. If these species are not recorded on any one visit, it does not automatically make the SAC unfavourable.	visual estimate in 2x2 m plots.	

Frequency -

1-20% = Rare

21-40% = Occasional

41- 60% = Frequent

> 60% = Constant

THE MAIDENS SAC
UK0030384

CONSERVATION OBJECTIVES

Document Details

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Prepared By	*L. Pothanikat*
Approved By	*J. Breen*
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V2	March 2017	Complete review	LP

Department of Agriculture, Environment and Rural Affairs
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INVESTORS IN PEOPLE

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: DOWN

REFERENCE COORDINATES: 54.9436 -5.7519

AREA: 7461.36 ha

5. SUMMARY SITE DESCRIPTION

The Maidens proposed SAC is a group of rocky reefs detached from the coast, north east of Larne, Northern Ireland. The Maidens (or Hulin Rocks) are identified on the Admiralty Charts as a group of small rocky reefs either awash or just emergent. In only two cases are they large enough to be termed islands and to carry buildings, namely the West Maiden, which has a disused lighthouse and the East Maiden, which supports the present lighthouse (cover photograph inset). As well as the main reef plateau of East and West Maiden, there are also four other reef areas that form a part of the proposed SAC: North Klondyke Shoal which is a large submerged reef or shoaling, approximately 9 km north of West Maiden; Outer Klondyke Pinnacle, a submerged pinnacle 6km east of West Maidens; an unnamed small deep reef 8km north west of West Maiden; and Hunter Rock 5km to the south of West Maiden.

The primary reason for the proposed designation of The Maidens as an SAC is for the Annex I habitat *Reef*. Most of the reef area of The Maidens is bedrock reef with a smaller proportion of stony reef. From the multibeam echo sounding (MBES) survey analysis, combined with video tow ground truthing, some of the area has been classified as 'rock with sand infill'. It is suggested that most of this 'rock with sand infill' should be classed as Annex I *Reef* as the ground truthing suggests that the mobile sand veneer would cover and uncover that reef area.

A small area to the south of East Maiden island has been shown by diving surveys to be shallow stable sandy gravels (partially sheltered by East and West Maiden

islands) that includes maerl and other long lived species and this small area has therefore been classed as Annex I *Sandbanks slightly covered by sea water all of the time*.

Like Annex I *Sandbanks slightly covered by seawater all the time*, Annex II *Grey seals* are not the primary feature of The Maidens proposed SAC. However, these relatively remote rocks, islands and the waters surrounding them in the North Channel are important for providing haul-out sites, resting sites and foraging areas for *Grey seals*, with a maxima count of 70 adults recorded in a July 2000 survey. Recent surveys in 2009 confirmed use of the site for both pupping and breeding.

Further details of the site are available on the NIEA website (https://www.daera-ni.gov.uk/publications/reasons-designation-special-area-conservation-maidens).

5.1 BOUNDARY RATIONALE

The boundary around The Maidens site has been drawn using the guidance provided by the JNCC (2004, amended by Aish *et al*. 2008), and was defined through GIS modelling using data from the mapping survey and considered against the guidelines. The key parts of this guidance are that the boundary should be restricted to only include Annex I habitat or that which is required for the maintenance of that habitat and the boundary line defined in whole degrees and minutes and seconds where possible. NIEA have used minutes to two decimal places as an equivalence of seconds as it is more commonly displayed on vessel GPS/Chartplotter systems. The guidance also states that the boundary should include as little non-Annex I habitat as possible, and should also be sufficient to allow for elimination of potential damage to the area from activities such as trawling and dredging.

The Maidens site is made up of five blocks of Annex I Reef:

1. The Maidens plateau
2. North Klondyke shoal
3. Deep reef west of North Klondyke
4. Outer Klondyke pinnacle
5. Hunter Rock

The North Klondyke shoal and the Outer Klondyke pinnacle are separated from each other and from the main Maidens plateau by deep sediment channels, over 200m deep in places, and these deep sediment channels have been excluded from the SAC area.

The Annex I sandbank (maerl and sandy gravel) feature is small and sited on The Maidens plateau reef area south of the East Maiden lighthouse.

The site is almost entirely subtidal and is remote from the coast. At the small islands of East Maiden and West Maiden and on the emergent outlying rocks the boundary of the proposed SAC extends up to Mean High Water. These intertidal areas include haul-outs for Annex II Grey seal and Common seal and are already designated in national legislation as an Area of Special Scientific Interest (ASSI).

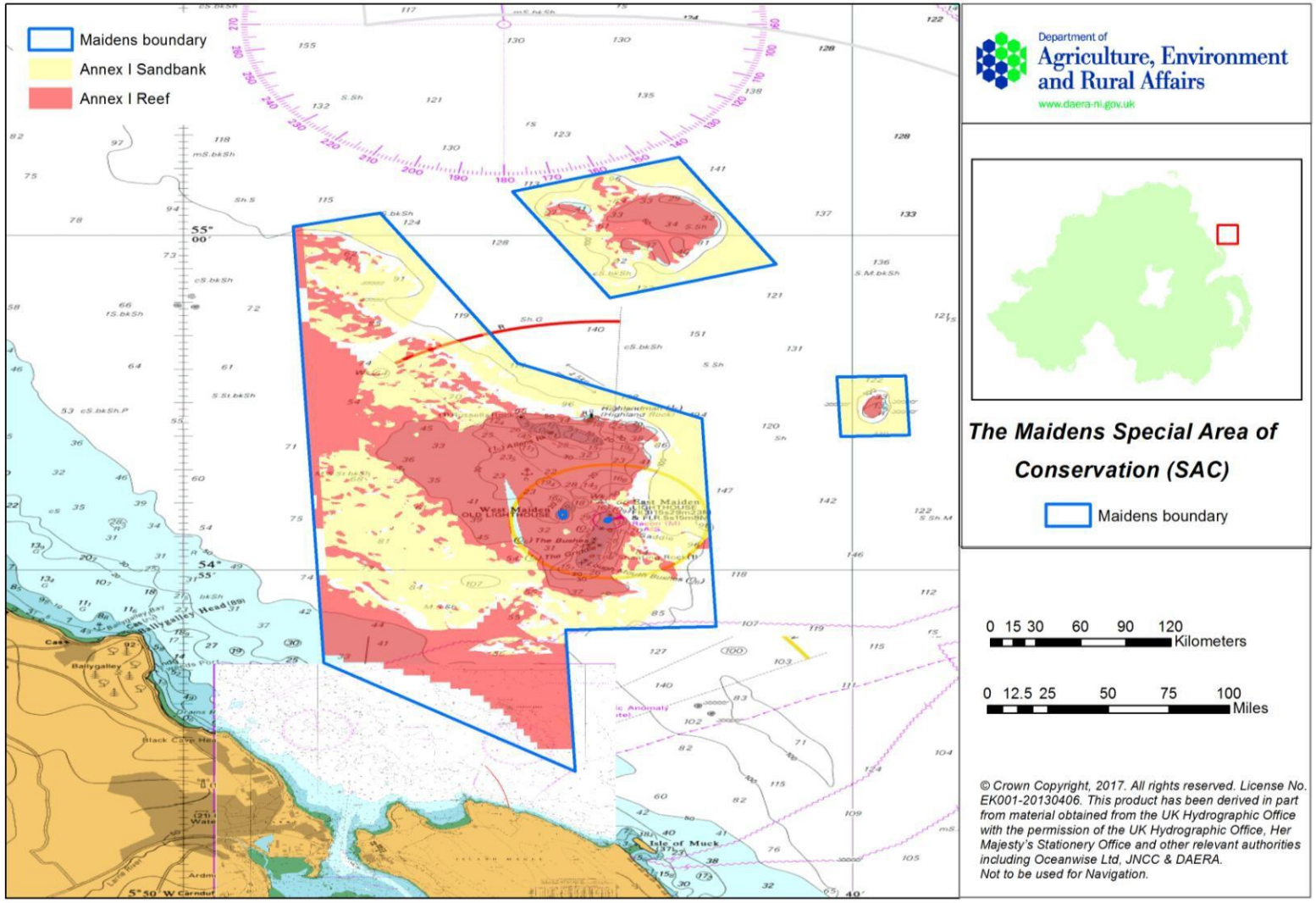

Figure 1 The Maidens SAC with Annex I habitats Reef and Sandbanks which are slightly covered by seawater all of the time

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ pop·
Habitat	Reef	A	2550 ha
Habitat	Sandbanks which are slightly covered by sea water all the time	B	200 ha
Species	Grey Seal *Halichoerus grypus*	C	50 individuals
Species	Common Seal *Phoca vitulina*	D	
Species	Harbour Porpoise *Phocoena phocoena*	D	

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 threshold for 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 The Maidens SAC.

6.1 ASSI SELECTION FEATURES

The Maidens ASSI

Feature Type	Feature	Size/ extent/ pop~
Habitat	Intertidal rock	XXha
Species	European Shag breeding population	97 individuals
Species	Common Seal (*Phoca vitulina*)	20[2] individuals
Species	Grey Seal (*Halichoerus grypus*)	60[2] individuals

[1] Population given as number of nests/individuals recorded during the Seabird 2000 survey
[2] Population given as number of individuals recorded during the 2008 seal survey

Table 2 List of ASSI features

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the

- **Reefs**
- **Sandbanks which are slightly covered by sea water all the time**
- **Grey Seal *Halichoerus grypus***

to favourable condition.
Maintain implies that the feature is in favourable condition and will, subject to natural change, remain at its condition at designation. Restore implies that the feature is degraded to some degree and that activities will have to be managed to reduce or eliminate negative impact(s). Restoration in the marine environment can refer to natural recovery through the removal of unsustainable physical, chemical and biological pressures, as well as intervention.

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 Annex I.

8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Global Status	Component Objective
Reefs	**A**	Maintain and enhance, as appropriate the extent of the reefs
		Allow the natural processes which determine

		the development, structure, function and distribution of the habitats associated with the reefs, to operate appropriately.
		Maintain and enhance, as appropriate, the viability, distribution and diversity of typical species within this habitat.
Sandbanks which are slightly covered by sea water all the time	B	Maintain the extent and volume of sandbanks which are slightly covered by sea water all the time, subject to natural processes.
		Allow the natural processes which determine the development, structure and extent of sandbanks which are slightly covered by sea water all the time, to operate appropriately.
		Maintain and enhance, as appropriate, the viability, distribution and diversity of typical species within this habitat.
Grey Seal *Halichoerus grypus*	C	Maintain (and if feasible enhance) population numbers and distribution of Grey Seal.
		Maintain and enhance, as appropriate, physical features used by Grey Seals within the site.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
European Shag breeding population	No significant decrease in population against national trends, caused by on-site factors
Intertidal Rock	Maintain and enhance species diversity within the maritime communities
	Maintain and enhance, as appropriate, transitions to other communities
Grey Seal *Halichoerus grypus*	See SAC Selection Feature Objective Requirements table
Common Seal *Phoca vitulina*	No significant decrease in population against national trends, caused by on-site factors

10. MANAGEMENT CONSIDERATIONS

The following issues relate to many marine sites and in certain circumstances may have some bearing on the management of the Maidens SAC.

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 The Maidens, or could affect it in the future. Although **Reefs, Sandbanks which are slightly covered by sea water all the time, and Grey Seal *Halichoerus grypus*** are the qualifying SAC features, factors affecting coastal ASSI features are also considered.

NOTE - Carrying out any of the Notifiable Operations listed in The Maidens ASSI schedule could affect the site.

Aggregate extraction/Maerl extraction
Extraction of aggregates or extraction of maerl, either within or adjacent to the SAC, have the potential to cause direct loss or deterioration of qualifying habitats and communities; including the deterioration of qualifying habitats and communities by smothering and increased turbidity from re-suspended material.

Agriculture and Forestry Operations
Diffuse run-off from agricultural practices has the potential to cause deterioration of qualifying habitats and communities, primarily through the alteration of water quality by discharge of organic or inorganic pollutants. Changes in agricultural (including grazing regimes) or forestry practices or changes of land use have the potential to cause deterioration of qualifying habitats and communities through changes in the nature and loading of sediments in rivers that discharge to coastal areas.

Aquaculture – Finfish farming
Finfish farming has the potential to cause deterioration of qualifying habitats and communities through changes in water quality, smothering from waste material and physical disturbance from mooring systems. There is potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals which are already widely distributed in the UK. Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Aquaculture – Shellfish farming
Shellfish farming has the potential to cause deterioration of the qualifying habitats and communities through physical damage (e.g. installation of mooring blocks and continued scouring by riser chains) and changes in community structure caused by smothering from pseudo-faeces (undigested waste products) and debris (including dead shells) falling from the farm. There is also potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals through importation or translocation of

shellfish stocks. Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Coastal and Marine Development and Infrastructure Maintenance
The construction and maintenance of structures, both within and adjacent to the sea, have the potential to cause direct loss or deterioration of qualifying habitats and communities. An example of this may be coastal defence structures that may change local patterns of sediment suspension or deposition. Other examples include: renewable and other energy installations (including offshore wind, tide and wave energy and oil and gas installations); pipelines and cables; and marina and harbour developments and maintenance including the dredging of harbours, marinas and navigation channels. In many of these cases disturbance of the seabed may cause increased turbidity and smothering in adjacent areas as well as the direct impact in the area of operation.

Discharge of Commercial effluent or sewage
Commercial effluent has the potential to cause deterioration of qualifying habitats and communities, through pollution or nutrient enrichment, which may cause subsequent changes in community structure. Contaminants may enter species food chains, including those that are persistent and those that tend to bioaccumulate and biomagnify. Lipophyllic contaminants such as organohalides are of particular concern as they tend to accumulate within fatty tissue and are remobilised during lactation in seals. Contamination of female seals by hydrocarbon residues may be detrimental to suckling pups.

Disposal of dredge spoil
The disposal of either capital or maintenance dredge spoil, either within or adjacent to the SAC, has the potential to cause deterioration of qualifying habitats and communities, through smothering, increased turbidity, or re-suspension of pollutants.

Commercial Fishing – Mobile gear (dredging and bottom trawling)
Benthic dredging and bottom trawling have the potential to cause deterioration and damage to qualifying habitats and communities (particularly maerl, Hall-Spencer, 2000) through direct contact with the dredge gear, and sedimentation when dredging occurs close to the qualifying interest. Loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities. The Department is currently engaging with the fishing community to gather detailed evidence on the locations of specific gear usage with a view to producing a fisheries management plan for the SAC. This includes a full analysis of all known fishing activities gathered over recent years.

Commercial Fishing – Pelagic mid-water trawling
Pelagic mid-water trawling has minimal potential to cause deterioration of qualifying habitats and communities through direct contact, as the trawl gear is

mostly well above the seabed (except occasionally for vessel turning in shallow water). However loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities.

Commercial Fishing – Static gear (creel/pot fishing)

The use of creels and / or pots in a localised area has the potential to cause deterioration of qualifying habitats and communities through direct contact, particularly during their deployment and / or recovery. Loss of certain species through targeted catch or by-catch has the potential to cause deterioration of qualifying habitats and communities. Seals can be accidentally captured and drowned in static fishing gear and persistent synthetic fishing gear debris, in particular, pups.

Marine Traffic – Boat maintenance and antifoulant use

Most antifoulant products are designed to kill or discourage naturally occurring organisms and, as such, cause damage to the water environment if used carelessly. Under such circumstances use of antifoulant has the potential to cause deterioration of qualifying habitats and communities within this site.

Marine Traffic – Commercial and recreational vessels

The Maidens SAC is within the confines of the North Channel, a busy shipping route. The ferry route between Larne and Lough Ryan passes through The Maidens SAC boundary. The Port of Larne has a Port Marine Safety Code and the following documents should be reviewed: 'Safety Management System' and 'Safety Policy Objectives'. The pumping of bilges, discharge of ballast water, accidental grounding, or accidental oil (or other chemical) spillage from commercial vessels could therefore all occur close to the SAC. Such incidents have the potential to cause deterioration of qualifying habitats and communities through direct or indirect impacts. Emergency and oil spillage contingency plans should take into account specific qualifying interests and recognise the importance of marine SACs should such incidents occur. Smaller recreational and fishing vessels also have the potential to cause deterioration of qualifying habitats and communities through fuel spillage and grounding.

There is also potential for accidental introduction of new non-native species and increasing the spread of existing non-native plants and animals through bilge or ballast water, sea chests, and bio-fouling on hulls (identified as a particular risk on vessels for sale that are in the water for some time before being moved to a new location). Invasive species have the potential to cause deterioration of the qualifying interests by altering community structure and quality.

Disturbance at seal haul-outs may disrupt the mother-pup bond and cause separation. Disturbance during the breeding season may lead to modifications of pupping activity as seen through avoidance of sites easily accessible by boats or through habituation to human presence.

Marine Traffic – Boat anchorages and moorings

Anchors and moorings have the potential to cause deterioration of qualifying habitats and communities through the direct impact of the anchor/mooring and the riser chains.

Marine Renewables

The Strategic Environmental Assessment (SEA) of Offshore Wind and Marine Renewable Energy by the Department of Energy, Trade and Investment (DETI, 2009) assessed the potential for commercial and test/demonstration sites in NI waters. This assessment identified potential impacts of such developments and related mitigating actions to be considered at the project developments stage. A possible commercial scale Tidal Resource Zone was identified off the North Coast within which the Crown Estate as managers of the seabed has offered development rights to two consortia, Tidal Ventures Ltd and Fair Head Tidal. However there are no tidal energy developments in this area at present and the Department is engaging with the developers in considering their respective marine licence applications.

The UK's Department of Business, Energy and Industrial Strategy (UK BEIS) administers marine environmental regulations associated with oil and gas exploration and production and the decommissioning of marine installations, wells, pipelines and associated infrastructure in the UK marine area (excluding internal waters). At present there is no oil or gas exploration licence for the 5 offshore blocks in the Antrim Coast (the Maidens SAC lies approximately 22km from this area).

The development of marine renewables has the potential to cause deterioration of qualifying habitats and communities through direct alteration, removal or manipulation of these qualifying interests and their associated species. Furthermore, deterioration of qualifying habitats and disturbance of species may occur through the use of pile driving or powerful sonar required for surveys or construction phases as these may directly harm marine mammals or act as a barrier to marine mammals using the area.

Scientific research

Research activities have the potential to cause deterioration of qualifying habitats and communities through direct alteration, removal or manipulation of these qualifying interests and their associated species. In addition, disturbance of seals may occur through various research activities, including the use of remotely operated technology (e.g. drones) especially when hauled out. These activities should be communicated to the Department for specific advice about the potential of impact and subsequent mitigation.

Geological surveys and military exercises

Geological and other surveys and military exercises all have the potential to cause deterioration of qualifying habitats and species, particularly through the use of

seismic surveys or powerful sonar that may harm cetaceans or act as a barrier to cetaceans using the area. These activities should be communicated to the Dept for specific advice for the potential of impact and subsequent mitigation.

Wildlife watching trips

Wildlife watching trips (boat and land based) have the potential to cause disturbance to species if operators are not appropriately trained in how to approach species while minimising potential disturbance. In addition, damage to sensitive habitats may occur through lack of knowledge of their location. Various wildlife training courses are available which teach best practice when dealing with wildlife.

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. The Northern Ireland Climate Change Adaptation Programme was published in January 2014. This contains the Northern Ireland Executive's response to the risks and opportunities identified in the Climate Change Risk Assessment for Northern Ireland (published January 2012) as part of the overall UK Climate Change Risk Assessment. The Adaptation Programme provides the strategic objectives in relation to adaptation to climate change, the proposals and policies by which each department will meet these objectives and the timescales associated with the proposals and policies identified in the period up to 2019.

12. MONITORING

The SACs are surveyed using two forms of monitoring:

Site Integrity Monitoring (SIM) is carried out to ensure compliance with the ASSI/ SAC conservation objectives. The most likely processes of change will either be picked up by SIM (e.g. fishing, disturbance etc.) or will be comparatively slow (e.g. gradual degradation of the habitat). Although the Maidens are remote, SIM is combined with regular seal counts as well as through the active marine ranger programme.

Site Condition Assessment of the designated features is carried out on a rolling 6 year basis to pick up subtle changes in the condition of the feature.

Site condition assessments include a variety of techniques such as diving, remote cameras, sediment sampling and acoustic seabed mapping. Marine mammal monitoring programmes also contribute.

12.1 MONITORING SUMMARY

1. ***Monitor the integrity of the site (SIM or Compliance Monitoring)***
This SIM should be carried out at least 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. Refer to Annex I.

The favourable condition table provided in Annex I 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.

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ANNEX I

The marine Annex I habitats are very broadly defined habitats that are often represented by large and complex sites. To effectively describe, monitor and manage such complex features, it has been necessary to divide some of them into smaller units called *sub-features*. Sub-features are distinctive biological communities (e.g. eelgrass beds, maerl beds, horse-mussel reefs), or particular structural or geographical elements of the feature. Due to the broad nature of marine Annex I features, it has often proved helpful, both in the development of conservation objectives, and of monitoring programs, to separate the feature into a number of constituent sub-features, and then to identify attributes and targets for the sub-features. The use of sub-features has been found to be particularly helpful for those marine Annex I features that represent whole physiographic units and permits a level of flexibility in the application of the UK's Common Standards Monitoring which has been found necessary when applying the standards at the site level.

Feature 1 (SAC) – Reef (status A)

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

Feature	Sub-feature	Attribute	Measure	Targets	Comments
Reef	Subtidal Rock and Boulder Communities Subtidal Rocky Reef Communities Intertidal Rock and Boulder Communities	* Characteristic biotopes at sites chosen so as to provide some indication of the distribution and extent of the Sub-feature.	Presence of the selected biotopes at selected sites measured once sure the reporting cycle.	Results should not deviate significantly from the established baseline, subject to natural change.	Baseline survey conducted by the Department with NMNI 2006-2009 and as a contract with AFBI (Strong, 2010). Changes in extent and distribution may indicate long term changes in the physical conditions at the site.
		* Species composition of selected biotopes at	Species composition of the selected biotopes measured once during the	Composite species of selected biotopes	Species composition will be used to determine the biotope classification. A list of selected indicator species identified by field surveys will be

		monitoring sites.	reporting cycle.	should not deviate significantly from the established baseline, subject to natural change.	utilised to determine the achievement of the conservation objectives through presence/absence at monitoring sites. The species composition of some biotopes may provide further information on changes/trends in these communities.

Feature 2 (SAC) – Sandbanks which are slightly covered by seawater all of the time (status B)
*=primary attribute. One failure among primary attribute = unfavourable condition

Feature	Sub-feature	Attribute	Measure	Targets	Comments
Subtidal sandbanks		*Extent	Area (ha) of the subtidal sandbanks to be measured periodically (frequency to be determined).	Ensure that quality and extent of sandbank are not threatened by aggregate removal.	Currently there is no licensed aggregate removal activity within or near to this SAC.
		*Sediment character	Particle size analysis (PSA). Parameters include percentage sand/silt/gravel, mean and median grain size, and sorting coefficient, used to characterise sediment type. Sediment character to be measured once during the reporting cycle.	Average PSA parameters should not deviate significantly from an established baseline subject to natural change.	Sediment character defined by PSA is key to the structure of the feature, and reflects all of the physical processes acting on it. Particle size composition varies across the feature and can be used to indicate spatial distribution of sediment types thus reflecting the stability of the feature and the processes supporting it. This is currently addressed through WFD monitoring programme.
		*Topography	Depth distribution of sandbanks from selected sites, measured periodically (frequency to	Depth distribution should not deviate significantly from an established	Depth and distribution of the sandbank reflects the energy conditions and stability of the sediment, which is key to the

			be determined).	baseline, subject to natural change.	structure of the feature. Depth of the feature is a major influence on the distribution of communities throughout. The baseline for this feature was delivered through work carried out by AFBI (2010) on to provide habitat maps.
	Subtidal Sand and Gravel Communities Subtidal Fine Sand and Mud Communities	*Characteristic biotopes at sites chosen so as to provide some indication of the distribution and extent of the Sub-Feature.	Presence of the selected biotopes as identified by the NI Sublittoral survey at selected sites measured once during the reporting cycle	Results should not deviate significantly from the established baseline, subject to natural change.	Baseline survey required. Changes in extent and distribution may indicate long term changes in the physical conditions at the site
		*Species composition of selected biotopes at monitoring sites.	Species composition of the selected biotopes as identified by the NI Sublittoral survey measured once during the reporting cycle.	Composite species of selected biotopes should not deviate significantly from the established baseline, subject to natural change.	Species composition will be used to determine the biotope classification. The species composition of some biotopes may provide further information on changes/trends in these communities.

Feature 3 (SAC) – Grey Seal *Halichoerus grypus* (status C)

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

Attribute	Measure	Targets	Comments
*Number of Adults	Maintain and enhance the population as appropriate.	The number of adults to be at least 50 individuals.	Data generated by ongoing DAERA Marine and Fisheries Division survey.
*Distribution of adults	Maintain the range and distribution of grey seals.		Ensure individuals operations or activities (in combination with other operations or activities) do not cause a change in range, distribution or population structure which would result in unfavourable conditions for the future conservation interests of this species.
*Habitat availability	Number of areas used for moulting, haul-out and breeding.	Ensure that there is a sufficiently large habitat (haul-outs) of suitable quality available to support the long term survival of this species.	

TULLY BOG SAC
UK0030326

CONSERVATION OBJECTIVES

Document Details

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Prepared By	*R. McKeown*
Approved By	*P. Corbett*
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Contact	cdp@doeni.gov.uk

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Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	Nov 2014	Complete review	RMK

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 as 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: TYRONE

GRID REFERENCE: H420755

AREA: 36 ha

5. SUMMARY SITE DESCRIPTION

Tully Bog is an isolated lowland raised bog lying in a shallow hollow within the former flood plain of the Lower Fairy Water River. The central intact dome is fairly well developed and supports a weak temporary pool system with a good hummock and hollow development on the bog plain.

There is a small raised drumlin in the centre of the bog, which is covered by a shallow layer of peat, where birch woodland has developed. Close to this, a linear pool with *S. cuspidatum* has formed in a deep, narrow fissure in the peat's surface. This may be the result of marginal cutting. *S. imbricatum* and *S. fuscum* are present.

Disturbance to the bog had been confined to cutting and occasional burning on both the intact core and cutover margins.

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 uses permanent man-made features all around the periphery. The boundary has been drawn to include all areas of intact lowland raised bog and associated semi-natural habitats, including cutover bog and Birch scrub.

6. SAC SELECTION FEATURES

Feature type	Feature	Global Status	Size/ extent/ population
Habitat	Active raised bog	B	23.77 ha
Habitat	Degraded raised bog still capable of regeneration	D	10.87 ha

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 Tully Bog SAC.

6.1 ASSI SELECTION FEATURES

Tully Bog ASSI

Feature Type	Feature	Size/ extent/ population
Habitat	Lowland Raised Bog	36 ha

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the active raised bog to favourable condition.

For each SAC/ASSI feature, there are a number of component objectives which are outlined in the tables 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 annexes.

8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

SAC Feature	Global Status	Component Objective
Active raised bog	B	Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation.
		Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species.
		Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog.
		Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog.
		Maintain the hydrology of the raised bog peat mass.
		Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

ASSI Feature	Component Objective
Lowland Raised Bog	Maintain the extent of intact lowland raised bog.
	Seek to expand the extent of actively regenerating raised bog.
	Maintain the hydrology of the raised bog peat mass.

10. MANAGEMENT CONSIDERATIONS

Ownership

12 owners hold both mineral and sporting interests; DETI hold mineral interests and DARD hold sporting interests.

Adjoining Land Use

The land surrounding the site is intensively managed agricultural land in silage and grazing.

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 Tully Bog, or could affect it in the future. Although Active Raised Bog is the qualifying SAC feature, factors affecting ASSI features are also considered.

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

Peat Cutting

There has been extensive hand cutting for many years around the periphery. Along the edge of the intact bog, the cut peat face is high in places, resulting in localised desiccation of the adjacent intact surface. Although the old hand cuttings now support either actively regenerating bog vegetation or birch wood, localised mechanised peat cutting has been carried out within the former in recent years at the northern end of the site. In one instance, mechanised cutting had encroached onto the intact surface of the bog. Peat cutting at the time of designation was not seen as problematical.
ACTION: No unauthorised peat cutting within the SAC.

Burning

Burning of the vegetation has taken place occasionally. NIEA surveys reported some evidence of burning over most of the northern half; in a limited area the effect was described as severe. However, the most recent NIEA habitat survey concluded that the bog had recovered well. Excessive burning will tend to reduce the cover of *Sphagnum* mosses and ericaceous species, increasing the proportion of *Molinia caerulea* and *Trichophorum cespitosum*. In addition, structural diversity will be reduced as many of the rarer and more prominent hummock-forming species (such as *S. imbricatum*) appear to be particularly susceptible to burning.
ACTION: No burning within the SAC.

Drainage

The intact surface remains largely free of drains. However, there are a few old drains associated with the cuttings around the periphery. Any drains that are

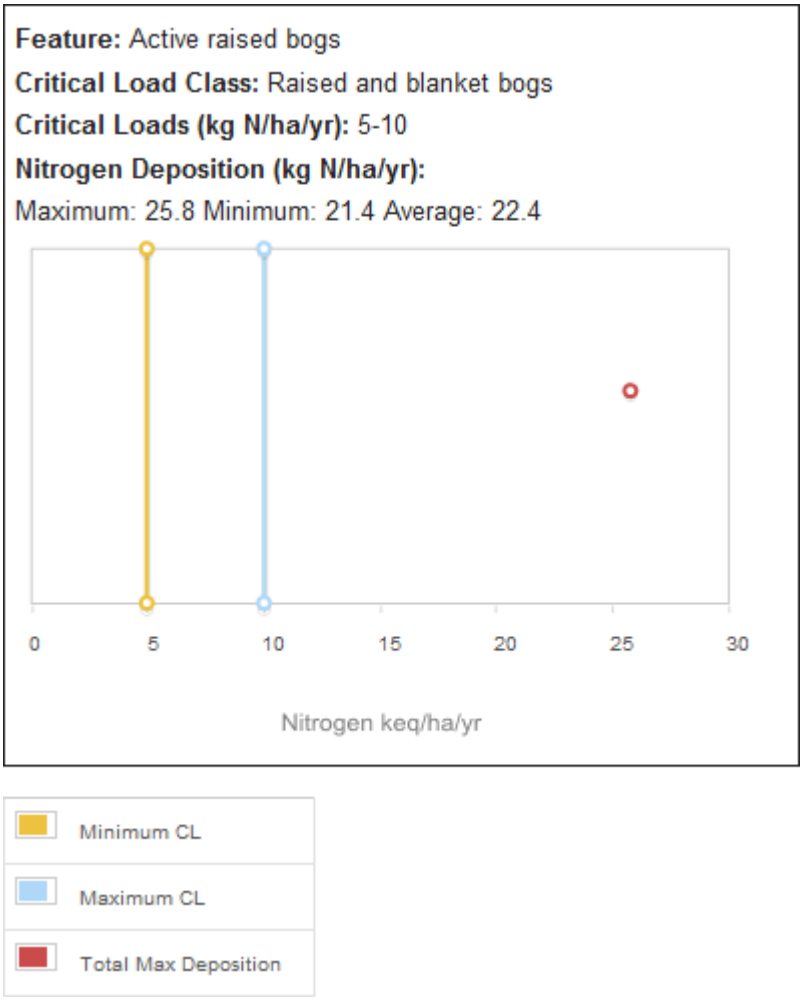
currently carrying water away from the peat mass should be identified and blocked. Note that drainage works outside of the site's boundaries could potentially impact on the bog's hydrology.
ACTION: Block active drains where appropriate.

Grazing

Lowland raised bogs are not suitable for grazing, as the surface is fragile and easily damaged by poaching.
ACTION: Fences around the periphery of the bog should be maintained to prevent grazing occurring on the site.

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 Tully Bog SAC.



(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.

Scrub Encroachment

Trees and scrub growth is extensive within the cutover bog extending right up to the periphery of the intact area in parts. In addition a localised stand of trees and shrubs is growing in the centre of the intact area due to the presence of mineral soil close to the surface here. Scattered birch scrub is extending out from this isolated stand onto the intact surface to the east. Scrub encroachment into the actively regenerating cutover areas, or onto the intact surface is undesirable and generally indicates drying out. Even where this is not the case, scrub can damage the bog vegetation through such factors as shading and leaf litter. In addition, tree roots may disrupt the hydrological function of the underlying acrotelm and catotelm, and act as nitrogen fixers (e.g. Birch), thus altering the chemical composition of the peat.

ACTION: Monitor scrub encroachment and take remedial action if required. Remove any invasive exotic species, such as Rhododendron as a matter of urgency.

Fly-tipping

There have been a few localised incidents of fly-tipping in the cutover area of the bog. A more serious problem occurs to the north of the bog where extensive infilling over a small area was carried out prior to designation. This infilling consists of hard-core infill which has now risen well above the surface of the bog. The dump was included within the site to prohibit further expansion. It has now been consented as a storage area as part of a Management Agreement.

ACTION: If localised fly-tipping does occur, it should be removed as soon as possible to help prevent any further incidences of dumping.

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

- ***Monitor the integrity of the site (SIM or Compliance Monitoring)***
  Complete boundary survey. Ensure that there has been no peat cutting, dumping or burning carried out within the SAC boundary. This SIM should be carried out once a year.

- ***Monitor the condition of the site (Condition Assessment)***
  Monitor the key attributes for the active raised bog. This will detect if the active raised bog is in favourable condition or not. See Annex 1 for SAC features.

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 <u>not by itself</u> 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.

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ANNEX 1

Feature 1
SAC Feature – Active raised bog

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

Attribute	Targets/Limits	Method of Assessment	Field Notes	Comments
Extent				
*Area of intact surface (ha)	Maintain the extent of intact bog surface (at 16.72 ha).	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.	No loss of intact raised bog was observed during the condition assessment, but SIM and aerial photographs were not consulted.	Any loss of the current intact area is unacceptable. The active raised bog communities include M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire community and M2, the *Sphagnum cuspidatum/recurvum* bog pool community dominated by *S. cuspidatum*.

*Area of actively regenerating cutover bog (ha)	Maintain the current extent of actively regenerating cutover bog (7.05 ha). This area should be extended where possible.	Visual estimate in 2x2 plots and across the intact raised bog using a combination of aerial photographs, SIM and Condition Assessment structured walk.		There should be no loss in extent of actively regenerating bog to scrub encroachment or further peat cutting.
* Area of mosaic communities and associated habitats	Maintain associated mosaic communities and habitats (bog woodland, fen, etc)	Visual estimate across the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	The condition of this attribute cannot be assessed until the next monitoring period.	Repeat monitoring using condition assessment, SIM, and aerial photographs should indicate whether mosaics and associated habitats have changed or been lost.
Structure				
Dwarf-shrub height	Average ericoid height should be 15 – 35 cm.	Visual estimate in 2x2 m plots.		
*Bare Peat (%)	Peat cutting or drainage should not damage the intact surface of the active raised bog. Bare peat should occupy < 5% of the total area of the active raised bog.	Visual estimate in 2x2m plots		

*Pool/hummock system extent and diversity	The extent and diversity of the raised bog pool system must be at least maintained. Permanent pools containing any of the species listed below within a 10 m radius of the plot should be recorded. *S. cuspidatum* , *S. denticulatum S. magellanicum, Drosera, anglica, D. intermedia,* Menyanthes trifoliata.	Visual estimate within a 10m radius of plots and across the feature using a combination of aerial photographs and Condition Assessment structured walk.	The condition of this attribute cannot be assessed until the next monitoring period.	Pool systems do not always occur on lowland raised bog systems. However, where they do occur, they are a very important micro-topographical feature of bog surface and their extent and condition should be maintained. Tully Bog supports a weak temporary pool complex, but hummocks are well developed.

Vegetation Composition – Positive Indicators				
*_Sphagnum_ Cover/Abundance (% cover and frequency) Active Peat Formation (DAFOR)	Ombrotrophic _Sphagnum_ moss species should have a minimum cover of 33% over at least 66% of the intact lowland raised bog surface. Thick, hummock forming species of sphagnum should be at least occasional.	Visual estimate in 2x2m plots. Visual estimate in 2x2m plots.	Species present should include a mixture of both thin species: - _S. capillifolium_ and _S. tenellum_ and the thick hummock forming species: - _S. papillosum_ and _S. magellanicum_ at least Occasional over the surface.	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 intact bog surface.
*Ericaceous Cover (%) and frequency of _Erica tetralix_ (DAFOR).	Ericoid cover should be maintained between 40% and 60% of the intact bog surface. _Erica tetralix_ should be at least present over a minimum 66% of the intact lowland raised bog surface.	Visual estimate in 2x2m plots		A mono-dominant sward of _Calluna vulgaris_ may suggest that the surface of the intact bog is drying out – i.e. the water table is too far below the surface of the bog.
*Graminoid Cover (%)	Graminoid cover should be maintained between 10 and 40%.	Visual estimate in 2x2m plots		

Vegetation Composition – Indicators of negative Change				
*Frequency and % cover of scrub/tree encroachment on any active peat surface (DAFOR and % cover)	Scrub/tree encroachment should be no more than Rare on the intact raised bog surface or in the actively regenerating cutover areas. Mean cover should be less than 2%.	Visual estimate within a 10 m radius of plots and across the active peat surface using aerial photographs and Condition Assessment structured walk.		If scrub/tree species are more than rare on any active peat surface, scrub control should be carried out.
**Rhynchospora alba* Abundance (% cover)	*Rhynchospora alba* cover should be less than 10%.	Visual estimate in 2x2m plots		*Rhynchospora alba* only occurs as a natural component of the bog vegetation around pool systems. A high frequency of this species over the intact surface of the bog may be a consequence of excessive burning.
**Myrica gale* Abundance (% cover)	*Myrica gale* cover should be less than 10%.	Visual estimate in 2x2m plots		

* Management - Burning (% cover)	Signs of recent burning should occupy less than 5% of the intact raised bog surface and the actively regenerating cutover areas.	Visual estimate in 2x2 m plots and across the active bog surface using a combination of aerial photographs and Condition Assessment structured walk.	Recent burning is represented by areas burnt within the last two years.	
* Management - Grazing (% cover)	Signs of grazing (poaching/dung) should be no more than rare on the intact raised bog surface and the actively regenerating cutover areas.	Visual estimate in 2x2 m plots.		The frequency of droppings, the extent of poaching, uprooting of dwarf shrubs, invasion by *Juncus squarrosus* etc. and the presence of grazing induced *Calluna vulgaris* growth forms indicate moderate and heavy grazing.
Indicators of Local Distinctiveness				
* Presence of rare or scarce species specific to the site. *Sphagnum austinni* *Sphagnum fuscum*	Locally distinctive species recorded for the site should be at least present along the length of the Condition Assessment structured walk.	Name the species at least present along the length of the Condition Assessment structured walk.		If these species are not recorded on any one visit, it does not automatically make the site unfavourable.

Northern Ireland Environment Agency
Gníomhaireacht Comhshaoil Thuaisceart Éireann
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UPPER BALLINDERRY SPECIAL AREA OF CONSERVATION

Site Code: UK0030296

SITE CONSERVATION OBJECTIVES

& Supporting advice

Version 3
6 September 2024

Document Details

Upper Ballinderry River SAC Conservation Objectives
V2 Published April 2015
Approved by Paul Corbett

V3 Revised supporting advice
Approved by Richard Gray, Sara McGuckin
Date effective from: 6 September 2024

Contact: BCSGeneral@daera-ni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2024	Complete review of supporting advice at Annex A - freshwater features, additional minor updates.	AD, RG, LS

Site Relationships

The Upper Ballinderry SAC is hydrologically linked to the Lough Neagh and Lough Beg SPA and Ramsar.

1. INTRODUCTION

There is a clear responsibility under the Habitats and Birds Directives[1] and associated domestic legislation, namely the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995 (as amended)[2], hereafter referred to as the Habitats Regulations to ensure that all habitats and species listed in Annexes I and II of the Habitats Directive, are maintained or restored to Favourable Conservation Status (FCS).

Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) also contribute to meeting UK international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions.

The UK national site network of European sites, formerly known as Natura 2000 sites, have a crucial role to play in achieving the overall objective of FCS 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 UK.

To ensure that each 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 national site network, countries 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 the national site network over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, national site network 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] Updated through the Conservation (Natural Habitats &c.) (Amendment)(Northern Ireland)(EU Exit) Regulations 2019.

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.

The site-level conservation objectives, the supporting advice (at Annex A) and any case-specific advice given by NIEA Natural Environment Division, should be used when developing, proposing or assessing an activity, plan or project that may affect this site.

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 National Site Network.

4. SITE INFORMATION

SITE: Upper Ballinderry River SAC
COUNTY: TYRONE
GRID REFERENCE: IH 725794
Upper G.R.: IH 6617719
Lower G.R.: IH 804768
AREA: 58.8 ha

5. SUMMARY SITE DESCRIPTION

The SAC includes the river and it’s associated riverine flora and fauna and adjacent semi-natural vegetation, primarily woodland flora and fauna. This 24.1km of river rises at an altitude of 195m and flows through Cookstown at an altitude of 45m. It is a fast-flowing spate river, notable for the physical diversity and naturalness of the bank and channel, and the richness and naturalness of its plant and animal communities which includes White-clawed Crayfish *Austropotamobius pallipes*, beds of Stream Water Crowfoot *Ranunculus penicillatus* var. *penicillatus* and one of the largest Northern Ireland populations of the now rare Freshwater Pearl Mussel *Margaritifera margaritifera*. The adjacent semi-natural vegetation is typically Blanket Bog in the upper catchment and woodlands in the lower. However, the woodland is very fragmented and variable but includes Oak, Alluvial and Ash woodland types which contain notable species as Rough Horsetail *Equisetum hyemale* and Wood Fescue *Festuca altissima*, in addition to a rich fungi community.

Further details of the site are contained in the ASSI Citation and Views About Management statement, which are available on the DAERA website (https://www.daera-ni.gov.uk/protected-areas).

5.1 BOUNDARY RATIONALE

General

Selection of site boundaries is inconsistent throughout the proposed SAC River network with no standardised criteria currently in used. The criteria used vary between countries and even between sites within each country that has resulted in a wide discrepancy in the area included within the proposed SAC's. The four options currently in use are (1) whole catchments, (2) main river stem from source to mouth, tributaries and upland catchment, (3) main river stem from source to mouth and tributaries and (4) main river stem from source to mouth only. The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature. In the case of the Upper Ballinderry River the SAC qualifying features are its population of *Margaritifera margaritifera* and its *Ranunculus* community which is confined to the main channel.

Specific

The upper river limits of this site is determined by the restricted size of the channel while the lower river limit is determined by Cookstown below which the river is severely degraded. The width of the lateral boundary beyond the river channel follows the same guidelines as that for all ASSI, which is dependent on the type of adjacent habitat. In the case of this site, there is limited adjacent habitat which can be justifiability included, so the lateral boundary is frequently restricted to the top of the riverbank.

The site boundary utilised permanent man-made boundary features wherever possible, however along some stretches of the river and woodland edge such boundaries where absent, and recognisable topographical or physical features such as break in bank top, slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

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

Feature type	Feature	Global Status	Size/ extent/ pop~
Species	Freshwater Pearl Mussel Margaritifera margaritifera	B	1000
Habitat	Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	95% of channel length
Species	Otter Lutra lutra	C	C
Habitat	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	D	

Habitat	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion alvae*)	D	<5%
Habitat	Blanket Bog	D	5
Species	White-clawed Crayfish *Austropotamobius pallipes*	D	P
Species	Atlantic Salmon *Salmo salar*	D	R

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex A 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 threshold for 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 Upper Ballinderry River SAC.

Guidance and literature: https://www.daera-ni.gov.uk/protected-areas/upper-ballinderry-river-sac

6.1 ASSI SELECTION FEATURES

Upper Ballinderry River ASSI

Table 2. List of ASSI features.

Feature Type	Feature	Size/ extent/ pop~
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic to mesotrophic types.	
Species	Freshwater Pearl Mussel *Margaritifera margaritifera*	
Species	Otter *Lutra lutra*	

7. CONSERVATION OBJECTIVES

The conservation objective for this site is:

To maintain (or restore where appropriate) the

- Fresh Water Pearl Mussel Margaritifera margaritifera
- Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation
- Otter Lutra lutra 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	Grade	Objective
Freshwater Pearl Mussel Margaritifera margartifera	B	Maintain and if feasible enhance population number through natural recruitment.
		Improve age structure of population.
		Improve water quality.
		Improve channel substrate quality by reducing siltation.
		Ensure host fish population is adequate for recruitment.
Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation	B	Maintain and if feasible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Otter Lutra lutra	C	Population numbers and distribution to be maintained and if possible, expanded.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water, and all associated wetland habitats

9. ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic to mesotrophic types.	Maintain and if possible enhance extent and composition of communities.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if possible enhance the river morphology
	Maintain the diversity and quality of habitats associated with the river, e.g. bog, wet grasslands, scrub and oak woodland.
Freshwater Pearl Mussel *Margaritifera margartifera*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table.

10. MANAGEMENT CONSIDERATIONS

Ownership

In total, there are 130 individuals or organisations with ownership or other rights associated with the site.

Adjoining Land Use

The upper reach of the river flows through a predominantly upland peatland landscape used for rough grazing with the river channel generally being un- enclosed. Along its mid-reach, the river runs through improved or semi-improved pasture used for silage and grazing and is generally fenced from the surrounding land at least along one bank top. In the lower reach, the main adjacent agricultural uses include tilled land and silage production as well as stock grazing. Here, a significant proportion of the river is bounded by woodland either as discrete woodland blocks along the valley side or as a thin bank top belt. The river channel or the adjacent woodlands are only partially fenced. Where the bank and channel of the river are accessible to stock their activities can be directly and indirectly damaging to both the *M. margaritifera* and the macrophyte community. The construction of weirs by fishing clubs as part of the Salmon Enhancement Scheme has locally altered the morphology of the river.

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 Upper Ballinderry River or could affect it in the future.

Although Freshwater Pearl Mussel Margaritifera margartifera, Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation and Otter Lutra lutra are the qualifying SAC features, factors affecting ASSI features are also considered.

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

Fish Farms

Fish farm installations usually abstract water from the watercourse then release effluent to the same course, the abstraction point is normally upstream of the release point. Where the abstraction is large relative to streamflow, the portion of channel between points of abstraction and release may have a much reduced discharge and water velocity. The effect can be so extreme that it obstructs the upstream movement of migrating fish and is also acting as a barrier to other water-born wildlife. Effluents from intensive fish farming units may differ from the natural stream water by having a modified temperature and pH and may be contaminated with toxic materials. It also carries waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and hence a low oxygen concentration in the water), increased suspended solids and enrichment of the

recipient stream. When fish-rearing facilities are being set up it is imperative to ensure there is always an adequate compensatory flow along the river and that the effluent is adequately treated.
ACTION: Proposals for any fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that that the effluent is adequately treated.

Water Extraction

A business premises at Kildress Bridge is strongly impacting upon the river by diverting most of the water from the channel. This diversion of water has caused the river channel, between the abstraction point and discharge point, to be all but dry during the summer. Observations indicated that the diversion weir has been recently raised. This weir is likely to be having serious implications for migrating fish and is also acting as a barrier to other water-born wildlife. Fresh water pearl mussel are found above and below the weir and thus this already vulnerable population is being further fragmented by this structure.
ACTION: Lower weir height to a level which permits adequate compensation flow to replenish the river channel even in times of drought.

Water Quality/Eutrophication

Analysis of the results relating to both chemical and biological water quality monitoring from 1991 to 1996 indicates there has been a deterioration in water quality over this period. Water quality is the most important factor in the enhancement of the Ballinderry catchment and is affected from both point and diffuse source pollution.

Stock having open access to the channel in many sections has caused poaching of the river bank/channel, leading to soil erosion, which represents another possible source of enrichment.
ACTION: Minimise enrichment of the water column from point source pollution, such as fish farms. Reduce levels of diffuse pollution by encouraging a catchment-wide campaign to reduce excessive fertiliser inputs on land. Restrict stock access to specific watering points.

Channel & Bank Modification

The Ballinderry river has been extensively altered by man in the recent past, however the river continues to recover from the effects of resectioning etc. Several fisheries weirs have been recently created in the lower reach of the river. These modifications have changed the natural flow regime of the river.
ACTION: Future in-river works should be minimised as they remove diversity and threaten vulnerable shellfish populations. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole. Initiate discussions with Rivers Agency to co-ordinate action.

Habitat enhancement schemes such as the 'Salmonid Enhancement Programme' should be thoughtfully planned. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character. Properly executed enhancement schemes can significantly improve the wildlife potential of rivers. It is important to effectively manage the installation

of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. Initiate discussions with DAERA Marine & Fisheries Division to co-ordinated action.

Substrate siltation

Sand wash from a number of commercial sandpits in the upper reach of the river has resulted in siltation of the riverbed downstream of the access points.
Livestock have open access to the river channel in many sections and have caused poaching of the bank/channel, causing soil erosion, resulting in siltation of downstream river beds.
ACTION: Sediment levels in tributaries and immediately down stream of sandpit inputs should be closely monitored and controlled.

Restriction of stock access to drinking areas only.

Trampling

Stock trampling in the channel threatens pearl mussel populations. Stock trampling and poaching in adjacent woodlands has resulted in severe damage to the woodland flora and has prevented regeneration.
ACTION: Restrict stock access to drinking areas only. Exclude stock from woodlands or reduce stocking levels to sustainable grazing levels.

Fly-tipping

Small-scale fly tipping has occurred along the banks and in the river channel as well as in adjacent woodland.
ACTION: Remove dumped material from the river banks and channel and where practical the woodland, to prevent the buildup of debris and to discourage further fly-tipping.

Alien Species

Giant Hogweed *Heracleum mantegazzianum* is present along the riverbanks in the lower reach of the river, close to Cookstown.
ACTION: Ensure the immediate removal of invasive/alien species to prevent them spreading further along the river.

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. Critical levels and critical loads have been calculated for protected site features.

Please refer to the UK Air Pollution Information System (APIS) for site relevant critical loads and levels at 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 levels and loads.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works 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. CONSERVATION MANAGEMENT PLAN

A Conservation Management Plan for the Upper Ballinderry River SAC has not yet been published.

13. MONITORING

Monitoring of SACs takes place 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 habitat).

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.

13.1 MONITORING SUMMARY

1. Monitor the integrity of the site (SIM or Compliance Monitoring)
   Complete boundary survey to ensure the boundary features, where present, are still intact. Ensure there has been no tree felling, ground and riverbed disturbance, dumping or inappropriate burning carried out within the SAC boundary. Evaluating stocking densities would also be desirable, while a check for feral goat damage should be carried out throughout the site. This SIM should be carried out once every 3 years. Inspection of river reaches with Pearl Mussel colonies should be undertaken once a year to insure there has not been any pearl fishing.

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 A.

   The favourable condition table provided in Annex A 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.

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ANNEX A – Supporting advice

Feature 1 (SAC) – Freshwater Pearl Mussel Margaritifera margaritifera (Status B) (* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Target	Method of Assessment	Comments
Population			
a. Spatial Extent	Should reflect distribution under near-natural conditions	Visual survey of riverbed	Population distribution should be close to that expected under near-natural conditions throughout the site, taking into account natural habitat conditions and allowing for natural fluctuations. The target is to secure a sustainable population of mussels that is able to utilise all naturally suitable habitat within the river
b. Population density	≥ 5 mussels per m^2 within sample transects	Visual survey of riverbed.	The density data from all transects within each monitoring unit should be aggregated and the resulting figure assessed against the target. In smaller rivers where 50m transects have not been surveyed, density data from all quadrats should be aggregated and assessed against the target.
c. Age structure	i. At least 20% of population ≤65mm ii. At least 5% of population ≤ 30mm.	Length measurement of mussels recorded in quadrats within 50m transects.	Population profiles should not be attempted where mussel beds are vulnerable to damage. In this case, the target is to find at least one pearl mussel ≤65mm. This results in a lower degree of confidence that the population is reproductively viable but should protect it from potential adverse disturbance during survey. A threshold of at least one mussel

			is required in order to confirm recent recruitment and minimise disturbance of a population during survey.
d. Dead shells	<1% of population per year and scattered distribution.	Counting within 50m transects.	1% (based on a 100-year life span) considered to be indicative of natural losses for survey sites and for the entire river population per year. Where >1% dead shells are found, an investigation into the cause should be carried out to assess whether it may be an exceptional natural event or an indication of an unnatural kill. The dead shells should be examined for freshness (by checking the colour of the nacre) to help assess the likelihood of a problem.

Attribute	Target	Method of Assessment	Comments
Water Quality			
For freshwater pearl mussel, organic pollution, reactive phosphorous, acidification, and other nutrients are particularly important. Nutrient concentrations should be near natural.	See sub-attributes below. Targets included in the CSM guidance for Rivers should be used. These targets are intended to support a healthy, naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. Some more stringent chemical targets for pearl mussel are listed below.	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Water quality should not be injurious to any life stage. All classified reaches within the designated site that contain, or should contain, freshwater pearl mussel should comply with targets given. Data from the last 3 years should be used. All water quality data should be available on request from NIEA.
a. Phosphorus	In locations where annual mean soluble reactive phosphorous (SRP) levels are <5 µg L^{-1}, the target should be 5 µg L^{-1}. For	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	The SRP target value should not be set for a river without first checking the baseline P levels and any historical data available for

	rivers that exceed this, the target is the more stringent value of either: high status values for SRP under the WFD, or the SRP target for CSM river habitat.		the that river. Undetectable levels of SRP are not necessarily a guarantee of good health, particularly if the local analysis equipment is unable to perform at low concentrations. If all the available phosphorus is being transferred into filamentous algae, then it will not be detectable as SRP in open water. A combination of very low SRP with the absence of filamentous algae is considered to indicate nutrient levels conducive to *Margaritifera* populations in favourable condition.
b. Nitrogen	Nitrate annual median value of <0.125 mg L^{-1} N	Standard monitoring protocols in CSM guidance for Rivers (Data from NIEA).	This threshold is based on a study of 560 sites in 126 rivers: 0.125mg L^{-1} N for Ireland (Moorkens, 2006). Like phosphorous, nitrate levels are a measure of the naturalness of the surrounding catchment, and limits should be set at those natural for that catchment. Where nutrient levels are too high to sustain pearl mussel populations, levels of all nutrients should be reduced until sustainability is achieved.
c. BOD	Mean BOD <1.0 mg L^{-1}	Standard monitoring protocols in CSM Guidance for Rivers. (Data from NIEA).	Rivers with reproducing populations in the UK, Ireland and Spain have BOD levels consistently<1.0 mg L^{-1}

Attribute	Target	Method of Assessment	Comments
Flow	Flow targets included in the CSM guidance for Rivers should be used, as these are intended to support a healthy naturally functioning river ecosystem which protects the whole biological community and individual species to a degree characteristic of the river. As a minimum, UKTAG standards for GES under the WFD should be met. River flow rates should be as natural as possible throughout the site, avoiding human induced high and low extremes.	Gauging stations (Data from DfI Rivers).	River flow affects a range of habitat factors of critical importance to FPM, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and base flows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach, however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy – long term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.

Attribute	Target	Method of Assessment	Comments
Habitat Structure In channel structures and morphology	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI.	Assess using RHAT methodology for river habitat or species-specific methods if available and appropriate. River Hydromorphology Assessment Technique - Training Manual | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The river's natural form and function should support all of the habitat features necessary for pearl mussels to thrive, in characteristic proportions. Widening or deepening of channels, and extensive artificial reinforcement of banks, are

			indicators of unfavourable condition. Further information on the importance of physical habitat to pearl mussels is available in published CEN guidance. Information on in-channel structures is available in CSM Guidance for Rivers.

Attribute	Target	Method of Assessment	Comments
Other Attributes			
a. Fine sediment (redox)	There should be no pronounced difference in redox potential (typically <20%) between open water and interstitial water at 5cm depth.	Redox measurements collected in open water and riverbed, at or around population transect locations.	Excessive delivery of fine sediment, from the catchment or artificially enhanced bank erosion, may lead to a range of problems relating to surface siltation, the compaction or concretion of riverbeds and to the infilling of substrate interstices. This affects oxygen supply and exchange within the substrate as well as the ability of juvenile mussels to burrow. Infiltration by fine sediments is one of the main causes of decline in juvenile recruitment for pearl mussel populations. *Infiltration of high loads of fine sediment typically results in low oxygen supply to interstices of the substrate. Redox measurements provide a reliable estimate as a surrogate for the oxygen level within the interstices of the substrate compared with the open water.
b. Fine sediment (siltation) and Suspended Solids	No unnaturally high levels of siltation indicated by: 'silt on substrate' highlighted in section K of the RHAT form ('Bank	Field observations and site-specific information derived from RHAT.	Direct measurement of turbidity is not recommended, because values vary naturally in response to changes in flows with no clear

	and channel features) OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (SI) as the predominant channel substrate where not expected from local geology. The continued use of the following Suspended Solids target is under further review by NIEA:- Annual mean <10mg L^{-1}		understanding of a suitable reference value.
c. Filamentous algae	<5% cover across assessment units	Visual assessment during mussel survey and relevant metrics collected during LEAFPACS survey by NIEA.	Filamentous algal cover should be measured during the pearl mussel survey. In oligotrophic conditions nutrient levels should never be high enough to allow dense mats of filamentous algae growth. The persistence of filamentous algae is an indication that nutrient levels may be too high for sustainable *Margaritifera* populations but may also indicate low flow problems. Using the LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys.
d. Fish host populations: native juvenile salmonid densities (0+ and 1+ year classes)	1. Should be abundant: >0.1 native juvenile host salmonids per m^2. 2. Should be able to find fish infected with glochidia between September and May.	Standard electrofishing protocols. Visual inspection of gills, particularly later in glochidia incubation period.	An abundant supply of native juvenile salmonids is vital to the survival of the larval stage. The relative importance of salmon and migratory and non-migratory brown trout populations to pearl mussels will vary between rivers. Physical and chemical conditions need to be suitable for the well-being of all life stages of salmonids, including free access up the river and conditions in the

			estuary and lower river where the juveniles of migratory salmonids are present. It is important to determine the species of host fish that a mussel population needs in a particular river as local pearl mussel populations can use salmon, trout or both species. Electrofishing should be carried out twice using standard methods, once in early autumn to establish the presence and density of suitable fish hosts as a proportion of the fish population just downstream of mussel beds, and again in late spring to establish the presence of 1+ fish in the vicinity of permanent mussel habitat. This does not adversely affect pearl mussels. The fish in the second survey should be checked for encystment of glochidia on the gills which are visible on the live fish. More detailed studies of fish numbers and glochidial encystment (e.g. number of glochidia per fish) can be undertaken but the above should be considered as a minimum requirement.
e. Alien/locally non-native species	No non-native species likely to cause impairment of freshwater pearl mussel populations	Survey data collected and analysed by NIEA.	Non-native species constitute a major threat to many river systems. Impacts may be on the river 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. Assessment of non-native species is based on the principles used in assessing high ecological status under the WFD, and applies to species on the banks and in the riparian zone as well as species of the channel and the margins. alien species | wfd uktag. Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies); this list contains only high-impact species.
f. Stocking transfers of other species	No inappropriate stocking/translocation of fish species.	Fishery stocking consents. Impact assessments of stocking consents on a catchment scale may be required to determine an acceptable level.	Rainbow trout and brook trout are resistant to glochidial infection and are not, therefore, suitable host species. Stocking of these species will create competition with native salmonids and is likely to reduce host opportunities for glochidia. Any stocking of native salmonids must take account of the genetic diversity of resident salmonids. The host fish/mussel relationship seems likely to have a genetic component, which could be affected by inappropriate stocking.
g. Introduction/transfers of freshwater pearl mussel	No introduction/transfers of freshwater pearl mussel unless agreed to be in the best interest of the population	Knowledge of site management	Translocation is not generally recommended as a conservation tool. It is a technique that has been little used and must still be considered experimental. Translocation (if feasible) should therefore be seen as a last resort. In GB and Northern Ireland, genetically distinct freshwater pearl mussel populations have

			been found to exist in separate catchments (Cauwelier, 2009). Any translocations or transfers of FPM must follow IUCN and other local guidelines.
h. Pearl Fishing	No evidence of pearl fishing	Standard survey protocol	Pearl mussel fishing is prohibited under the Wildlife (NI) Order 1985.
i. in-stream activities	No evidence of damage of existing mussel beds	NIEA monitoring/consenting programmes and standard survey protocol.	Engineering works that disturb riverbeds can be disastrous for mussel populations, so every effort needs to be made to leave them undisturbed. Other relevant activities include fishing (wading in the river) and canoeing (at access points to the river) particularly for vulnerable populations. As a minimum, existing areas should be safeguarded, whilst habitat lost through engineering works should be reinstated.

Feature 2 (SAC) – Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation (Status B)

Attribute	Measure	Targets	Comments
Water quantity	Flow	The natural flow regime of the river should be protected. Daily flows should be close to what would be expected in the absence of abstractions and discharges (the naturalized flow). Flow targets for WFD high ecological status should be used to avoid deterioration and for restoration if this is technically feasible. These are: <5% deviation at <Qn95 and <10% at >Qn95 based on 'natural' water (i.e. water that has not been abstracted and returned). There should be no obvious problems with water availability within the assessment unit. Springs in aquifer-fed rivers should be maintained.	The principal flow targets given in Table 3 of CSM Guidance for Rivers should be taken as the minimum expected for an SAC river where appropriate and locally agreed targets are not already in place. Flow data is available at Search Data | National River Flow Archive (ceh.ac.uk)
Water Quality	Organic pollution	Organic pollution is assessed using a combination of physico-chemical and biological attributes. Targets apply throughout the assessment unit, not just at sparsely distributed monitoring sites. Targets: 10%ile DO (% saturation) = 85 Mean BOD (mg L^{-1}) = 1.5 90%ile total ammonia (NH_3-N, mg L^{-1}) = 0.25 95%ile un-ionised ammonia (NH_3-N, mg L^{-1}) = 0.025	Chemical data from all routine monitoring sites should be obtained from NIEA for the 3 years preceding the time of condition assessment. The statistics in the table should be calculated using all samples within that 3-year period.
	Reactive phosphorus	Compliance with these two targets is mandatory as an annual mean and March-September growing season mean. See tables 5 and 6 of CSM Guidance for Rivers for targets.	Table 5 of CSM Guidance for Rivers has targets for phosphorus (ug L^{-1} SRP) for near-natural examples of ASSI/SAC river habitat and Table 6 of CSM Guidance for Rivers has targets for maximum phosphorus concentrations (ug L^{-1} SRP) consistent with favourable condition of ASSI/SAC river habitat.
	Trophic Diatom Index	The target using the Trophic Diatom Index (TDI) Ecological Quality Ratio should be a normalized EQR of ≥ 0.8, equivalent to high ecological status (WFD-	Environment agencies typically take two or three diatom samples each year at routine monitoring sites. Any sample failing to comply with the relevant biological

		UKTAG, 2014a). This target should be used as an adjunct to nutrient targets proposed in Tables 5 and 6 respectively.	target within the 3-year period at any sampling site in the assessment unit should be regarded as non-compliant.
	Acidification	The targets proposed here are the same as the high/good boundary proposed for the WFD (WFD-UKTAG, 2012a). Targets: pH (Clear waters with DOC≤10mg L^{-1}) : mean > 6.54 pH (Humic waters with DOC>10mg L^{-1}) : mean > 5.1	This target applies only to assessment units whose WFD water body type is classified as siliceous or peat. Other types have buffering capacity and are therefore will not be affected by acidification. Analysis of water chemistry data from NIEA. At least 3 years of data are required, which must include winter samples.
	Other pollutants	Good chemical status is the target for any pollutant listed on Annex X of the WFD and not specifically considered above.	Data on the chemical status of individual water bodies are available from NIEA.
Habitat Structure	Assess using River Habitat Assessment Tool (RHAT)	Refer to River Habitat Assessment Tool (RHAT) guidance used in NI - River Hydromorphology Assessment Technique - Training Manual | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)	The minimum frequency should be a 10% coverage (i.e. 1 site every 5km), coincident with macrophyte monitoring sites where this is done. The location of each RHAT assessment unit (and macrophyte monitoring) should be marked on a map of the site. It is recommended that GPS and site photographs are used to facilitate accurate relocation of sites on future visits.

Fine Sediment	Siltation	No unnaturally high levels of siltation indicated by: "silt on substrate" highlighted in section K of the RHAT form ("Bank and channel features") OR One-third or more of the total number of RHAT spot-checks in the assessment unit have silt (Si) as the predominant channel substrate where not expected from local geology.	Direct measurement of turbidity is not recommended, because values vary naturally in response to changes in flows with no clear understanding of a suitable reference value. Field observations and site-specific information derived from RHAT.
Negative Indicators	Alien/locally absent species	No high-impact alien species established (i.e. self-sustaining populations). Standard checklists of species are based on those used for WFD assessments[1]. A site will be assessed as unfavourable when there is good evidence that any non-native species or locally absent species is causing an impact on site integrity.	Where a macrophyte survey has been carried out, the presence of alien species in the UKTAG lists[1] should be noted. Where there are no macrophyte survey data, and for other organisms (e.g. invertebrates, mink), contact NIEA for local reports on alien or locally absent species.
Biological Assemblages	Plant community Macroinvertebrates	LEAFPACS tool should give a result of high ecological status for the assessment unit. WHPT tool should give a result of high ecological status for the assessment unit.	LEAFPACS method, with 3-5 sections per assessment unit surveyed depending on its size. More variable assessment units may require more surveys. *See Box 3.0 of CSM Guidance for Rivers Version 2016 for further info on LEAFPACS method. RICT macroinvertebrate data, collected by NIEA. See – RICT & RIVPACS User Guides — Freshwater Biological Association (fba.org.uk)
Indicators of local distinctiveness	Targets for local distinctiveness (discretionary)	Maintain distinctive elements (e.g. rare species, habitat features) at current extent/levels and/or in current locations.	As appropriate.
Direct human disturbance	Fish stocking	Fish introductions should not interfere with the ability of the river to support self-sustaining populations of characteristic species.	Use stocking consents.

	Exploitation Weed cutting	Exploitation (e.g. netting or angling) should not interfere with the ability of the river to support self-sustaining populations of characteristic species. A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices.	Assessed through recorded exploitation and status of target species. Field observations during macrophyte survey.

[1] http://www.wfduk.org/tagged/alien-species# Note: This document includes a separate list of alien species for Ecoregion 17 (in which Northern Ireland lies), this list contains only high-impact species.

Feature 3 (SAC) – Otter Lutra lutra (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use available data from other surveys or CeDAR.
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	WFD Chemical and Ecological status	Water quality should be at least 'Good' status, with no pollution incidents	Refer to NIEA Water Management Unit for data
Food Sources	Assessment of fish stocks and other food sources (e.g., amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Loughs Agency/ AFBI for monitoring data where available. (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant development	

Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency/NIEA Water Management Unit if available
Site integrity	Total area	No reduction or fragmentation of area	

Annex A

Conservation Objectives / Ramsar Citation

Republic of Ireland Sites

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Croaghonagh Bog SAC 000129

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000129	Croaghonagh Bog SAC
7130	Blanket bogs (* if active bog)

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

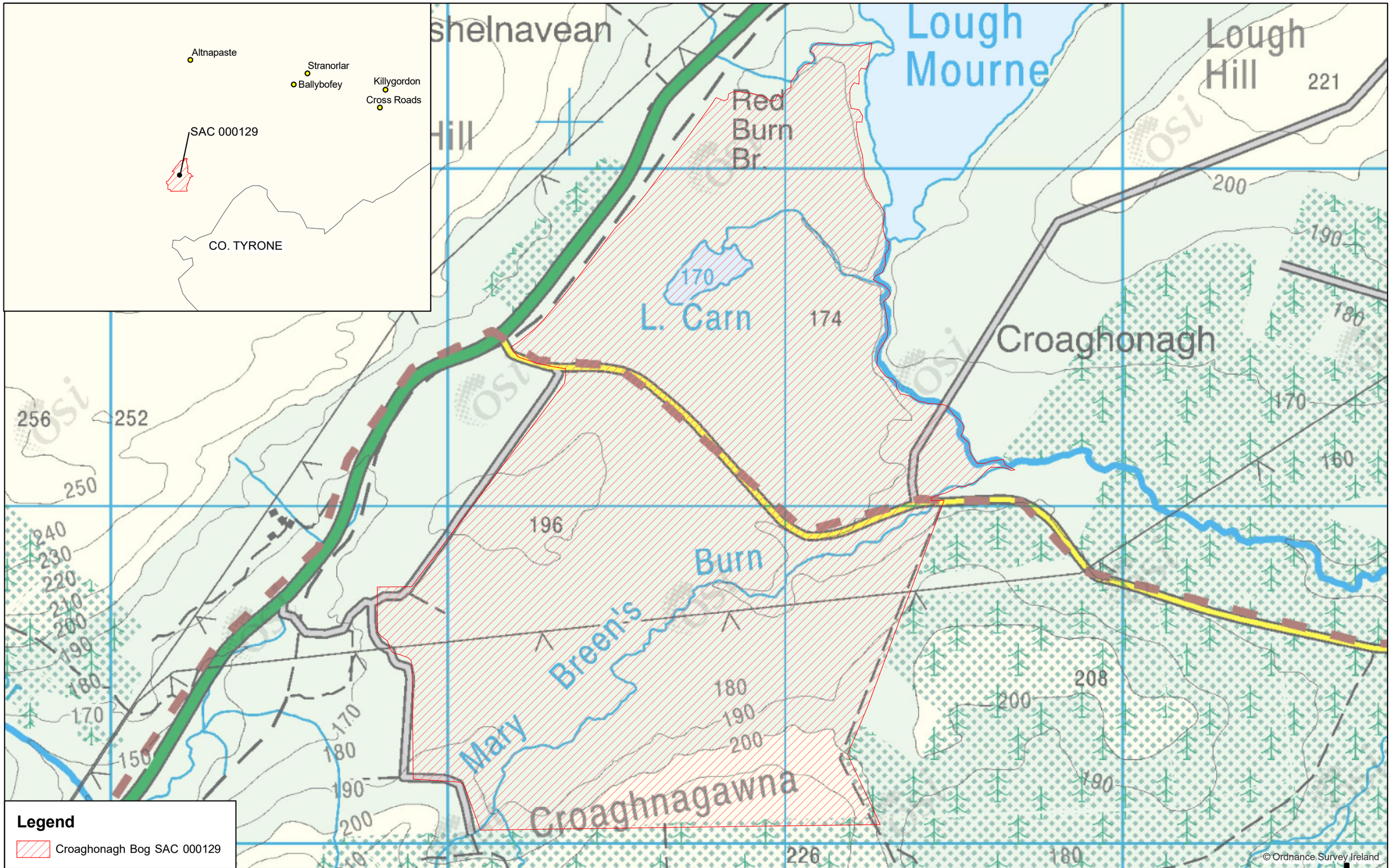
Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2006
Title :	National Parks and Wildlife Service Conservation Plan for 2006-2011. Croaghonagh Bog cSAC Site Code 000129 Co. Donegal
Author :	NPWS
Series :	Conservation Plan
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Croaghonagh Bog SAC (site code: 129) Conservation objectives supporting document- blanket bogs and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (* if active bog) in Croaghonagh Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for Croaghonagh Bog SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 170ha, covering 68% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Croaghonagh Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat is documented to occur throughout the SAC. Further information can be found within Douglas et al. (1990), NPWS (2006) and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Douglas et al. (1990) recorded a variety of blanket bog vegetation communities in this SAC, one of which corresponds to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species

Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)



Legend

Croaghonagh Bog SAC 000129

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An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
CROAGHONAGH BOG SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000129; version 1.00
Co. Donegal

0 0.15 0.3 0.45 0.6 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Ordnance Survey of Ireland Licence No EN 0059216. © Ordnance Survey of Ireland Government of Ireland.

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Map Version 1
Date: Feb 2017

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Donegal Bay SPA 004151

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:
NPWS (2012) Conservation Objectives: Donegal Bay SPA 004151. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Series Editors: Rebecca Jeffrey & Naomi Kingston
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

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Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
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4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004151 Donegal Bay SPA

A003	Great Northern Diver *Gavia immer*	wintering
A046	Light-bellied Brent Goose *Branta bernicla hrota*	wintering
A065	Common Scoter *Melanitta nigra*	wintering
A144	Sanderling *Calidris alba*	wintering
A999	Wetlands	

Please note that this SPA overlaps with Donegal Bay (Murvagh) SAC (000133), Durnesh Lough SAC (000138) and Lough Melvin SAC (000428) and is adjacent to Lough Eske and Ardnamona Wood SAC (000163). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title: Donegal Bay SPA (004151). Conservation objectives supporting document [Version 1]

Year: 2012

Author: NPWS

Series: Unpublished Report to NPWS

A003 Great Northern Diver *Gavia immer*

To maintain the favourable conservation condition of Great Northern Diver in Donegal Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Great Northern Diver, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Light-bellied Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Donegal Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Light-bellied Brent Goose, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A065 Common Scoter *Melanitta nigra*

To maintain the favourable conservation condition of Common Scoter in Donegal Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Common Scoter, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A144 Sanderling *Calidris alba*

To maintain the favourable conservation condition of Sanderling in Donegal Bay SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	There should be no significant decrease in the range, timing or intensity of use of areas by Sanderling, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Donegal Bay SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Wetland habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 10,461ha, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 10,461ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

INVER BAY
Bá Inbhir

INVER BAY

DONEGAL BAY
Bá Dhún na nGall

Rosguill Peninsula

Rossnowlagh

Donegal Bay

Bundoran

Ballyshannon

Donegal

Lifford

Letterkenny

Buncrana

CO. DONEGAL

SPA 004151

Legend

SPA 004151

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 1:
DONEGAL BAY SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SPA 004151 Version 2.01

0 1 2 3 km

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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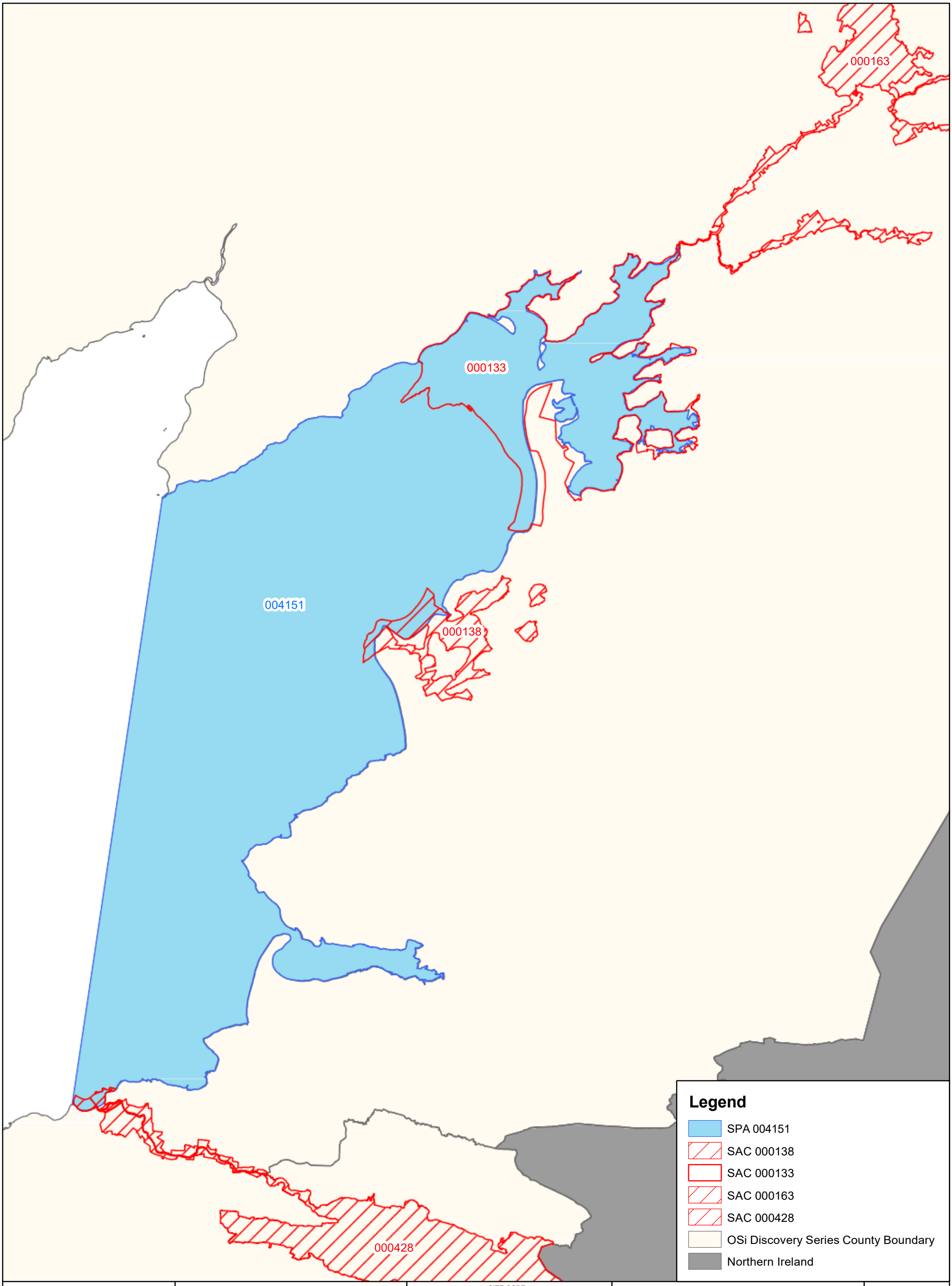
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

Map Version 1
Date: Dec 2011



An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 2:
DONEGAL BAY SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SPA 004151 Version 2.01
SAC 000133 Version 1, SAC 000138 Version 1.02,
SAC 000163 Version 1.02, SAC 000428 Version 1.01

0 1.5 3 km

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Boundaries of designated areas are subject to revision.
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Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

Map Version 1
Date: Dec 2011

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Dunragh Loughs/Pettigo Plateau SAC 001125

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (2017) Conservation Objectives: Dunragh Loughs/Pettigo Plateau SAC 001125. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

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- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

001125	Dunragh Loughs/Pettigo Plateau SAC
4010	Northern Atlantic wet heaths with *Erica tetralix*
7130	Blanket bogs (* if active bog)

Please note that this SAC overlaps with Pettigo Plateau Nature Reserve SPA (004099) and is adjacent to River Finn SAC (002301) and Lough Derg (Donegal) SPA (004057). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2005
Title :	Conservation Plan for 2005-2010. Dunragh Loughs/Pettigo Plateau cSAC, SPA and NR Site Code 001125 and 004099 Co. Donegal
Author :	NPWS
Series :	Conservation Plan
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Dunragh Loughs/Pettigo Plateau SAC (site code: 1125) Conservation objectives supporting document- blanket bog and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

4010 Northern Atlantic wet heaths with Erica tetralix

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Dunragh Loughs/Pettigo Plateau SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with *Erica tetralix* has not been mapped in detail for Dunragh Loughs/Pettigo Plateau SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 401ha, covering 20% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Dunragh Loughs/Pettigo Plateau SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Wet heath is documented to occur on hillsides throughout the SAC. It occurs in close association with blanket bog, wet grassland and flushes (NPWS, 2005). Further information can be found within NPWS (2005) and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Douglas et al. (1990) recorded wet heath vegetation communities in this SAC, one of which corresponds to a community recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (*Erica tetralix*) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of *Cladonia* and *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (*Empetrum nigrum*) at least 15%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Rhododendron (*Rhododendron ponticum*) and the moss *Campylopus introflexus* have been recorded from the SAC (Douglas et al., 1990; NPWS internal files) but these non-native species cannot be attributed specifically to wet heath

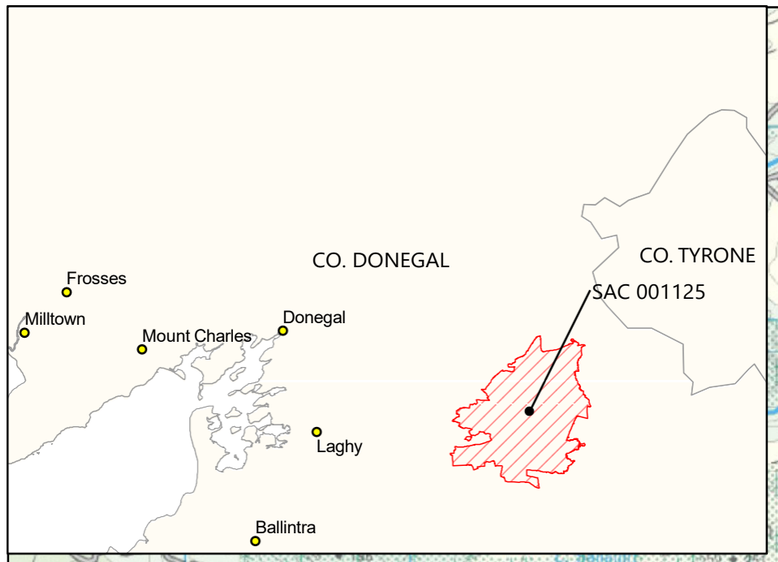
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (* if active bog) in Dunragh Loughs/Pettigo Plateau SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for Dunragh Loughs/Pettigo Plateau SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 540ha, covering 27% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Dunragh Loughs/Pettigo Plateau SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Blanket bog is documented to occur throughout the SAC. It is particularly well-developed on the gentle undulating terrain that is present on the plateau in the southern section of the SAC. Further information can be found within Douglas et al. (1990), NPWS (2005), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of blanket bog vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), two of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Rhododendron (*Rhododendron ponticum*) was recorded from blanket bog within the SAC (NPWS internal files). The non-native moss *Campylopus introflexus* has been recorded from the SAC (Douglas et al., 1990) but it cannot be attributed specifically to blanket bog

Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)



Legend

Dunragh Loughs/Pettigo Plateau SAC 001125

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:

DUNRAGH LOUGHS / PETTIGO PLATEAU SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001125; version 3.
CO. DONEGAL

0 0.45 0.9 1.35 1.8 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Map Version 1
Date: March 2017

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SAC 002301

SAC 002301

SAC 001125

SPA 004099

SAC 002301

SPA 004057

Legend

- Dunragh Loughs/Pettigo Plateau SAC 001125
- River Finn SAC 002301
- Lough Derg (Donegal) SPA 004057
- Pettigo Plateau Nature Reserve SPA 004099
- OSi Discovery Series County Boundary

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 2:

DUNRAGH LOUGHS / PETTIGO PLATEAU SAC CONSERVATION OBJECTIVES ADJACENT AND OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:

SAC 001125; version 3. SAC 002301 version 3.01
SPA 004057; version 3 CO. DONEGAL

0 3 6 9 12 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann.

Map Version 1
Date: March 2017

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National Parks and Wildlife Service

Conservation Objectives Series

Gweedore Bay and Islands SAC 001141

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

001141	Gweedore Bay and Islands SAC
1150	Coastal lagoons*
1170	Reefs
1220	Perennial vegetation of stony banks
1355	Otter *Lutra lutra*
1395	Petalwort *Petalophyllum ralfsii*
1410	Mediterranean salt meadows (Juncetalia maritimi)
1833	Slender Naiad *Najas flexilis*
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)*
2140	Decalcified fixed dunes with *Empetrum nigrum**
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)*
2170	Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)
2190	Humid dune slacks
21A0	Machairs (* in Ireland)
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
4030	European dry heaths
4060	Alpine and Boreal heaths
5130	*Juniperus communis* formations on heaths or calcareous grasslands

Please note that this SAC overlaps with West Donegal Coast SPA (004150) and West Donegal Islands SPA (004230). It adjoins Rutland Island and Sound SAC (002283). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1996
Title :	Biomar survey of Irish machair sites
Author :	Crawford, I.; Bleasdale, A.; Conaghan, J.
Series :	Irish Wildlife Manual No. 3
Year :	1999
Title :	National Shingle Beach Survey of Ireland 1999
Author :	Moore, D.; Wilson, F.
Series :	Unpublished Report to NPWS
Year :	2006
Title :	Otter survey of Ireland 2004/2005
Author :	Bailey, M.; Rochford, J.
Series :	Irish Wildlife Manual No. 23
Year :	2007
Title :	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents. Article 17 forms and supporting maps
Author :	NPWS
Series :	Unpublished report to NPWS
Year :	2007
Title :	Inventory of Irish coastal lagoons (version 2)
Author :	Oliver, G.
Series :	Unpublished report to NPWS
Year :	2009
Title :	Coastal Monitoring Project 2004-2006
Author :	Ryle, T.; Murray, A.; Connolly, K.; Swann, M.
Series :	Unpublished report to NPWS
Year :	2009
Title :	Saltmarsh monitoring project 2007-2008
Author :	McCorry, M.; Ryle, T.
Series :	Unpublished report to NPWS
Year :	2012
Title :	The Conservation Status of Juniper Formations in Ireland
Author :	Cooper, F.; Stone, R.E.; McEvoy, P.; Wilkins, T.; Reid, N.
Series :	Irish Wildlife Manual No. 63
Year :	2013
Title :	National otter survey of Ireland 2010/12
Author :	Reid, N.; Hayden, B.; Lundy, M.G.; Pietravalle, S.; McDonald, R.A.; Montgomery, W.I.
Series :	Irish Wildlife Manual No. 76
Year :	2013
Title :	A survey of the benthic macrophytes of three hard-water lakes: Lough Bunny, Lough Carra and Lough Owel
Author :	Roden, C.; Murphy, P.
Series :	Irish Wildlife Manual No. 70

Year :	2013
Title :	Monitoring survey of Annex I sand dune habitats in Ireland
Author :	Delaney, A.; Devaney, F.M; Martin, J.M.; Barron, S.J.
Series :	Irish Wildlife Manual No. 75
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2015
Title :	Gweedore Bay and Islands SAC (site code: 1141) Conservation objectives supporting document- coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2015
Title :	Gweedore Bay and Islands SAC (site code: 1141) Conservation objectives supporting document- coastal lagoons V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2015
Title :	Gweedore Bay and Islands SAC (site code: 1141) Conservation objectives supporting document- marine habitat V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2015
Title :	Gweedore Bay and Islands SAC (site code: 1141) Conservation objectives supporting document- *Najas flexilis* V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1982
Title :	Otter survey of Ireland
Author :	Chapman, P.J.; Chapman, L.L.
Series :	Unpublished report to Vincent Wildlife Trust
Year :	1988
Title :	The Irish red data book 1. Vascular plants
Author :	Curtis, T.G.F; McGough, H.N.
Series :	Wildlife Service, Dublin
Year :	1991
Title :	The spatial organization of otters (*Lutra lutra*) in Shetland
Author :	Kruuk, H.; Moorhouse, A.
Series :	J. Zool, 224: 41-57

Year :	2000
Title :	Colour in Irish lakes
Author :	Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
Series :	Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie. 27: 2620-2623
Year :	2002
Title :	Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalinisation
Author :	Arts, G.H.P.
Series :	Aquatic Botany, 73: 373-393
Year :	2006
Title :	Otters - ecology, behaviour and conservation
Author :	Kruuk, H.
Series :	Oxford University Press
Year :	2006
Title :	The vegetation of Irish machair
Author :	Gaynor, K.
Series :	Biology and Environment: Proceedings of the Royal Irish Academy, vol 106B, No. 3: 311-321
Year :	2006
Title :	A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
Author :	Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
Series :	EPA, Wexford
Year :	2008
Title :	The phytosociology and conservation value of Irish sand dunes
Author :	Gaynor, K.
Series :	Unpublished PhD thesis, National University of Ireland, Dublin
Year :	2009
Title :	The identification, characterization and conservation value of isoetid lakes in Ireland
Author :	Free G.; Bowman, J.; McGarrigle, M.; Little, R.; Coroni, R.; Donnelly, K.; Tierney, D.; Trodd, W.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems 19 (3): 264–273
Year :	2010
Title :	Otter tracking study of Roaringwater Bay
Author :	De Jongh, A.; O'Neill, L.
Series :	Unpublished draft report to NPWS
Year :	2011
Title :	Reef investigations in Gweedore Bay and Islands cSAC (site code:IE001141)
Author :	Aquafact
Series :	Unpublished report to the Marine Institute and NPWS
Year :	2013
Title :	Conservation of selected legally protected and Red Listed bryophytes in Ireland
Author :	Campbell, C.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin

Year :	2013
Title :	Monitoring and assessment of Irish lagoons for the purposes of the EU Water Framework Directive, 2009-2011. Parts 1 and 2
Author :	Roden, C.M; Oliver, G.A.
Series :	Unpublished report to the Environmental Protection Agency
Year :	in prep.
Title :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, A.
Series :	Unpublished report to NPWS
Year :	in prep.
Title :	Monitoring of hard-water lakes in Ireland using charophytes and other macrophytes
Author :	Roden, C.; Murphy, P.
Series :	Unpublished report to NPWS

Spatial data sources

Year :	Revision 2011
Title :	Inventory of Irish Coastal Lagoons. Version 3
GIS Operations :	Clipped to SAC boundary
Used For :	1150 (map 3)
Year :	Interpolated 2014
Title :	Subtidal survey 2010
GIS Operations :	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used For :	1170, marine community types (maps 4 and 5)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used For :	Marine community types base data (map 5)
Year :	Revision 2010
Title :	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Coastal CO data investigated and resolved with expert opinion used
Used For :	1410 (map 6)
Year :	2009
Title :	Coastal Monitoring Project 2004-2006. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Saltmarsh CO data investigated and resolved with expert opinion used
Used For :	1220, 2110, 2120, 2130, 2140, 2150, 2170, 2190, 21A0 (map 7)
Year :	2013
Title :	Sand Dune Monitoring Project 2011. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Saltmarsh CO data investigated and resolved with expert opinion used
Used For :	2110, 2120, 2130, 2140, 2150, 2170, 2190, 21A0 (map 7)
Year :	Revision 2012
Title :	National Shingle Beach Survey
GIS Operations :	Clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1220 (map 7)
Year :	2008
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
Used For :	3110 (map 8)
Year :	2012
Title :	The conservation status of juniper formations in Ireland
GIS Operations :	Juniper formations polygons clipped to SAC boundary
Used For :	5130 (map 9)

Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the terrestrial side of the river banks data; creation of 20m buffer applied to canal centreline data. These datasets are combined with the derived EPA WFD Waterbodies data and Coastal Lagoon data for the 1355 CO. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising. Creation of 250m buffer on marine side of HWM to highlight potential commuting points
Used For :	1355 (map 10)
Year :	2010
Title :	EPA WFD Waterbodies data
GIS Operations :	Creation of a 20m buffer applied to river and stream centreline data; creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets are combined with the derived OSi data and Coastal Lagoon data for the 1355 CO. Overlapping regions investigated and resloved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1355 (map 10)
Year :	Revision 2011
Title :	Inventory of Irish Coastal Lagoons. Version 3
GIS Operations :	Creation of 80m buffer on the aquatic side of lagoon data; creation of 10m buffer on the terrestrial side of lagoon data. These datasets are combined with the derived OSi data and EPA WFD Waterbodies data for the 1355 CO. Overlapping regions are investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1355 (map 10)
Year :	2015
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1395 (map 11)
Year :	2013
Title :	*Najas flexilis* data
GIS Operations :	Lake habitat for species clipped to SAC boundary
Used For :	1833 (map 12)

1150 Coastal lagoons

To restore the favourable conservation condition of Coastal lagoons in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to slight natural variation. Favourable reference area 10.0ha for mapped lagoons. See map 3	Areas calculated from spatial data derived from Oliver (2007). Site codes IL082 (Kincas Lough) and IL083 (Moorlagh). See lagoons supporting document for further details. NB there may be additional, unsurveyed lagoons within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for mapped lagoons	Sites IL082 and IL083 in Oliver, 2007. See lagoons supporting document for further details. NB there may be additional, unsurveyed lagoons within the SAC
Salinity regime	Practical salinity units (psu)	Median annual salinity and temporal variation within natural ranges	Kincas Lough and Moorlagh are recorded as euhaline to oligohaline lagoons. See lagoons supporting document for further details
Hydrological regime	Metres	Annual water level fluctuations and minima within natural ranges	Maximum depth of Kincas Lough is recorded as 5m and Mooragh is less than 1m. See lagoons supporting document for further details
Barrier: connectivity between lagoon and sea	Permeability	Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management	Kincas Lough and Moorlagh are described as rock/peat lagoons. See lagoons supporting document for further details
Water quality: Chlorophyll *a*	µg/L	Annual median chlorophyll *a* within natural ranges and less than Sµg/L	Target based on Roden and Oliver (2013). See lagoons supporting document for further details
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Annual median MRP within natural ranges and less than 0.1mg/L	Target based on Roden and Oliver (2013). See lagoons supporting document for further details
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Annual median DIN within natural ranges and less than 0.15mg/L	Target based on Roden and Oliver (2013). See lagoons supporting document for further details
Depth of macrophyte colonisation	Metres	Macrophyte colonisation to at least 2m depth	Where a lagoon is less than 2m deep, it is expected that macrophyte colonisation would extend to the full depth. See lagoons supporting document for further details
Typical plant species	Number and m²	Maintain number and extent of listed lagoonal specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoons supporting document for further details
Typical animal species	Number	Maintain listed lagoon specialists, subject to natural variation	Species listed in Oliver, 2007. See lagoons supporting document for further details
Negative indicator species	Number and % cover	Negative indicator species absent or under control	Low salinity, shallow water and elevated nutriennt levels increase the threat of unnatural encroachment by reedbeds. See lagoons supporting document for further details

1170 Reefs

To maintain the favourable conservation condition of Reefs in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 4 for mapped area	Habitat area estimated as 369ha from a 2010 subtidal reef survey (Aquafact, 2011) and intertidal observations made in 2012
Distribution	Occurrence	The distribution of reefs remains stable, subject to natural processes. See map 4 for mapped distribution	Based on information from a 2010 subtidal reef survey (Aquafact, 2011) and intertidal observations made in 2012
Community structure	Biological composition	Conserve the following community types in a natural condition: Reef community complex; *Laminaria*-dominated community complex. See map 5	Reef mapping based on information from a 2010 subtidal reef survey (Aquafact, 2011) and intertidal observations made in 2012. See marine supporting document for further details

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession	Current area unknown. It was recorded as being present, but extent was not mapped, from two sub-sites during the National Shingle Beach Survey (NSBS) (Moore and Wilson, 1999): Coastline from Port ui Chuirean to Bunaninver, and Port bun an Inbhir. A small area of this habitat was also recorded on Gola Island by the Coastal Monitoring Project (CMP) (Ryle et al., 2009). NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 7 for surveyed locations	Distribution unknown at present, although the habitat has been recorded at Port ui Chuirean to Bunaninver and Port bun an Inbhir by Moore and Wilson (1999) and at Gola Island by Ryle et al. (2009). Donegal is noted for its raised beaches and habitat is likely to be more widespread. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Moore and Wilson (1999) noted the presence of rock armour at the coastline from Port Ui Chuirean to Bunaninver sub-site, which may be compromising the supply and natural circulation of sediment. Shingle features are relatively stable in the long term. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Moore and Wilson (1999). Lichens are present at both subsites visited by the NSBS, indicating a degree of stability. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones	Based on data from Moore and Wilson (1999). Both sub-sites support good quality vegetated shingle flora. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Moore and Wilson (1999) and Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. No negative indicator species were recorded at the sub-sites by the NSBS or CMP. See coastal habitats supporting document for further details

1410 Mediterranean salt meadows (Juncetalia maritimi)

To maintain the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Keadew - 0.09ha. See map 6	Based on data from the Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). One sub-site that supports Mediterranean Salt Meadows was mapped (0.09ha) and additional areas of potential MSM habitat (9.66ha) were identified from an examination of aerial photographs, giving a total estimated area of 9.75ha. NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7 for mapped distribution	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadows is found high up in the saltmarsh but requires occasional tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). At Keadew, embryonic dunes, fixed dunes and blanket bog were recorded on the upper boundary of the saltmarsh. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation in the sward	Based on data from McCorry and Ryle (2009). The overall grazing intensity of the saltmarsh at Keadew is low. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Trails from pedestrian and vehicular traffic criss-cross the saltmarsh habitat particularly at the western end of the sub-site. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with characteristic species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	Common cordgrass (*Spartina anglica*) has not been recorded in this SAC and its establishment should be prevented	Based on data from McCorry and Ryle (2009). *Spartina* swards were not recorded in this SAC by SMP. See coastal habitats supporting document for further details

2110 Embryonic shifting dunes

To maintain the favourable conservation condition of Embryonic shifting dunes in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Keadew - 0.46ha; Cruit Lower - 1.29ha; Kincaslough - 0.14ha; Carnboy - 1.39ha; Derrybeg - 0.69ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat mapped at five sub-sites to give a total estimated area of 3.97ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Shifting dunes were recorded at all sub-sites except for Gola Island and Lunniagh. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. At Derrybeg, rock armour has been placed on the edge of a walkway and pier in the north west of the site. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: plant health of foredune grasses	Percentage cover	More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species: sand couch grass (*Elytrigia juncea*) and/or lyme grass (*Leymus arenarius*)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details

2120 Shifting dunes along the shoreline with Ammophila arenaria (white dunes)

To maintain the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Keadew - 0.73ha; Cruit Lower - 1.88ha; Kincaslough - 1.59ha; Carnboy - 2.41ha; Derrybeg - 3.96ha; Gola Island - 0.54ha; Lunniagh - 3.68ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat mapped at seven sub-sites to give a total estimated area of 14.79ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Shifting dunes were recorded at all sub-sites. The shifting dunes at Keadew are undergoing natural erosion. The shifting dunes at Cruit Lower are functioning well with sand accretion noted. At Kincaslough the shifting dunes are eroding at the western side of the sub-site while at the eastern end of the beach they are functioning well. At Carnboy this habitat had been eroded in the past but was rebuilding at time of CMP survey. At Derrybeg the shifting dunes have eroded behind the rock armour. At Lunniagh, dune accretion is occurring on the north side of the river and dunes measure up to 50m wide in places. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Marram grass (*Ammophila arenaria*) reproduces vegetatively and requires constant accretion of fresh sand to maintain active growth encouraging further accretion. At Derrybeg, rock armour has been placed on the edge of a walkway and pier in the north west of the site. Sand extraction occurs at Lunniagh. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: plant health of dune grasses	Percentage cover	More than 95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details

2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)

To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes') in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Keadew -14.74ha; Cruit Lower - 30.55ha; Kincaslough - 79.90ha; Carnboy - 56.83ha; Derrybeg - 30.74ha; Gola Island - 3.38ha; Lunniagh - 186.32ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat mapped at all seven sub-sites to give a total estimated area of 402.46ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). At Keadew, Derrybeg and Lunniagh, the sand dune habitats occur alongside saltmarsh habitats. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). Overgrazing was noted at Lunniagh, while fixed dune was undergrazed or lightly grazed in parts at Keadew, Cruit Lower, Carnboy, Derrybeg and Gola Island. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). An abundance of orchid species was noted at Kincaslough including frog orchid (*Coeloglossum viride*), common twayblade (Listera ovata), pyramidal orchid (*Anacamptis pyramidalis*) and fragrant orchid (*Gymnodenia conopsea*) and are indicators of local distinctiveness. See coastal habitats supporting document for further details.
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower and bracken (*Pteridium aquilinum*) at Derrybeg. See coastal habitats supporting document for further details

Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Burnet rose (*Rosa pimpinellifolia*) was recorded at Derrybeg. See coastal habitats supporting document for further details

2140 Decalcified fixed dunes with Empetrum nigrum

To maintain the favourable conservation condition of Decalcified fixed dunes with *Empetrum nigrum* in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-site mapped: Keadew - 0.47ha. See map 7	Current area unknown. Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded at one sub-site, giving a total estimated area of 0.47ha. However, habitat is difficult to map as it occurs in a mosaic with fixed dunes. Likely to be more widespread. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Exact distribution unknown. Based on data from Ryle et al. (2009) and Delaney et al. (2013). This habitat was recorded at two sub-sites: Keadew and Cruit lower, but was only mapped at the Keadew sub-site. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). At Keadew the coastal heath occurs in close association with fixed dune habitat. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: sward height	Centimeters	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Keadew and Cruit Lower, the dunes are undergrazed. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

2150 Atlantic decalcified fixed dunes (Calluno-Ulicetea)

To maintain the favourable conservation condition of Atlantic decalcified fixed dunes (Calluno-Ulicetea) in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-site mapped: Cruit Lower - 3.57ha. See map 7	Current area unknown. Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded at one sub-site, giving a total estimated area of 3.57ha. Habitat is difficult to map as it occurs in a mosaic with fixed dunes. Likely to be more widespread. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7 for mapped distribution	Exact distribution unknown. Based on data from Ryle et al., (2009) and Delaney et al. (2013). This habitat was recorded at one sub-site: Cruit Lower. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: sward height	Centimeters	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Cruit Lower, both the fixed dune and machair are ungrazed resulting in a tall sward with low species diversity. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

2170 Dunes with Salix repens ssp. argentea (Salicion arenariae)

To maintain the favourable conservation condition of Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae) in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Cruit Lower - 0.94ha; Kincaslough - 0.03ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded at two sub-sites, giving a total estimated area of 0.97ha. Habitat is difficult to map as it can be confused with humid dune slacks. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7 for mapped distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations	Maintain natural hydrological regime	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% cover, subject to natural processes	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Cruit Lower the fixed dunes are ungrazed. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	See coastal habitats supporting document for further details
Vegetation composition: cover and height of *Salix repens*	Percentage cover; centimetres	Maintain more than 10% cover of creeping willow (*Salix repens*); vegetation height should be in the average range 5 - 20cm	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Cover of creeping willow (*Salix repens*) should be maintained (e.g. through an appropriate grazing regime) to prevent the development of a coarse, rank vegetation cover. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative sample of monitoring stops	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower. See coastal habitats supporting document for further details

Vegetation composition: scrub/trees	Percentage cover	For trees and scrub other than creeping willow (*Salix repens*), there should be no more than 5% cover or their presence should be under control	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

2190 Humid dune slacks

To maintain the favourable conservation condition of Humid dune slacks in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Keadew - 0.01ha; Cruit Lower - 0.34ha; Carnboy - 0.38ha; Kincaslough - 1.09ha; Derrybeg - 0.19ha; Lunniagh - 5.68ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat mapped at six sub-sites to give a total estimated area of 7.69ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7 for mapped distribution	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation, resulting in increased rates of erosion. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations	Maintain natural hydrological regime	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). It appears that there has been some drying out of some of the slacks at Cruit Island, which may be due to anthropogenic activities. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Lunniagh, dune slacks are affected by overgrazing and poaching was noted. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative numberof monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). Butterfly orchid (*Platanthera* spp.) was noted at Kincaslough. Petalwort (*Petalophyllum ralfsii*), a species on Annex II of the Habitats Directive, is recorded from the dune slacks in this SAC. See the conservation objective for *Petalophyllum ralfsii* (1395) and the coastal habitats supporting document for further details
Vegetation composition: cover of *Salix repens*	Percentage cover; centimetres	Maintain less than 40% cover of creeping willow (*Salix repens*)	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Cover of creeping willow (*Salix repens*) needs to be controlled (e.g. through an appropriate grazing regime) to prevent the development of a coarse, rank vegetation cover. See coastal habitats supporting document for further details

Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Bunet rose (*Rosa pimpilellifolia*) was recorded at Derrybeg. See coastal habitats supporting document for further details

21A0 Machairs (* in Ireland)

To restore the favourable conservation condition of Machairs in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Keadew - 28.31ha; Cruit Lower - 9.65ha; Derrybeg - 92.13ha; Lunniagh - 39.69ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was mapped at four sub-sites, giving a total estimated area of 169.78ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 7	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Machair was recorded at all sub-sites except Gola Island, Carnboy and Kincaslough. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations	Maintain natural hydrological regime	Based on data from Ryle et al. (2009), Delaney et al. (2013), Crawford et al. (1996) and Gaynor (2006). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of Machair habitat, subject to natural processes	Based on data from Ryle et al., (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimeters	Maintain structural variation within sward	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Overgrazing was noted at Lunniagh, while fixed dune and machair habitats were undergrazed or lightly grazed in parts at Keadew, Cruit Lower and Derrybeg. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Petalwort (*Petalophyllum ralfsii*), a species listed on Annex II of the Habitats Directive, was recorded in machair habitat in this SAC. See the conservation objective for *Petalophyllum ralfsii* (1395) and the coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al., (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. This species is known to occur at Cruit Lower and bracken (*Pteridium aquilinum*) has been recorded at Derrybeg. See coastal habitats supporting document for further details
Vegetation composition: bryophytes	Percentage cover	Should always be at least an occasional component of the vegetation	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	The selection of the SAC for habitat 3110 was based on data for Mullaghderg Loughs. Re-examination of these data and the occurrence of *Najas flexilis* in Mullaghderg East and West suggest, however, that their vegetation is more closely aligned to habitat 3130. It is possible that habitat 3110 occurs elsewhere within the SAC. It may occur in the small lake in Derrybeg townland (see map 8), but this requires field confirmation. The habitat is highly unlikely to occur in lakes influenced by calcareous sand or by the sea, both of which are prevalent in the SAC. Two measures of extent should be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. For further information on all attributes see the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, in prep.)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, it is unlikely that the habitat occurs in the SAC. If the habitat is found, further information on the attribute for distribution can be found in O Connor (in prep.)
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant species, see Article 17 habitat assessment for 3110 (NPWS, 2013) and the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, in prep.)
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	The characteristic zonation of lake habitat 3140 has been described (Roden and Murphy, 2013; in prep.), however significant further work is necessary to describe the characteristic zonation and other spatial patterns in the other lake habitats
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. An indicative target of >6 m has been developed for hard water lakes (3140) (see Roden and Murphy, 2013; in prep.). Indicative targets will be developed for the other lake habitats with time
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that the oligotrophic soft water habitat is associated with a range of nutrient-poor substrates, from stones, cobble and gravel, through sands, silt, clay and peat. Substratum particle size is likely to vary with depth and along the shoreline within a single lake

Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. A target has been set for hard water lakes (3140), however targets have yet to be established for the remaining lake habitats. Habitat 3110 is associated with very clear water. The OECD fixed boundary system set transparency targets for oligotrophic lakes of ≥6m annual mean Secchi disk depth, and ≥ 3m annual minimum Secchi disk depth. Free et al. (2009) found high isoetid abundance in lakes with Secchi depths of more than 3m
Water quality: nutrients	µg/l P; mg/l N	Maintain the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	As a nutrient poor habitat, oligotrophic and Water Framework Directive (WFD) 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For the oligotrophic soft water lake habitat, annual average TP concentration should be ≤l0µg/l TP, average annual total ammonia concentration should be ≤0.040mg/l N and annual 95th percentile for total ammonia should be ≤0.090mg/l N. For further information see the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton biomass	µg/l Chlorophyll *a*	Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status	Oligotrophic and WFD 'high' status targets apply to the oligotrophic soft water habitat (3110). Where a lake has a chlorophyll *a* concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll *a* concentration must be <5.8 µg/l. The annual average chlorophyll a concentration should be <2.5 µg/l and the annual peak chlorophyll *a* concentration should be <8.0 µg/l. For further information see the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, habitat 3110 requires WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/ absent attached algal biomass (<5% cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in the oligotrophic soft water habitat should, therefore, be trace/ absent (<5% cover). EPA phytobenthos can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, habitat 3110 requires high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for the oligotrophic soft water lake habitat is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥ 0.90, as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009

Acidification status	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. In Europe, acidification of isoetid lakes can lead to loss of isoetids and dominance by submerged *Sphagnum* mosses and *Juncus bulbosus* (Arts, 2002). The specific requirements of lake habitat 3110, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined. For oligotrophic soft water lakes (3110), and adopting a precautionary approach based on Arts (2002), minimum pH should not be <5.5. Maximum pH should be <9.0, in line with the surface water standards established for soft waters (where water hardness is ≤100 mg/l CaCO3). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38 mg/l PtCo (Free, et al., 2000) and 33 mg/l PtCo (Free et al. 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50 mg/l PtCo. Water colour can be very low (<20 mg/l PtCo or even <10 mg/l PtCo) in oligotrophic soft water lakes (3110), where the peatland in the lake's catchment is intact
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through factors such as shading and competition
Turbidity	nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat area	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet-woodland that intergrade with and support the structure and functions of the lake habitat. Equally, fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves

4030 European dry heaths

To maintain the favourable conservation condition of European dry heaths in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Total area of this habitat has not been calculated although it is known to be distributed thoughout the SAC, usually occurring in mosaic with other habitats such as exposed rock, other heath types and fixed dune habitats (NPWS internal files)
Habitat distribution	Occurrence	No decline from current habitat distribution, subject to natural processes	See note above. The heath in this SAC is widely distributed and is a good example of a maritime variant in the western part of its Irish and European range (NPWS internal files)
Ecosystem function: soil nutrient status	Soil pH and nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Changes to soil nutrient status can occur from high stock densities or supplementary feeding above appropriate levels
Vegetation composition: positive indicator species	Number and percentage cover at a representative number of monitoring stops	At least two positive indicator species, as listed in Perrin et al. (2014), with combined cover of at least 50%	Attribute and target based on Perrin et al. (2014). Bell heather (*Erica cinerea*), cross-leaved heath (*Erica tetralix*) and ling (*Calluna vulgaris*) are listed for the heath in this SAC (NPWS internal files)
Vegetation composition: bryophyte and non-crustose lichen species	Number at a representative number of monitoring stops	At least three bryophyte or non-crustose lichen species present, excluding *Campylopus* and *Polytrichum* moss species	Percentage cover at a representative number of monitoring stops
Vegetation composition: rare/scarce species	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order 1999 and/or the red data book (Curtis and McGough, 1988)
Vegetation structure: dwarf shrub species	Percentage cover at a representative number of monitoring stops	Cover of bog myrtle (*Myrica gale*), creeping willow (*Salix repens*) and Western gorse (*Ulex gallii*) collectively less than 50%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator weed species	Percentage cover at a representative number of monitoring stops	Cover of negative indicator weedy species collectively less than 1%	Attribute and target based on Perrin et al. (2014), where weed species are also listed
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops and in local vicinity	Cover of non-native species less than 1%.	Attribute and target based on Perrin et al. (2014)
Vegetation composition: native trees and shrubs	Pecentage cover in local vicinity	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: bracken	Percentage cover in local vicinity	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014). Dense areas of soft rush can indicate disturbance
Vegetation structure: senescent ling	Percentage cover at a representative number of monitoring stops	Senescent proportion of ling (*Calluna vulgaris*) cover less than 50%	Percentage cover at a representative number of monitoring stops

Vegetation structure: growth phases of ling	Percentage cover in local vicinity	Outside boundaries of sensitive areas, all growth phases of ling (*Calluna vulgaris*) should occur throughout, with at least 10% of cover in mature phase	Attribute and target based on Perrin et al. (2014), where sensitive areas and growth phases are defined
Vegetation structure: signs of browsing	Percentage at a representative number of monitoring stops	Last complete growing season's shoots of ericoids showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity	No signs of burning within sensitive areas	Attribute and target based on Perrin et al. (2014) where sensitive areas are also defined
Physical structure: disturbed bare ground	Percentage cover at a representative number of monitoring stops and in local vicinity	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)

4060 Alpine and Boreal heaths

To maintain the favourable conservation condition of Alpine and Boreal heaths in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Total area of this habitat has not been calculated. It occurs in mosaic with other habitats such as exposed rock, other heath types and fixed dune habitats (NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See notes for area above
Ecosystem function: soil nutrient status	Soil pH and nutrient levels at a representative number of monitoring stops	Maintain soil chemical status within natural range	Changes to soil nutrient status can occur from high stock densities or supplementary feeding above appropriate levels
Vegetation composition: lichens and bryophytes	Number at a representative number of monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is least three	Based on Perrin et al. (2014). Alpine and boreal heaths are not necessarily rich in lichen and bryophyte species, but a minimum number should still be present
Vegetation composition: positive indicator species	Percentage cover at a representative number of monitoring stops	Cover of positive indicator species at least 66%	Based on Perrin et al. (2014). A positive species criterion is set to ensure that vegetation remains representative of this habitat and is not degrading or succeeding to a different habitat. Bearberry (*Actostaphylos uva-ursi*), Crowberry (*Empetrum nigrum*), bell heather (*Erica cinerea*) and ling (*Calluna vulgaris*) are recorded from this SAC (NPWS internal files)
Vegetation composition: dwarf-shrub species	Percentage cover at a representative number of monitoring stops	Cover of dwarf-shrub species at least 10%	Based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of monitoring stops	Total cover of negative indicator species less than 10%	Based on Perrin et al. (2014) where negative species are listed
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation
Vegetation structure: signs of grazing	Percentage at a representative number of monitoring stops	Less than 10% collectively of live leaves of specific graminoids showing signs of grazing	Based on Perrin et al. (2014). High levels of grazing of these species would indicate undesirable levels of livestock/other grazers
Vegetation structure: signs of browsing	Percentage at a representative number of monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry (*Empetrum nigrum*) showing signs of browsing	Based on Perrin et al. (2014). High levels of browsing of these dwarf shrubs would indicate undesirable levels of livestock/other grazers
Vegetation structure: burning	Occurrence in local vicinity	No signs of burning within the habitat	Based on Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human foot prints, vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion

5130 Juniperus communis formations on heaths or calcareous grasslands

To restore the favourable conservation condition of *Juniperus communis* formations on heaths or calcareous grasslands in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Total area of this habitat has not been calculated although it is known to be distributed thoughout the SAC, usually occurring in mosaic with other habitats such as exposed rock, other heath types and fixed dune habitats (NPWS internal files). Cooper el al. (2012) surveyed and mapped four sub-sites containing juniper formations that occur completely or partially within the SAC. See map 9. Further areas of the habitat are likely to be present
Habitat distribution	Occurrence	No decline. See map 9 for surveyed locations	See notes for area above
Juniper population size	Number per formation	At least 50 plants per formation	To classify as a juniper formation, at least 50 plants should be present (Cooper et al., 2012)
Vegetation composition: typical species	Number per formation	At least 50% of the listed positive indicator species for the relevant vegetation group present	Cooper et al. (2012) lists positive indicator species for five vegetation groups
Vegetation composition: negative indicator species	Occurrence per formation	Negative indicator species, particularly non-native invasive species, absent or under control	Negative indicator species listed by Cooper et al. (2012)
Vegetation structure: cone-bearing plants	Percentage per formation	At least 10% of plants are bearing cones	Attribute and target based on Cooper et al. (2012)
Vegetation structure: seedling recruitment	Percentage per formation	At least 10% of juniper plants are seedlings	Attribute and target based on Cooper et al. (2012)
Vegetation structure: dead juniper	Percentage per formation	Mean percentage of each juniper plant dead less than 10%	Attribute and target based on Cooper et al. (2012)

1355 Otter *Lutra lutra*

To maintain the favourable conservation condition of Otter in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 154ha above high water mark (HWM); 40ha along river banks/ around lakes and ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 1,192ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 12.1km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 82ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase. For guidance, see map 10	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed

1395 Petalwort *Petalophyllum ralfsii*

To maintain the favourable conservation condition of Petalwort in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution of populations	Number and geographical spread of populations	No decline. See map 11 for known locations	There are currently three known populations: (4a) Damph Beg, in slack area and on gravelly sand of small low bank above track into small disused sand-quarry, above edge of dune slack; (4b) Derrybeg, on low NW-facing part of bank just above edge of dune slack and (4c) Keadew Point, at three locations. The population at Damph Beg has not been seen since 2002. Data from NPWS surveys and Campbell (2013)
Population size	Number of individuals	No decline. Population at (4a) Damph Beg: c.10 thalli; (4b) Derrybeg: c.8 thalli; (4c) Keadew Point: c.88 thalli. Total: c.100 thalli	Counts of thalli: for Damph Beg, from mean number of thalli recorded by Holyoak in 1999 and 2002 (24 and 7 thalli) and Lockhart in 2006 (0 thalli) = 10.33; for Derrybeg, from mean number of thalli recorded by Holyoak in 2002 (3 thalli) and Lockhart in 2006 (12 thalli) = 7.5 thalli; for Keadew Point, from mean of number of thalli in two 1 x 1m plots, from three counts between early April 2009 and April 2011 (Campbell, 2013) = 4.2 thalli per m² in 21m² = c.88 thalli
Area of suitable habitat	Hectares	No decline. Area of suitable habitat at Damph Beg and Derrybeg currently unknown, but thought to be very small, c.0.5m² each. Area of suitable habitat at Keadew Point estimated at c.21m². Total = c.0.002ha	The extents of suitable habitat at Damph Beg and at Derrybeg has not been measured by GPS, but are known to be very small (c.0.5m² each). Main area of occupancy at Keadew Point is on a layer of humus-rich sand c.1cm thick overlying pure sand on a rocky outcrop above the shoreline, measured by GPS co-ordinates = 24.3m² (Campbell, 2013). Only about 80% of this area is actually suitable habitat for *Petalophyllum ralfsii* (c.19m²). Two outlying records (1m² each) from Keadew Point were also reported by Lockhart in 1998 and Holyoak in 2002 giving a total of c.21m² for Keadew Point
Hydrological conditions: soil moisture	Occurrence of damp soil conditions	Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter	*Petalophyllum ralfsii* grows in damp sand. Based on Campbell (2013)
Vegetation: open structure	Height and percentage cover of vegetation	Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground	*Petalophyllum ralfsii* grows in compacted, sandy ground, maintained by rabbit (*Oryctolagus cuniculus*) and sheep grazing and some trampling (by walkers). Recorded at Damph Beg with low moss and patchy low phanaerogams (Holyoak, 2002), not refound there by Lockhart in 2006 who reported that the prospects for survival are reasonable, but small available niche is vulnerable; recorded at Derrybeg on wet humic sand with very low, patchy moss-rich grassland (2.4cm high) (by Holyoak in 2002); at Keadew Point, Campbell (2013) recorded a mean height of vegetation of 6cm, with bryophyte cover c.34-75% and bare ground c.4-25% (based on two 1 x 1m plots from 2009 and 2011)

1833 Slender Naiad *Najas flexilis*

To maintain the favourable conservation condition of Slender Naiad in Gweedore Bay and Islands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population extent	Hectares and distribution	No change to the spatial extent of *Najas flexilis* within each lake, subject to natural processes. See map 12 for known locations	See *Najas flexilis* supporting document for further details
Population depth	Metres	No change to the depth range of *Najas flexilis* within each lake, subject to natural processes	See *Najas flexilis* supporting document for further details
Population viability	Plant traits	No decline in plant fitness, subject to natural processes	See *Najas flexilis* supporting document for further details
Population abundance	Square metres	No change to the cover abundance of *Najas flexilis*, subject to natural processes	See *Najas flexilis* supporting document for further details
Species distribution	Occurrence	No decline, subject to natural processes	See *Najas flexilis* supporting document for further details
Habitat extent	Hectares	No decline, subject to natural processes	See *Najas flexilis* supporting document for further details
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat for the species	See *Najas flexilis* supporting document for further details
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the populations of the species	See *Najas flexilis* supporting document for further details
Water quality	Various	Maintain appropriate water quality to support the populations of the species	See *Najas flexilis* supporting document for further details
Acidification status	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the populations of *Najas flexilis*, subject to natural processes	See *Najas flexilis* supporting document for further details
Water colour	mg/L PtCo	Maintain appropriate water colour to support the populations of *Najas flexilis*	See *Najas flexilis* supporting document for further details
Associated species	Species composition and abundance	Maintain appropriate associated species and vegetation communities to support the populations of *Najas flexilis*	See *Najas flexilis* supporting document for further details
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the populations of *Najas flexilis*	See *Najas flexilis* supporting document for further details

Department of Arts, Heritage and the Gaeltacht

MAP 1:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 1 2 3 km

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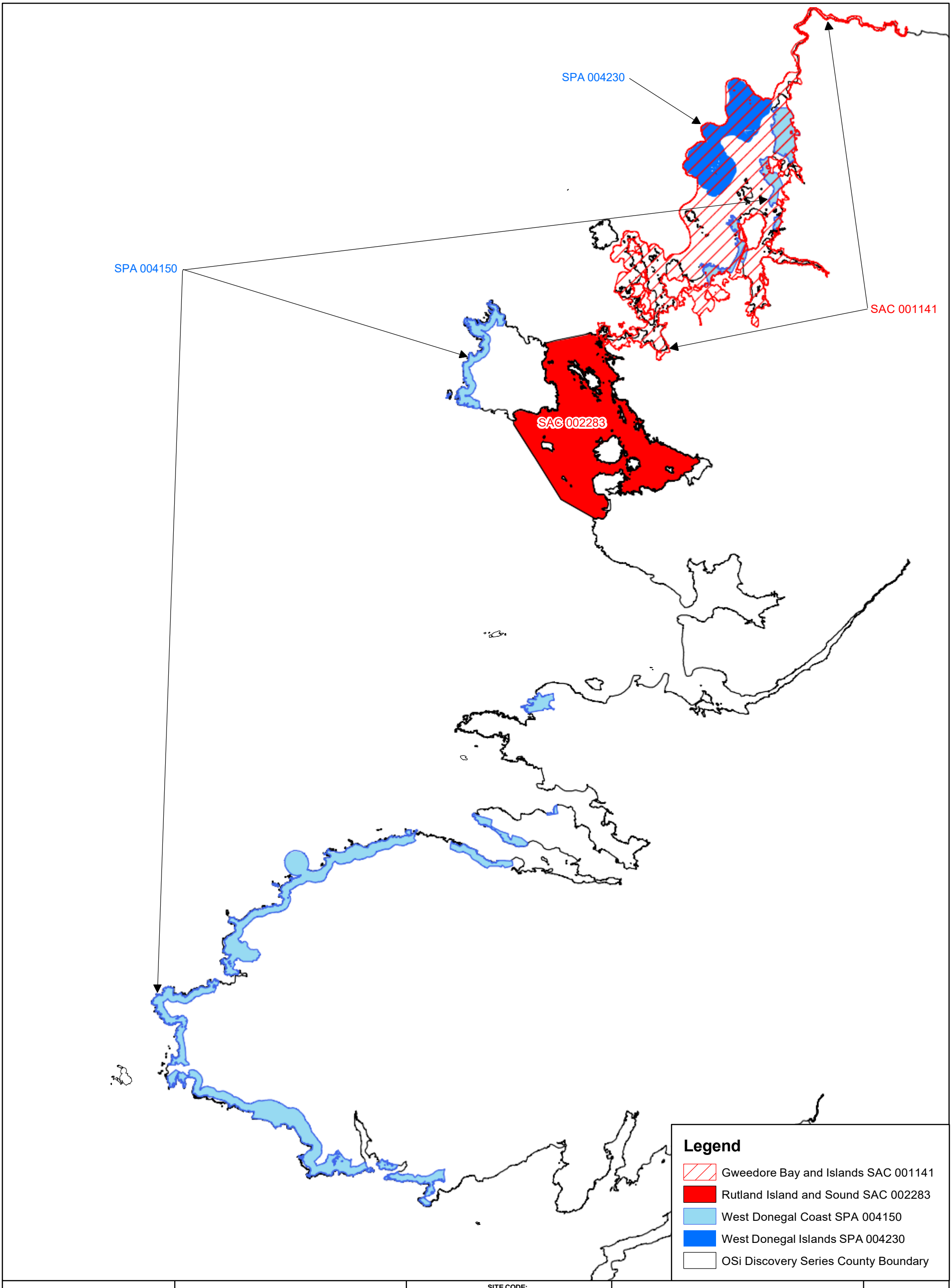

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MAP 2:
GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES ADJOINING / OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01, SAC 002283; version 3.01.
SPA 004150; version 2.01, SPA 004230; version 1.01.
CO. DONEGAL

0 1 2 3 4 5 km

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Map Extent

IL082 Kincas L.

IL083 Moorlagh

Legend

- Gweedore Bay and Islands SAC 001141
- 1150 *Coastal lagoons
- OSi Discovery Series County Boundary

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Department of Arts, Heritage and the Gaeltacht

MAP 3: GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES COASTAL LAGOONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 0.25 0.5 0.75 1 km

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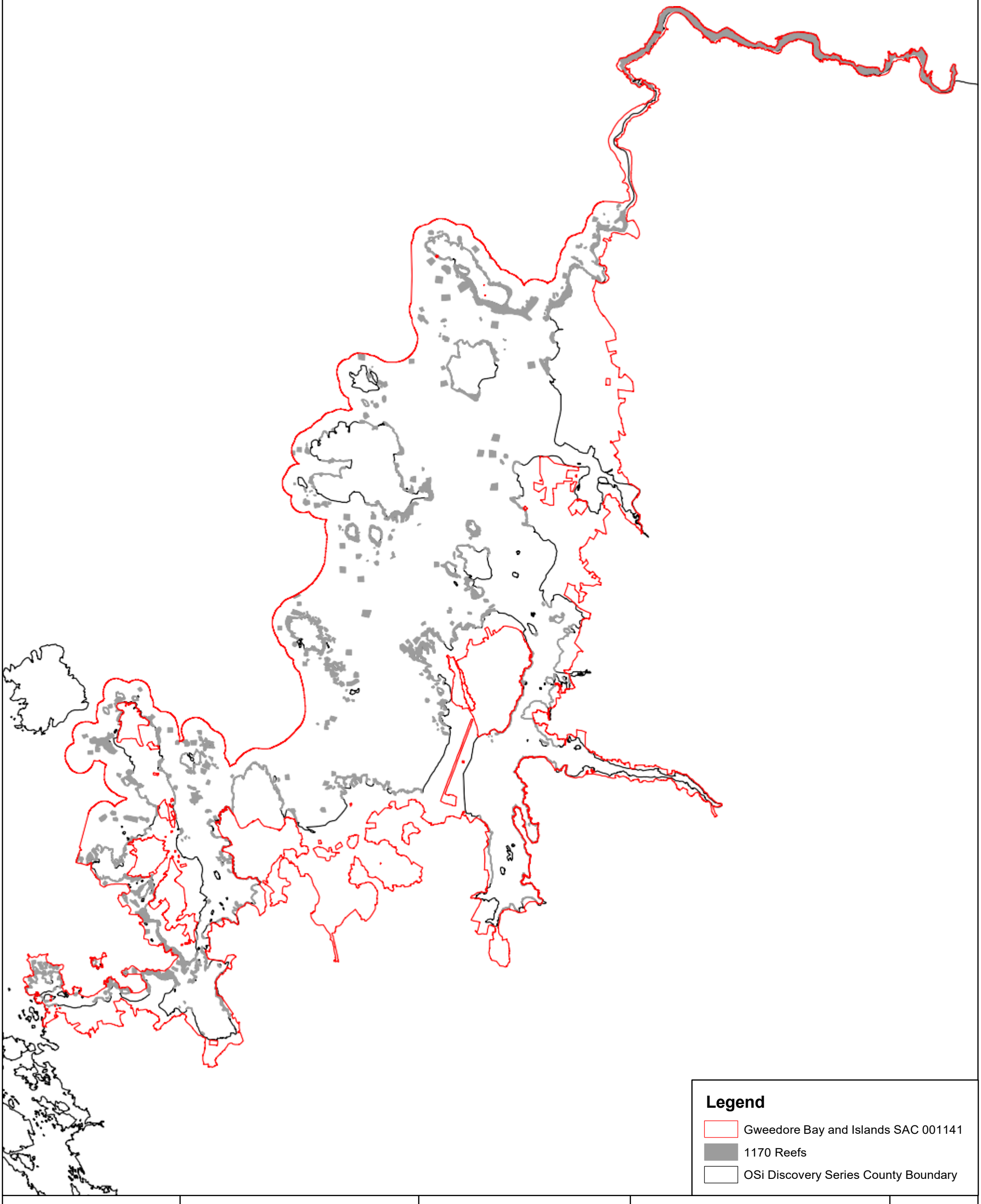
Date: Jan 2015



Legend

- Gweedore Bay and Islands SAC 001141
- 1170 Reefs
- OSi Discovery Series County Boundary

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MAP 4:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
REEFS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
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0 1 2 3 km

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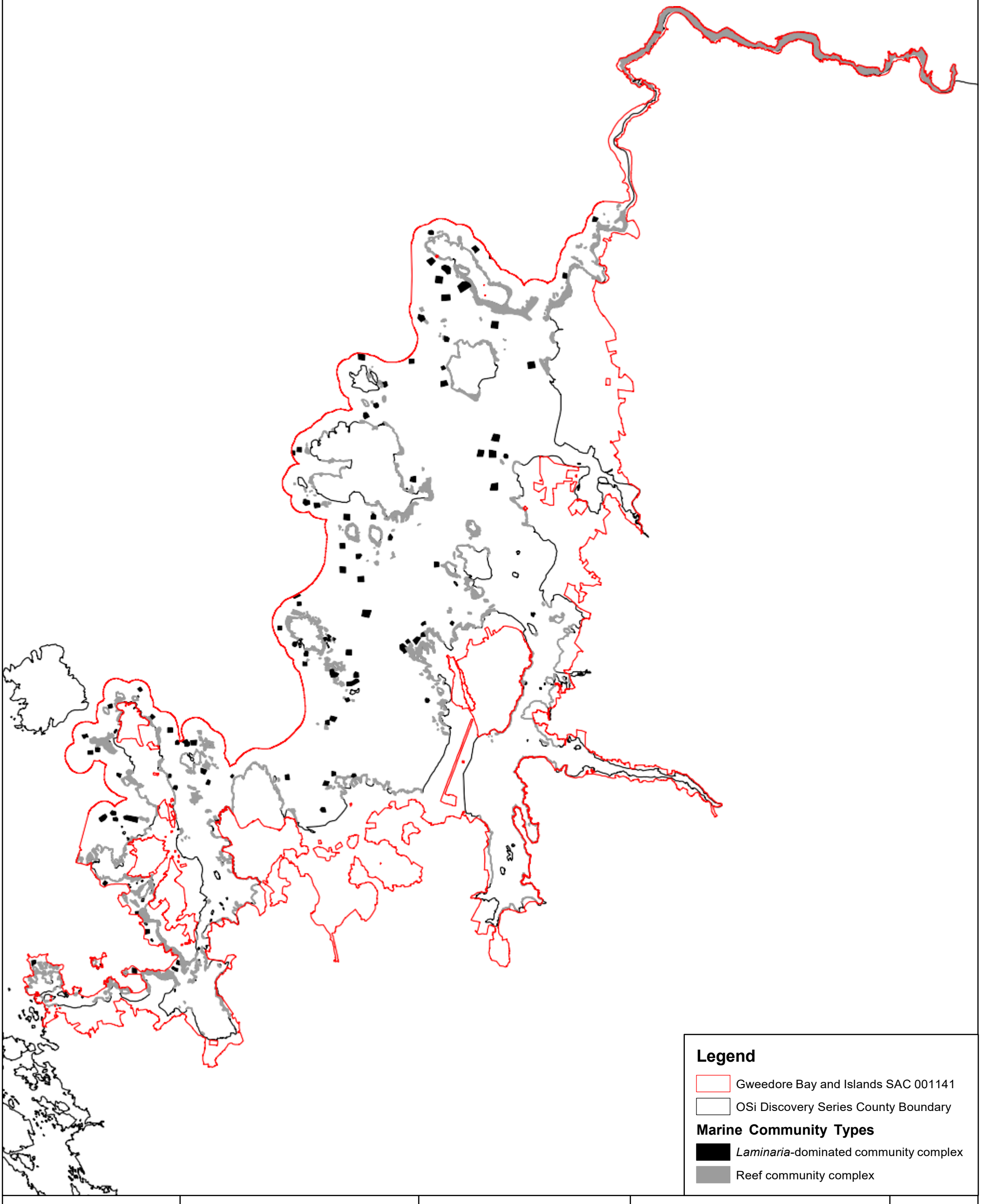

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MAP 5:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 1 2 3 km

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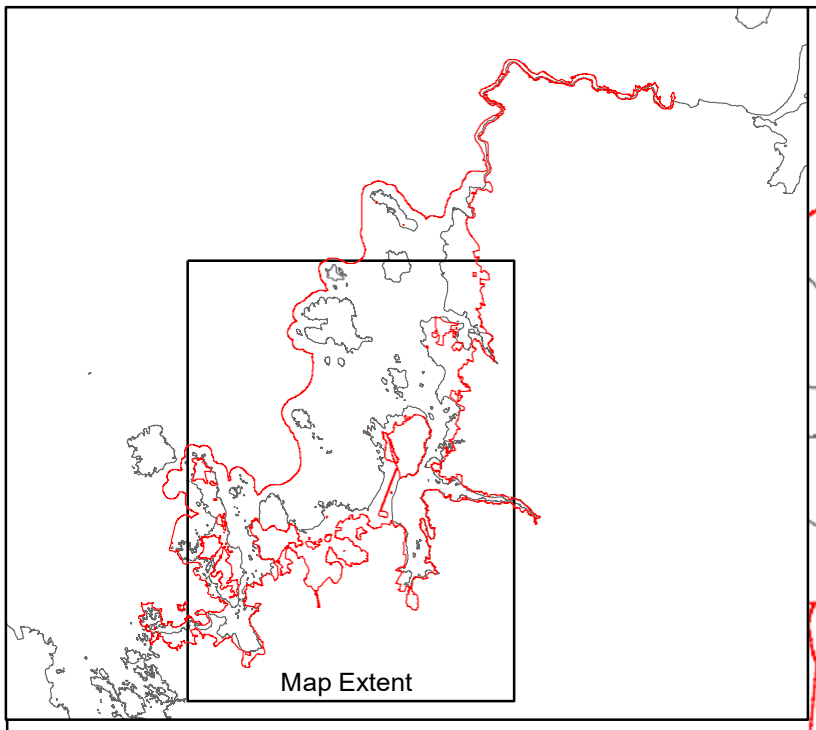

SMP: 0129

Legend

- Gweedore Bay and Islands SAC 001141
- OSi Discovery Series County Boundary
- SMP: 0129 Saltmarsh Monitoring Project Site Codes

Saltmarsh Habitats

Qualifying Interests

- 1410 Mediterranean salt meadows (Juncetalia maritimi)
- Potential 1330 / Potential 1410. Potential Atlantic salt meadows (Glauco-Puccinellietalia maritimae) / Potential Mediterranean salt meadows (Juncetalia maritimi)

Non Qualifying Interests

- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- Potential 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

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MAP 6: GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES SALTMARSH HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 0.25 0.5 0.75 1 km

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Date: Jan 2015

Legend

- Gweedore Bay and Islands SAC 001141
- OSi Discovery Series County Boundary
- National Shingle Beach Survey sub-sites
- CMP: 153 Coastal Monitoring Project Site Codes
- SDM: 155 Sand Dunes Monitoring Project Site Codes

Sand Dune Habitats

Qualifying Interests

- 1220 Perennial vegetation of stony banks
- 2110 Embryonic shifting dunes
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- 2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')
- 2140 *Decalcified fixed dunes with *Empetrum nigrum*
- 2150 *Atlantic decalcified fixed dunes (Calluno-Ulicetea)
- 2170 Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)
- 2190 Humid dune slacks
- 21A0 *Machairs

Non Qualifying Interests

- 1210 Annual vegetation of drift lines

Coastline from Port ui Chuirean to Bunaninver

Port bun an Inbhir

CMP: 159

CMP: 158

SDM: 157

CMP: 156

SDM: 155

CMP: 154

CMP: 153

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MAP 7:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
SAND DUNE HABITATS &
PERENNIAL VEGETATION OF STONY BANKS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 1 2 3 km

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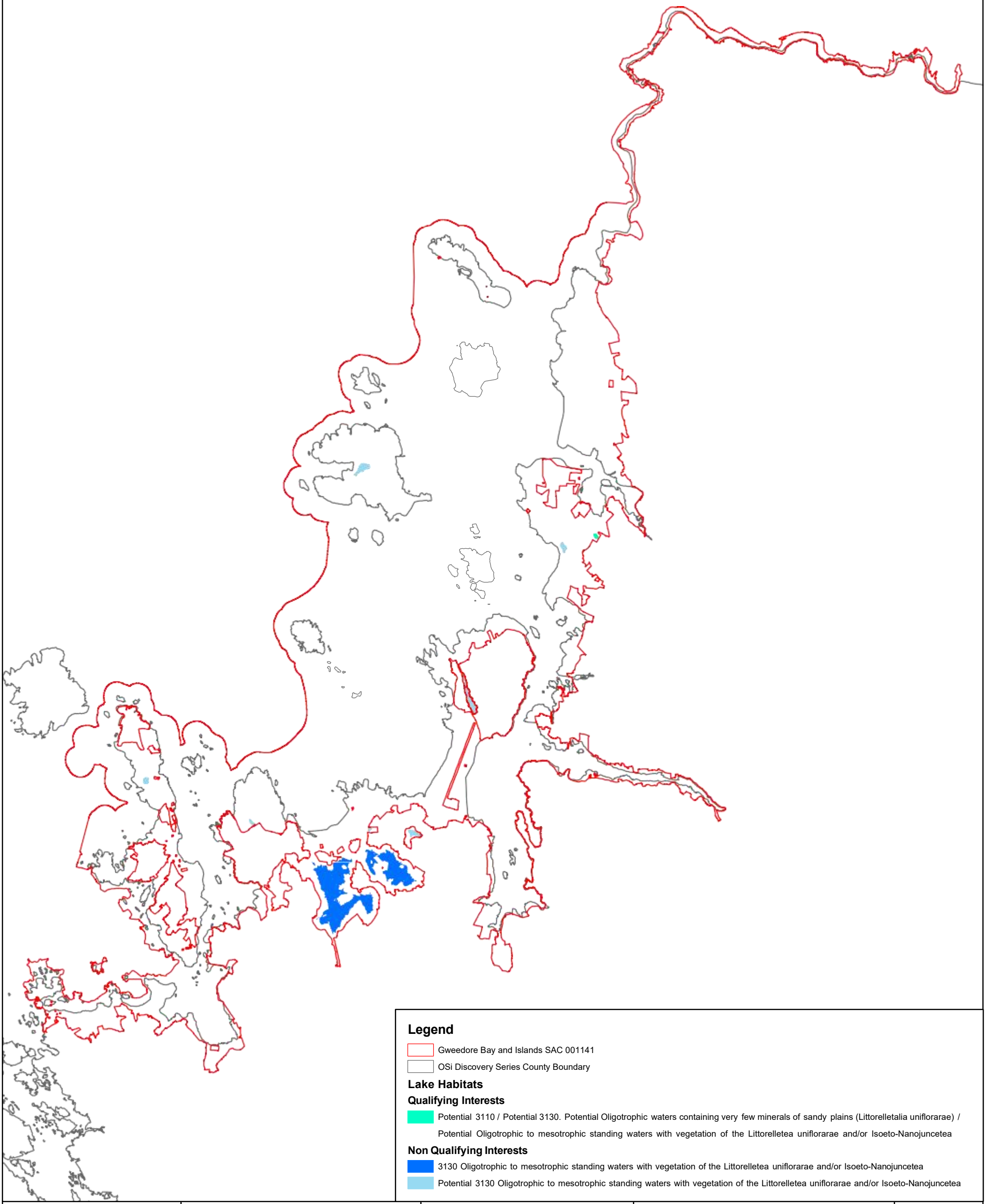

Legend

Gweedore Bay and Islands SAC 001141

OSi Discovery Series County Boundary

Lake Habitats

Qualifying Interests

Potential 3110 / Potential 3130. Potential Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorarae) / Potential Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorarae and/or Isoeto-Nanojuncetea

Non Qualifying Interests

3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorarae and/or Isoeto-Nanojuncetea

Potential 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorarae and/or Isoeto-Nanojuncetea

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MAP 8:
GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES LAKE HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
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0 1 2 3 km

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Map Version 1
Date: Jan 2015

Legend

- Gweedore Bay and Islands SAC 001141
- 5130 *Juniperus communis* formations on heaths or calcareous grasslands Survey Sites
- OSi Discovery Series County Boundary

DL14

DL12

DL11

DL15

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MAP 9: GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES JUNIPER FORMATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
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0 1 2 3 km

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Legend

- Gweedore Bay and Islands SAC 001141
- 1355 Otter-*Lutra lutra* Commuting 250m HWM buffer
- OSi Discovery Series County Boundary

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MAP 10:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
OTTER COMMUTING

Map to be read in conjunction with the NPWS Conservation Objectives Document.

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0 1 2 3 km

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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
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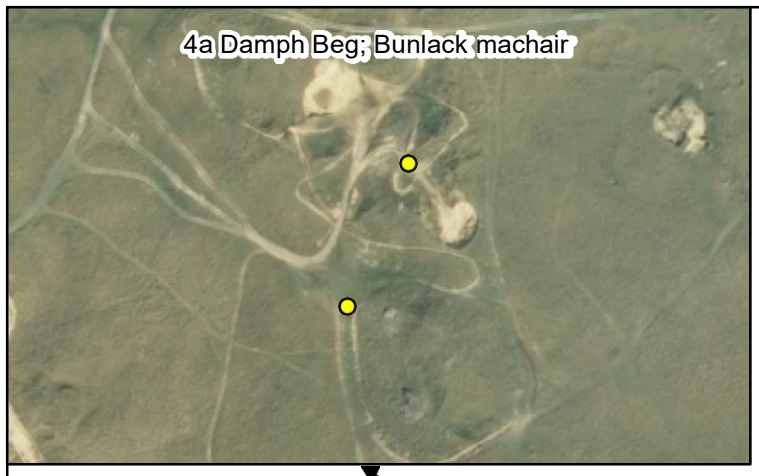

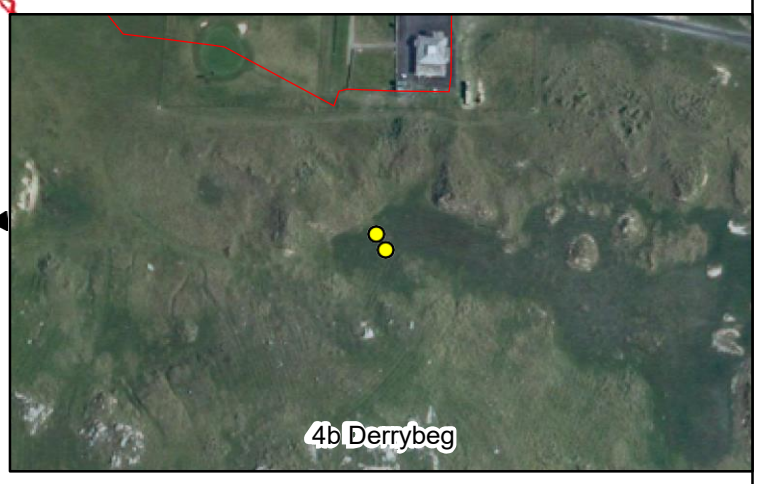

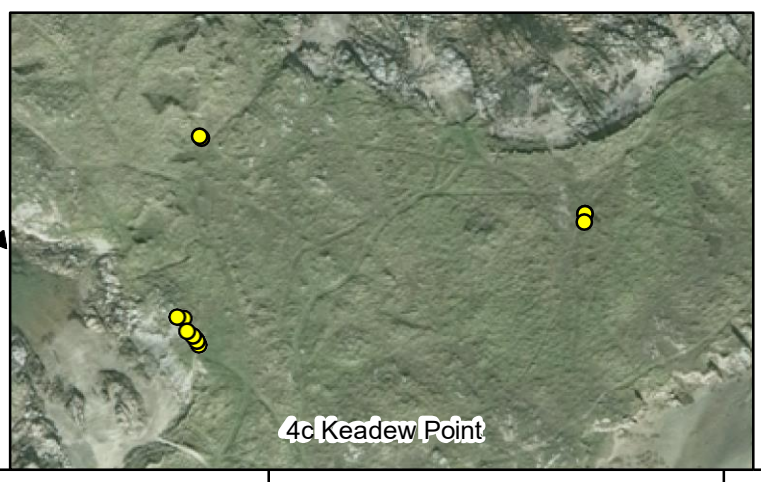

Legend

- Gweedore Bay and Islands SAC 001141
- 1395 Petalwort - *Petalophyllum ralfsii*
- OSi Discovery Series County Boundary

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MAP 11:
GWEEDORE BAY AND ISLANDS SAC
CONSERVATION OBJECTIVES
PETALWORT

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 1 2 3 km

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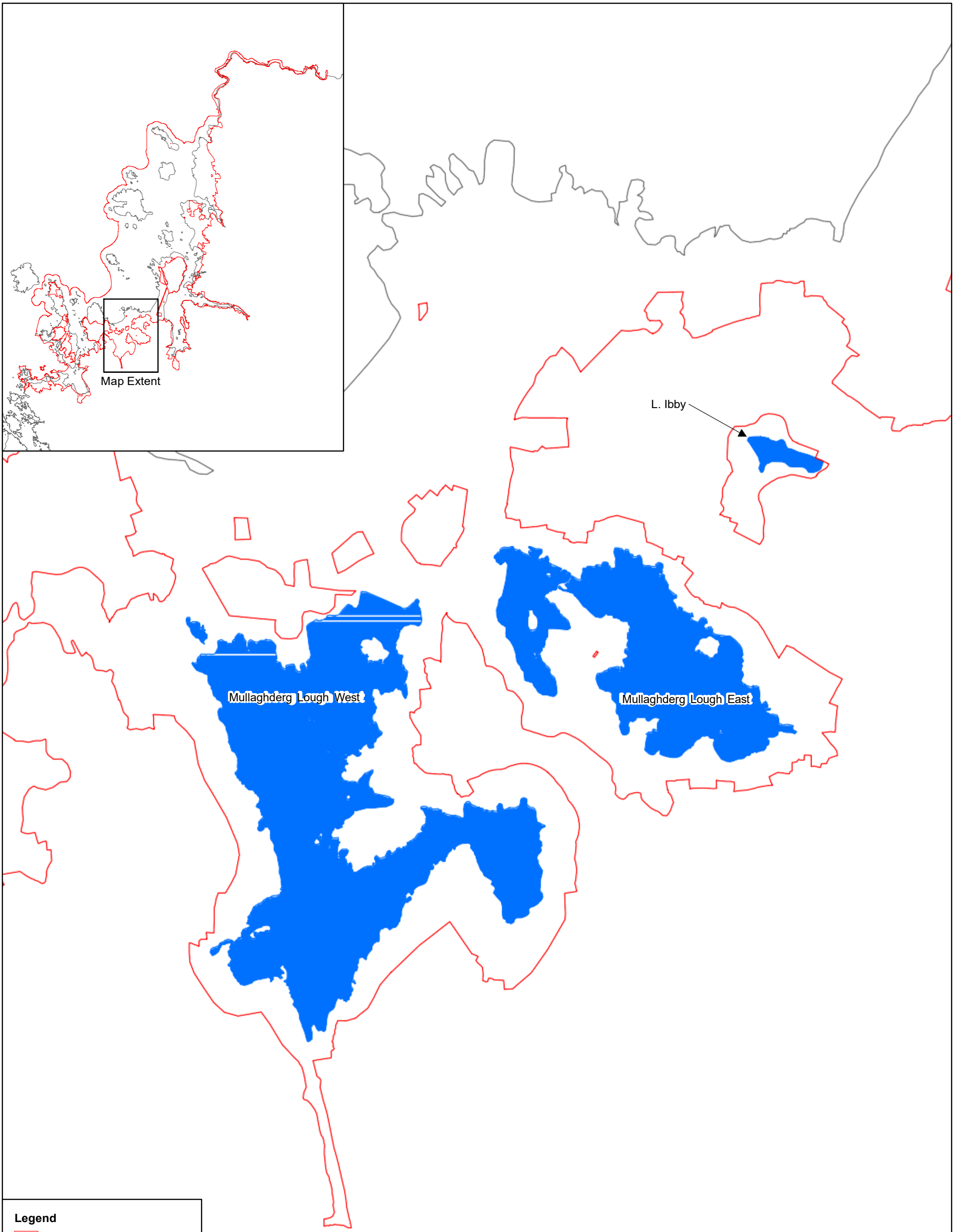

Legend

- Gweedore Bay and Islands SAC 001141
- 1833 Slender Naiad - *Najas flexilis*
- OSi Discovery Series County Boundary

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MAP 12: GWEEDORE BAY AND ISLANDS SAC CONSERVATION OBJECTIVES SLENDER NAIAD

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001141; version 3.01. CO. DONEGAL

0 100 200 300 400 500 m

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ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Horn Head and Rinclevan SAC 000147

National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: natureconservation@npws.gov.ie

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Series Editors: Maria Long and Colin Heaslip
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000147	Horn Head and Rinclevan SAC
1013	Geyer's Whorl Snail *Vertigo geyeri*
1364	Grey Seal *Halichoerus grypus*
1395	Petalwort *Petalophyllum ralfsii*
1833	Slender Naiad *Najas flexilis*
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)*
2170	Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)
2190	Humid dune slacks
21A0	Machairs (* in Ireland)
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea

Please note that this SAC overlaps with Horn Head to Fanad Head SPA (004194) and adjoins Ballyness Bay SAC (001090). See map 2. The conservation objectives for this site should be used in conjunction with those for overlapping and adjacent sites as appropriate. IMPORTANT: This 'Version 2' document includes 1 additional QI (3130). The conservation objectives for pre-existing QIs have not been updated.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1998
Title :	Biomar survey of Irish machair sites 1996
Author :	Crawford, I.; Bleasdale, A.; Conaghan, J.
Series :	Irish Wildlife Manual No. 3
Year :	2004
Title :	Harbour seal population assessment in the Republic of Ireland: August 2003
Author :	Cronin, M.; Duck, C.; O Cadhla, O.; Nairn, R.; Strong, D.; O'Keeffe, C.
Series :	Irish Wildlife Manual No. 11
Year :	2004
Title :	Summary of National Parks and Wildlife Service surveys for common (harbour) seals (*Phoca vitulina*) and grey seals (*Halichoerus grypus*), 1978 to 2003
Author :	Lyons, D.O.
Series :	Irish Wildlife Manual No. 13
Year :	2004
Title :	Aerial surveying of grey seal breeding colonies on the Blasket Islands, Co. Kerry, the Inishkea Group, Co. Mayo and the Donegal coast during the 2003 breeding season
Author :	Cronin, M.; Ó Cadhla, O.
Series :	Unpublished report to NPWS
Year :	2004
Title :	The distribution of *Najas flexilis* in Ireland 2002-2004
Author :	Roden, C.M.
Series :	Unpublished report to NPWS
Year :	2007
Title :	Grey seal moult population survey in the Republic of Ireland, 2007
Author :	Ó Cadhla, O.; Strong, D.
Series :	Unpublished report to NPWS
Year :	2008
Title :	An assessment of the breeding population of grey seals in the Republic of Ireland, 2005
Author :	O Cadhla, O.; Strong, D.; O'Keeffe, C.; Coleman, M.; Cronin, M.; Duck, C.; Murray, T.; Dower, P.; Nairn, R.; Murphy, P.; Smiddy, P.; Saich, C.; Lyons, D.O.; Hiby, L.
Series :	Irish Wildlife Manual No. 34
Year :	2009
Title :	Coastal Monitoring Project 2004-2006
Author :	Ryle, T.; Murray, A.; Connolly, K.; Swann, M.
Series :	Unpublished report to NPWS
Year :	2011
Title :	Monitoring and condition assessment of populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland
Author :	Moorkens, E.; Killeen, I.
Series :	Irish Wildlife Manuals, No. 55
Year :	2013
Title :	Monitoring survey of Annex I sand dune habitats in Ireland
Author :	Delaney, A.; Devaney, F.M.; Martin, J.M.; Barron, S.J.
Series :	Irish Wildlife Manuals, No. 75

Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2013
Title :	An aerial survey of harbour seals in Ireland. Part 1: Lough Foyle to Galway Bay. August 2011
Author :	Duck, C.; Morris, C.
Series :	Unpublished report to NPWS
Year :	2014
Title :	Horn Head and Rinclevan SAC (site code: 147) Conservation objectives supporting document-coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2014
Title :	Horn Head and Rinclevan SAC (site code: 147) Conservation objectives supporting document-marine species V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2014
Title :	Horn Head and Rinclevan SAC (site code: 147) Conservation objectives supporting document-*Najas flexilis* V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2015
Title :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, Á.
Series :	Unpublished document by NPWS
Year :	2019
Title :	The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2021
Title :	A study of lakes with Slender Naiad (*Najas flexilis*)
Author :	Roden, C.; Murphy, P.; Ryan, J.B.
Series :	Irish Wildlife Manuals No. 132

Other References

Year :	1982
Title :	Eutrophication of waters. Monitoring assessment and control
Author :	OECD
Series :	OECD, Paris
Year :	1983
Title :	The grey seal (*Halichoerus grypus*) in Ireland
Author :	Summers, C.F.
Series :	Unpublished Report to the Minister for Fisheries, Forestry and Wildlife
Year :	2006
Title :	The vegetation of Irish machair
Author :	Gaynor, K.
Series :	Biology and Environment: Proceedings of the Royal Irish Academy, 106B(3): 311-321
Year :	2007
Title :	Aerial surveying of grey seal breeding colonies on the Blasket Islands, Co. Kerry, the Inishkeas group, Co. Mayo and the Donegal coast, Ireland
Author :	Cronin, M.A.; Duck, C.D.; Ó Cadhla, O.
Series :	J. Nat. Conserv. 15(2): 77-83
Year :	2008
Title :	The phytosociology and conservation value of Irish sand dunes
Author :	Gaynor, K.
Series :	Unpublished Ph.D. Thesis, National University of Ireland, Dublin
Year :	2013
Title :	Conservation of selected legally protected and Red Listed bryophytes in Ireland
Author :	Campbell, C.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin
Year :	2016
Title :	A narrative for conserving freshwater and wetland habitats in England
Author :	Mainstone, C.; Hall, R.; Diack, I.
Series :	Natural England Research Reports Number 064
Year :	2020
Title :	Slender Naiad (*Najas flexilis*) habitat quality assessment
Author :	Gunn, I.D.M.; Carvalho, L.
Series :	CRW2018_27. Scotland's Centre of Expertise for Waters (CREW)

Spatial data sources

Year :	2009
Title :	Coastal Monitoring Project 2004-2006. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Saltmarsh CO data investigated and resolved with expert opinion used
Used For :	2110, 2120, 2130, 2170, 2190, 21A0 (map 3)
Year :	2013
Title :	Sand Dune Monitoring Project 2011. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Saltmarsh CO data investigated and resolved with expert opinion used
Used For :	2110, 2120, 2130, 2170, 2190, 21A0 (map 3)
Year :	2014
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1013, 1364, 1395 (maps 4 and 5)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	High Water Mark (HWM) polyline feature class converted into polygon feature class; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1364 (map 5)
Year :	2013
Title :	*Najas flexilis* data
GIS Operations :	Lake habitat for species clipped to SAC boundary
Used For :	1833 (map 6)

2110 Embryonic shifting dunes

To maintain the favourable conservation condition of Embryonic shifting dunes in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Dunfanaghy - 0.39ha. See map 3	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat is very difficult to measure in view of its dynamic nature. Recorded at one sub-site, giving a total estimated area of 0.39ha
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Embryo dunes were absent from Rinclevan sub-site. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. At Dunfanaghy, there is a rock armour wall which protects the golf course at the most easterly end of the beach. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). A range of coastal habitats occur at both sub-sites. The sand dune habitats grade into saltmarsh at Dunfanaghy. See coastal habitats supporting document for further details
Vegetation composition: plant health of foredune grasses	Percentage cover	More than 95% of sand couch grass (*Elytrigia juncea*) and/or lyme grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities with typical species: sand couch grass (*Elytrigia juncea*) and/or lyme grass (*Leymus arenarius*)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-native species) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. See coastal habitats supporting document for further details

2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)

To maintain the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rinclevan - 4.08ha; Dunfanaghy - 1.09ha. See map 3	Habitat was mapped during the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013) at two sub-sites to give a total estimated area of 5.18ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 3 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Shifting dunes were recorded from both sub-sites. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Marram grass (*Ammophila arenaria*) reproduces vegetatively and requires constant accretion of fresh sand to maintain active growth encouraging further accretion. At Rinclevan there was no substantial accreting of fore dune development. At Dunfanaghy there is good development of fore dunes, however in some areas they are discontinuous as a result of trampling and overuse which has led to erosion. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). A range of coastal habitats occur at both Rinclevan and Dunfanaghy. The sand dune habitats grade into a small area of saltmarsh at Dunfanaghy. See coastal habitats supporting document for further details
Vegetation composition: plant health of dune grasses	Percentage cover	95% of marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (*Ammophila arenaria*) and/or lyme-grass (*Leymus arenarius*)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species; species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. At Rinclevan, sea-buckthorn (*Hippophae rhamnoides*) was recorded while bracken (*Pteridium aquilinum*) was noted at Dunfanaghy by the Ryle et al. (2009). See coastal habitats supporting document for further details

2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*

To maintain the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes') in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rinclevan-277.75ha; Dunfanaghy - 14.58ha. See map 3	Based on data from Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded from two sub-sites, giving a total estimated area of 292.33ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 3 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. At Dunfanghy there is a rock armour wall which protects a golf course. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). A range of coastal habitats occur at both Ringclevan and Dunfanghy. At Dunfanaghy, the sand dune habitats grade into a small area of saltmarsh. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). Petalwort (*Petalophyllum ralfsii*), a species that favours open conditions, is a qualifying interest for the SAC. See the conservation objective for this species (1395) as well as the coastal habitats supporting document for further details
Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Rinclevan the fixed dunes are overgrazed by both sheep and cattle. A sizable portion of the northern half of the dunes are owned by NPWS and the maintenance of a controlled grazing regime in this area is part of a management plan for the dunes. At Dunfanaghy the fixed dunes are undergrazed. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Ryle et al. (2009), Delaney et al. (2013) and Gaynor (2008). At Rinclevan, petalwort (*Petalophyllum ralfsii*) is recorded at the southern end of the dune system (see also the conservation objective for this species (1395). Lesser meadow rue (*Thalictrum minus*) was recorded in the fixed dunes at Rinclevan. See coastal habitats supporting document for further details.
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. At Rinclevan, a large stand of sea-buckthorn (*Hippophae rhamnoides*) was recorded in the eastern end of the site. At Dunfanaghy, Ryle et al. (2009) estimated that 70% of the fixed dune habitat was covered in bracken (*Pteridium aquilinum*). See coastal habitats supporting document for further details

Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009) and Delaney et al. (2013). At Dunfanaghy, Ryle et al. (2009) noted the presence of scattered hawthorn (*Crataegus monogyna*) and willow (*Salix* sp.) bushes in the dunes, as well as bramble (*Rubus fruticosus*).See coastal habitats supporting document for further details

2170 Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)

To restore the favourable conservation condition of Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae) in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Rinclevan - 9.04ha. See map 3	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded from one sub-site, giving a total estimated area of 9.04ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for known distribution	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% cover, subject to natural processes	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: cover and height of *Salix repens*	Percentage cover; centimetres	Maintain more than 10% cover of creeping willow (*Salix repens*); vegetation height should be in the average range 5 - 20cm	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Cover of creeping willow (*Salix repens*) is maintained through an appropriate grazing regime, which prevents the development of a coarse, rank vegetation cover. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of monitoring stops	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. At Rinclevan, a large stand of Sea-buckthorn (*Hippophae rhamnoides*) was recorded in the eastern end of the site. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	For trees and scrub other than creeping willow (*Salix repens*), there should be no more than 5% cover, or their presence should be under control	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

2190 Humid dune slacks

To maintain the favourable conservation condition of Humid dune slacks in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-sites mapped: Rinclevan - 42.57ha See map 3	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was mapped at one sub-site, giving a total estimated area of 42.57ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details.
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation, resulting in increased rates of erosion. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations (metres)	Maintain natural hydrological regime	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). At Rinclevan, the dune slack site area in the southern half of the dunes is one of the largest slack systems in the country and it is mostly intact and undamaged. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). A range of coastal habitats occur at both Rinclevan and Dunfanaghy. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 5% of dune slack habitat, with the exception of pioneer slacks which can have up to 20% bare ground	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008), Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: cover of *Salix repens*	Percentage cover; centimetres	Maintain less than 40% cover of creeping willow (*Salix repens*)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Cover of creeping willow (*Salix repens*) needs to be controlled (e.g. through an appropriate grazing regime) to prevent the development of a coarse, rank vegetation cover. Creeping willow (*Salix repens*) occurs constantly within the dune slack habitat at Rinclevan. See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled. At Rinclevan, a large stand of sea-buckthorn (*Hippophae rhamnoides*) was recorded in the eastern end of the site. See coastal habitats supporting document for further details

Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

21A0 Machairs (* in Ireland)

To restore the favourable conservation condition of Machairs in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes including erosion and succession. For sub-site mapped: Rinclevan - 41.32ha. See map 3	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney et al., 2013). Habitat was recorded from one sub-site, giving a total estimated area of 41.32ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations (metres)	Maintain natural hydrological regime	Based on data from Ryle et al. (2009), Delaney et al. (2013), Crawford et al. (1996) and Gaynor (2006). See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Ryle et al. (2009) and Delaney et al. (2013). A range of coastal habitats occur at Dunfanghy and Rinclevan. See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of Machair habitat, subject to natural processes	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimeters	Maintain structural variation within sward.	Based on data from Ryle et al. (2009) and Delaney et al. (2013). The machair at Rinclevan is overgrazed by sheep at Pollaguill Bay. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009) and Delaney et al. (2013). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details.
Vegetation composition: bryophytes	Percentage cover	Should always be at least an occasional component of the vegetation	Based on data from Ryle et al. (2009) and Delaney et al. (2013). See coastal habitats supporting document for further details

3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea

To maintain the Favourable conservation condition of Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea in the Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Habitat 3130 is found in Port Lough (Loch an Phoirt) and was assessed as in Good conservation condition in 2016, but changes noted since 2004 were of concern (Roden et al., 2021). Habitat 3130 occurs in clear-water lakes of intermediate alkalinity where *Isoetes lacustris* and *Potamogeton perfoliatus/praelongus* co-occur and is characterised by high species-richness and a deep-water flora that can include *Najas flexilis* (Roden et al., 2021). Habitat 3130 was in Poor, deteriorating Conservation Status across Ireland in the two reporting periods, 2007-2018 (NPWS, 2013, 2019). Most lakes with 3130 appear to be damaged and high conservation value 3130 lakes in Good condition are extremely rare (Roden et al., 2021). Lake surface area is the simplest measure of extent and should be stable or increasing. See map 6. For further information, see Roden et al. (2021) and the lake habitats supporting document for *Najas flexilis*
Habitat distribution	Occurrence	No decline, subject to natural processes	At Horn Head and Rinclevan SAC, habitat 3130 is found at Port Lough, on Dalradian marble and schist. The habitat was described by Roden et al. (2021) as 'of exceptional conservation value', ranking second in conservation importance of all lakes studied, however the appearance of abundant, large plants of Canadian Pondweed *Elodea canadensis* between 2004 and 2016, and presence of blackened charophyte remains in 2016 were of concern. Previous surveys of Port Lough include Stewart and Preston in 1989, Stewart in 1991 and Roden in 2004 (Roden et al., 2021). See also the conservation objective for Slender Naiad *Najas flexilis* in this volume and the *Najas flexilis* conservation objective supporting document for the SAC for information relating to all attributes and targets
Vegetation species richness	Occurrence	Maintain appropriate species richness	Roden et al. (2021) recorded a diverse flora at Port Lough with many species more typical of base-rich water, and listed 31 aquatic plants. N.F. Stewart (pers. comm.) collated records for nine additional marginal and aquatic taxa at the lake. Notable species at Port Lough include *Callitriche hermaphroditica*, *Chara curta*, *Najas flexilis* and *Nitella confervacea*. *Elodea canadensis* was first recorded in Port Lough in 2016, when it had high abundance of large plants, and had suppressed a very unusual vegetation of *Najas flexilis* and *Callitriche hermaphroditica* growing between *Chara* hummocks (Roden et al., 2021). Habitat 3130 has a varied and species-rich flora, with high conservation value examples having >30 species of aquatic macrophytes (Roden et al., 2021). Almost all lakes with more than 30 species had euphotic depth >3m and the target is for the number of species to be stable or increasing (Roden et al., 2021)

Vegetation composition: typical species	Occurrence	Maintain typical species, in good condition, and demonstrating typical abundances and distribution	Habitat 3130 has a varied and species-rich flora with several rare typical species (Roden et al., 2021). In 2016, Port Lough had a stable *Najas flexilis* population and 11 typical indicator species (Roden et al., 2021). The indicator species recorded were *Littorella uniflora, Lobelia dortmanna, Myriophyllum alterniflorum, Isoetes lacustris, Callitriche hermaphroditica, Chara virgata, Nitella translucens, Potamogeton berchtoldii, Potamogeton perfoliatus, Najas flexilis* and *Nitella confervacea*, the last two being high quality indicators (Roden et al., 2021). The targets are: 1) a stable *Najas flexilis* population, 2) at least nine indicator species, 3) one or more high quality indicator species (Roden et al., 2021) and 4) to maintain condition and extent of typical species. See NPWS (2013, 2019), O Connor (2015) and *Najas flexilis* targets
Vegetation composition: characteristic zonation	Occurrence	Maintain characteristic deep-water vegetation	In 2016, there was full development of the characteristic deep-water vegetation at Port Lough: below 1m, the flora was diverse and included *Isoetes lacustris, Najas flexilis*, pondweeds and charophytes (Roden et al., 2021). The characteristic zonation (3 or more zones) is described in Roden et al. (2021). Shallow water (0-1.5m) has a *Lobelia-Littorella* zone, then an *Isoetes* zone (0.5-3m), both also typical of oligotrophic lakes (habitat 3110). The characteristic deep water community is the most sensitive element and consists of some or all of *Callitriche hermaphroditica, Hydrilla verticillata, Najas flexilis, Potamogeton berchtoldii, P. perfoliatus, P. pusillus, Nitella confervacea, Nitella flexilis, Nitella translucens*. Full development is when a distinct deep water zone is present, with one or more of its typical species having >25% cover. More alkaline 3130 lakes, such as Port Lough, also have stonewort and pondweed communities
Vegetation distribution: maximum (euphotic) depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The target for Port Lough is set as at least 5m. Maximum depth of vegetation or euphotic depth was 5m in Port Lough in 2016 (Roden et al., 2021). *Najas flexilis*, pondweeds and *Nitella* spp. were common at the base of the euphotic zone, however the widespread co-occurrence of *Elodea canadensis* was concerning, as was the noticeable deposit of blackened charophyte remains (Roden et al., 2021). Maximum depth of colonisation (euphotic depth) ranged from 5.5m to <2m in lakes surveyed from 2016-2018 and the target in 3130 lakes was set as at least 3m (Roden et al., 2021). Euphotic depth of >4m or >5m has been recorded in species-rich 3130 lakes in good condition and is considered to have declined in many lakes, owing to increased water colour. Lakes within undisturbed peatland are expected to have clear water and large maximum vegetation depth
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	Roden et al. (2021) found that, in summer, the *Lobelia-Littorella* zone is typically submerged and if more than half is exposed it is of concern, and water level should never be lower than the top of the *Isoetes* zone. Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction, drainage and over-grazing. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. Groundwater inputs are likely to be important for the characteristic deep-water zone and *Najas flexilis* (Gunn and Carvalho, 2020), and for the communities with *Chara* spp. in lakes such as Port Lough. The hydrological regime of the lake must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced

Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Gravel, fine mud and bedrock were recorded in Port Lough in 2016, and silt was dominant below 1m (Roden et al., 2021). Roden (2004) said 'the bottom is a fine reddish mud'. The high abundance of large *Elodea canadensis* plants in deep water in Port Lough in 2016 may indicate enrichment of the substratum with nutrients and organic matter. Roden et al. (2021) found that habitat 3130 is generally dominated by bedrock, sand and loose stones, silt mud or hard peat, and said that the appearance of large expanses of unconsolidated peat would indicate excessive sediment input. Groundwater inputs are likely to be important for the substratum of the characteristic deep-water zone and *Najas flexilis* (Gunn and Carvalho, 2020) and for the communities with *Chara* spp. in lakes such as Port Lough. Research is required to further characterise the chemical composition of the substratum
pH and alkalinity	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Port Lough had pH 7.5 and alkalinity 36mg/l in February 2019 (Roden et al., 2021). The habitat is associated with intermediate alkalinity, largely between 20-80mg/l but lower values may occur on Old Red Sandstone (ORS) (Roden et al., 2021). Surveyed lakes had average alkalinity of 25mg/l (range 5.5-73mg/l) (Roden et al., 2021). In line with targets for *Najas flexilis*, median pH values should be greater than 7 pH units. Groundwater may influence sediment and water chemistry and be important for *Najas flexilis* and other characteristic flora, contributing base-poor water to obligate carbon dioxide photosynthesisers in more calcareous lakes and more base-rich water to highly oligotrophic lakes (ORS). Acidification by organic acids released from degraded peatland and conifer plantations may impact on the habitat. See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Nutrients	mg/l P or mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	Roden et al. (2021) reported a total phosphorus (TP) concentration of 0.028mg/l at Port Lough, based on a single sample taken in February 2019. Roden et al. (2021) noted that the best quality lakes surveyed had average TP of <0.015mg/l. Lakes in Good condition with high-frequency nutrient data had an overall average of 0.01mg/l TP (lake averages ranged 0.008-0.015mg/l TP). While Roden et al. (2021) suggested a target of <0.015mg/l TP, the target for Good condition is set as an average of ≤0.010mg/l or WFD High Status, however vegetation attributes determine the overall conservation condition. See also the *Najas flexilis* supporting document for the SAC and The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019. WFD High Status targets for total ammonia (annual average ≤0.04mg/l N and annual 95th percentile ≤0.09mg/l N) may also be appropriate

Water colour	mg/l PtCo	Restore appropriate water colour to support the habitat	Water colour in Port Lough was 68mg/l Platinum-Cobalt Scale (PtCo) on 5 February 2019 (Roden et al., 2021). The habitat is found in clear water. Water colour (dissolved light-absorbing compounds that impact on light penetration) is negatively correlated with max vegetation (euphotic) depth: lakes with euphotic depth >3m had colour <40mg/l PtCo, while those with euphotic depth >3.5m had colour <35mg/l PtCo (Roden et al., 2021). Lakes with high colour had fewer species and smaller populations of *Najas flexilis*. Roden et al. (2021) set Good condition at <40mg/l PtCo, however this was considered to be an impacted state some distance from reference condition. The primary source of increased colour in Ireland is peatland disturbance, e.g. through turf-cutting, over-grazing, plantation forestry. Further work is necessary to determine water colour in intact peatland catchments and sustainable levels for the habitat, which may be <30mg/l PtCo or even <20mg/l PtCo
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	Dissolved organic carbon (DOC) in the water column is linked to water colour and acidification (organic acids). It can provide a substrate (food source) for heterotrophic organisms, which can impact directly (e.g. shading) and indirectly (e.g. nutrient release) on the characteristic lake communities. Damage and degradation of peatland, e.g. through afforestation or turf-cutting, leading to decomposition of peat, is likely to be the predominant source of dissolved and particulate organic carbon in Ireland. The high colour recorded in Port Lough in February 2019 may have indicated high DOC from catchment sources. Roden et al. (2021) noted elevated water colour in winter was common in study lakes, but could not characterise the natural seasonal patterns
Turbidity	Nephelometric turbidity units/mg/l SS/other appropriate unit	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads of fine particulate matter entering the lake, or eutrophication. Particulate loads from peatlands are the most likely sources of increased turbidity in lakes with the habitat. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Roden et al. (2021) reported a Secchi depth of 3m in Port Lough in August 2016 and high water colour in February 2019. Roden (2004) described it as a clear water lough. Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. Roden et al. (2021) advised it is preferable to measure euphotic depth directly by observation, but noted that a decreasing trend in Secchi depth indicates declining water quality. Transparency can be affected by phytoplankton blooms, water colour and turbidity. The OECD fixed boundary system (OECD, 1982) set transparency targets for oligotrophic lakes of ≥6m annual mean Secchi disk depth and ≥3m annual minimum Secchi disk depth

Attached algal biomass	Algal cover	Maintain trace/absent attached algal biomass (<5% cover)	Filamentous algae were not recorded in Port Lough in 2016 (Roden et al., 2021). Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. Roden et al. (2021) noted that occasional blooms of filamentous algae occur in 3130 lakes in the absence of excess nutrients, especially species of the orders Zygnematales or Oedogoniales, but that drifting masses of *Cladophora* species may indicate a decline in water quality. In general, the cover abundance of attached algae in lakes with 3130 should be trace/absent (<5% cover)
Fringing habitat: area and condition	Hectares	Maintain/restore the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3130	Much of the shoreline of Port Lough is bedrock or large boulders with sparse vegetation, although a very dense *Phragmites* bed occurs in the southern arm (Roden et al., 2021). It is fringed by some areas of semi-natural grassland, woodland and scrub, but mainly with more intensively used agricultural land. Heterogeneous lake fringes with a range of natural and semi-natural habitats are preferable. Restoration or maintenance of open, species-rich fen, marsh and grassland can be particularly important. Fringing habitats along lakes intergrade with and support the structure and functions of the lake habitat. Equally, fringing wetland habitats are dependent on the lake, particularly its water levels, and support invertebrate and plant communities and species of high diversity and conservation concern. See also Mainstone et al. (2016)

1013 Geyer's Whorl Snail *Vertigo geyeri*

To maintain the favourable conservation condition of Geyer's Whorl Snail in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: occupied sites	Number	No decline. There is one known site for this species in this SAC, which overlaps three 1km squares C0038, C0039 and B9938. See map 4	The site comprises suitable habitat on the south side of the valley of the Polaguill Burn and specifically runnels and small streams which drain the south side of the valley. From Moorkens and Killeen (2011) (site code VgCAM14)
Distribution in habitat patches	Occurrence	Adults or sub-adult snails present in at least two samples (out of a minimum of four) taken from discrete areas of suitable habitat	From Moorkens and Killeen (2011)
Presence on transect	Occurrence	Adult or sub-adult snails are present in at least two of the four samples taken from optimal or sub-optimal habitat on the transect	Transect established as part of condition assessment monitoring at this site (Moorkens and Killeen, 2011). See habitat extent attribute below for definition of optimal and sub-optimal habitat
Transect habitat quality	Metres	18m of habitat along the transect is classed as optimal or sub-optimal and there are five zones of habitat along the transect classed as optimal or sub-optimal	From Moorkens and Killeen (2011). See habitat extent attribute below for definition of optimal and sub-optimal habitat
Transect optimal wetness	Metres	Soils, at time of sampling, are damp (optimal wetness) and covered with a layer of humid thatch for 18m of the transect	From Moorkens and Killeen (2011)
Habitat extent	Hectares	At least 4ha of optimal habitat with a further 6ha supporting some sub-optimal habitat	Optimal habitat is defined as flushed fen grassland with sward lawns 10-30cm tall, (or on the transect, runnels), stony ground with tufa, containing species such as yellow sedge (*Carex viridula*), marsh horsetail (*Equisetum palustre*), jointed rush (*Juncus articulatus*), common butterwort (*Pinguicula vulgaris*), black bog-rush (*Schoenus nigricans*) and the mosses *Drepanocladus revolvens* and *Campylium stellatum*. The water table should be between 0 and 5cm of the soil surface, but not above ground level. Sub-optimal grassland is defined as having same vegetation composition as above or including purple moorgrass (*Molinia caerulea*) and rushes (*Juncus* spp.), but either vegetation height is less than 5cm or greater than 30cm; or the water table is below 5cm or ground is flooded; or there are extensive areas of bare ground. From Moorkens and Killeen (2011)

1364 Grey Seal *Halichoerus grypus*

To maintain the favourable conservation condition of Grey Seal in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use	See marine supporting document for further details
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition. See map 5 for known sites	Attribute and target based on background knowledge of Irish breeding populations, a preliminary survey in 2003 (Cronin and Ó Cadhla, 2004; Cronin et al., 2007), comprehensive breeding surveys in 2005 (Ó Cadhla et al., 2008) and unpublished NPWS records including those reported by Summers (1983) and Lyons (2004). See marine supporting document for further details
Moulting behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition	Attribute and target based on background knowledge of Irish populations, on review of data from Lyons (2004), a national moult survey (Ó Cadhla and Strong, 2007) and unpublished NPWS records. See marine supporting document for further details
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition. See map 5 for known sites	Attribute and target based on review of data from Lyons (2004), Cronin et al. (2004), Duck and Morris (2013) and unpublished NPWS records. See marine supporting document for further details
Population composition	Number of cohorts	The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually	Attribute and target based on review data from Lyons (2004), Ó Cadhla et al. (2007), Ó Cadhla and Strong (2007) and unpublished NPWS records. See marine supporting document for further details
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the grey seal population at the site	See marine supporting document for further details

1395 Petalwort *Petalophyllum ralfsii*

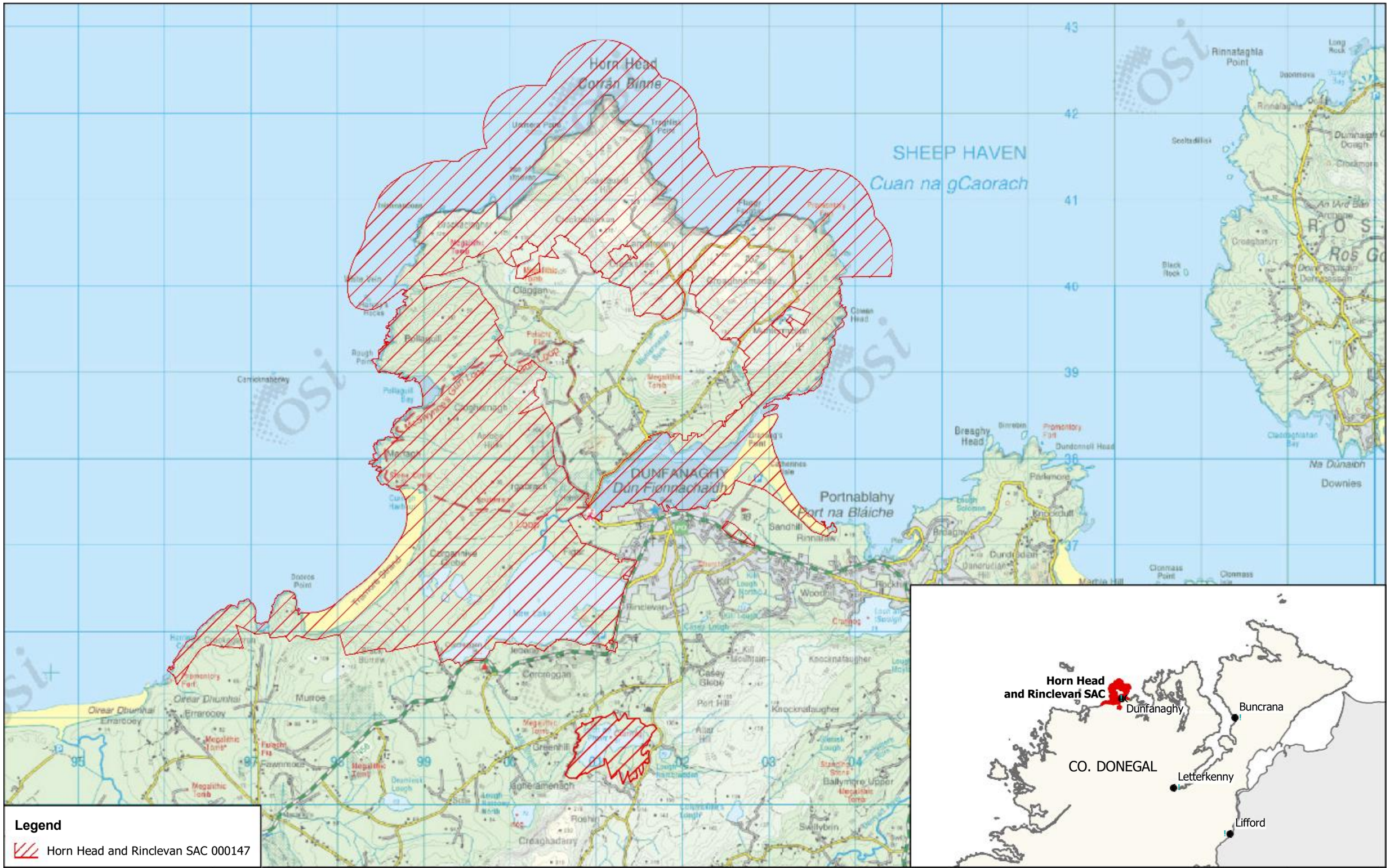
To maintain the favourable conservation condition of Petalwort in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution of populations	Number and geographical spread of populations	No decline. See map 4 for recorded location	The population occurs in carpet of low mosses on thin, damp sandy soil overlying more or less horizontal rock on top of low rocky knoll above sand beach and near dunes at Tramore/Black Burrow/SW of Dunfanaghy. Data from 2002 NPWS survey
Population size	Number of individuals	No decline. The population is estimated at a minimum of 3 thalli	Three thalli were counted in 2002
Area of suitable habitat	Hectares	No decline. Area of suitable habitat at Tramore/Black Burrow/SW of Dunfanaghy is estimated at c.0.000006ha	The area of occupancy is estimated to be 0.06 m². Therefore the area of suitable habitat is estimated 0.000006ha
Hydrological conditions: soil moisture	Occurrence of damp soil conditions	Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter	*Petalophyllum ralfsii* grows in damp sand. Based on Campbell (2013)
Vegetation: open structure	Height and percentage cover of vegetation	Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground	*Petalophyllum ralfsii* grows in compacted, sandy ground, maintained by rabbit (*Oryctolagus cuniculus*), sheep and cattle grazing. At time of survey in 2002, the estimated vegetation height was less than 3cm

1833 Slender Naiad *Najas flexilis*

To maintain the favourable conservation condition of Slender Naiad in Horn Head and Rinclevan SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population extent	Hectares; distribution	No change to the spatial extent of *Najas flexilis* within the lake, subject to natural processes. See map 6 for known location	See *Najas flexilis* supporting document for further details
Population depth	Metres	No change to the depth range of *Najas flexilis* within the lake, subject to natural processes	See *Najas flexilis* supporting document for further details
Population viability	Plant traits	No decline in plant fitness, subject to natural processes	See *Najas flexilis* supporting document for further details
Population abundance	Square metres	No change to the cover abundance of *Najas flexilis*, subject to natural processes	See *Najas flexilis* supporting document for further details
Species distribution	Occurrence	No decline, subject to natural processes	See *Najas flexilis* supporting document for further details
Habitat extent	Hectares	No decline, subject to natural processes	See *Najas flexilis* supporting document for further details
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat for the species	See *Najas flexilis* supporting document for further details
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the population of the species	See *Najas flexilis* supporting document for further details
Water quality	Various	Maintain appropriate water quality to support the population of the species	See *Najas flexilis* supporting document for further details
Acidification status	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the population of *Najas flexilis*, subject to natural processes	See *Najas flexilis* supporting document for further details
Water colour	mg/l PtCo	Maintain appropriate water colour to support the population of *Najas flexilis*	See *Najas flexilis* supporting document for further details
Associated species	Species composition and abundance	Maintain appropriate associated species and vegetation communities to support the population of *Najas flexilis*	See *Najas flexilis* supporting document for further details
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population of *Najas flexilis*	See *Najas flexilis* supporting document for further details



NPWS An Seirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 1:
HORN HEAD AND RINCLEVAN SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000147; version 3.04
CO. DONEGAL

0 0.5 1 2 Kilometres

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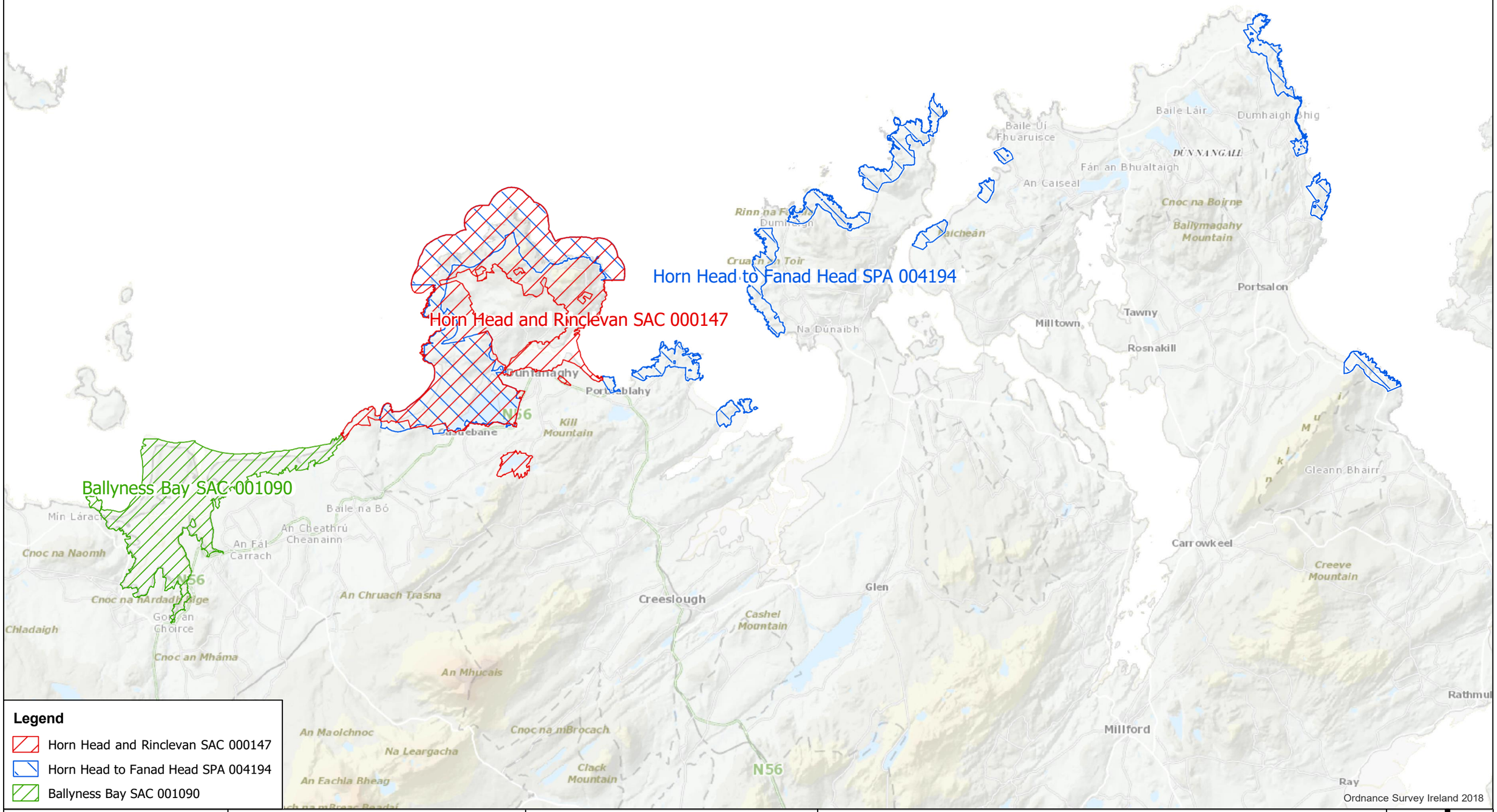
Map version 2
Date: March 2024



Legend

- Horn Head and Rinclevan SAC 000147
- Horn Head to Fanad Head SPA 004194
- Ballyness Bay SAC 001090

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MAP 2:
HORN HEAD AND RINCLEVAN SAC
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000147; version 3.04
CO. DONEGAL

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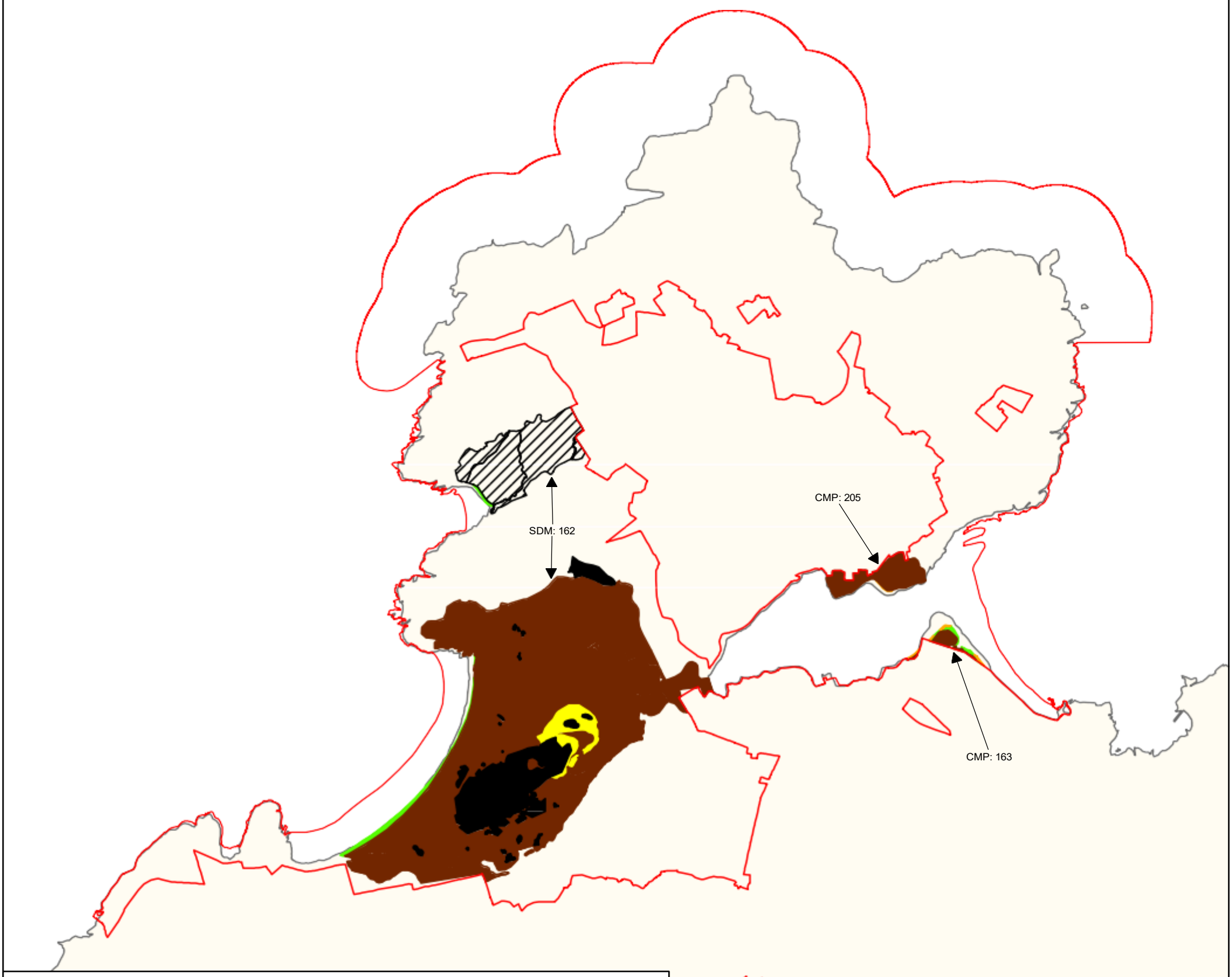
Map version 2
Date: March 2024



Legend

- Horn Head and Rinclevan SAC 000147
- OSi Discovery Series County Boundary
- CMP: 163 Coastal Monitoring Project Site Codes
- SDM: 162 Sand Dunes Monitoring Project Site Codes

Sand Dune Habitats

Qualifying Interests

- 2110 Embryonic shifting dunes
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- 2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')
- 2170 Dunes with *Salix repens* ssp. *argentea* (Salicion arenariae)
- 2190 Humid dune slacks
- 21A0 Machairs (*in Ireland)

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MAP 3:
HORN HEAD AND RINCLEVAN SAC
CONSERVATION OBJECTIVES
SAND DUNE HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000147; version 3. CO. DONEGAL

0 0.5 1 km

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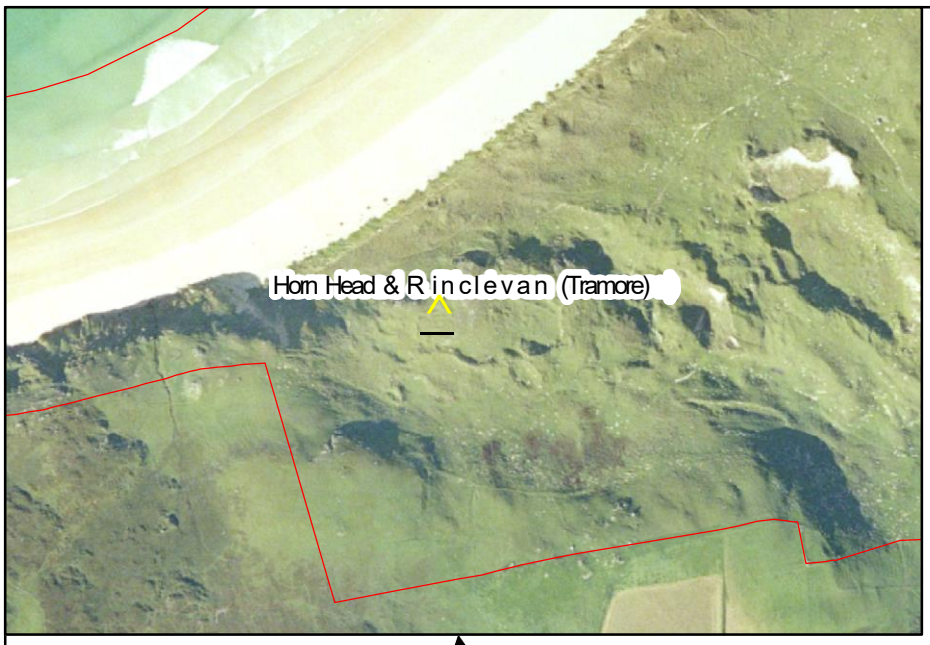
Map Version 1
Date: Sep 2014



C0039

B9938

C0038

Legend

- Horn Head and Rinclevan SAC 000147
- 1395 Petalwort - *Petalophyllum ralfsii*
- 1013 Geyer's Whorl Snail - *Vertigo geyeri*
- OSi Discovery Series County Boundary

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MAP 4:
HORN HEAD AND RINCLEVAN SAC
CONSERVATION OBJECTIVES
GEYER'S WHORL SNAIL / PETALWORT

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000147; version 3. CO. DONEGAL

0 0.5 1 km

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Map Version 1
Date: Sep 2014

Legend

- Horn Head and Rinclevan SAC 000147
- 1364 Grey Seal - *Halichoerus grypus* breeding sites
- 1364 Grey Seal - *Halichoerus grypus* resting sites
- 1364 Grey Seal - *Halichoerus grypus* habitat
- OSi Discovery Series County Boundary

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Department of Arts, Heritage and the Gaeltacht

MAP 5:
HORN HEAD AND RINCLEVAN SAC CONSERVATION OBJECTIVES GREY SEAL

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000147; version 3. CO. DONEGAL

0 0.5 1 km

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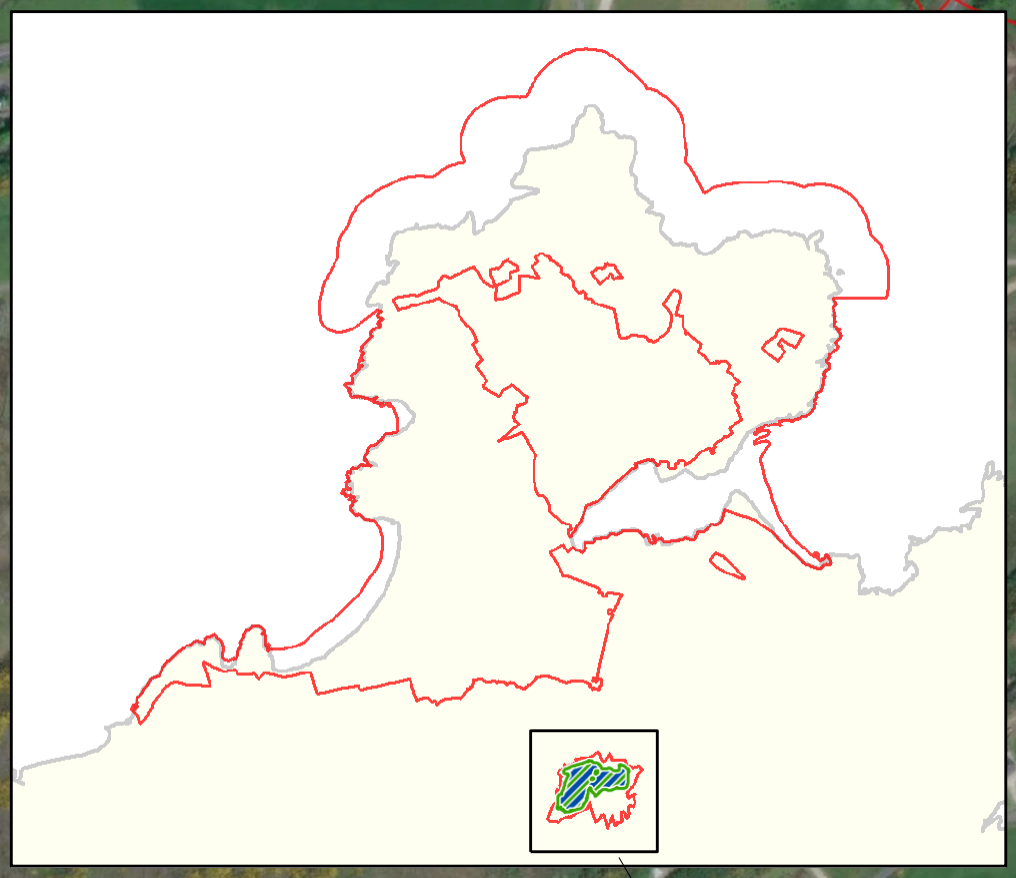
Map Version 1
Date: Sep 2014



Legend

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto- Nanojuncetea*
- 1833 Slender Naiad - *Najas flexilis*
- Horn Head and Rinclevan SAC 000147
- OSI Discovery Series County Boundaries

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 6:
HORN HEAD AND RINCLEVAN SAC
CONSERVATION OBJECTIVES
INDICATIVE LAKE HABITATS
& SLENDER NAIAD

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000147; version 3.04
CO. DONEGAL

0 25 50 100 Metres

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. © Folaíonn sé rannán Náisiúnta Mapála de shonraí Tailte Éireann
arna atáirgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Tailte Éireann CYAL50351092

Map version 2
Date: August 2024

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Lough Derg (Donegal) SPA 004057

National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: natureconservation@npws.gov.ie

Citation:

NPWS (2025) Conservation Objectives: Lough Derg (Donegal) SPA 004057. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Series Editors: Maria Long and Colin Heaslip
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004057	Lough Derg (Donegal) SPA
A183	Lesser Black-backed Gull *Larus fuscus*
A184	Herring Gull *Larus argentatus*

Please note that this SPA overlaps with River Finn SAC (002301). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2007
Title :	Seabird Productivity at East and South coast colonies in Ireland in 2007: Site accounts
Author :	Trewby, M.; Burt E.; Newton, S.
Series :	Unpublished report to NPWS
Year :	2021
Title :	Estimated foraging ranges of the breeding seabirds of Ireland's marine special protected area network
Author :	Power, A.; McDonnell, P.; Tierney, T.D.
Series :	Published NPWS report

Other References

Year :	2003
Title :	Implications for seaward extensions to existing breeding seabird colony Special Protection Areas
Author :	McSorley, C.A.; Dean, B.J.; Webb, A.; Reid J.B.
Series :	JNCC Report No. 329
Year :	2004
Title :	Seabird populations of Britain and Ireland
Author :	Mitchell, P.I.; Newton, S.F.; Ratcliffe, N.; Dunn, T.E.
Series :	Poyser, London
Year :	2010
Title :	How Representative is the Current Monitoring of Breeding Seabirds in the UK?
Author :	Cook, A.S.C.P.; Robinson, R.A.
Series :	BTO Research Report No. 573
Year :	2014
Title :	The Lesser Black-backed Gull *Larus fuscus* in England: how to resolve a conservation conundrum
Author :	Ross-Smith, V.H.; Robinson, R.A.; Banks, A.N.; Frayling, T.D.; Gibson, C.C.; Clark, J.A.
Series :	Seabird, 27 (October), pp.41-61
Year :	2019
Title :	Desk-based revision of seabird foraging ranges used for HRA screening
Author :	Woodward, I.; Thaxter, C.B.; Owen, E.; Cook, A.S.C.P.
Series :	BTO Research Report No. 724
Year :	2020
Title :	Lesser Black-backed Gull (*Larus fuscus*), version 1.0. In Birds of the World (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, Editors)
Author :	Burger, J.; Gochfeld, M.; Kirwan, G. M.; Christie,D. A.; de Juana, E
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2020
Title :	Herring Gull (*Larus argentatus*), version 1.0. In Birds of the World (S. M. Billerman, Editor)
Author :	Weseloh, D. V.; Hebert, C. E.; Mallory, M. L.; Poole, A. F.; Ellis, J. C.; Pyle, P.; Patten, M. A.
Series :	Cornell Lab of Ornithology, Ithaca, NY, USA
Year :	2021
Title :	GPS tracking reveals landfill closures induce higher foraging effort and habitat switching in gulls
Author :	Langley, L.P.; Bearhop, S.; Burton, N.H.; Banks, A.N.; Frayling, T.; Thaxter, C.B.; Clewley, G.D.; Scragg, E.; Votier, S.C.
Series :	Movement Ecology, 9, pp.1-13
Year :	2023
Title :	Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015-2021)
Author :	Burnell, D.; Perkins, A.J.; Newton, S.F.; Bolton, M.; Tierney, T.D.; Dunn, T.E.
Series :	Lynx Nature Books, Barcelona

A183 Lesser Black-backed Gull *Larus fuscus*

To restore the Favourable conservation condition of Lesser Black-backed Gull in Lough Derg (Donegal) SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	A large colony of nesting gulls was discovered on Inishgoosk Island in Lough Derg, Co. Donegal in 1977 (NPWS internal files). A survey in 1999 estimated a population of 500 pairs of Lesser Black-backed Gull at the site which was the largest colony in Ireland at the time (Mitchell et al., 2004). However, breeding Lesser Black-backed Gull have not been recorded at this site in subsequent surveys. It has been speculated that the breeding gull population on the lake moved away after the closure of a nearby landfill in Donegal town. Gulls (Laridae) forage regularly at landfills around the world (Weseloh et al., 2020). Local populations can become dependent on food on landfill and rubbish dumps and are vulnerable to improved waste disposal management or landfill closures (Langley et al., 2021). The natural-nesting (i.e. non-urban) Lesser Black-backed Gull population in Ireland has increased by 163% between national surveys in 1998 - 2002 and 2015 - 2021 (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. Trewby et al. (2007) reported that the mean productivity of Lesser Black-backed Gull from Lambay Island SPA was 1.66 (± 0.14 SE) chicks fledged per pair in 2007 (18 pairs across three subplots). Further monitoring and research work is required in order to identify a minimum productivity rate for this species at this site and at the national level. Ross-Smith et al. (2014) summarise Lesser Black-backed Gull productivity in some UK colonies, and colonies with productivity rates above 1.0 had increasing population trends
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding population and its availability for use. The suitability and availability of habitat across the SPA may vary through time. Lesser Black-backed Gull nests colonially, often with other gull species on offshore islands and coastal cliffs (Mitchell et al., 2004). Lesser Black-backed Gull historically nested on Inishgoosk Island in this SPA
Forage spatial distribution, extent, abundance and availability	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	The diet of Lesser Black-backed Gull is diverse and opportunistic. This species can forage over both terrestrial and aquatic habitats. Frequent prey items include small fish, aquatic invertebrates, bird's eggs and chicks, trawler discards, rodents, and berries (Burger et al., 2020). Based on several studies, Woodward et al. (2019) provide estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for Lesser Black-backed Gull, which are 43km, 127km, and 533km respectively (see Power et al., 2021)

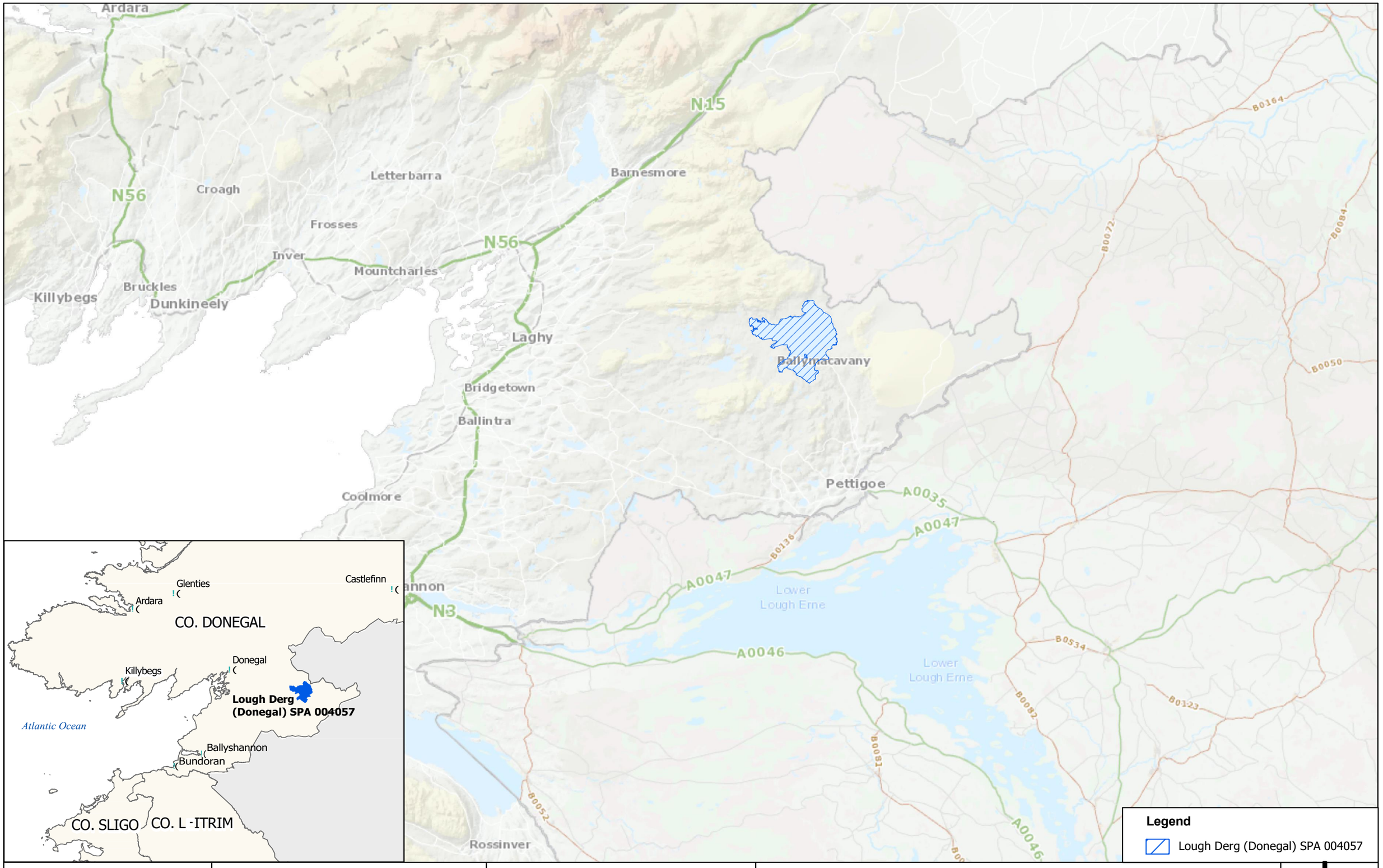
Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure, which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing, and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	Inland breeding gulls may use freshwater and terrestrial habitats ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003). Additionally, some species may engage in maintenance behaviours outside of the breeding colony but not in the water
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Inland breeding gulls require regular and efficient access to freshwater and terrestrial habitats ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours. Based on several studies, Woodward et al. (2019) provide estimates of foraging ranges from the nest site during the breeding season (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) for Lesser Black-backed Gull, which are 43km, 127km, and 533km respectively (see Power et al., 2021)

A184 Herring Gull *Larus argentatus*

To restore the Favourable conservation condition of Herring Gull in Lough Derg (Donegal) SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population size	Number of Apparently Occupied Nests (AON)	Long term SPA population trend is stable or increasing	A large colony of nesting gulls was discovered on Inishgoosk Island in Lough Derg, Co. Donegal in 1977 (NPWS internal files). A survey in 1999 estimated a population of 100 pairs of Herring Gull at the site (Mitchell et al., 2004). However, breeding Herring Gull have not been recorded at this site in subsequent surveys. It has been speculated that the breeding gull population on the lake moved away after the closure of a nearby landfill in Donegal town. Gulls (Laridae) forage regularly at landfills around the world (Weseloh et al., 2020). Local populations can become dependent on food on landfill and rubbish dumps and are vulnerable to improved waste disposal management or landfill closures (Langley et al., 2021). The natural-nesting (i.e. non-urban) Herring Gull population in Ireland has increased by 94% between national surveys in 1998 - 2002 and 2015 - 2021 (Burnell et al., 2023)
Productivity rate	Number of fledged young per breeding pair	Sufficient to maintain a stable or increasing population	There was no productivity data available for this species in this SPA. Cook and Robinson (2010) undertook Population Viability Analyses (PVA) of a selection of breeding populations in the UK. Over their study period, Herring Gull productivity at monitored nests was 0.75. Were this level to be maintained, Herring Gull populations would decline by 60% over 25 years. For the population to stabilise, breeding success would have to increase to 1.3 - 1.5 chicks per nest per year. A lack of comprehensive Irish data precludes the identification of a minimum productivity rate for this species at the site and at the national level
Distribution: extent of available nesting options within the SPA	Numbers and spatial distribution	Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population	Distribution encapsulates the number of locations and area of potentially suitable nesting habitat for the breeding population and its availability for use. The suitability and availability of habitat areas may vary through time. This will affect the spatio-temporal patterns of use of the habitats by Herring Gull. Typically, coastal Herring Gull colonies are located along rocky coastlines with cliffs, islets and offshore islands (Mitchell et al., 2004). Herring Gull historically nested on Inishgoosk island in this SPA
Forage spatial distribution, extent, abundance and availability	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	Herring Gull is a generalist and opportunistic feeder and can forage over both terrestrial and aquatic habitats. Its diet includes fish, fish offal, bivalves, gastropods, crustaceans, squid, insects, other seabirds, small land birds, small mammals, terrestrial insects, earthworms, berries, carrion, and a wide variety of human refuse (Weseloh et al., 2020). Woodward et al. (2019) reviewed the foraging ranges of seabird species from over 300 studies including: direct tracking of birds; estimates based on flight speeds and time activity; survey observations; and speculative estimates. Woodward et al. (2019) provide estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of Herring Gull foraging ranges from the nest site during the breeding season, which are 15km, 59km, and 92km respectively (see Power et al., 2021)

Disturbance at the breeding site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on birds at the breeding site	Disturbance events at the nest site/breeding colony level can result in a reduction of overall productivity and even lead to the abandonment of the breeding colony. The impact of any significant disturbance (direct or indirect) to the breeding population will ultimately affect the achievement of targets for population size and/or spatial distribution. Disturbance contributes to increased energetic expenditure, which can result in increased likelihood of mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends. Factors such as intensity, frequency, timing, and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population size and spatial distribution
Disturbance at areas ecologically connected to the colony	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact on breeding population	Inland breeding gulls may use freshwater and terrestrial habitats ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours (e.g. courtship, bathing, preening) as defined in McSorley et al. (2003)
Barriers to connectivity	Number, location, shape, and area (ha)	Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA	Inland breeding gulls require regular and efficient access to freshwater and terrestrial habitats ecologically connected to the colony in order to forage as well as to engage in other maintenance behaviours. Based on several studies, Woodward et al. (2019) provide estimates (i.e. overall mean, mean of maximum distances across all studies, and maximum distance recorded) of Herring Gull foraging ranges from the nest site during the breeding season, which are 15km, 59km, and 92km respectively (see Power et al., 2021)



NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 1:
LOUGH DERG (DONEGAL) SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004057; version 3
CO. DONEGAL

0 1.25 2.5 5 Kilometres

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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arna ataírgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Táilte Éireann CYAL50351092

Map version 1
Date: May 2024

River Finn SAC

Lough Derg (Donegal) SPA

River Finn SAC

Legend

Lough Derg (Donegal) SPA 004057

River Finn SAC 002301

NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 2:
LOUGH DERG (DONEGAL) SPA
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004057; version 3
CO. DONEGAL

0 2.5 5 10 Kilometres

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arna atáirgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Táilte Éireann CYAL50351092

Map version 1
Date: May 2024

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Lough Eske and Ardnamona Wood SAC 000163

An Roinn Cultúir,
Oidhreachta agus Gaeltachta
Department of Culture,
Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Culture, Heritage and the Gaeltacht,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@chg.gov.ie

Citation:

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Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

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Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000163	Lough Eske and Ardnamona Wood SAC
1029	Freshwater Pearl Mussel *Margaritifera margaritifera*
1106	Salmon *Salmo salar*
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
7220	Petrifying springs with tufa formation (Cratoneurion)*
6985	Killarney Fern *Vandenboschia speciosa*
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1973
Title :	A Report on Areas of Biological and Geological Interest in County Donegal
Author :	Young, R.
Series :	Unpublished report
Year :	2007
Title :	Monitoring Populations of the Freshwater Pearl Mussel, *Margaritifera margaritifera*. 2006 Baseline Survey of the River Eske, County Donegal
Author :	Moorkens, E.
Series :	Unpublished report to NPWS
Year :	2008
Title :	National survey of native woodlands 2003-2008
Author :	Perrin, P.M.; Martin, J.; Barron, S.; O'Neill, F.H.; McNutt, K.E.; Delaney, A.
Series :	Unpublished report to NPWS
Year :	2009
Title :	NS II Freshwater pearl mussel sub-basin management plans: fisheries survey. Stage 1 report
Author :	Paul Johnston Associates
Series :	Unpublished report to NPWS
Year :	2009
Title :	NS II Freshwater Pearl Mussel Sub-basin Management Plans: Monitoring of the Freshwater Pearl Mussel in the Eske
Author :	Moorkens, E.A.
Series :	Unpublished report to NPWS
Year :	2009
Title :	NS2 Freshwater Pearl Mussel Sub-Basin Management Plans. Phytobenthos monitoring of the Eske Catchment, Co. Donegal. (NWIRBD). June 2009
Author :	Ní Chatháin, B.
Series :	Unpublished report to NPWS
Year :	2009
Title :	NS II Freshwater Pearl Mussel Sub-basin Management Plans: Report on Biological Monitoring of Surface Water Quality in Eske Catchment, Co. Donegal
Author :	Williams, L.
Series :	Unpublished report to NPWS
Year :	2010
Title :	A provisional inventory of ancient and long-established woodland in Ireland
Author :	Perrin, P.M.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 46
Year :	2010
Title :	Second Draft Eske Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015). March 2010
Author :	NPWS
Series :	Unpublished document to the Department of the Environment, Heritage and Local Government
Year :	2013
Title :	Conservation status assessment for petrifying springs
Author :	Lyons, M.D.; Kelly, D.L.
Series :	Unpublished report to NPWS

Year :	2013
Title :	Results of a monitoring survey of old sessile oak woods and alluvial forests
Author :	O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals, No. 71
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2015
Title :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, Á.
Series :	Unpublished document by NPWS
Year :	2015
Title :	Monitoring methods for the Killarney fern (*Trichomanes speciosum* Willd.) in Ireland
Author :	Ní Dhúill, E.; Smyth, N.; Waldren, S.; Lynn, D.
Series :	Irish Wildlife Manuals, No. 82
Year :	2016
Title :	Monitoring guidelines for the assessment of petrifying springs in Ireland
Author :	Lyons, M.D.; Kelly, D.L.
Series :	Irish Wildlife Manuals, No. 94
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red List Series, NPWS
Year :	2017
Title :	Survey and Condition Assessment of the population of the freshwater mussel *Margaritifera margaritifera* in the River Eske, County Donegal. 2014-2016
Author :	Moorkens, E.
Series :	Unpublished report to NPWS
Year :	2019
Title :	The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2019
Title :	The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments
Author :	NPWS
Series :	Conservation assessments
Year :	in prep.
Title :	The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats
Author :	Daly, O.H.; O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals
Year :	in prep.
Title :	A study of the mixed *Najas flexilis* lake habitat (3130), 2015-2018
Author :	Roden, C.; Murphy, P.; Ryan, J.
Series :	Unpublished report to NPWS

Year :	in prep.
Title :	Monitoring and assessment of Killarney Fern (*Vandenboschia speciosa* (Willd.) Kunkel) in Ireland, 2015-2018
Author :	Ní Dhúill, E.; O'Neill, F.H.; Hodd, R.
Series :	Irish Wildlife Manuals

Other References

Year :	1898
Title :	The Flora of the County Donegal
Author :	Hart, H.C.
Series :	Sealy Bryers and Walker, Dublin. David Nutt, 270 & 271 Strand W.C., London
Year :	1982
Title :	Eutrophication of waters. Monitoring assessment and control
Author :	OECD
Series :	OECD, Paris
Year :	1996
Title :	The distribution and ecology of the freshwater pearl mussel, *Margaritifera margaritifera* L. 1758, in County Donegal, Ireland and implications for its conservation
Author :	Beasley, C.R.
Series :	Unpublished Ph.D. thesis, The Queen's University of Belfast
Year :	2000
Title :	Colour in Irish lakes
Author :	Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
Series :	Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, 27: 2620-2623
Year :	2001
Title :	Aquatic plants in Britain and Ireland
Author :	Preston, C.D.; Croft, J.M.
Series :	Harley Books, Colchester
Year :	2002
Title :	Reversing the habitat fragmentation of British woodlands
Author :	Peterken, G.
Series :	WWF-UK, London
Year :	2002
Title :	Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalinisation
Author :	Arts, G.H.P.
Series :	Aquatic Botany, 73: 373-393
Year :	2006
Title :	The status of host fish populations and fish species richness in European freshwater pearl mussel (*Margaritifera margaritifera*) streams
Author :	Geist, J.; Porkka, M.; Kuehn, R.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems, 16: 251-266
Year :	2006
Title :	A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
Author :	Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
Series :	Environmental Protection Agency, Wexford

Year :	2009
Title :	The identification, characterization and conservation value of isoetid lakes in Ireland
Author :	Free, G.; Bowman, J.; McGarrigle, M.; Little, R.; Coroni, R.; Donnelly, K.; Tierney, D.; Trodd, W.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems, 19(3): 264-273
Year :	2009
Title :	A survey of the *Margaritifera margaritifera* (L.) population in a section of the Eske River at Clardrumnaghan Bridge (Thrushbank), County Donegal
Author :	Ross, E.
Series :	Unpublished report for Donegal County Council
Year :	2010
Title :	Water Quality in Ireland 2007-2009
Author :	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
Series :	Environmental Protection Agency, Wexford
Year :	2014
Title :	Assessing near-bed velocity in a recruiting population of the endangered freshwater pearl mussel (*Margaritifera margaritifera*) in Ireland
Author :	Moorkens, E.; Killeen, I.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems, 24(6): 853-862
Year :	2015
Title :	Water Quality in Ireland 2010-2012
Author :	Bradley, C.; Byrne, C.; Craig, M.; Free, G.; Gallagher, T.; Kennedy, B.; Little, R.; Lucey, J.; Mannix, A.; McCreesh, P.; McDermott, G.; McGarrigle, M.; Ní Longphuirt, S.; O'Boyle, S.; Plant, C.; Tierney, D.; Trodd, W.; Webster, P.; Wilkes, R.; Wynne, C.
Series :	Environmental Protection Agency, Wexford
Year :	2015
Title :	The flora and conservation status of petrifying springs in Ireland
Author :	Lyons, M.D.
Series :	Unpublished Ph.D. thesis, Trinity College Dublin
Year :	2016
Title :	Irish Vegetation Classification: Technical Progress Report No. 2
Author :	Perrin, P.
Series :	Report submitted to National Biodiversity Data Centre
Year :	2017
Title :	Water Quality in Ireland 2010-2015
Author :	Fanning, A.; Craig, M.; Webster, P.; Bradley, C.; Tierney, D.; Wilkes, R.; Mannix, A.; Treacy, P.; Kelly, F.; Geoghegan, R.; Kent, T.; Mageean, M.
Series :	Environmental Protection Agency, Wexford
Year :	2019
Title :	The Status of Irish Salmon Stocks in 2018 with Catch Advice for 2019
Author :	Technical Expert Group on Salmon (TEGOS)
Series :	Report of the Technical Expert Group on Salmon (TEGOS) to Inland Fisheries Ireland (IFI)

Spatial data sources

Year :	2008
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
Used For :	3110 (map 2)
Year :	Derived 2019
Title :	Internal NPWS files
GIS Operations :	Dataset created from spatial reference contained in files
Used For :	7220 (map 3)
Year :	Revision 2010
Title :	National Survey of Native Woodlands 2003-2008. Version 1
GIS Operations :	QI selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91A0 (map 4)
Year :	2019
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1029 (map 5)
Year :	Revision 2012
Title :	Margaritifera Sensitive Areas data
GIS Operations :	Relevant catchment boundary identified. Expert opinion used as necessary to resolve any issues arising
Used For :	1029 (map 5)

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Lake habitat 3110 occurs in Lough Eske (see map 2) in Lough Eske and Ardnamona Wood SAC. Habitat 3130 is also considered to occur in the lake. Sources for aquatic plant records for the lakes in the SAC include NPWS internal files and N.F. Stewart and C.D. Preston records made for Preston and Croft (2001). It was briefly surveyed as part of an on-going study of slender naiad (*Najas flexilis*) lakes (Roden et al., in prep.). Lough Eske is on the Water Framework Directive (WFD) monitoring programme and regular macrophyte surveys are conducted by the Environmental Protection Agency (EPA). Two measures of extent should be used: 1. the area of the lake itself and 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, lake habitat 3110 occurs in Lough Eske in the SAC. See map 2
Vegetation composition: typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	See NPWS (2013, 2019) and O Connor (2015) for lists of typical plant species. In 1990 N.F. Stewart and C.D. Preston recorded: SW Bay- *Equisetum fluviatile, Isoetes* sp., *Juncus bulbosus, Littorella uniflora, Lobelia dortmanna, Mentha aquatica, Myriophyllum alterniflorum, Nymphaea alba, Phalaris arundinacea, Potamogeton berchtoldii, P. natans, P.* x *nitens, Ranunculus flammula, Chara virgata, Nitella flexilis*; Harvey's Point- *Osmunda regalis, Alisma plantago-aquatica, Baldellia ranunculoides, Caltha palustris, Carex rostrata, Cladium mariscus, Comarum palustre, Eleocharis multicaulis, Eleogiton fluitans, Juncus bulbosus, Littorella uniflora, Lobelia dortmanna, Lythrum salicaria, Mentha aquatica, Myriophyllum alterniflorum, Nymphaea alba, Phragmites australis, Potamogeton natans, Utricularia intermedia* agg., *Chara virgata, Nitella flexilis*. Roden et al. (in prep.) recorded 28 species such as *I. echinospora, P. praelongus, P. perfoliatus*
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Further work is necessary to describe the characteristic zonation and other spatial patterns in lake habitat 3110 (see O Connor, 2015). Roden et al. (in prep.) noted simple vegetation structure in Lough Eske: a *Littorella-Lobelia* shore zone with patches of *Phragmites, Schoenoplectus* and *Equisetum fluviatile* in sheltered bays; below 1m to the base of the euphotic zone, *Isoetes lacustris* is dominant; occasional plants of *Potamogeton berchtoldii* and *Nitella translucens* occur down to 3m. The absence of a *Nitella*-dominated zone below the *Isoetes* band may indicate declining conservation condition (Roden et al., in prep.) and habitat 3130 was categorised as Poor in Lough Eske for 2013-2018 (NPWS, 2019). Additional information on vegetation zonation in the SAC may be available from EPA surveys and other sources

Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. Roden et al. (in prep.) recorded a maximum vegetation depth of 3m. Further work is necessary to develop indicative targets for lake habitat 3110. Maximum depth should be large in 3110 lakes; however, pressures such as eutrophication, overgrazing, forestry and peat-cutting can lead to reduced vegetation depth
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction, drainage and overgrazing. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that lake habitat 3110 is associated with a range of nutrient-poor substrates, from stones, cobble and gravel, through sands, silt, clay and peat. Substratum particle size is likely to vary with depth and along the shoreline within a single lake. Roden et al. (in prep.) recorded sand, cobbles, silt and rock in Lough Eske. Additional data on lake substrata in the SAC may be available from EPA surveys and other sources
Water quality: transparency	Metres	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. Specific targets have yet to be established for lake habitat 3110 (O Connor, 2015). Habitat 3110 is associated with very clear water. The OECD fixed boundary system set transparency targets for oligotrophic lakes of &#65533;6m annual mean Secchi disk depth, and &#65533;3m annual minimum Secchi disk depth (OECD, 1982). Free et al. (2009) found high isoetid abundance in lakes with Secchi depths of more than 3m. In this SAC, Free et al. (2006) recorded a Secchi depth of 3.7m in Lough Eske. Roden et al. (in prep.) recorded a Secchi depth of 2.7m
Water quality: nutrients	µg/l P; mg/l N	Maintain/restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	As a nutrient-poor habitat, oligotrophic and WFD 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For lake habitat 3110, annual average total phosphorus (TP) concentration should be &#65533;l0µg/l TP, average annual total ammonia concentration should be &#65533;0.040mg/l N and annual 95th percentile for total ammonia should be &#65533;0.090mg/l N. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. Lough Eske passed the TP target in 2010-12 and 2012-15 (high status) (Bradley et al., 2015; Fanning et al., 2017), but failed in 2007-09 (good status) (McGarrigle et al., 2010)

Water quality: phytoplankton biomass	µg/l chlorophyll *a*	Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status	Oligotrophic and WFD 'high' status targets apply to lake habitat 3110. Where a lake has a chlorophyll *a* concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll *a* concentration must be <5.Sµg/l. The annual average chlorophyll *a* concentration should be <2.5µg/l and the annual peak chlorophyll *a* concentration should be ≤S.0µg/l. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. Lough Eske passed the target (high status) in 2007-09, 2010-12 and 2013-15 (McGarrigle et al., 2010; Bradley et al., 2015; Fanning et al., 2017)
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, lake habitat 3110 requires WFD high status
Water quality: attached algal biomass	Algal cover	Maintain trace/absent attached algal biomass (<5% cover)	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in lake habitat 3110 should, therefore, be trace/absent (<5% cover)
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Restore high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for lake habitat 3110 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥0.90, as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009. Lough Eske failed the target, having good macrophyte status in 2007-09 and 2010-12 (McGarrigle et al., 2010; Bradley et al., 2015) and moderate status in 2013-15 (Fanning et al., 2017)
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. In Europe, acidification of isoetid lakes can lead to loss of isoetids and dominance by submerged bog mosses (*Sphagnum* spp.) and bulbous rush (*Juncus bulbosus*) (Arts, 2002). The specific requirements of lake habitat 3110, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined. For lakes with habitat 3110, and adopting a precautionary approach based on Arts (2002), minimum pH should not be <5.5 pH units. Maximum pH should be <9.0 pH units, in line with the surface water standards established for soft waters (where water hardness is ≤l00mg/l calcium carbonate). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009. Lough Eske passed the WFD metric in 2007-09, 2010-12 and 2013-15 (McGarrigle et al., 2010; Bradley et al., 2015; Fanning et al., 2017)

Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50mg/l PtCo. Water colour can be very low (<20mg/l PtCo or even <10mg/l PtCo) in lakes with habitat 3110, where the peatland in the lake's catchment is intact. In this SAC, Free et al. (2006) reported colour of 27mg/l PtCo in Lough Eske
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate unit	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of lake habitat 3110	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet woodland that intergrade with and support the structure and functions of the lake habitat. In Lough Eske and Ardnamona Wood SAC, fringing habitats may include freshwater marsh, poor fen, flush, blanket bog, wet and dry heath, and a variety of native woodland and grassland types. Fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves. Whorled caraway (*Carum verticillatum*) is known from the margins of Lough Eske (Hart, 1898; Young, 1973). There is also a record for six-stamened waterwort (*Elatine hexandra*) in Hart (1898). Both species are Near Threatened in Ireland (Wyse Jackson et al., 2016)

7220 Petrifying springs with tufa formation (Cratoneurion)

To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Square metres	Area stable or increasing, subject to natural processes	The habitat Petrifying springs with tufa formation (Cratoneurion)* has not been surveyed in detail in Lough Eske and Ardnamona Wood SAC and thus the exact total area of the qualifying priority habitat in the SAC is currently unknown. The habitat is known to occur along the north side of the valley of the Lowerymore River in the SAC, notably at White Goat's Island, where it occurs in semi-open terrain within woodland in an area of the river where waterfalls occur. A second area of petrifying springs with tufa formation was also recorded a short distance further downstream on the same river (NPWS internal files). It is important to note that further areas of the habitat may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for point location at White Goat's Island	Point distribution (see map 3) is based on NPWS internal files. Note that further areas of the habitat may be present within the SAC. Lyons and Kelly (2016) describe eight plant communities of Irish petrifying springs based on relevé data. It is not currently known which communities occur in the habitat in Lough Eske and Ardnamona Wood SAC. Further information on the vegetation communities associated with this habitat is presented in Lyons and Kelly (2016)
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes	Petrifying springs rely on permanent irrigation, usually from upwelling groundwater sources or seepage sources (Lyons and Kelly, 2013). Water flow should not be altered anthropogenically. See Lyons and Kelly (2016) for further details on this attribute
Water quality - nitrate level	mg/l	No increase from baseline nitrate level and less than 10mg/l	Target based on data from McGarrigle et al. (2010). See Lyons and Kelly (2016) for further details on this attribute
Water quality - phosphate level	µg/l	No increase from baseline phosphate level and less than 15µg/l	Based on data from Lyons (2015). See Lyons and Kelly (2016) for further details on this attribute
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number	Based on Lyons and Kelly (2016), where the lists of positive and high quality indicator species are presented. A good diversity of bryophytes have been recorded in the habitat at White Goat's Island, including the positive indicator bryophyte species *Palustriella commutata, Eucladium verticillatum* and *Pellia endiviifolia*. Other species recorded include remote sedge (*Carex remota*), herb-robert (*Geranium robertianum*), yellow pimpernel (*Lysimachia nemorum*) and the bryophytes *Conocephalum conicum, Eurhynchium striatum* and *Plagiomnium undulatum* (NPWS internal files)
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; potentially negative woody species should be absent in unwooded springs; invasive species should be absent	Based on Lyons and Kelly (2016), where the lists of potentially negative herbaceous, bryophyte, algal and woody species are presented. See Lyons and Kelly (2016) also for details on potentially invasive species. If two or more potentially negative bryophyte/alga species are present, and if at least two are Frequent, or at least one is Abundant, then the habitat fails for this attribute. See Lyons and Kelly (2016) for further details. The potentially negative bryophyte species *Cratoneuron filicinum* has been recorded in the habitat in the SAC (NPWS internal files), but at an unknown level of cover

Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground <10cm)	Attribute and target based on Lyons and Kelly (2016)
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant	Attribute and target based on Lyons and Kelly (2016)

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To maintain the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles is present at Ardnamona Wood in Lough Eske and Ardnamona Wood SAC. Ardnamona Wood is state-owned and protected as a Nature Reserve. As part of the National Survey of Native Woodlands (NSNW), the sub-site Ardnamona Wood (NSNW site code 1427) was surveyed by Perrin et al. (2008). Map 4 shows the surveyed woodland (52.9ha) within the SAC. The surveyed area contains a mosaic of woodland habitats, comprising c.80% 91A0 woodland habitat. Ardnamona Wood (site code 1427) was also included in national monitoring surveys (O'Neill and Barron, 2013; Daly et al., in prep.) and is considered to contain an excellent example of the extreme oceanic variant of 91A0 woodland habitat. It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The surveyed woodland area is shown on map 4	Distribution based on Perrin et al. (2008) and Daly et al. (in prep.). It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 11m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	The target aims for a diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer and ground layer. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/national-vegetation-database/irish-vegetation-classification)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91A0 woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea*. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem. Dead wood comprises old senescent trees, standing dead trees, fallen dead wood (including large branches) and rotten stumps of any species. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: veteran trees	Number per hectare	No decline	Veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources

Woodland structure: indicators of local distinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands (Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species. Perrin and Daly (2010) list Ardnamona Wood (NSNW site code 1427) as 'possible ancient woodland'. Ardnamona Wood has been noted as being particularly species-rich. Notably, the rare lichen tree lungwort (*Lobaria pulmonaria*) has been recorded in the old oak woodland in the SAC (NPWS internal files). The Flora (Protection) Order, 2015 (FPO) listed and Vulnerable narrow-leaved helleborine (*Cephalanthera longifolia*) (Wyse Jackson et al., 2016) has also been recorded (NPWS internal files). The Annex II and FPO listed species Killarney fern (*Vandenboschia speciosa*) also occurs in the habitat in the SAC. See the conservation objective for Killarney fern (species code 6985) in this volume
Woodland structure: indicators of overgrazing	Occurrence	All four indicators of overgrazing absent	There are four indicators of overgrazing within 91A0: topiary effect on shrubs and young trees; browse line on mature trees; abundant dung; and severe recent bark stripping (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea* (Daly et al., in prep.; O'Neill and Barron, 2013). Species present reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91A0 woodlands present; at least 6 positive indicator species for 91A0 woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91A0 are sessile oak (*Quercus petraea*) and the hybrid oak *Quercus* x *rosacea*. Positive indicator species for 91A0 are listed in Daly et al. (in prep.) and O'Neill and Barron (2013). Species present reported in Perrin et al. (2008). See also Young (1973)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species such as montbretia (*Crocosmia* x *crocosmiiflora*)) should be absent or under control. In general, the following are the most common non-native invasive species in 91A0 woodlands: beech (*Fagus sylvatica*), sycamore (*Acer pseudoplatanus*) and rhododendron (*Rhododendron ponticum*). Rhododendron has previously been removed from parts of the woodland (Perrin et al., 2008; NPWS internal files)

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of Freshwater Pearl Mussel (*Margaritifera margaritifera*) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Kilometres	Maintain/restore distribution at 6.08km. See map 5	The conservation objective applies to the Eske freshwater pearl mussel (*Margaritifera margaritifera*) population. The distribution and abundance of the species in the Eske was mapped in 2006 as part of full, baseline monitoring (Moorkens, 2007). Mussels are distributed throughout the River Eske from Lough Eske to the estuary. Mussels also occurred in Lough Eske in 1994 (Moorkens, 2007). Mussels are abundant in two stretches: from Drumnacarry to the Limestone Brook confluence, and from below the N56 to the Drummenny confluence. Significant mussel kills were recorded in the abundant stretch downstream of the N56 in 2014 and 2016 (Moorkens, 2017). The target is for the species to be sufficiently widespread to maintain itself on a long-term basis as a viable component of the Eske system. See NPWS (2010) for further information
Population size	Number of adult mussels	Restore population to at least 200,000 adult mussels	Moorkens (2007) estimated the Eske population as at least 200,000. Beasley (1996) counted 10,962 mussels at 5 sites along the Eske, with significant within-site variation in mussel density. In 2006, mussel density of up to 240/m² was recorded, while maximum density in transects was 77/m² (Moorkens, 2007). Moorkens (2017) found 24% of quadrats were occupied, average density was 1.8/m² and highest density was 19/m². Habitat is below carrying capacity throughout. Pearl fishing was documented in the past (Beasley, 1996). Moorkens (2007) recorded a significant decline in population between 1994 and 2006. Further losses were noted in 2009 (Moorkens, 2009). Further significant declines were recorded in 2014-2016 (Moorkens, 2017). NPWS (2019) estimated that the population may have declined to as little as 45,000. The target is for the species to be sufficiently abundant to maintain itself on a long-term basis as a viable component of the Eske system
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length	Mussels ≤65mm are 'young mussels' and found buried in the substratum or beneath adult mussels. Mussels ≤30mm are 'juvenile mussels' and always buried in the substratum. See the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 and I.S. EN 16859:2017. The Eske is an ageing population. Beasley (1996) found some mussels of 25-30mm. The smallest mussel was 7mm in 1994, but 67mm in 2006 when the Eske failed both targets (Moorkens, 2007). It failed both targets again in 2009 (no mussels under 75mm) (Moorkens, 2009; NPWS, 2010). Ross (2009) found 4 young mussels: 0% and 0.l7% ≤30mm and l.5% and 0.5% ≤65mm in quadrats and translocation, respectively. No young/juvenile mussels were observed in 2014-16 (Moorkens, 2017). The Eske population is unsustainable owing to lack of survival of juvenile mussels. The target is for sufficient juvenile recruitment to allow the species to maintain itself on a long-term basis as a viable component of the Eske system

Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution	5% is considered the cut-off between the combined errors associated with natural fluctuations and sampling methods and evidence of true population decline. 1% dead shells is indicative of natural losses. The Eske failed both targets in 2014-16 with recent severe decline in live adults and many dead and moribund mussels; 200m estimated in 2006 to have 50,000-75,000 had declined to <6,000 in 2016 (Moorkens, 2017). The Eske also failed both targets in 2009, with some decline in adult numbers since 2006 and excessive dead shells (Moorkens, 2009; NPWS, 2010). The baseline survey also reported a decline in adult numbers between 1994 and 2006 (Moorkens, 2007). The Eske population is unsustainable owing to lack of survival of juvenile mussels and elevated adult mortality. The target is for sufficient survival of adults to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Suitable habitat: extent	Kilometres	Restore suitable habitat in more than 6.08km in the Eske system (see map 5) and any additional stretches necessary for salmonid spawning	The extent of the freshwater pearl mussel habitat in the Eske River is from Lough Eske to the estuary (Moorkens, 2007, 2009, 2017; NPWS, 2010). The species was also known to occur in Lough Eske near the river's outflow (Moorkens, 2007). The mussel habitat is severely impacted by nutrient-enrichment and sedimentation. Disturbance to the natural hydrological regime, morphological changes and toxic pollution also appear to be significant factors. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Suitable habitat: condition	Kilometres	Restore condition of suitable habitat	The species' habitat is a combination of 1) the area of habitat adult and juvenile mussels can occupy; 2) the area of spawning and nursery habitats host fish can occupy. Fish nursery habitat typically overlaps with mussel habitat. Fish spawning habitat is generally adjacent to mussel habitat, but may lie upstream of the generalised mussel distribution. Only spawning areas that can regularly contribute juvenile fish to areas occupied by adult mussels should be considered. Mussel and fish spawning/nursery habitat availability is determined by flow and substratum conditions, and is highly sensitive to hydromorphological, sedimentation and nutrient enrichment pressures from throughout the catchment (map 5). See I.S. EN 16859:2017. Mussel habitat is widespread in the Eske but cannot support sufficient juvenile survival. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Water quality: macroinvertebrate and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality - macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93	The EQR targets correspond to high ecological status for these two Water Framework Directive biological quality elements.They represent high water quality with very low nutrient concentrations (oligotrophic conditions). Reaching these targets does not however guarantee achieving the targets for the other attributes. In 2009, the habitat in the Eske system failed the macroinvertebrate target, but passed the diatom target; however, confidence in the diatom result was low owing to early sampling (Ní Chatháin, 2009; Williams, 2009; NPWS, 2010). See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system

Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%)	Macroalgae and, particularly, macrophytes have increased in the Eske since the 1990s (Moorkens, 2007). In 2014-16, it passed the algal target and failed the macrophyte target, having dense *Ranunculus* growths (Moorkens, 2017). Both targets failed in 2009, macrophyte cover was up to 100% in unshaded mussel habitat and filamentous algae widespread (Moorkens, 2009; Ní Chatháin, 2009; Williams, 2009; NPWS, 2010). Both were also widespread and abundant in 2006, obscuring mussels (Moorkens, 2007). Abundant decaying organic matter/floc has been noted in mussel habitat, with death of in-stream macroalgae/macrophytes the most likely source. Sufficient recruitment of juvenile mussels is being prevented by the poor condition of the river substratum. Algal/macrophyte growths may also be contributing to elevated adult mortality. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment	The Eske failed the target in 2014-16 and for the Sub-basin Management Plan (NPWS, 2010; Moorkens, 2017). In 2014, Moorkens (pers. comm.) noted very high turbidity throughout the river, downstream of Thrushbank Bridge. Silt infiltration was recorded in 70% of quadrats (Moorkens, 2017). Heavy sedimentation was noted in some mussel habitat in 2009 (Moorkens, 2009; NPWS, 2010). Williams (2009) noted sedimentation in glides and a significant silt plume during kicks at 2 sites on the Eske. Sedimentation of the mussel habitat has provided a rooting medium for macrophytes in the Eske. Sufficient survival of juvenile mussels is being prevented by the poor condition of the river substratum. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate	Differences in redox potential between the water column and the substrate correlate with differences in oxygen levels. Juvenile mussels require full oxygenation while buried in gravel. In suitable habitat, there should be very little loss of redox potential between the water column and underlying gravels. See I.S. EN 16859:2017. The Eske failed the redox target in 2014-16 and 2009. In 2014-16, average redox potential was 22% and only 41% of measurements had redox of 20% or less (Moorkens, 2017). In 2009, the average loss was 30.7%, indicating a severe decline of oxygen in the substratum (Moorkens, 2009; NPWS, 2010). Severe redox declines were also measured in 2006 (Moorkens, 2007). The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system

Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regime	The availability of suitable mussel habitat is largely determined by flow (also catchment geology). To restore the habitat for the species, flow variability over the annual cycle must be such that: 1) high flows can wash fine sediments from the substratum; 2) high flows are not artificially increased so as to cause excessive scour of mussel habitat; 3) low flows do not exacerbate the deposition of fine sediments or growth of algae/macrophytes; 4) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle; see Moorkens and Killeen (2014) and I.S. EN 16859:2017. Groundwater inflow to the substratum contributes to water-cycling. Catchment drainage, resulting in hydrological regime change, may be contributing to the decline of the species in the Eske. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae	Salmonid fish are host to the larval stage of the freshwater pearl mussel and, thus, are essential to completion of the life cycle. 0+ and 1+ fish are typically used, both because of habitat overlaps and the development of immunity with age in fish. Fish presence is sufficient, as higher fish density and biomass is indicative of enriched conditions in mussel rivers. Geist et al. (2006) found that higher densities of host fish coincided with eutrophication, poor substrate quality for mussels and a lack of mussel recruitment, while significantly lower densities and biomass of host fish were associated with high juvenile mussel numbers. Fish movements must be such that 0+ fish remain in the mussel habitat until their 1+ summer. No fish stocking should occur within the mussel habitat, nor any works that may change the salmonid balance or residency time. In May 2009, glochidia were found on salmon but not on trout in the Eske (Johnston, 2009; NPWS, 2010)
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population	Semi-natural and natural riparian habitats, including those along lake fringes, even where they do not form part of a natural floodplain, are an integral part of the structure and functioning of river systems. Open wetlands, e.g. wet heath and blanket bog, are particularly critical to the hydrological regime of mussel rivers. Fringing habitats aid in the settlement of fine suspended material, protect banks from erosion, contribute to nutrient cycling, and to the aquatic food web (e.g. allochthonous matter from poor fens/flushes), and provide habitat (refuge and resources) for life-stages of fish, birds and aquatic invertebrates. Equally, fringing habitats are dependent on rivers/lakes, particularly their water levels, and support wetland communities and species of conservation concern. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Eske system. See the conservation objective for 3110

1106 Salmon *Salmo salar*

To restore the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

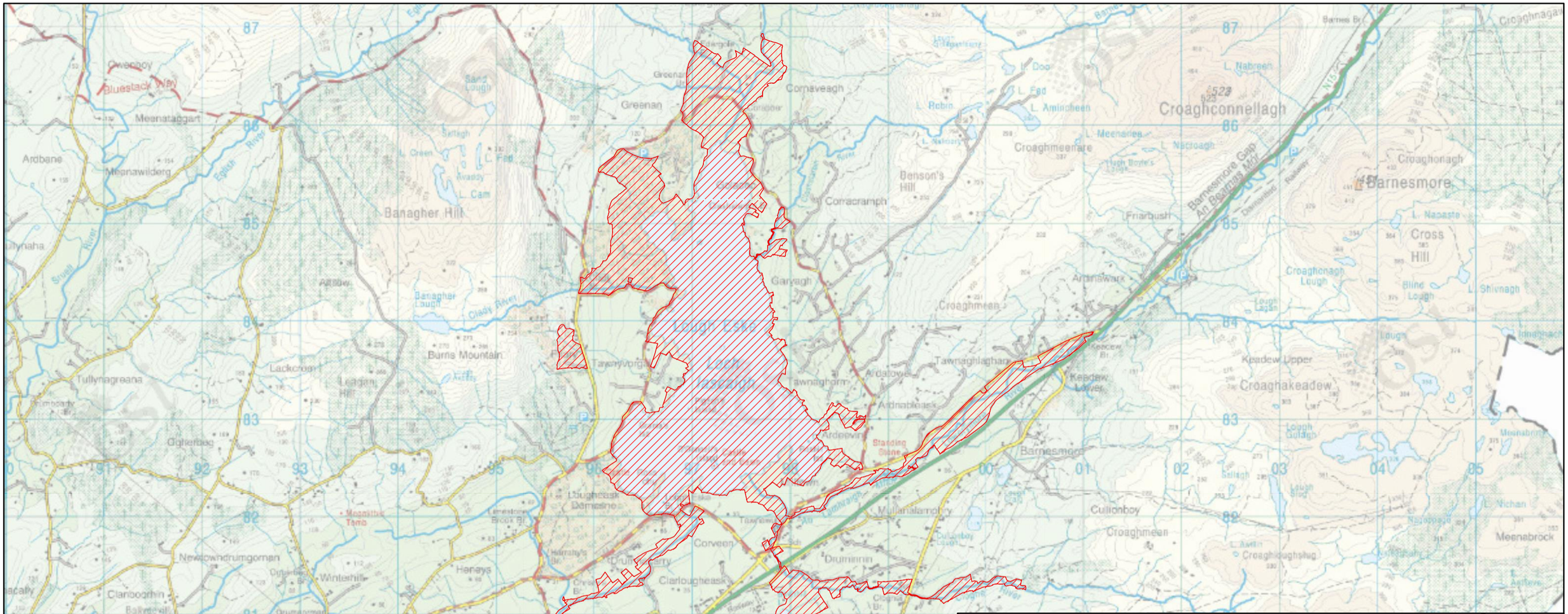
Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Technical Expert Group on Salmon's (TEGOS) annual model output of CL attainment levels. See Technical Expert Group on Salmon (2019) for further details. Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The fish counter on the River Eske is used as the source of adult salmon run estimates. The Eske is currently below CL, meeting 56% of CL
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice (*Lepeophtheirus salmonis*)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

6985 Killarney Fern *Vandenboschia speciosa*

To maintain the favourable conservation condition of Killarney Fern (*Vandenboschia speciosa*) in Lough Eske and Ardnamona Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	No loss in geographical spread of populations, subject to natural processes	The population of Killarney fern (*Vandenboschia speciosa* [formerly *Trichomanes speciosum*; species code 1421]) is currently known from locations in Lough Eske and Ardnamona Wood SAC within hectad G98. Exact locations are not mapped here on account of the threat posed by illegal collecting. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Number of populations	Number	No decline, subject to natural processes	One population of the species has been recorded in the SAC since 1960. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Number of colonies	Number	No decline, subject to natural processes	Six colonies of the species have been recorded in the population in the SAC since 1960, five in 2016 and one in 1993. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population: life-cycle stage	Type (sporophyte or gametophyte)	Maintain life-cycle stage composition of populations, subject to natural processes	One of the six colonies recorded since 1960 is composed of sporophytes (frond stage) with co-existing gametophytes (filamentous stage) and five are composed of gametophytes only. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population size: area of occupancy	Square metres	No decline, subject to natural processes	Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population size: living sporophyte fronds	Number	No decline, subject to natural processes	Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population structure: young and unfurling fronds	Occurrence	Young (not fully expanded) and/or unfurling (crozier) fronds present in populations previously observed to have these, subject to natural processes	Young and/or unfurling fronds have been recorded from Lough Eske and Ardnamona Wood SAC. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population structure: fertile fronds	Occurrence	Fertile fronds present in populations previously observed to have these, subject to natural processes	Fertile fronds have not been recorded from the SAC. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Population structure: juvenile sporophyte fronds emerging from gametophytes	Number	No decline, subject to natural processes	Juvenile sporophyte fronds emerging from gametophytes have not been recorded from the SAC. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Habitat extent	Hectares	No loss of suitable habitat, subject to natural processes	The species grows in deeply shaded, humid situations - dripping caves, overhangs and crevices on cliffs, rocky slopes, by waterfalls, in stream ravines and gullies, on rock or soil banks in woodlands and, occasionally, under fallen trees and on the floor of damp woodlands. Whilst also occurring in these habitats, the gametophyte stage can grow in drier areas that do not suit the sporophyte. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files

Hydrological conditions: wet/damp microhabitats	Occurrence	Maintain hydrological conditions at the locations of known populations - visible water source, with dripping or seeping water present and/or substrate wet/damp to touch, subject to natural processes	Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Hydrological conditions: relative humidity	Percentage	Maintain relative humidity levels at known colonies at not less than 80%, subject to natural processes	Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Hydrological conditions: desiccated fronds	Number	No increase, subject to natural processes	Presence of desiccated sporophyte fronds and gametophyte mats is indicative of unsuitable conditions. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Light levels: shading	Shade index score	At least 4 for woodland sporophyte-only and mixed colonies; at least 5 for open upland sporophyte-only and mixed colonies; at least 6 for gametophyte-only colonies, subject to natural processes	Shade Index: 4. Moderate shade, e.g. light-medium deciduous canopy with sun flecks. 5. Permanently shaded from direct sunlight but otherwise open to sky. 6. Deep woodland (e.g. coniferous or in ravine) shade, no sun flecks. 7. Perpetual deep shade, e.g. cave entrance, beneath boulder. The species occurs in moderate to deep shade in woodland in Lough Eske and Ardnamona Wood SAC. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Woodland canopy cover	Percentage	No loss of woodland canopy at, or in the vicinity of, the locations of known populations and canopy cover here maintained at more than 33%, subject to natural processes	Woodland management at or near to locations of known populations of the species must take account of its habitat requirements, particularly with regard to maintenance of sufficient canopy cover. The species occurs in woodland in Lough Eske and Ardnamona Wood SAC. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files
Invasive species	Occurrence	Maintain absence of invasive non-native and vigorous native plant species at the locations of known populations or, if present, maintain vegetation cover of these at less than 10%, taking into account the habitat requirements of *V. speciosa*	In order to avoid negative impacts on the Killarney fern (*Vandenboschia speciosa*), its habitat requirements (site hydrology, relative humidity, canopy cover, shading levels, etc.) must be taken into account in locations that are subject to or proposed for management actions to control invasive non-native and/or vigorous native plant species. Based on Ní Dhúill et al. (2015, in prep.), NPWS (2019) and NPWS internal files



Legend

Lough Eske and Ardnamona Wood SAC 000163

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Department of Culture, Heritage and the Gaeltacht

MAP 1:
LOUGH ESKE AND ARDNAMONA WOODSAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000163; version 3.01. CO. DONEGAL

0 0.5 1 1.5 2 Kilometers

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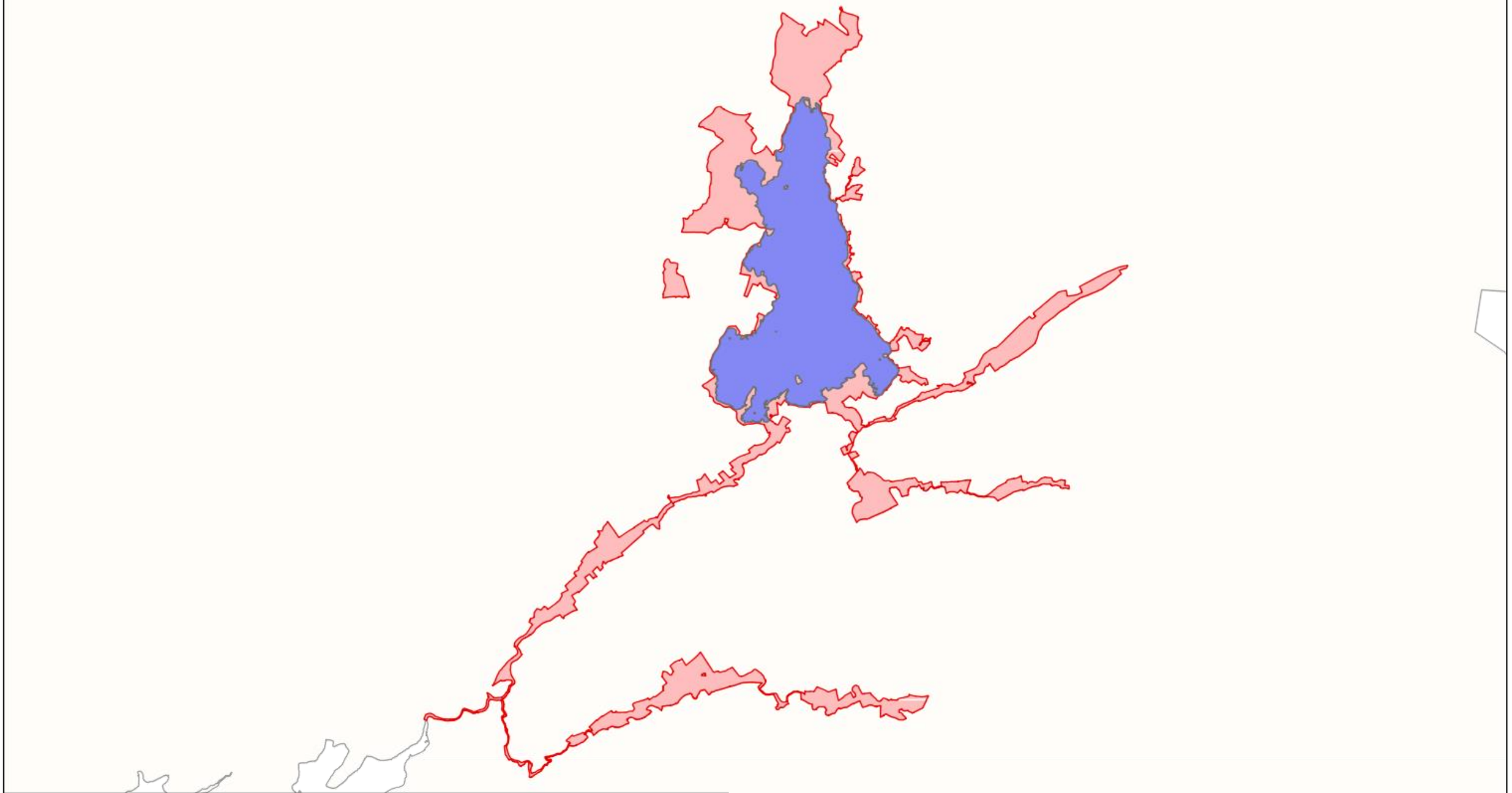
Map Version 1
Date: May 2019



Legend

- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- OSi Discovery Series County Boundary
- Lough Eske and Ardnamona Wood SAC 000163

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Department of Culture, Heritage and the Gaeltacht

MAP 2:
LOUGH ESKE AND ARDNAMONA WOOD SAC
CONSERVATION OBJECTIVES
INDICATIVE LAKE HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000163; version 3.01. CO. DONEGAL

0 0.6 1.2 1.8 2.4 Kilometers

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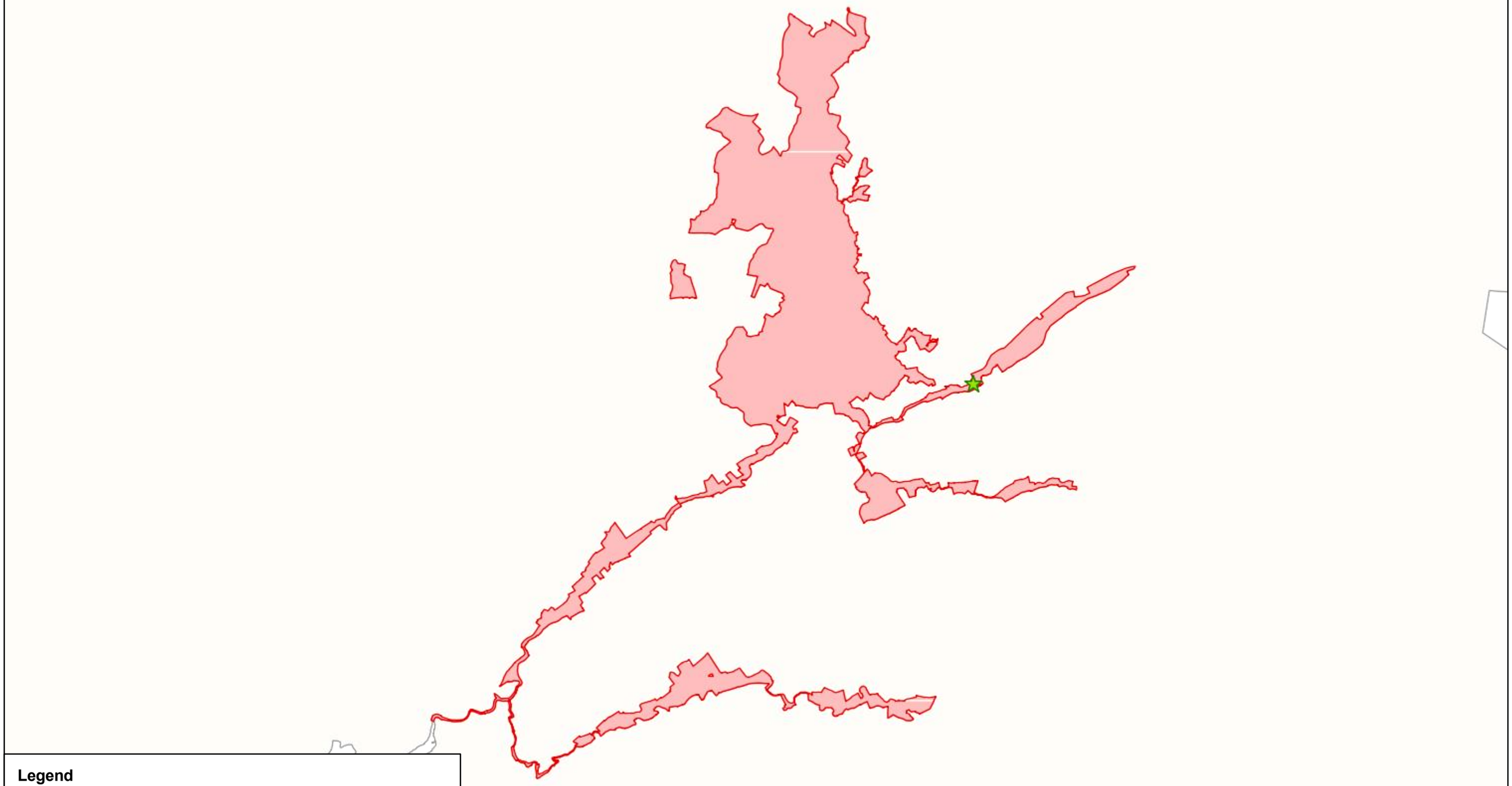
Date: May 2019



Legend

- Lough Eske and Ardnamona Wood SAC 000163
- OSi Discovery Series County Boundary
- ★ 7220 Petrifying springs with tufa formation (*Cratoneurion*)

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Department of Culture, Heritage and the Gaeltacht

MAP 3:
LOUGH ESKE AND ARDNAMONA WOOD SAC
CONSERVATION OBJECTIVES
PETRIFYING SPRINGS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000163; version 3.01. CO. DONEGAL

0 0.7 1.4 2.1 2.8 Km

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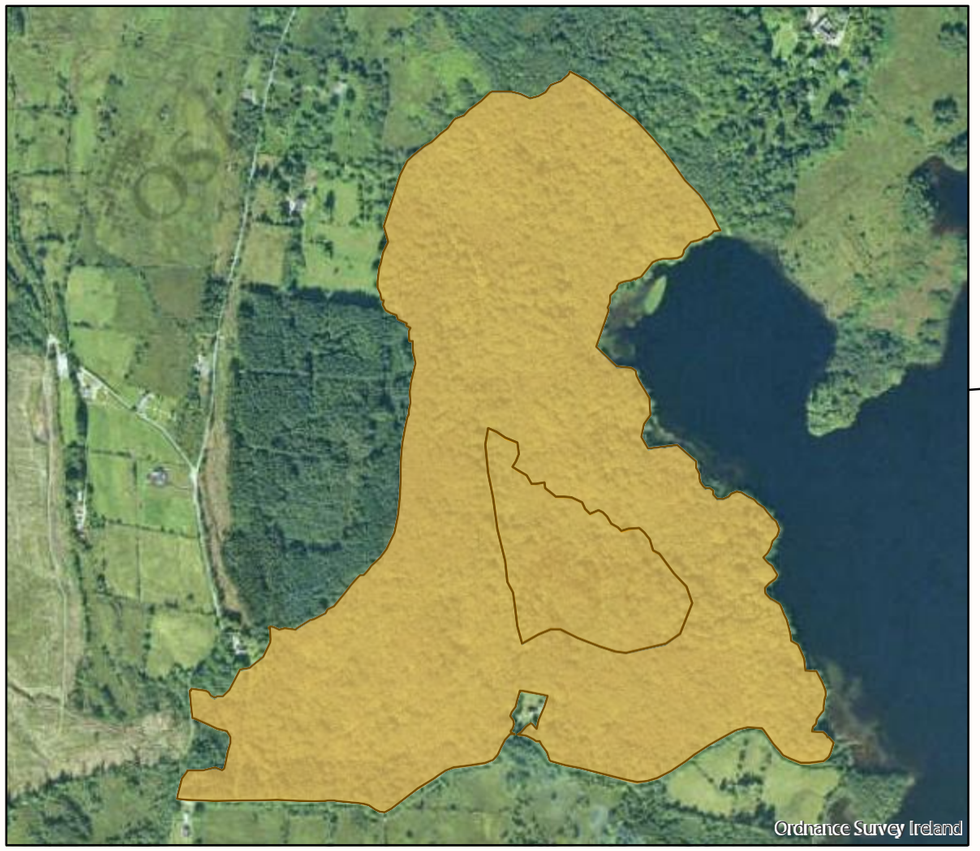
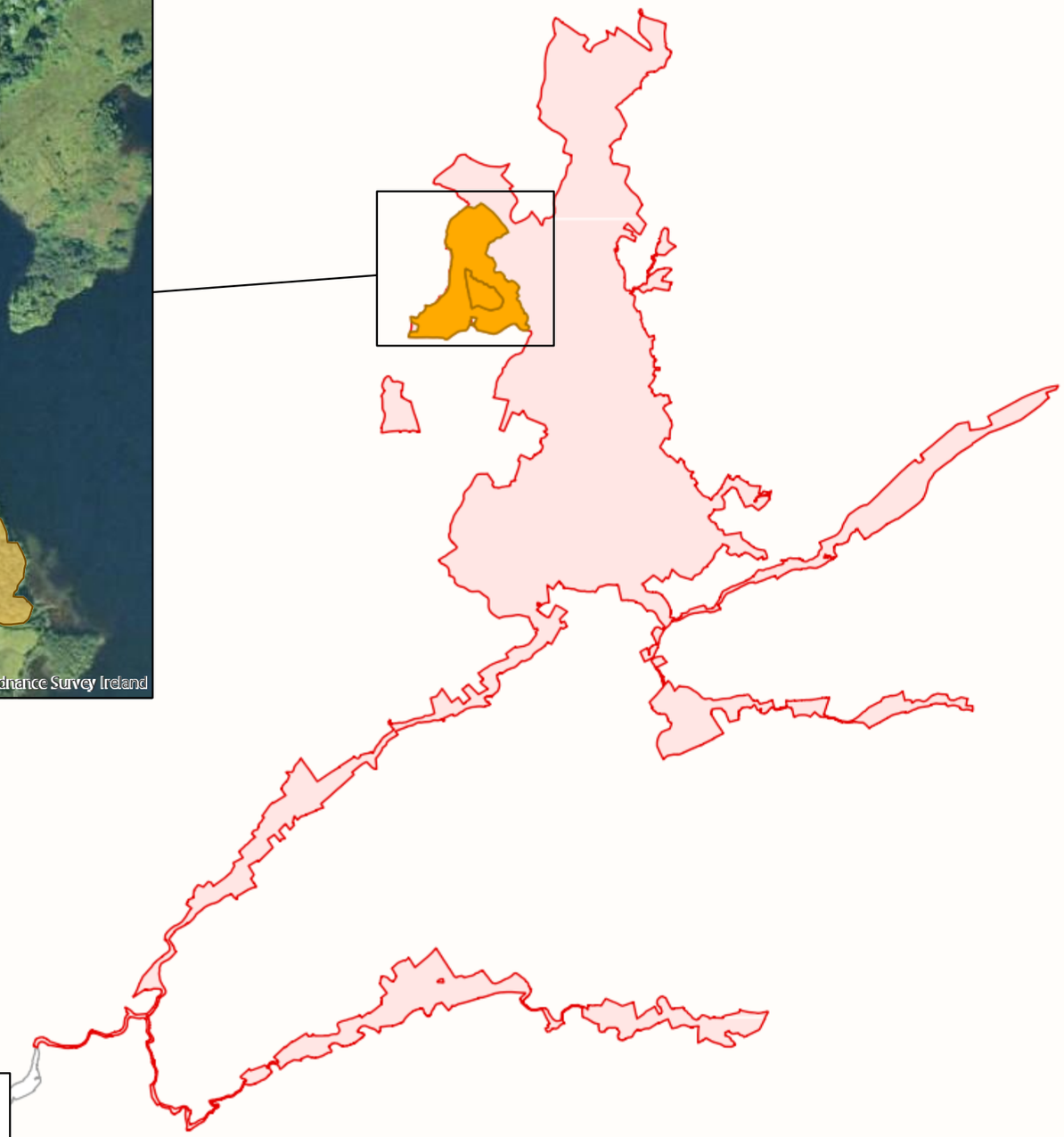
Date: May 2019





Legend

- Lough Eske and Ardnamona Wood SAC 000163
- OSi Discovery Series County Boundary
- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

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Department of Culture, Heritage and the Gaeltacht

MAP 4:
LOUGH ESKE AND ARDNAMONA WOOD SAC
CONSERVATION OBJECTIVES
WOODLAND HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000163; version 3.01. CO. DONEGAL

0 0.5 1 1.5 2 2.5 Kilometers

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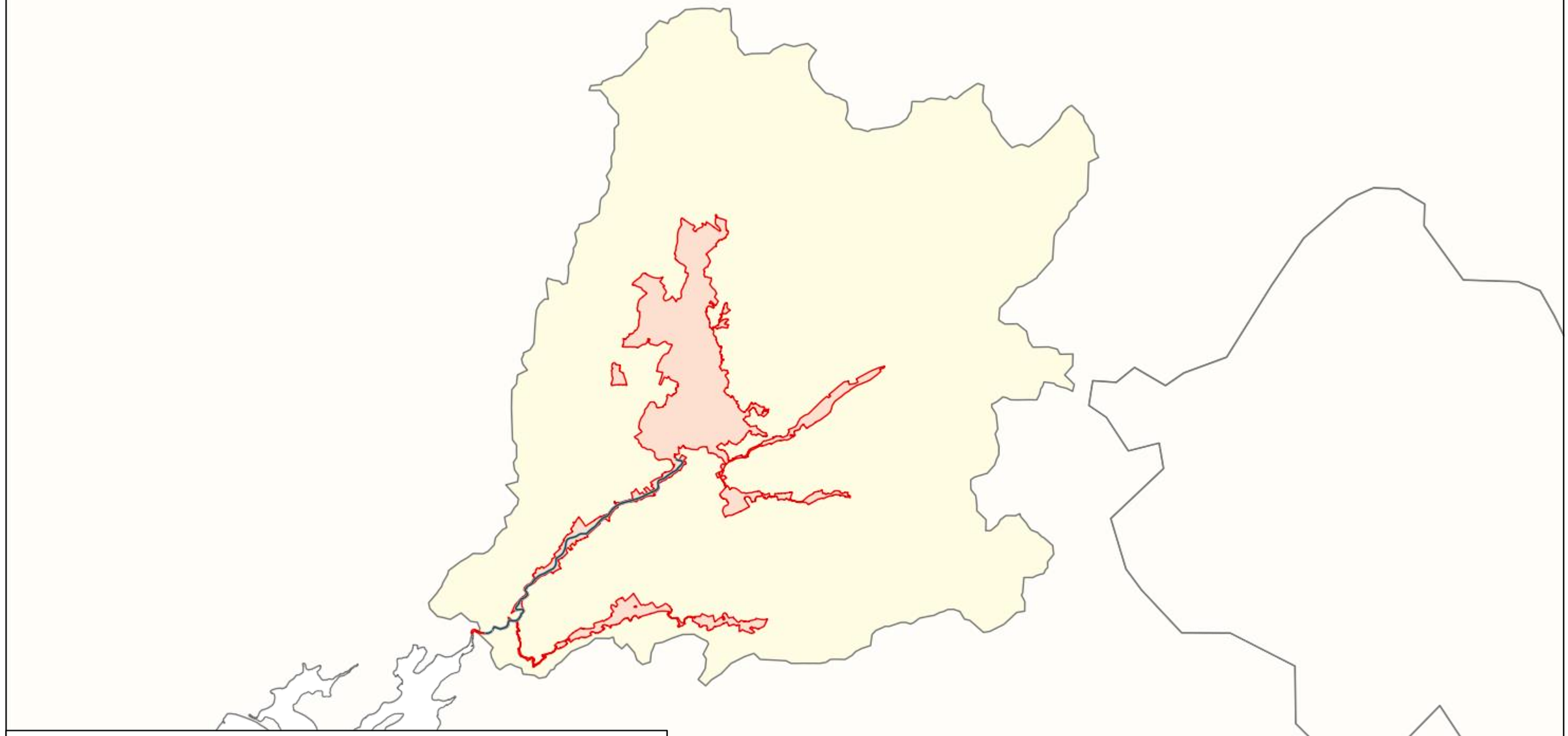
Date: May 2019



Legend

- Lough Eske and Ardnamona Wood SAC 000163
- 1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Suitable habitat target
- 1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Distribution target
- 1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Catchment
- OSi Discovery Series County Boundaries

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MAP 5:
LOUGH ESKE AND ARDNAMONA WOOD SAC
CONSERVATION OBJECTIVES
FRESHWATER PEARL MUSSEL

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000163; version 3.01. CO. DONEGAL

0 0.85 1.7 2.55 3.4 4.25 km

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Map Version 1
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Conservation Objectives Series

Lough Foyle SPA 004087

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National Parks and Wildlife Service,
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7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004087 Lough Foyle SPA

A001	Red-throated Diver *Gavia stellata*
A005	Great Crested Grebe *Podiceps cristatus*
A037	Bewick's Swan *Cygnus columbianus bewickii*
A038	Whooper Swan *Cygnus cygnus*
A043	Greylag Goose *Anser anser*
A046	Brent Goose *Branta bernicla hrota*
A048	Shelduck *Tadorna tadorna*
A050	Wigeon *Anas penelope*
A052	Teal *Anas crecca*
A053	Mallard *Anas platyrhynchos*
A063	Eider *Somateria mollissima*
A069	Red-breasted Merganser *Mergus serrator*
A130	Oystercatcher *Haematopus ostralegus*
A140	Golden Plover *Pluvialis apricaria*
A142	Lapwing *Vanellus vanellus*
A143	Knot *Calidris canutus*
A149	Dunlin *Calidris alpina alpina*
A157	Bar-tailed Godwit *Limosa lapponica*
A160	Curlew *Numenius arquata*
A162	Redshank *Tringa totanus*
A179	Black-headed Gull *Chroicocephalus ridibundus*
A182	Common Gull *Larus canus*
A184	Herring Gull *Larus argentatus*
A999	Wetlands

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2014
Title :	Lough Foyle SPA (site code: 4087) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

A005 Great Crested Grebe *Podiceps cristatus*

To maintain the favourable conservation condition of Great Crested Grebe in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great crested grebe, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Lough Foyle SPA [004087]

A037 Bewick's Swan *Cygnus columbianus bewickii*

To maintain the favourable conservation condition of Bewick's Swan in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in range, timing or intensity of use of areas by Bewick's swan, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A038 Whooper Swan *Cygnus cygnus*

To maintain the favourable conservation condition of Whooper Swan in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by whooper swan, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A043 Greylag Goose *Anser anser*

To maintain the favourable conservation condition of Greylag Goose in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by greylag goose, other than that occurring from natural patterns of variation.	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A046 Brent Goose *Branta bernicla hrota*

To maintain the favourable conservation condition of Light-bellied Brent Goose in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

To maintain the favourable conservation condition of Shelduck in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A052 **Teal *Anas crecca***

To maintain the favourable conservation condition of Teal in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A053 **Mallard *Anas platyrhynchos***

To maintain the favourable conservation condition of Mallard in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by mallard, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A063 **Eider *Somateria mollissima***

To maintain the favourable conservation condition of Eider in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by eider, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A142 Lapwing *Vanellus vanellus*

To maintain the favourable conservation condition of Lapwing in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A143 Knot *Calidris canutus*

To maintain the favourable conservation condition of Knot in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by knot, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Lough Foyle SPA [004087]

A149 **Dunlin *Calidris alpina alpina***

To maintain the favourable conservation condition of Dunlin in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas used by black-headed gull other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A184 Herring Gull *Larus argentatus*

To maintain the favourable conservation condition of Herring Gull in Lough Foyle SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by herring gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document

Conservation Objectives for : Lough Foyle SPA [004087]

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Lough Foyle SPA as a resource for the regularly occurring waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 588 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 588ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

Legend

Lough Foyle SPA 004087

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 1:
LOUGH FOYLE SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SPA 004087; version 2.01. CO. DONEGAL

0 0.5 1 km

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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Map Version 1
Date: Sep 2014

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Lough Nageage SAC 002135

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@chg.gov.ie

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Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

002135	Lough Nageage SAC

1092	White-clawed Crayfish *Austropotamobius pallipes*

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2009
Title :	Monitoring of white-clawed crayfish *Austropotamobius pallipes* in Irish lakes in 2007
Author :	O'Connor, W.; Hayes, G.; O'Keeffe, C.; Lynn, D.
Series :	Irish Wildlife Manuals, No. 37
Year :	2010
Title :	A technical manual for monitoring white-clawed crayfish (*Austropotamobius pallipes*) in Irish lakes
Author :	Reynolds, J.; O'Connor, W.; O'Keeffe, C.; Lynn, D.
Series :	Irish Wildlife Manuals, No.45
Year :	in prep.
Title :	Survey of the status of white-clawed crayfish, *Austropotamobius pallipes*, in designated SACs in 2017
Author :	Gammell, M.; McFarlane, A.; Brady, D.; O'Brien, J.; Mirimin, L.; Graham, C.; Lally, H.; Minto, C.; O'Connor, I.
Series :	Irish Wildlife Manuals

Other References

Year :	1992
Title :	Crayfish in Co. Donegal (H34)
Author :	Ffrench Mullen, P.; Lucey, J.
Series :	The Irish Naturalists' Journal, 24, 133-133

Spatial data sources

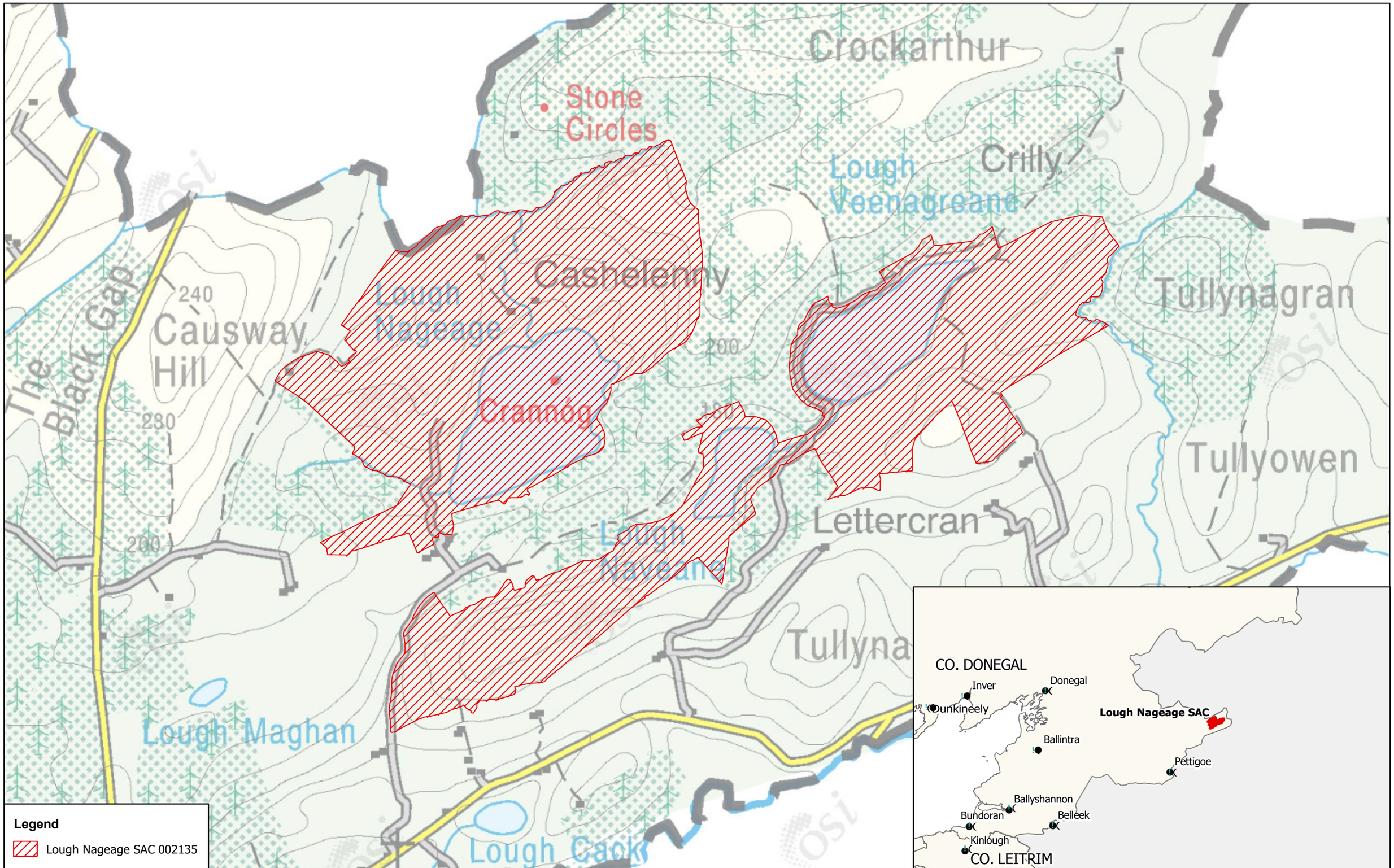
Year :	2021
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1092 (map 2)

1092 White-clawed Crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed Crayfish in Lough Nageage SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Number of occupied 1km squares	No reduction from baseline. See map 2	White-clawed crayfish was first found in Lough Nageage in 1991 (Ffrench Mullen and Lucey, 1991). The species was subsequently found in Lough Veenagreane (O'Connor et al., 2009). There have been no records from Lough Naveane and the peaty nature of this lake suggests that it is not suitable for the species. O'Connor et al. (2009) reported crayfish in both Nageage and Veenagreane. Gammell et al. (in prep.) also found the species in Veenagreane but reported none in Nageage. However, this absence may be related to the timing of the survey (August). A similar negative result from a summer survey was reported by O'Connor et al. (2009); however, the species was found in a repeat survey of Lough Nageage later in the year also by O'Connor et al. (2009). In 2020 crayfish were reported from both Nageage and Veenagreane. The species is recorded from the following 1km squares H1673, H1772, H1774 and H1874
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and females with eggs in at least 50% of positive samples taken at appropriate time and methodology	See Reynolds et al. (2010) for further details. Gammell et al. (in prep.) found juveniles in Lough Veenagreane
Population size	Catch per unit effort	No reduction from baseline of 0.1	The CPUE figures are based on the figures in O'Connor et al. (2009) and Gammell et al. (in prep.) calculated for Lough Veenagreane. A CPUE for Lough Nageage was not calculated due to low numbers or absence in samples. This may be refined further with more detailed assessment of the stocks in both lakes. Gammell et al. (in prep.) assessed the population in Lough Veenagreane as having Low Population abundance grade
Negative indicator species	Occurrence	No non-indigenous crayfish species	Non-indigenous crayfish species (NICS) are identified as a major direct threat to the white-clawed crayfish (*Austropotamobius pallipes*) and as a disease vector, in particular crayfish plague (*Aphanomyces astaci*), which is fatal to white-clawed crayfish. Legislation has banned the import of the five most common NICS to Ireland (S.I. No. 354/2018)
Disease	Occurrence	No instances of disease	Crayfish plague, caused by the water-borne mould *Aphanomyces astaci*, is identified as major threat to the species in Ireland. Instances of crayfish plague have occurred in Ireland since 2015 causing local extinctions. There have been no confirmed or suspected outbreaks in this SAC
Water quality	Water chemistry measures	No decline	White-clawed crayfish is not considered very sensitive of water quality but the species is intolerant of low pH and poorest water quality and lack of calcareous influence. Baseline levels need to be determined for both lakes as neither is monitored for water quality. The visual assessment by O'Connor et al. (2009) was that Lough Nageage appeared slightly polluted and the substrate was covered with filamentous algae

Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline from the baseline	White-clawed crayfish need high habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions and habitat features must be available on the whole length of occupied habitat. Gammell et al. (in prep.) scored the habitat heterogeneity and following this methodology the baseline score of 0.5 is set



An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 1:
LOUGH NAGEAGE SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 002135; version 3.03.
CO. DONEGAL

0 125 250 500 Metres

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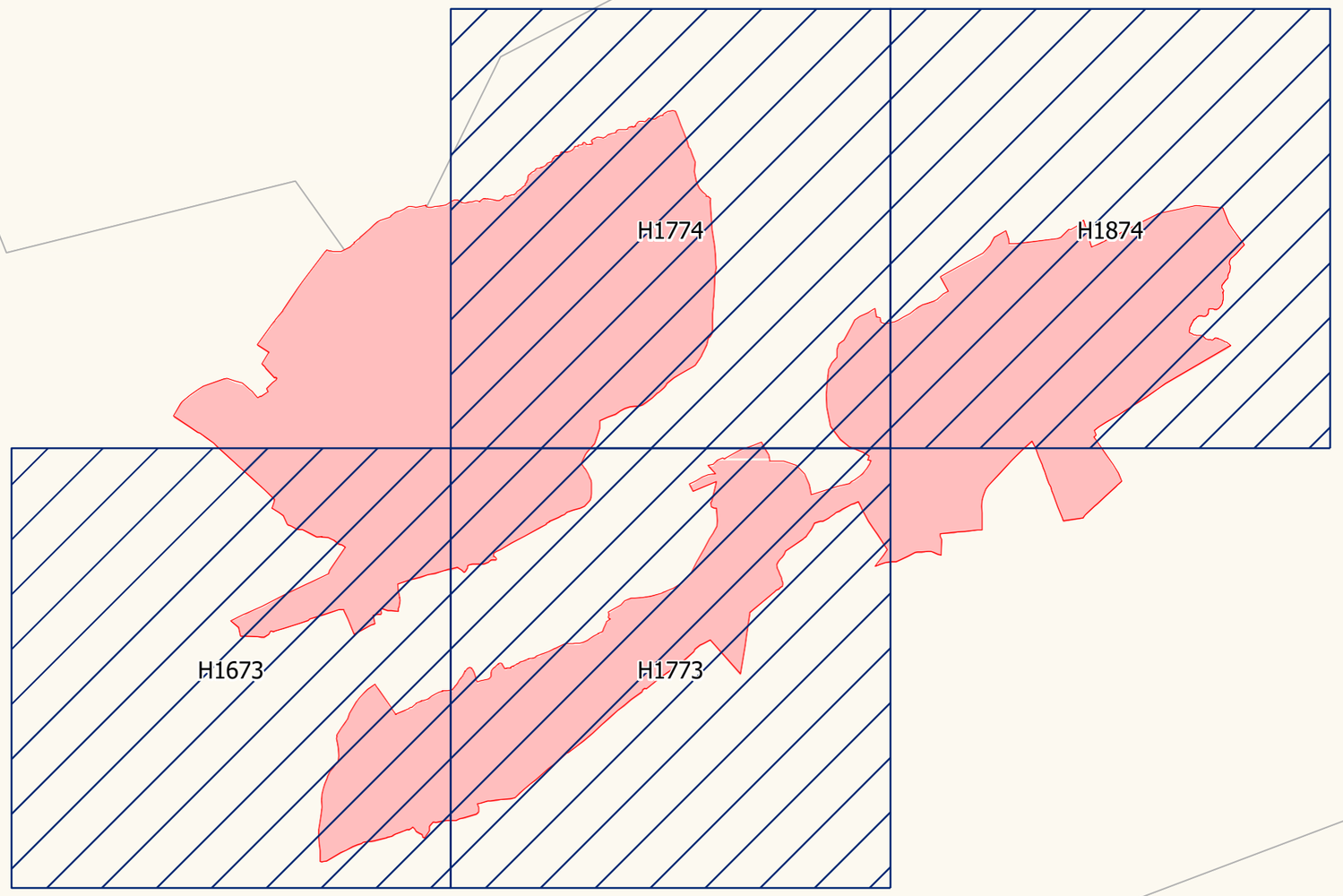
Date: February 2021



Legend

- 1092 White-clawed crayfish *Austropotamobius pallipes* 1km grid squares
- Lough Nageage SAC 002135
- OSi Discovery Series County Boundary

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 2:
LOUGH NAGEAGE SAC
CONSERVATION OBJECTIVES
WHITE-CLAWED CRAYFISH

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 002135; version 3.03.
CO. DONEGAL

0 125 250 500 Metres

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Date: March 2021

Addition of Harbour Porpoise as a new Qualifying Interest and the addition of an Activity Requiring Consent to Lough Swilly Special Area of Conservation 002287 in County Donegal

Ireland designates Special Areas of Conservation (SACs) in its inshore and offshore waters to protect marine habitats and species listed on Annex I and Annex II of the 1992 EU Habitats Directive.

The Minister has added Harbour Porpoise as a Qualifying Interest to Lough Swilly SAC 002287 in County Donegal.

The full list of Qualifying Interests, including the newly added Harbour Porpoise, for Lough Swilly SAC is as follows:

Natural Habitat Type

In this list the sign [*] *indicates a priority habitat type as defined in the Directive.*

Natura 2000 Code	Description
1130	Estuaries
1150	Coastal lagoons*
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Animal and Plant Species

Natura 2000 Code	Common Name	Scientific Name
1351	Harbour Porpoise	*Phocoena phocoena*
1355	Otter	*Lutra lutra*

The addition of Harbour Porpoise as a Qualifying Interest has resulted in an additional activity (ARC 35) being added to the list of Activities Requiring Consent (ARCs) that apply to this site. The Minister has reason to believe that this activity may cause disturbance of and may impact on the conservation status of this species. Therefore, the Minister has issued a new Direction adding ARC 35 to the list of ARCs that apply to this site and has directed that these activities cannot be carried out, caused or permitted to be carried out or continued to be carried out in the SAC, unless it is with the consent of the Minister.

It is an offence to contravene these Directions by carrying out any of the activities within the site unless the activity is carried out with the consent of the Minister or another statutory authority (in practice, such consent should be sought initially from the Department's National Parks and Wildlife Service https://www.npws.ie/contact-us).

The full list of Activities Requiring Consent, including the newly added ARC 35, that apply to this site are:

ARC Code	Description
ARC 01	Reclamation, including infilling.
ARC 02	Stocking or re-stocking with fish.
ARC 03	Blasting, drilling, dredging or otherwise removing or disturbing fossils, rock, minerals, mud, sand, gravel or other sediment.
ARC 05	Cutting, uprooting or otherwise removing plants. [Consent is not required for harvesting of cultivated crops, or for grazing or mowing.]
ARC 06	Introduction, or re-introduction, of plants or animals not found in the area. [Consent is not required for the planting of crops on established reseeded grassland or cultivated land.]
ARC 08	Undertaking scientific research involving the collection and removal of biological material.
ARC 09	Construction or alteration of tracks, paths, roads, bridges, culverts or access routes.
ARC 10	Construction, removal or alteration of fences, stone walls, hedgerows, banks or any field boundary other than temporary electric fencing. [Consent is not required for normal maintenance.]
ARC 11	Digging, ploughing, harrowing or otherwise disturbing soil or substrate. [Consent is not required for these activities on established reseeded grassland or cultivated land provided it is greater than 50m from a river, stream, floodplain, wetland, lake, turlough or pond.]
ARC 12	Applying inorganic or organic fertiliser, including slurry and farmyard manure. [Consent is not required for these activities on established reseeded grassland or cultivated land provided it is greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 13	Applying lime. [Consent is not required for this activity on established reseeded grassland or cultivated land provided it is greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 14	Storage, burial, disposal or recovery of any materials. [Consent is not required for these activities on established reseeded grassland or cultivated land provided it is greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 15	Burning, topping, clearing scrub or rough vegetation or reseeding. [Consent is not required for these activities on established reseeded grassland or cultivated land provided it is greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 18	Application of pesticides, including herbicides. [Consent is not required for these activities on established reseeded grassland or cultivated land provided it is

	greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 19	Supplementary feeding of livestock. [Consent is not required for this activity on established reseeded grassland or cultivated land provided it is greater than 20m from a river, stream or floodplain; or greater than 50m from a wetland, lake, turlough or pond.]
ARC 20	Significant changes in livestock density (including introduction of grazing), changes in livestock type or grazing season, other than on established reseeded grassland. [Consent is not required for changes of less than 20% in livestock density unless notice has been given that a lower percentage is applicable to a particular site.]
ARC 22	Changing of agricultural use from hay meadow to any other use.
ARC 24	Works on, or alterations to, the banks, bed or flow of a drain, watercourse or waterbody.
ARC 25	Drainage works including digging, deepening, widening or blocking a drain, watercourse or waterbody.
ARC 27	Water abstraction, sinking of boreholes and wells.
ARC 28	Felling of trees or removing timber, including dead wood.
ARC 29	Planting of trees or multi-annual bioenergy crops.
ARC 31	Developing or consenting to the development or operation of commercial recreational/visitor facilities or organised recreational activities.
ARC 35	Undertaking active acoustic surveys in the marine environment
ARC 36	Harvesting marine invertebrate species in intertidal areas.
ARC 37	Driving mechanically propelled vehicles in intertidal areas, except over prescribed access routes.

22nd March 2024

Sceideal 1 / Schedule 1

LIMISTEAR FAOI
CHAOMHNU SPEISIALTA

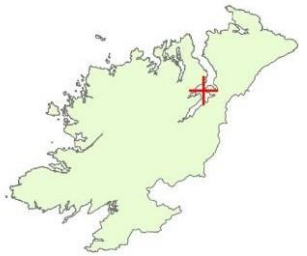
SPECIAL AREA OF CONSERVATION

LimistCar faoi Chaomhnll Spcisialta
Special Area of Conservation

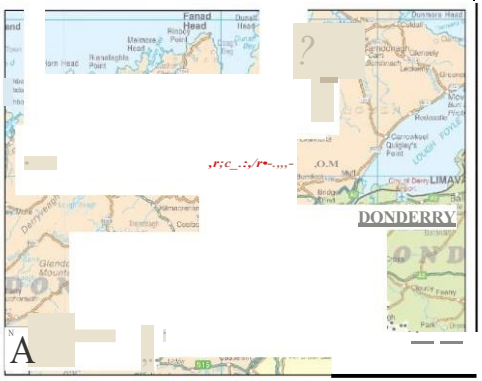
Rialachan 4(1)(b) Jnneacs Mapa Mionsonraithe
Regulation 4(1)(b) Detail Map lndex

LCS Loch Suili
Lough Swilly SAC
002287

Achar / Area 9,298.20 ha



Co. Dhun na nGall
Co. Donegal



Scála / Scale1:125,000

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National Parks and Wildlife Service

Conservation Objectives

Lough Swilly SAC 002287
Lough Swilly SPA 004075

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

002287 Lough Swilly SAC

QI	Description
1130	Estuaries
1150	* Coastal lagoons
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1355	Otter *Lutra lutra*
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

004075 Lough Swilly SPA

QI	Description	
A005	Great Crested Grebe *Podiceps cristatus*	wintering
A028	Grey Heron *Ardea cinerea*	wintering
A038	Whooper Swan *Cygnus cygnus*	wintering
A043	Greylag Goose *Anser anser*	wintering
A048	Shelduck *Tadorna tadorna*	wintering
A050	Wigeon *Anas penelope*	wintering
A052	Teal *Anas crecca*	wintering
A053	Mallard *Anas platyrhynchos*	wintering
A056	Shoveler *Anas clypeata*	wintering
A062	Scaup *Aythya marila*	wintering
A067	Goldeneye *Bucephala clangula*	wintering
A069	Red-breasted Merganser *Mergus serrator*	wintering
A125	Coot *Fulica atra*	wintering
A130	Oystercatcher *Haematopus ostralegus*	wintering
A143	Knot *Calidris canutus*	wintering
A149	Dunlin *Calidris alpina*	wintering
A160	Curlew *Numenius arquata*	wintering
A162	Redshank *Tringa totanus*	wintering
A164	Greenshank *Tringa nebularia*	wintering
A179	Black-headed Gull *Chroicocephalus ridibundus*	breeding
A182	Common Gull *Larus canus*	wintering
A191	Sandwich Tern *Sterna sandvicensis*	breeding
A193	Common Tern *Sterna hirundo*	breeding
A395	Greenland White-fronted goose *Anser albifrons flavirostris*	wintering
A999	Wetlands & Waterbirds	

Supporting documents, relevant reports & publications (listed by date)

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Title: Seabird Monitoring Programme (SMP) Database

Year: 2011

Author: JNCC

Series: http://jncc.defra.gov.uk/smp/Default.aspx

Title: Lough Swilly SAC (002287): Conservation objectives supporting document - coastal habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: Lough Swilly SPA (004075): Conservation objectives supporting document [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: Lough Swilly SAC (002287): Conservation objectives supporting document - marine habitats [Version 1]

Year: 2011

Author: NPWS

Series: Unpublished Report to NPWS

Title: Otter tracking study of Roaringwater Bay

Year: 2010

Author: De Jongh, A.; O'Neill, L.

Series: Unpublished Draft Report to NPWS

Title: A provisional inventory of ancient and long-established woodland in Ireland

Year: 2010

Author: Perrin, P.M.; Daly, O.H.

Series: Irish Wildlife Manuals No. 46

Title: Saltmarsh Monitoring Report 2007-2008

Year: 2009

Author: McCorry, M.; Ryle, T.

Series: Unpublished Report to NPWS

Title: National Survey of Native Woodlands 2003-2008

Year: 2008

Author: Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A.

Series: Unpublished Report to NPWS

Title: Saltmarsh Monitoring Report 2006

Year: 2007

Author: McCorry, M.

Series: Unpublished Report to NPWS

Title: Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents, Article 17 forms and supporting maps
Year: 2007
Author: NPWS
Series: Unpublished Report to NPWS

Title: Inventory of Irish coastal lagoons
Year: 2007
Author: Oliver, G.
Series: Unpublished Report to NPWS

Title: Otter Survey of Ireland 2004/2005
Year: 2006
Author: Bailey, M.; Rochford, J.
Series: Irish Wildlife Manuals No. 23

Title: Otters - ecology, behaviour and conservation
Year: 2006
Author: Kruuk, H.
Series: Oxford University Press

Title: Seabird Populations of Britain and Ireland
Year: 2004
Author: Mitchell, P.I.; Newton, S.F.; Ratcliffe, N.; Dunn, T.E.
Series: Poyser, London

Title: Reversing the habitat fragmentation of British woodlands
Year: 2002
Author: Peterken, G.
Series: WWF-UK, London

Title: Diet of Otters *Lutra lutra* on Inishmore, Aran Islands, west coast of Ireland
Year: 1999
Author: Kingston, S.; O'Connell, M.; Fairley, J.S.
Series: Biol & Environ Proc R Ir Acad B 99B:173–182

Title: Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds.
Year: 1995
Author: Walsh, P.; Halley, D.J.; Harris, M.P.; del Nevo, A.; Sim, I.M.W.; Tasker, M.L.
Series: JNCC, Peterborough

Title: The spatial organization of otters (*Lutra lutra*) in Shetland
Year: 1991
Author: Kruuk, H.; Moorhouse, A.
Series: J. Zool, 224: 41-57

Title: Otter survey of Ireland
Year: 1982
Author: Chapman, P.J.; Chapman, L.L.
Series: Unpublished Report to Vincent Wildlife Trust

Spatial data sources

Year:	2010
Title:	EPA transitional waterbody data
GIS operations:	Clipped to SAC boundary
Used for:	1130 (map 2)

Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; Saltmarsh and Sand Dune datasets erased out
Used for:	Marine community types base data (map 3)

Year:	Interpolated 2011
Title:	Intertidal/subtidal surveys 2009, 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data
Used for:	Marine community types (map 3)

Year:	Revision 2011
Title:	Inventory of Irish Coastal Lagoons. Version 3
GIS operations:	Clipped to SAC boundary
Used for:	1150 (map 4)

Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QI selected; clipped to SAC boundary
Used for:	1330 (map 5)

Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary
Used for:	91A0 (map 6)

Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; saltmarsh data for site combined to HWM and LWM polygon feature class; resulting polygon feature class unioned with SPA boundary; resulting polygon feature class clipped to SPA boundary; bird use zone attributes assigned to each polygon
Used for:	Bird use zones (map 7)

Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the landward side of the river banks data; creation of a 20m buffer applied to river centerline and stream data; combination of 10m river banks and 20m river and stream centerline buffer datasets; combined river and stream buffer dataset clipped to HWM; combination of HWM buffer dataset with river and stream buffer dataset; overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary
Used for:	1355 (no map)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 2	Habitat area was estimated at 6118ha using OSI data and the defined Transitional Water Body area under the Water Framework Directive. See marine habitats supporting document for further information
Community distribution	Hectares	The following communities should be conserved in a natural condition: Fine sand community complex; Intertidal mixed sediment with polychaetes; Subtidal mixed sediment with polychaetes and bivalves; Muddy fine sand with *Thyasira flexuosa*; Mud community complex and *Ostrea edulis* dominated community. See map 3	The communities were derived from the 2009 and 2010 intertidal survey and 2009 subtidal survey. See marine habitats supporting document for further information

1150 * Coastal lagoons

To restore the favourable conservation condition of Lagoons in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to slight natural variation. Favourable reference area 206ha- Inch Lough 176ha; Blanket Nook 30ha. See map 4	Areas calculated from spatial data derived from Oliver, 2007. Two lagoons are identified
Salinity regime	Practical salinity units (psu)	Maintain median annual salinity within natural ranges: Inch 0.1 - 3.0psu; Blanket Nook 10 - 20psu	Inch is one if the largest oligohaline (low salinity) lagoons in Ireland and most of the waterbody should have a salinity of 0.5 to 3.0 for most of the time but locally, fresh water may occur and at depth salinities of over 20 psu have been recorded. Blanket Nook is a mesohaline (medium salinity) lagoon. See Oliver (2007) for further information
Hydrological regime	Metres	Maintain current annual water level fluctuations and minima	Both lagoons are shallow- Inch only 2m and Blanket Nook 1m deep (Oliver, 2007). Small changes in summer levels would result in major losses of lagoonal area. Need to investigate normal fluctuations and set specific targets
Barrier	Sluice function	Maintain permeability, including appropriate management of sluices	Both lagoons are artificial with embankment barriers containing sluices. Need to identify main saline inputs and ensure that they, or equivalent, saline inputs are retained
Water quality: Chlorophyll a	µg/L	Reduce annual median chlorophyll a to less than 2.5µg/L at Inch; less than 5µg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L	Reduce annual median MRP to less than 0.01mg/L at Inch; less than 0.02mg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L	Reduce annual median DIN to less than 0.15mg/L at Inch; less than 0.4mg/L at Blanket Nook	These limits are needed to ensure that excessive shading from phytoplankton does not restrict macrophytes colonisation in the lagoons (J. Ryan, pers comm)
Depth of macrophyte colonisation	Metres	Increase colonisation to maximum depth of both lagoons	Increased depth of colonisation increases both the extent and diversity of submergent macrophytes. This is especially important in Inch where, as well as being of major interest in their own right, the presence of a healthy submerged macrophyte sward is also important for the achievement of the SPA objectives
Typical plant species	Number and m^2	Maintain number and extent of listed lagoonal specialists, subject to natural variation	Species listed in Oliver (2007), especially *Chara canescens*, *Ruppia* spp. and *Zannichellia palustris* in Inch

1150 * Coastal lagoons

To restore the favourable conservation condition of Lagoons in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Typical invertebrate species	Number	Maintain listed lagoon specialists, subject to natural variation	Species listed in Oliver (2007), especially *Jaera ischiosetosa* (an isopod crutacean) in Blanket Nook
Negative indicator species	Number and % cover	Negative indicator species absent or under control	Because of eutrophication and the shallowness of both lagoons there is a danger that the cover of emergents and/or floating algal mats might increase at the expense of submerged macrophytes

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Fahan - 7.29ha, Green Hill - 2.02ha, Lower Lough Swilly - 8.44ha, Rathmelton - 10.01ha, Ray - 0.05ha. See map 5	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007; McCorry and Ryle, 2009). Five sub-sites were mapped and additional areas of potential saltmarsh were identified from an examination of aerial photographs, giving a total estimated area of Atlantic salt meadow of 38.98ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5 for known distribution	See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry (2007) and McCorry and Ryle (2009). Creek and pan structure is well developed at Rathmelton, but poorly developed or absent at all other sub-sites. Significant drainage has occurred at Green Hill. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. See map 5	Based on data from McCorry (2007) and McCorry and Ryle (2009). Most of the saltmarsh habitat in Lough Swilly is Atlantic salt meadow, although *Salicornia* mudflats have been recorded at Lower Lough Swilly and Rathmelton. Mediterranean salt meadow has also been recorded at Rathmelton. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry (2007) and McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from the Saltmarsh Monitoring Project (McCorry, 2007; McCorry and Ryle, 2009). See coastal habitats supporting document for further details

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with characteristic species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation composition: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur	Based on data from McCorry (2007) and McCorry and Ryle (2009). Significantly large stands of *Spartina* have been recorded at Rathmelton, Lower Lough Swilly and Green Hill. The evidence suggests that there has been recent spread of *Spartina* at Green Hill and parts of Rathmelton, while it may have been planted at Lower Lough Swilly. See coastal habitats supporting document for further details

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in north-west estimated at 65% (Bailey and Rochford, 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 95.7ha above high water mark (HWM); 44.0ha along river banks/ around pools	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 839.5ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 15.5km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake/lagoon) habitat	Hectares	No significant decline. Area mapped and calculated as 83.7ha	No field survey. Lagoons have been included with other freshwater habitat as they are low/medium salinity. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk and Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006) and wrasse and rockling in coastal waters (Kingston et al., 1999)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m. e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010) . It is important that such commuting routes are not obstructed

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 58.68ha for sub-sites surveyed: Rathmullen wood - 26.00ha; Salt Pans wood - 13.47ha; Ballynarry wood - 15.61ha; Carrow Cashel wood - 3.60ha. See map 6	Area based on Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports. NB further unsurveyed areas maybe present within the site
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 6	Distribution based on Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports. NB further unsurveyed areas maybe present within the site
Woodland size	Hectares	Large woods at least 25ha in size and "small" woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types, including oak-ash; alder-ash in seepage areas and alongside streams; oak-birch; willow-alder-ash	Described in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak regenerates poorly. In suitable sites ash can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in Lough Swilly SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: indicators of local disctinctiveness	Occurrence	No decline	Includes ancient or long-established (i.e. pre-1840s) woodlands, archaeological and geological features as well as red-listed and other rare or localised species. Perrin and Daly (2010) list Rathmullen wood, Salt pans wood and Ballynarry wood as potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens)*	Species listed in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	Species reported in Perrin et al. (2008) - site codes 1420, 1430, 1434 and 1695 and internal NPWS reports

A005 Great Crested Grebe *Podiceps cristatus*

To maintain the favourable conservation condition of Great Crested Grebe in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A038 Whooper Swan *Cygnus cygnus*

To maintain the favourable conservation condition of Whooper Swan in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A043 Greylag Goose *Anser anser*

To maintain the favourable conservation condition of Greylag Goose in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

To maintain the favourable conservation condition of Shelduck in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A053 Mallard *Anas platyrhynchos*

To maintain the favourable conservation condition of Mallard in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A062 Scaup *Aythya marila*

To maintain the favourable conservation condition of Scaup in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A067 Goldeneye *Bucephala clangula*

To maintain the favourable conservation condition of Goldeneye in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A125 Coot *Fulica atra*

To maintain the favourable conservation condition of Coot in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A143 Knot *Calidris canutus*

To maintain the favourable conservation condition of Knot in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A149 Dunlin *Calidris alpina*

To maintain the favourable conservation condition of Dunlin in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A164 Greenshank *Tringa nebularia*

To maintain the favourable conservation condition of Greenshank in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard gull survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard gull survey methods (see Walsh et al., 1995).
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment using (Generalised Additive Modelling (GAM)) could not be undertaken for this species due to an incomplete dataset. A measure of population change was calculated using the 'generic threshold' method. See Section 4 of the SPA conservation objectives supporting document for more details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A191 Sandwich Tern *Sterna sandvicensis*

To maintain the favourable conservation condition of Sandwich Tern in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995)
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	The only known breeding site is on Inch Island

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Mitchell et al. (2004) provides summary population information. The Seabird Monitoring Programme (CMP) also provides background data (JNCC, 2011)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995)
Distribution: breeding colonies	Number; location; area (Hectares)	No significant decline	

A395 Greenland White-fronted goose *Anser albifrons flavirostris*

To maintain the favourable conservation condition of Greenland White-fronted Goose in Lough Swilly SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trend assessment (Generalised Additive Modelling (GAM)) was undertaken using waterbird count data collected through the Irish Wetland Bird Survey and other surveys. See the the SPA conservation objectives supporting document for further details
Distribution	Number and range of areas used by waterbirds	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	As determined by regular low tide and other waterbird surveys. Waterbird distribution from the 2009/2010 waterbird survey programme is discussed in Section 5 of the SPA conservation objectives supporting document

A999 Wetlands & Waterbirds

To maintain the favourable conservation condition of the wetland habitat in Lough Swilly SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat is stable and not significantly less than the areas of 4,162, 2,419, 201 and 317 hectares for subtidal, intertidal, supratidal and lagoon (and associated) habitats respectively, other than that occurring from natural patterns of variation. See map 7	Wetland areas defined as follows: subtidal- seaward extent of SPA boundary up to MLWM; intertidal- MLWM to MHWM; supratidal- MHWM to SPA boundary minus the area of terrestrial habitat; lagoon (and associated) habitats- lagoon extent and adjacent wetland habitat as defined by embankments

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MAP 1: LOUGH SWILLY CONSERVATION OBJECTIVES SAC & SPA DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

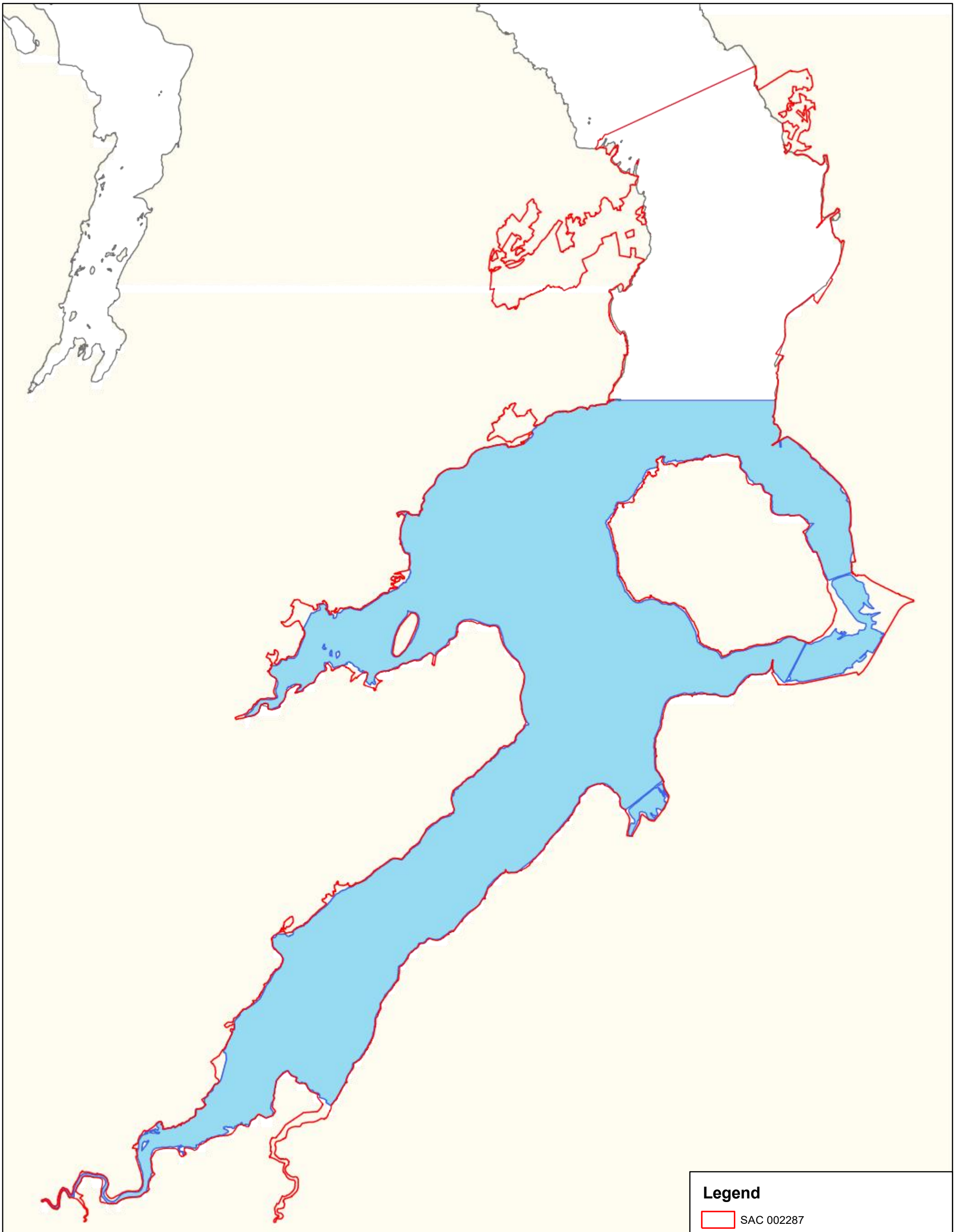
CO. DONEGAL

0 1 2 3 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated

areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059208).
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE SAC 002287
Version 1.01
SPA 004075
Version 1.04
Map Version 1
Date: March 2011



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MAP 2: LOUGH SWILLY CONSERVATION OBJECTIVES ESTUARIES

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. DONEGAL

0 1 2 3 km

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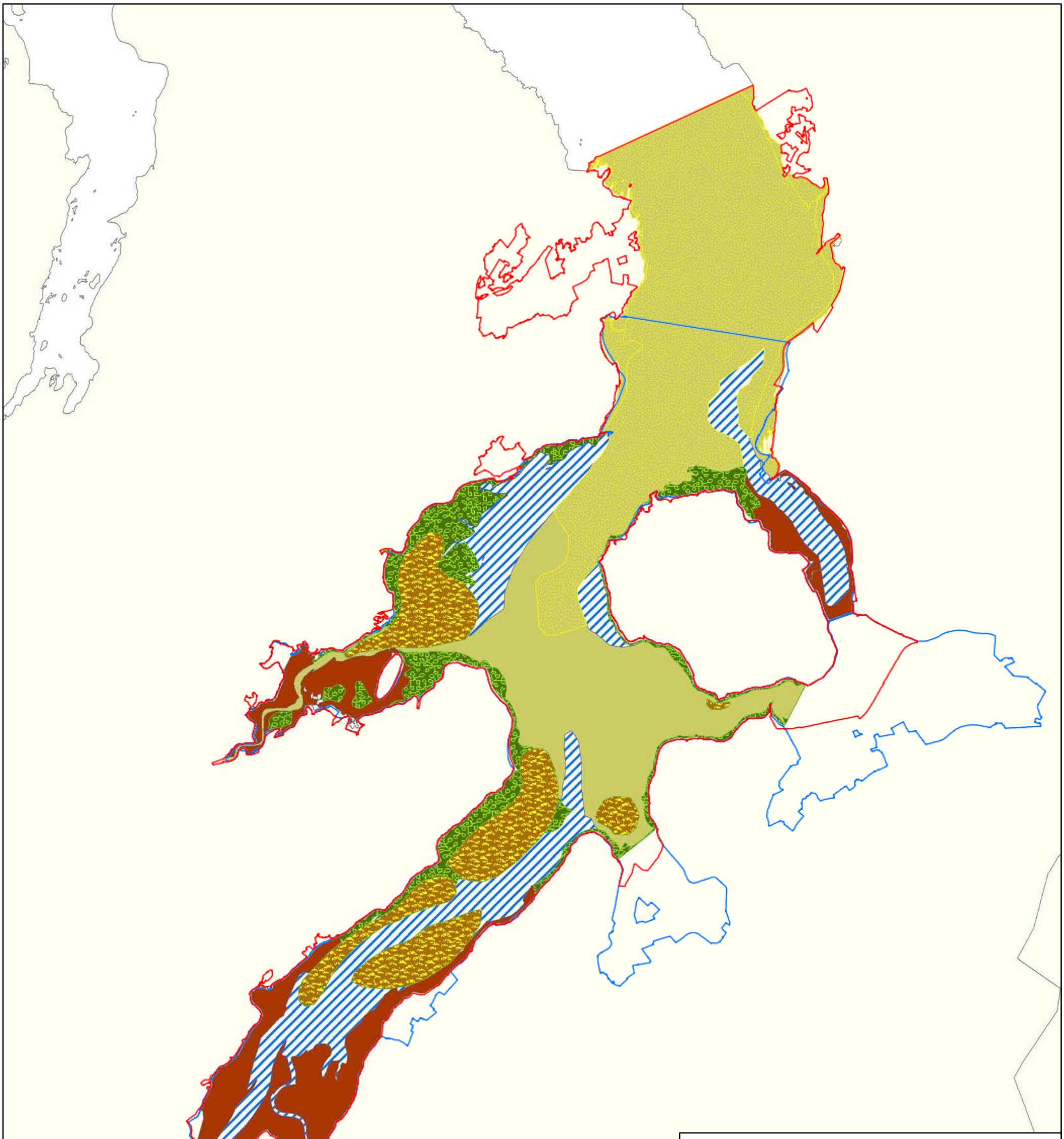
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



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MAP 3: LOUGH SWILLY CONSERVATION OBJECTIVES MARINE COMMUNITY TYPES

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. DONEGAL

0 1 2 3 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are

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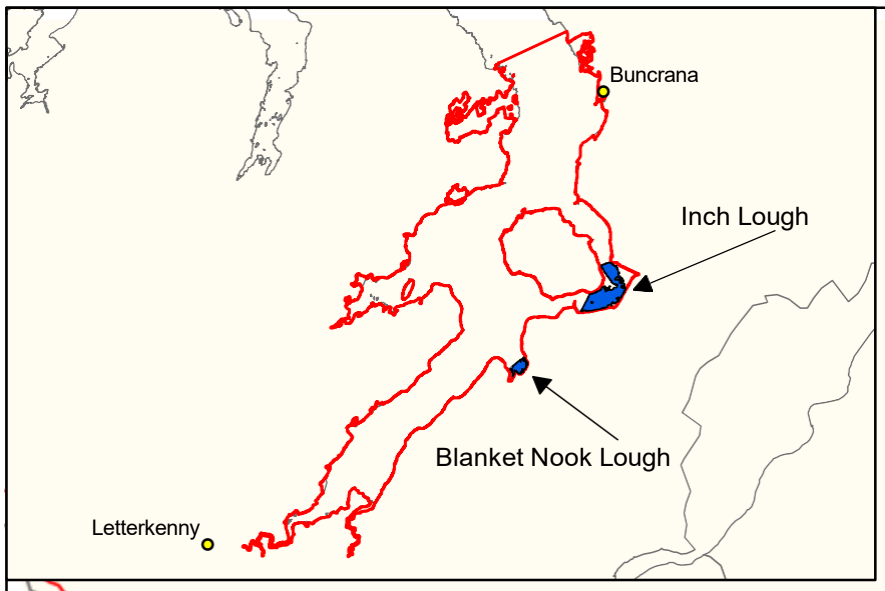
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE SAC 002287
Version 1.01
SPA 004075
Version1.04 Map Version 1
Date: March 2011



Legend

- SAC 002287
- 1150 * Coastal Lagoons
- OSi Discovery Series County Boundary

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MAP 4: LOUGH SWILLY CONSERVATION OBJECTIVES COASTAL LAGOONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. DONEGAL

0 0.25 0.5 0.75 1 km

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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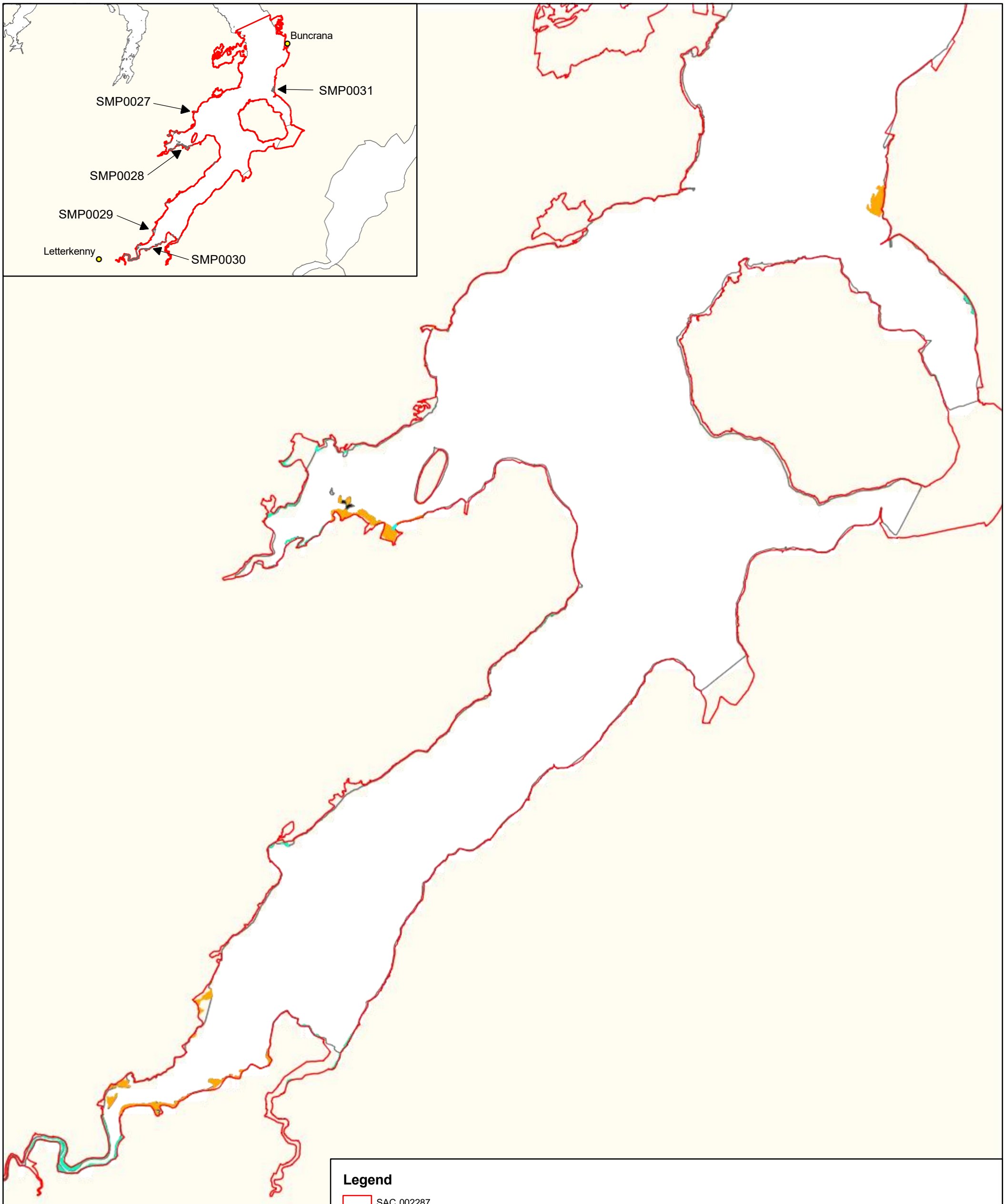
SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



Legend

- SAC 002287
- OSi Discovery Series County Boundary

Saltmarsh Habitats

- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest
- 1330 / 1410 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest / Mediterranean salt meadows (Juncetalia maritimi)
- Potential 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) Qualifying Interest
- 1310 Salicornia and other annuals colonising mud and sand
- 1410 Mediterranean salt meadows (Juncetalia maritimi)

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MAP 5: LOUGH SWILLY CONSERVATION OBJECTIVES SALTMARSH HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. DONEGAL

0 0.5 1 1.5 2 km

The mapped boundaries are of an indicative and general nature only.
Boundaries of designated areas are subject to revision.
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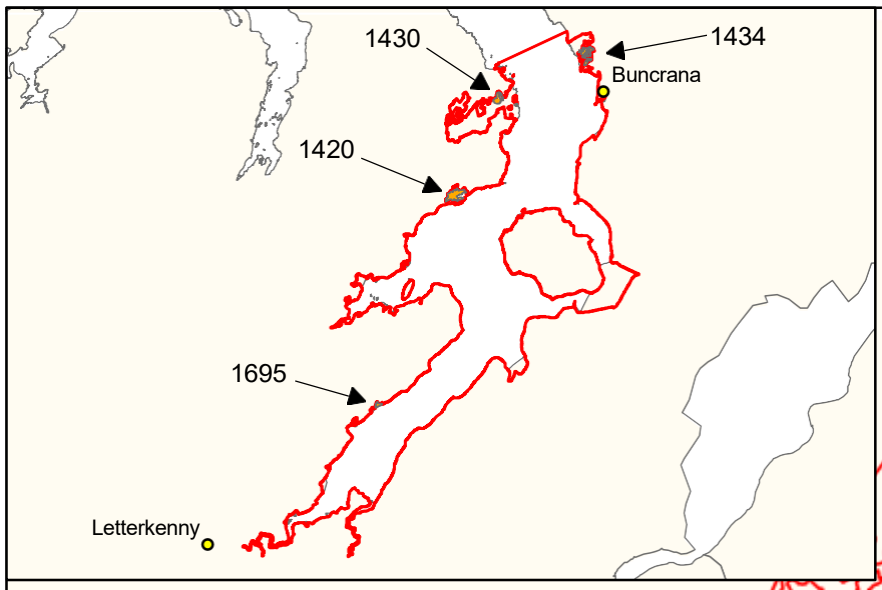
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



Legend

- SAC 002287
- OSi Discovery Series County Boundary
- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- WD1 (Mixed) broadleaved woodland
- WN2 Oak-ash-hazel woodland
- WN6 Wet willow-alder-ash woodland

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Department of Arts, Heritage and the Gaeltacht

MAP 6: LOUGH SWILLY CONSERVATION OBJECTIVES OLD OAK WOODLANDS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

CO. DONEGAL

0 0.5 1 1.5 2 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subje

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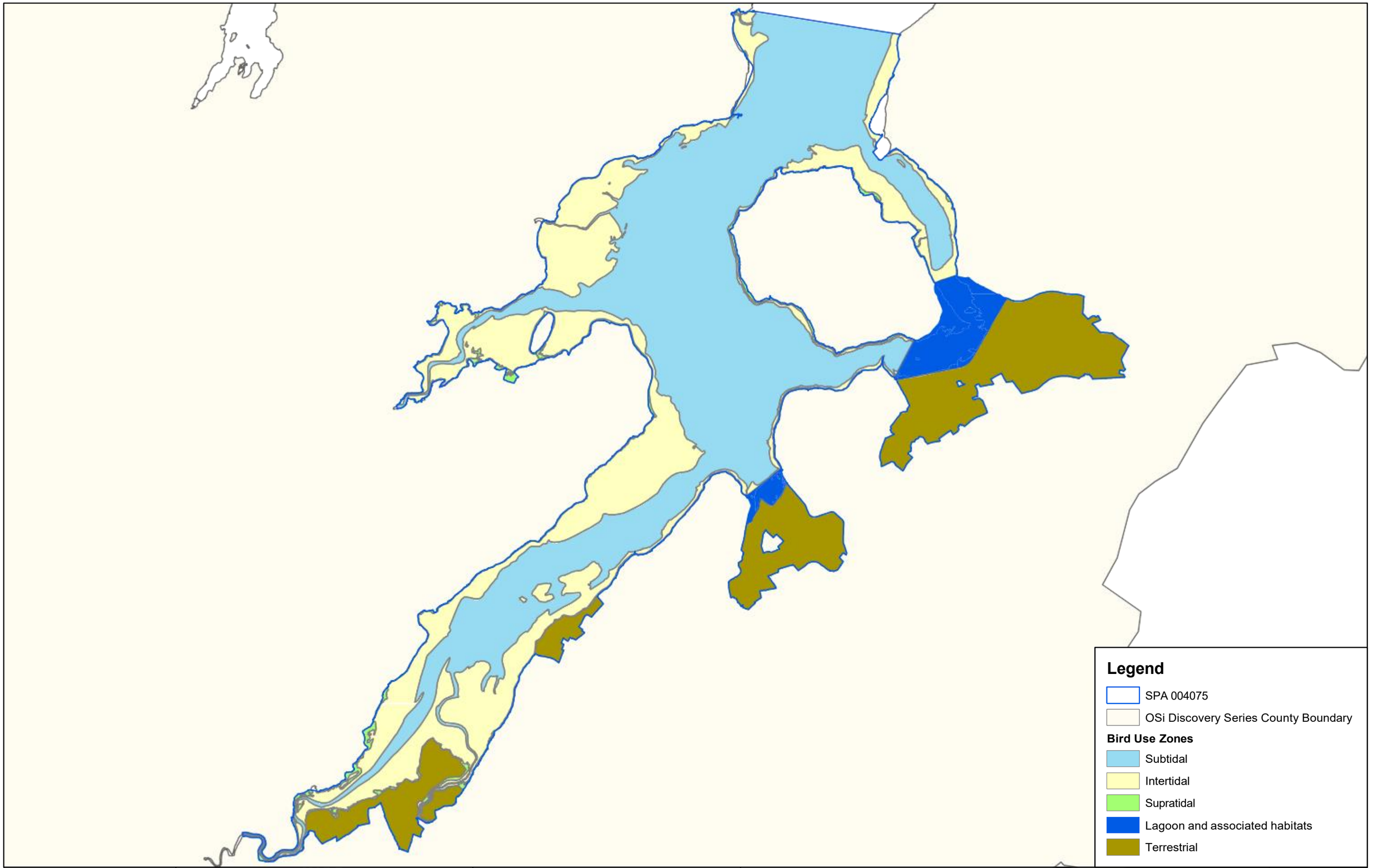
(Permit number EN 0059208).
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na
Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SITE CODE

SAC 002287
Version 1.01

Map Version 1
Date: March 2011



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Department of Arts, Heritage and the Gaeltacht

MAP 7
LOUGH SWILLY
CONSERVATION OBJECTIVES
WETLANDS AND WATERBIRDS
BIRD USE ZONES

Map to be read in conjunction with the NPWS Conservation Objectives Supporting Document.

CO. DONEGAL

0 1 2 3 4 km

SITE CODE

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the

Government (Permit number EN 0059208).
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadunas Uimh. EN 0059208)

SPA 004075
Version 1.04

Map Version 1
Date: March 2011

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Produced by: National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,
7 Ely Place, Dublin 2, Ireland.
Web: www.npws.ie
E-mail: natureconservation@environ.ie

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NPWS (2011) Conservation Objectives: Lough Swilly SAC 002287 and Lough Swilly SPA 004075. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

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National Parks and Wildlife Service

Conservation Objectives Series

Magheradrumman Bog SAC 000168

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (2017) Conservation Objectives: Magheradrumman Bog SAC 000168. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000168	Magheradrumman Bog SAC
4010	Northern Atlantic wet heaths with *Erica tetralix*
7130	Blanket bogs (* if active bog)

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2005
Title :	National Parks and Wildlife Service Conservation Plan for 2005-2010. Magheradrumman Bog cSAC Site Code 000168 Co. Donegal
Author :	NPWS
Series :	Conservation Plan
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Magheradrumman Bog SAC (site code: 168) Conservation objectives supporting document-blanket bogs and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

4010 Northern Atlantic wet heaths with Erica tetralix

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Magheradrumman Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with *Erica tetralix* has not been mapped in detail for Magheradrumman Bog SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 403ha, covering 40% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Magheradrumman Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat occurs in the south of the SAC on Tavash Hill, Puckan Hill and Croaghmore. Further information can be found within NPWS (2005) and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The diversity of wet heath communities within this SAC is unknown. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (*Erica tetralix*) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of *Cladonia* and *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (*Empetrum nigrum*) at least 15%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)

Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

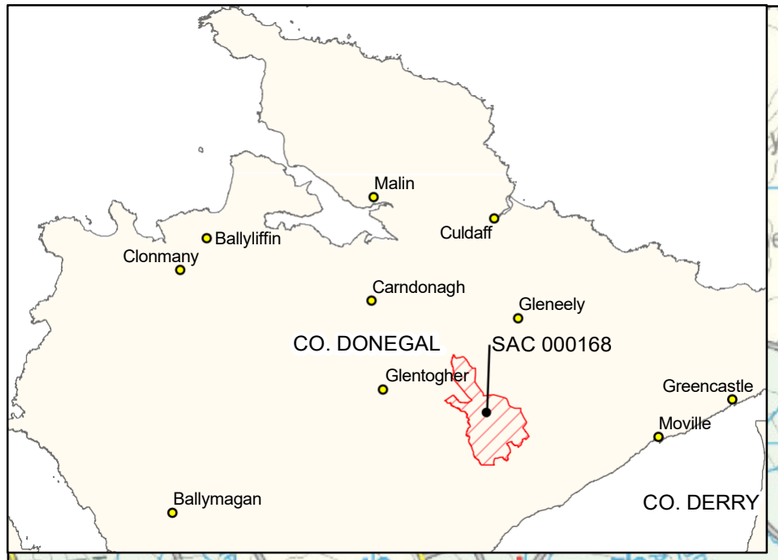
Conservation Objectives for : Magheradrumman Bog SAC [000168]

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (* if active bog) in Magheradrumman Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for Magheradrumman Bog SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 559ha, covering 56% of the SAC. Further information can be found in NPWS (2005). Further details on this and the following attributes can be found in the Magheradrumman Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat dominates the central and northern areas of the SAC. Further information can be found within Douglas et al. (1990), NPWS (2005) and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Douglas et al. (1990) recorded a variety of blanket bog vegetation communities in this SAC, two of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)

Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). The Near Threatened moss *Sphagnum teres* (Lockhart et al., 2012) is associated with regenerating cutover bog in the north of Magheradrumman Bog SAC (Douglas et al., 1990; NPWS, 2005)



Legend

Magheradrumman Bog SAC 000168

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Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
MAGHERADRUMMAN BOG SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000168; version 1. Co. Donegal

0 0.4 0.8 1.2 1.6 km

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Map Version 1
Date: Feb 2017

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Conservation Objectives Series

Meenaguse Scragh SAC 001880

An Roinn Cultúir,
Oidhreachta agus Gaeltachta
Department of Culture,
Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Culture, Heritage and the Gaeltacht,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@chg.gov.ie

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

001880	Meenaguse Scragh SAC
4010	Northern Atlantic wet heaths with *Erica tetralix*

Please note that this SAC is adjacent to Lough Nillan Bog (Carrickatlieve) SAC (000165) and Lough Nillan Bog SPA (004110). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjacent sites as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1998
Title :	A Survey of Protected, Threatened and Scarce Plant Species in County Donegal
Author :	Conaghan, J.
Series :	Unpublished report to NPWS
Year :	2005
Title :	Conservation Plan for 2005-2010. Meenaguse Scragh cSAC Site Code 001880 Co. Donegal
Author :	NPWS
Series :	Conservation Plan
Year :	2009
Title :	Irish Red List No. 1 - Water beetles
Author :	Foster, G.N.; Nelson, B.H.; O Connor, Á.
Series :	Ireland Red List Series, NPWS
Year :	2009
Title :	Ireland Red List No. 2: Non-marine molluscs
Author :	Byrne, A.; Moorkens, E.A.; Anderson, R.; Killeen, I.J.; Regan, E.C.
Series :	Ireland Red List series, NPWS
Year :	2010
Title :	Ireland Red List No. 4: Butterflies
Author :	Regan, E.C.; Nelson, B.; Aldwell, B.; Bertrand, C.; Bond, K.; Harding, J.; Nash, D.; Nixon, D.; Wilson, C.J.
Series :	Ireland Red List series, NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manuals, No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red List Series, NPWS

Other References

Year :	2009
Title :	Common Standards Monitoring guidance for upland habitats
Author :	JNCC
Series :	Joint Nature Conservation Committee, Peterborough
Year :	2012
Title :	Rare and threatened bryophytes of Ireland
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	National Museums Northern Ireland
Year :	2013
Title :	Interpretation manual of European Union habitats- Eur 28
Author :	European Commission- DG Environment
Series :	European Commission
Year :	2017
Title :	Irish Vegetation Classification: Technical Progress Report No. 3
Author :	Perrin, P.
Series :	Report submitted to National Biodiversity Data Centre

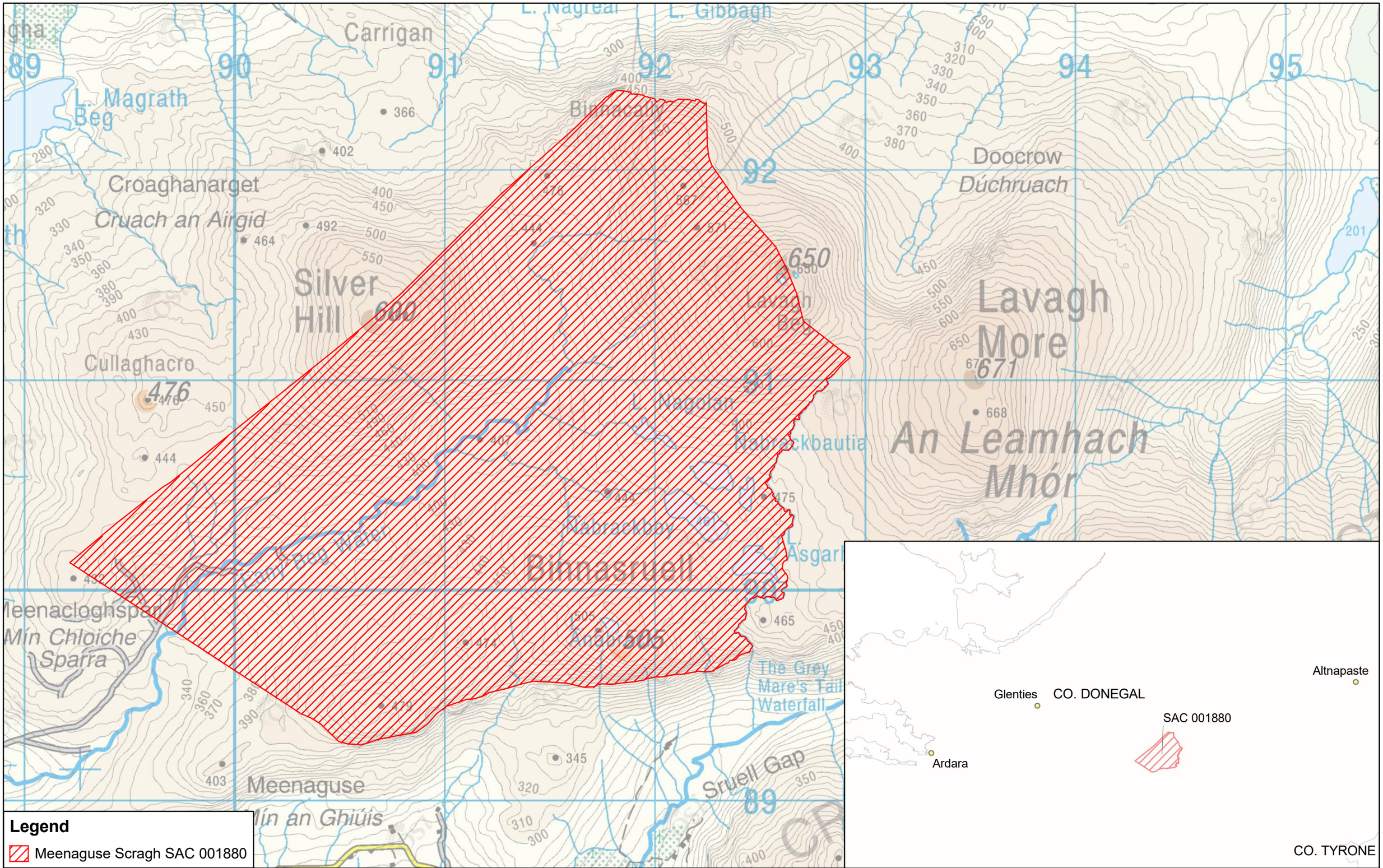
4010 Northern Atlantic wet heaths with *Erica tetralix*

To maintain the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Meenaguse Scragh SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with *Erica tetralix* has not been mapped in detail for Meenaguse Scragh SAC and thus the total current area of the qualifying habitat in the SAC is unknown. The habitat occurs in mosaic with blanket bog vegetation on the lower slopes of Silver Hill, Binnacally, Binnasruell and Lavagh Bog surrounding Lough Anarget, which is overgrown by an extensive floating mat of bog mosses (scragh), in the valley bottom. The habitat also occurs in association with upland acidic grassland and exposed rock and flush vegetation (NPWS, 2005; NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See the notes on Habitat area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The entire diversity of wet heath vegetation communities within this SAC is unknown. Information on vegetation communities associated with this habitat in the uplands is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; www.biodiversityireland.ie/projects/national-vegetation-database/irish-vegetation-classification)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (*Erica tetralix*) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014). Cross-leaved heath is the only characteristic species of the habitat listed in European Commission (2013). Whilst it is seldom abundant in wet heaths, its presence at high frequencies is considered one of the few characteristics common between the varied communities of this habitat (JNCC, 2009)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. Positive indicator species recorded in the habitat in the SAC include ling (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bog asphodel (*Narthecium ossifragum*) and tormentil (*Potentilla erecta*) (NPWS internal files)
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of *Cladonia* and *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014). A plentiful lichen/bryophyte layer is characteristic of this habitat. In this SAC, bog mosses (*Sphagnum* spp.) and frequent hummocks of *Racomitrium lanuginosum* have been recorded as a feature of the habitat (NPWS internal files)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (*Empetrum nigrum*) at least 15%	Attribute and target based on Perrin et al. (2014). A dwarf shrub layer with ericoid species is characteristic of this habitat (crowberry is only rarely present). Low cover of these species would be indicative of chronic overgrazing, burning, etc. In this SAC, ling (*Calluna vulgaris*) and cross-leaved heath (*Erica tetralix*) occur, and crowberry (*Empetrum nigrum*) has been recorded as occurring in small quantities in the habitat (NPWS internal files)

Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014). A dwarf shrub layer is characteristic of wet heaths, but the vegetation should be a mixture of dwarf shrub and graminoid species with higher cover of dwarf shrubs being potentially indicative of drainage
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014). High cover of native trees and shrubs would indicate that the habitat may be succeeding towards scrub or woodland due to lack of grazing or due to the habitat drying out
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of bracken would indicate that the habitat may be succeeding towards a dense bracken community
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014). High cover of soft rush would suggest undesirable hydrological conditions. Note, however, that poor flushes dominated by soft rush can naturally occur in mosaic with this habitat. Discrete areas of this separate habitat should not be considered here
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014). High levels of disturbed *Sphagnum* would indicate undesirable levels of grazers
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing	Attribute and target based on Perrin et al. (2014). In this SAC, overgrazing has been reported in localised areas of the habitat (NPWS, 2005; NPWS internal files). However, overall grazing damage to the habitat appears to have been low as indicated by the presence of cowberry (*Vaccinium vitis-idaea*), as this species cannot tolerate heavy grazing pressure
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human footprints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands. In this SAC, overgrazing has been reported as causing some localised erosion on the slopes of Silver Hill and the western slopes of Binnasruell (NPWS, 2005; NPWS internal files)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014). Drainage can result in loss of characteristic species and transition to drier habitats

Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). The Annex V and Near Threatened species mountain clubmoss (*Diphasiastrum alpinum*) and stag's-horn clubmoss (*Lycopodium clavatum*) (Wyse Jackson et al., 2016) have been recorded in the SAC (Conaghan, 1998), but cannot be specifically assigned to this habitat. A number of Red Listed and Near Threatened bryophytes (see Lockhart et al., 2012) and water beetles (Foster et al., 2009) have also been recorded in the SAC, but cannot be specifically assigned to this habitat



Legend

Meenaguse Scragh SAC 001880

An Roinn Cultúir, Oidhreachta agus Gaeltachta
Department of Culture, Heritage and the Gaeltacht

MAP 1:
MEENAGUSE SCRAGH SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001880; version 3.0. CO. DONEGAL

0 210 420 630 840 Meters

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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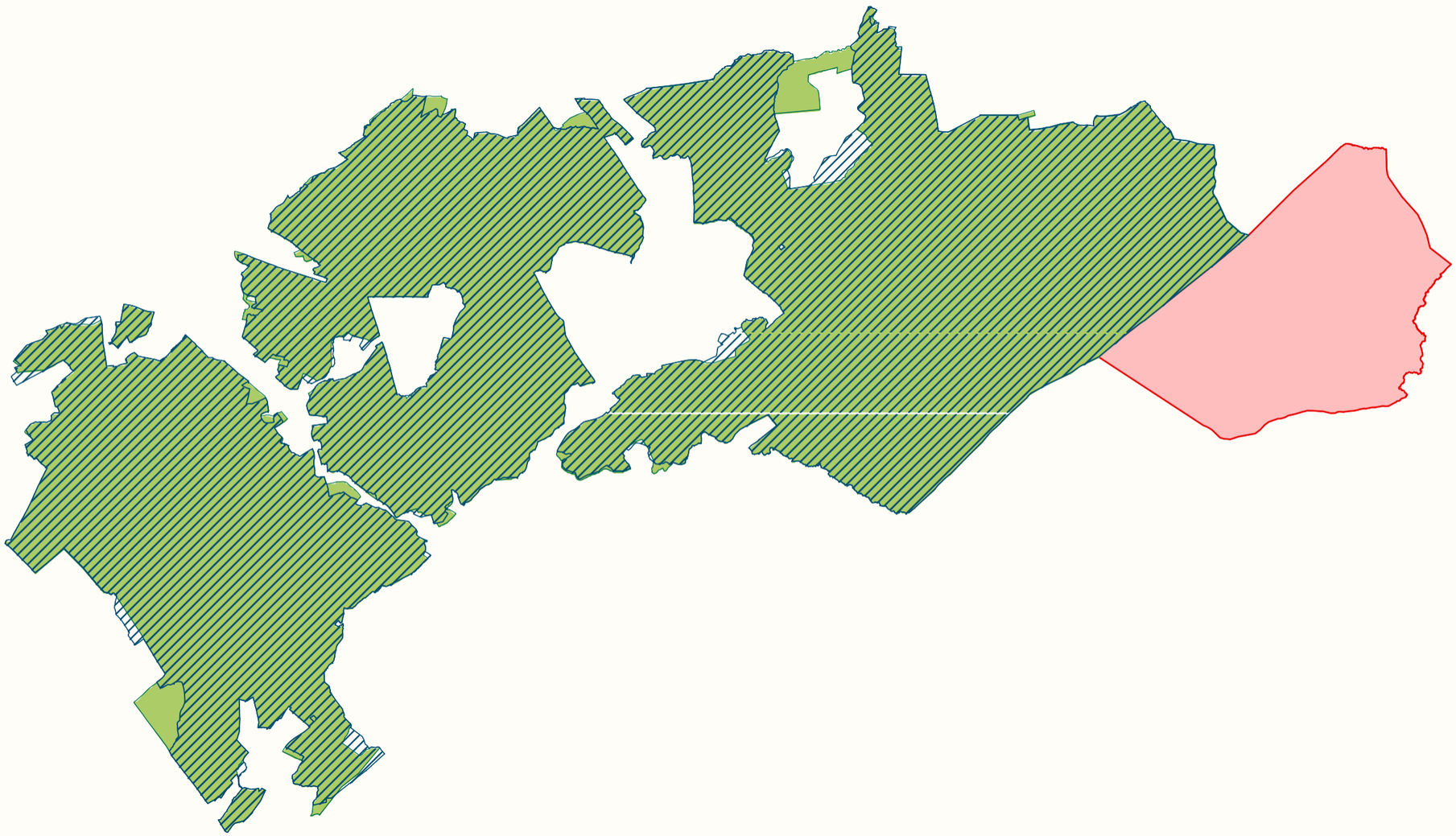
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh OSI-NMA-014. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann

N

Map Version 1
Date: Feb 2019



Legend

- Meenaguse Scragh SAC 001880
- Lough Nillan Bog (Carrickatlieve) SAC 000165
- Lough Nillan Bog SPA 004110
- OSi Discovery Series County Boundary

An Roinn Cultúir, Oidhreachta agus Gaeltachta
Department of Culture, Heritage and the Gaeltacht

MAP 2:
MEENAGUSE SCRAGH SAC
CONSERVATION OBJECTIVES
ADJACENT, ADJOINING AND OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001880; version 3.0. SAC 000165; version 3.0., SPA 004110; version 3.0. CO. DONEGAL

0 0.5 1 1.5 2 2.5 Kilometers

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh OSI-NMA-014. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann

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Map Version 1
Date: Feb 2019

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Meenaguse/Ardbane Bog SAC 000172

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (2017) Conservation Objectives: Meenaguse/Ardbane Bog SAC 000172. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000172	Meenaguse/Ardbane Bog SAC

7130	Blanket bogs (* if active bog)

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

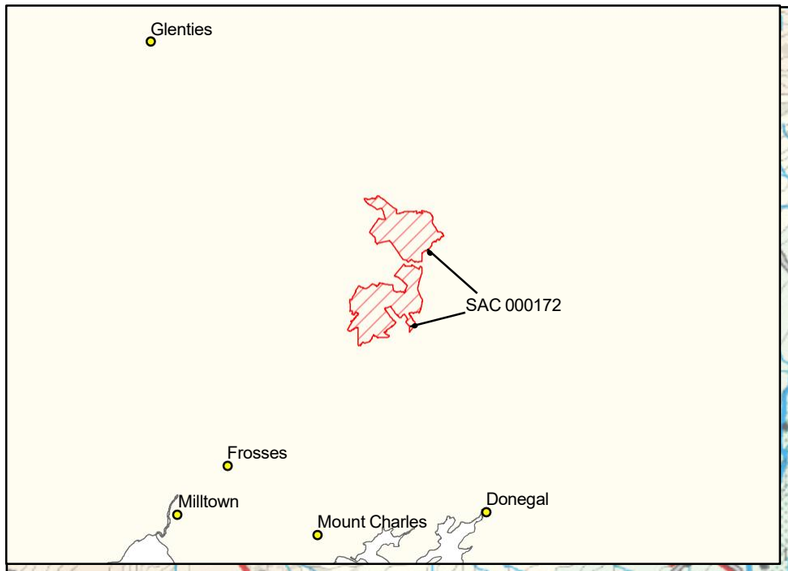
Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Meenaguse/Ardbane Bog SAC (site code: 172) Conservation objectives supporting document-blanket bog and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting habitat

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (* if active bog) in Meenaguse/Ardbane Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for Meenaguse/Ardbane Bog SAC and thus the total area of the qualifying habitat is unknown. Further details on this and the following attributes can be found in the Meenaguse/Ardbane Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Blanket bog is documented to occur throughout the SAC on flat and undulating terrain (NPWS internal files). Further information can be found within NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of blanket bog vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), one of which corresponds to a community recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). The non-native moss *Campylopus introflexus* occurs within blanket bog in this SAC (Douglas et al., 1990)
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species

Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)



Legend

Meenaguse/Ardbane Bog SAC 000172

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:

MEENAGUSE / ARDBANE BOG SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000172; version 3.
Co. DONEGAL

0 0.4 0.8 1.2 1.6 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Map Version 1
Date: March 2017

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Pettigo Plateau Nature Reserve SPA 004099

National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,

90 King Street North, Dublin 7, D07 N7CV, Ireland.

Web: www.npws.ie
E-mail: natureconservation@npws.gov.ie

Citation:

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Series Editors: Maria Long and Colin Heaslip
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004099	Pettigo Plateau Nature Reserve SPA
A395	Greenland White-fronted Goose *Anser albifrons flavirostris*

Please note that this SPA overlaps with Dunragh Loughs/Pettigo Plateau SAC (001125). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

Other References

Year :	1995
Title :	Impacts of hunting disturbance on waterbirds - a review
Author :	Madsen, J.; Fox, A.D.
Series :	Wildlife Biology 1(4):193-207
Year :	2014
Title :	A review of Greenland white-fronted geese in Ireland 1982/83 – 2011/12
Author :	Burke, B.; Egan, F.; Norriss, D.; Wilson, H.J.; Walsh, A.J.
Series :	Unpublished report
Year :	2016
Title :	Assessing connectivity with Special Protection Areas (SPAs)
Author :	Scottish Natural Heritage
Series :	Guidance Series Version 3 - June 2016
Year :	2019
Title :	Report of the 2018/19 international census of Greenland white-fronted geese
Author :	Fox, T.; Francis, I.; Walsh, A.; Norriss, D.
Series :	Unpublished report
Year :	2019
Title :	Report under Article 12 of the Birds Directive Period 2013-2018
Author :	EEA
Series :	European Environment Agency. European Topic Centre on Biological Diversity. Pp 1-9. https://cdr.eionet.europa.eu/Converters/run_conversion?file=ie/eu/art12/envxztxxq/IE_birds_reports_20191031-130157.xml&conv=612&source=remote
Year :	2020
Title :	Report of the 2019/20 international census of Greenland white-fronted geese
Author :	Fox, T.; Francis, I.; Walsh, A.; Norriss, D.
Series :	Unpublished report
Year :	2021
Title :	Report of the 2020/21 international census of Greenland white-fronted geese
Author :	Fox, T.; Francis, I.; Walsh, A.; Norriss, D.; Kelly. S.
Series :	Unpublished report
Year :	2022
Title :	Report of the 2021/22 international census of Greenland white-fronted geese
Author :	Fox, T.; Francis, I.; Walsh, A; Norriss, D.; Kelly, S.
Series :	Unpublished report
Year :	2023
Title :	Report of the 2022/23 international census of Greenland white-fronted geese
Author :	Fox, T.; Francis, I.; Walsh, A; Norriss, D.; Kelly, S.
Series :	Unpublished report
Year :	2024
Title :	Differential responses to weather and land-cover conditions explain spatial variation in winter abundance trends in a migratory bird of conservation concern
Author :	Schindler, A.R.; Fox, A.D.; Wikle, C.K.; Ballard, B.M.; Walsh, A.J.; Kelly, S.B.A.; Weegman, M.D.
Series :	Journal of Applied Ecology. DOI: https://doi.org/10.1111/1365-2664.14804

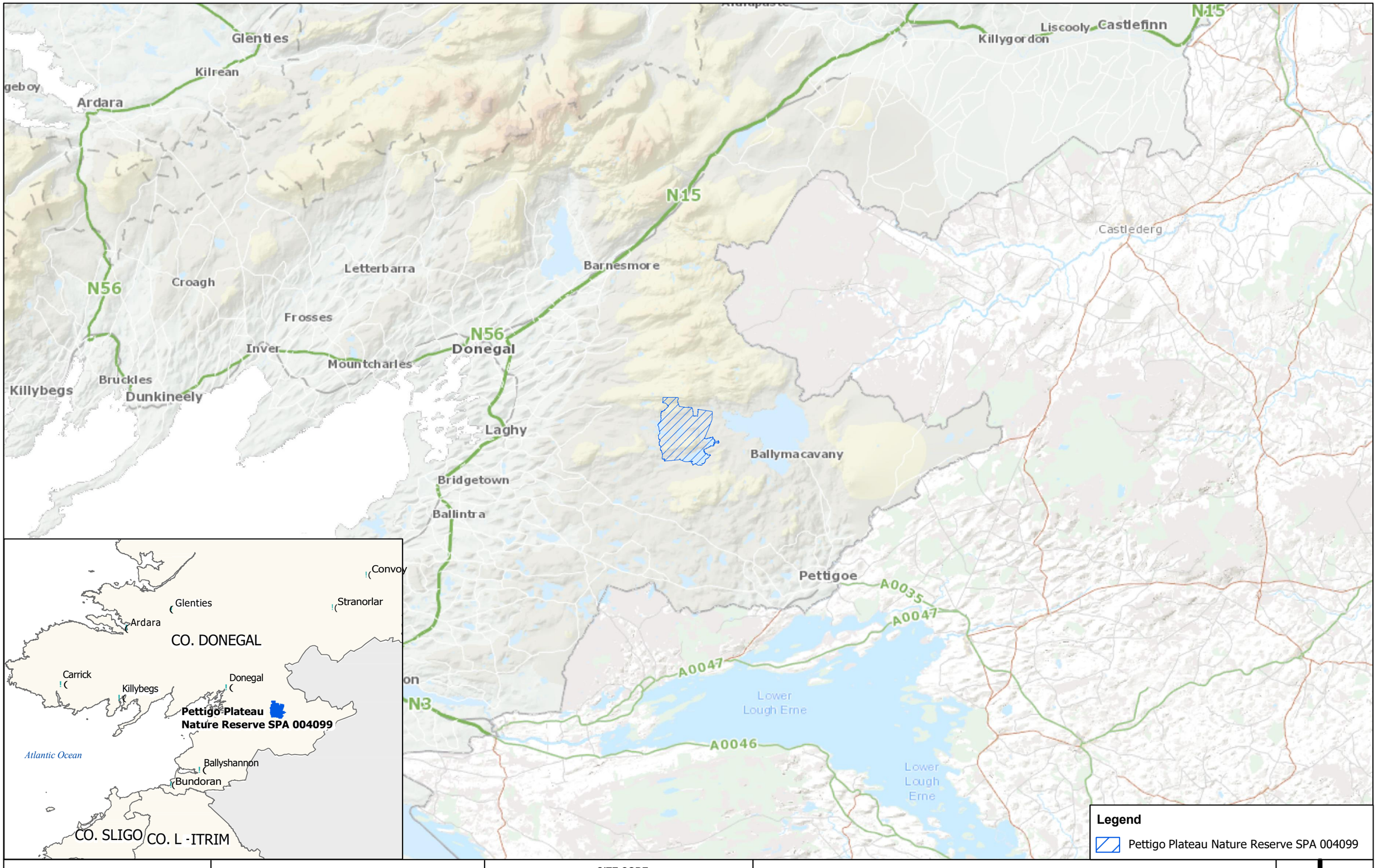
Conservation Objectives for : Pettigo Plateau Nature Reserve SPA [004099]

A395 Greenland White-fronted Goose *Anser albifrons flavirostris*

To restore the Favourable conservation condition of Greenland White-fronted Goose in Pettigo Plateau Nature Reserve SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Winter population trend	Percentage change in number of individuals	Long term winter population trend is stable or increasing	The national population of wintering Greenland White-fronted Goose in Ireland has declined by 13% from 1985 - 2018 (EEA, 2019). It is understood that a single flock of Greenland White-fronted Goose uses Pettigo Plateau Nature Reserve SPA and Durnesh Lough SPA (see Burke et al., 2014). During the baseline assessments to inform SPA designation, 136 Greenland White-fronted Goose were estimated to be using these two SPAs (5 year mean of peak counts for baseline period 1994/95 - 1998/99; see Burke et al., 2014). More recent data showed a population of 76 Greenland White-fronted Goose used these two SPAs (5 year mean of peak counts 2018/19 - 2022/23; see Fox et al., 2019, 2020, 2021, 2022 and 2023). This represents a population decline of 44% since the baseline period. It appears the species' general use of this SPA has decreased markedly, in line with a noted shift from foraging on peatland sites to grassland sites (Burke et al., 2014; see also Schindler et al., 2024)
Winter spatial distribution	Hectares, time and intensity of use	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target	Distribution encapsulates the number of locations and area of potentially suitable habitat for the wintering population and its availability for use. The suitability and availability of habitat areas are likely to vary throughout the season, for example, due to variation in land management practices or the abundance of resources available (due to natural variation and other factors). This will affect the spatio-temporal patterns of use of the habitats by the wintering population
Disturbance at wintering site	Intensity, frequency, timing and duration	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and distribution	The impact of any significant disturbance (direct or indirect) to the wintering population will ultimately affect the achievement of targets for population trend and/or spatial distribution. Disturbance contributes to increased energetic expenditure which can result in increased likelihood of winter mortality or reduced fitness (if energy expenditure is greater than energy gain) and, in turn, negatively impact population trends (see, for example, Madsen and Fox, 1995). Factors such as intensity, frequency, timing and duration of a (direct or indirect) disturbance source must be taken into account to determine the potential impact upon the targets for population trend and spatial distribution
Barriers to connectivity and site use	Number, location, shape and hectares	Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA	Barriers limiting the population's access to this SPA or ecologically important sites outside the SPA will ultimately affect the achievement of targets for population trend and/or spatial distribution. Factors such as the number, location, shape and area of potential barriers must be taken into account to determine their potential impact. Access to ecologically important sites outside the SPA must also be considered as a single SPA may not satisfy all the ecological requirements of the wintering population, and it may require access to other SPAs or sites for certain activities, such as foraging when preferred foraging areas are unavailable due to disturbance, extensive flooding, or other factors

Forage spatial distribution, extent and abundance	Location, hectares, and forage biomass	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target	This species is a grazer, feeding on a wide range of vegetation. Key forage materials include roots, tubers (such as potatoes), shoots (such as winter wheat), stolons, rhizomes, leaves (such as grasses), and seed such as (spilled) grain. Key habitats include peat bogs (including raised bogs and blanket bogs), grasslands (such as wet grassland, callows, semi-improved grassland, and intensive grassland), arable stubble, winter cereal fields, coastal grasslands, and occasionally salt marsh. In general, the foraging distance of wintering Greenland White-fronted Goose from night roosts is estimated at 5km - 8km (Scottish Natural Heritage, 2016), although this will vary depending on site and landscape
Roost spatial distribution and extent	Location and hectares of roosting habitat	Sufficient number of locations, area and availability of suitable roosting habitat to support the population targ	Roosting is a critical ecological requirement for the wintering population. Overnight roosting habitat mainly consists of permanent waterbodies, such as lakes, estuaries, bays, and other open waterbodies. When roosting in waterbodies, this species can roost on above-water features such as sandbanks. Daytime roosting is also a common behaviour, where birds minimise activity levels to conserve energy, while benefitting from the vigilance of other flock members. A lack of sufficient and suitable roosting habitats can result in increased mortality risk, whether indirectly (e.g. via increased energy expenditure travelling to/from roost sites) or directly (e.g. via increased predation risk), or reduction in site use; this would ultimately affect the achievement of targets for population trend and/or spatial distribution
Supporting habitat: area and quality	Hectares and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA	The wintering population can make extensive use of suitable habitats in important areas outside the SPA for foraging and roosting. The extent, availability and quality of these supporting habitats may be of importance for the resilience of the SPA population. Suitable supporting habitats include those highlighted in the attributes for foraging and roosting habitat



Legend

Pettigo Plateau Nature Reserve SPA 004099

NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 1:
PETTIGO PLATEAU NATURE RESERVE SPA
CONSERVATION OBJECTIVES
SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004099; version 3
CO. DONEGAL

0 1.25 2.5 5 Kilometres

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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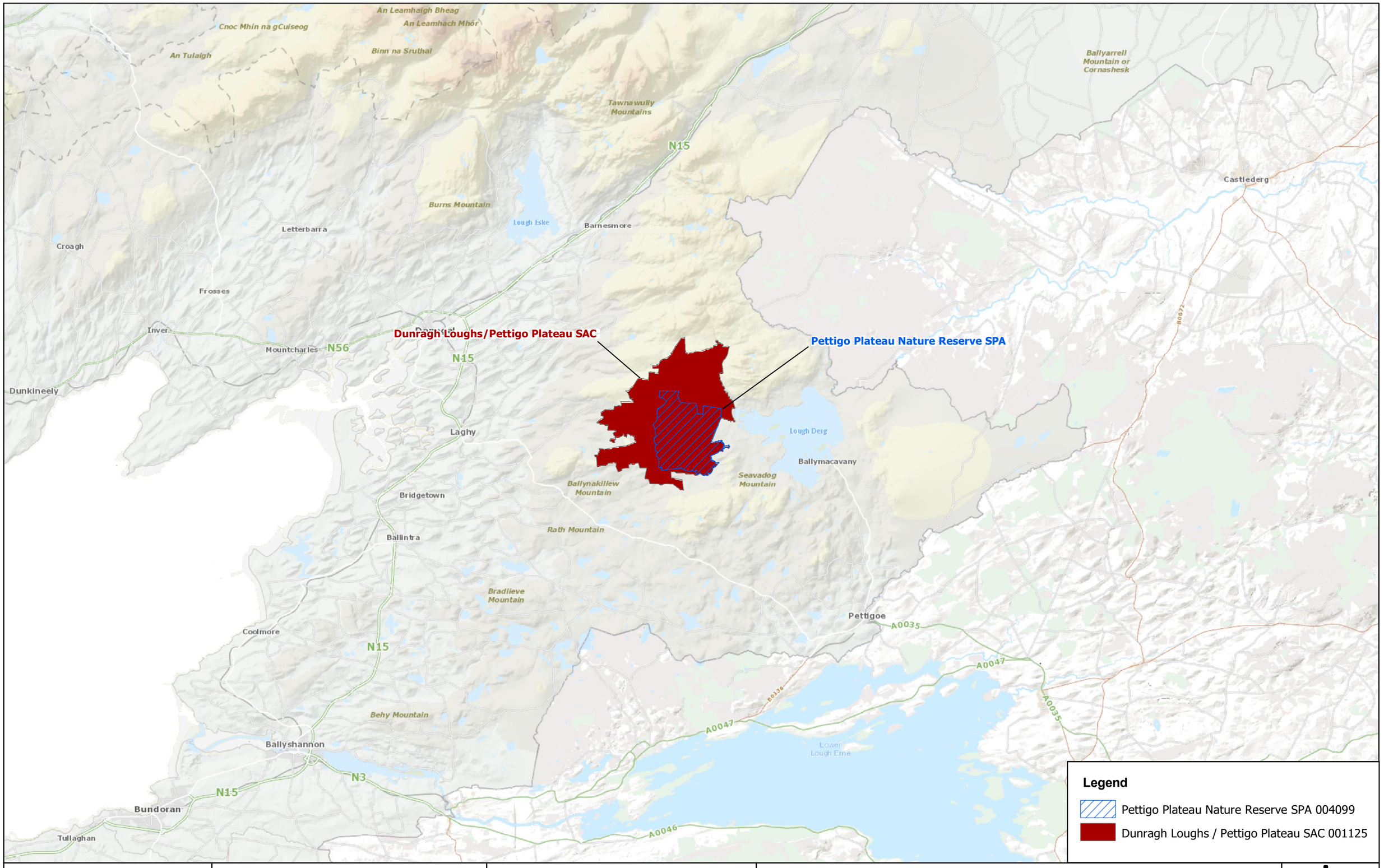
arna atáirgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Táilte Éireann CYAL50351092

Map version 1
Date: August 2024



NPWS An tSeirbhís Páirceanna Náisiúnta agus Fiadhúlra National Parks and Wildlife Service

MAP 2:
PETTIGO PLATEAU NATURE RESERVE SPA
CONSERVATION OBJECTIVES
OVERLAPPING AND ADJACENT SITES

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SPA 004099; version 3
CO.DONEGAL

0 1.25 2.5 5 Kilometres

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. © Folaíonn sé rannán Náisiúnta Mapála de shonraí Tailte Éireann
arna atáirgeadh faoin rannán mapála Náisiúnta d'uimhir cheadúnais Táilte Éireann CYAL50351092

Map version 1
Date: August 2024

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National Parks and Wildlife Service

Conservation Objectives Series

River Finn SAC 002301

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

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Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

002301	River Finn SAC
1106	Salmon *Salmo salar*
1355	Otter *Lutra lutra*
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
4010	Northern Atlantic wet heaths with *Erica tetralix*
7130	Blanket bogs (* if active bog)
7140	Transition mires and quaking bogs

Please note that this SAC overlaps with Derryveagh and Glendowan Mountains SPA (004039) and Lough Derg (Donegal) SPA (004057) and adjoins Meentygrannagh Bog SAC (000173), Dunragh Loughs/Pettigo Plateau SAC (001125) and Cloghernagore Bog and Glenveagh National Park SAC (002047). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjoining sites as appropriate.

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2006
Title :	Otter survey of Ireland 2004/2005
Author :	Bailey, M.; Rochford, J.
Series :	Irish Wildlife Manual No. 23
Year :	2007
Title :	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents. Article 17 forms and supporting maps
Author :	NPWS
Series :	Unpublished report to NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2013
Title :	National otter survey of Ireland 2010/12
Author :	Reid, N.; Hayden, B.; Lundy, M.G.; Pietravalle, S.; McDonald, R.A.; Montgomery, W.I.
Series :	Irish Wildlife Manual No. 76
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2015
Title :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, Á.
Series :	Unpublished document by NPWS
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	River Finn SAC (site code: 2301) Conservation objectives supporting document- blanket bog and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1934
Title :	The Botanist in Ireland
Author :	Praeger, R.L.
Series :	Hodges, Figgis and Co., Dublin
Year :	1982
Title :	Otter survey of Ireland
Author :	Chapman, P.J.; Chapman, L.L.
Series :	Unpublished report to Vincent Wildlife Trust
Year :	1982
Title :	Eutrophication of waters. Monitoring assessment and control
Author :	OECD
Series :	OECD, Paris
Year :	1991
Title :	The spatial organization of otters (*Lutra lutra*) in Shetland
Author :	Kruuk, H.; Moorhouse, A.
Series :	Journal of Zoology, 224: 41-57
Year :	2000
Title :	Colour in Irish lakes
Author :	Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
Series :	Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, 27: 2620-2623
Year :	2002
Title :	Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalinisation
Author :	Arts, G.H.P.
Series :	Aquatic Botany, 73: 373-393
Year :	2006
Title :	Otters - ecology, behaviour and conservation
Author :	Kruuk, H.
Series :	Oxford University Press
Year :	2006
Title :	A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
Author :	Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
Series :	EPA, Wexford
Year :	2008
Title :	Water Quality in Ireland 2004-2006
Author :	Clabby, K.J.; Bradley, C.; Craig, M.; Daly, D.; Lucey, J.; McGarrigle, M.; O'Boyle, S.; Tierney, D.; Bowman, J.
Series :	EPA, Wexford
Year :	2009
Title :	The identification, characterization and conservation value of isoetid lakes in Ireland
Author :	Free, G.; Bowman, J.; McGarrigle, M.; Little, R.; Coroni, R.; Donnelly, K.; Tierney, D.; Trodd, W.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems, 19 (3): 264–273

Year :	2010
Title :	Otter tracking study of Roaringwater Bay
Author :	De Jongh, A.; O'Neill, L.
Series :	Unpublished draft report to NPWS
Year :	2010
Title :	Water quality in Ireland 2007-2009
Author :	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
Series :	EPA, Wexford
Year :	2015
Title :	Water quality in Ireland 2010-2012
Author :	Bradley, C.; Byrne, C.; Craig, M.; Free, G.; Gallagher, T.; Kennedy, B.; Little, R.; Lucey, J.; Mannix, A.; McCreesh, P.; McDermott, G.; McGarrigle, M.; Ní Longphuirt, S.; O'Boyle, S.; Plant, C.; Tierney, D.; Trodd, W.; Webster, P.; Wilkes, R.; Wynne, C.
Series :	EPA, Wexford
Year :	2016
Title :	The Status of Irish Salmon Stocks in 2015 with Precautionary Catch Advice for 2016
Author :	SSCS (Standing Scientific Committee on Salmon)
Series :	Independent Scientific Report to Inland Fisheries Ireland

Spatial data sources

Year :	2008
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
Used For :	3110 (map 3)
Year :	2010
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	Creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets combined with the derived OSi Discovery Series river and canal datasets. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising. Creation of 250m buffer on aquatic side of the lake boundary to highlight potential commuting points
Used For :	1355 (map 4)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	Creation of a 10m buffer on the terrestrial side of river banks data; creation of 20m buffer applied to canal centreline data. Creation of 20m buffer applied to river and stream centreline data; These datasets combined with the derived OSI 1:5000 vector lake buffer data. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	1355 (no map)

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Lake habitat 3110 is likely to occur in the larger lakes in River Finn SAC, such as Loughs Derg, Finn and Belshade. Lake habitat 3130 may also occur in Loughs Derg and Finn. The exact distribution of lake habitat 3110 in the SAC is unknown however, as little specific information on the lake vegetation is currently available. Lake habitat 3110 may co-occur with lake habitat 3160 in small and upland lakes. In line with Article 17 reporting (NPWS, 2013), all lakes larger than 1ha have been mapped as 'potential 3110' (see map 3). Two measures of extent should be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, the exact distribution of lake habitat 3110 in River Finn SAC is not known. In map 3, all lakes larger than 1ha (based on 1:5,000 data) have been mapped as potential 3110
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant species, see the Article 17 habitat assessment for lake habitat 3110 (NPWS, 2013) and the lake habitats supporting document (O Connor, 2015). The moss *Fontinalis antipyretica*, quillwort (*Isoetes lacustris*), bulbous rush (*Juncus bulbosus*), shoreweed (*Littorella uniflora*), water lobelia (*Lobelia dortmanna*), broad-leaved pondweed (*Potamogeton natans*) and floating bur-reed (*Sparganium angustifolium*) have been recorded in Lough Derg (Praeger, 1934; internal NPWS and EPA files). Environmental Protection Agency (EPA) biologists have also recorded slender naiad (*Najas flexilis*) in Lough Derg, suggesting lake habitat 3130 may occur. EPA records for stonewort (*Chara* sp.), intermediate water starwort (*Callitriche hamulata*) and pondweeds (*Potamogeton berchtoldii, P. gramineus* and *P. perfoliatus*) in Lough Finn are also indicative of lake habitat 3130
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Further work is necessary to describe the characteristic zonation and other spatial patterns in lake habitat 3110 (see O Connor, 2015)
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. Further work is necessary to develop indicative targets for lake habitat 3110. Water clarity is expected to be high in upland 3110 lakes, resulting in a large maximum depth of vegetation
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced

Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that lake habitat 3110 is associated with a range of nutrient-poor substrates, from stones, cobble and gravel, through sands, silt, clay and peat. Substratum particle size is likely to vary with depth and along the shoreline within a single lake
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. Specific targets have yet to be established for lake habitat 3110 (O Connor, 2015). Habitat 3110 is associated with very clear water, particularly upland examples. The OECD fixed boundary system set transparency targets for oligotrophic lakes of ≥6m annual mean Secchi disk depth, and ≥3m annual minimum Secchi disk depth. Free et al. (2009) found high isoetid abundance in lakes with Secchi depths of more than 3m
Water quality: nutrients	µg/l P; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species	As a nutrient-poor habitat, oligotrophic and Water Framework Directive (WFD) 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For lake habitat 3110, annual average total phosphorus (TP) concentration should be ≤l0µg/l TP, average annual total ammonia concentration should be ≤0.040mg/l N and annual 95th percentile for total ammonia should be ≤0.090mg/l N. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton biomass	µg/l Chlorophyll *a*	Maintain appropriate water quality to support the habitat, including high chlorophyll *a* status	Oligotrophic and WFD 'high' status targets apply to lake habitat 3110. Where a lake has a chlorophyll *a* concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll *a* concentration must be <5.Sµg/l. The annual average chlorophyll *a* concentration should be <2.5µg/l and the annual peak chlorophyll *a* concentration should be ≤S.0µg/l. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, lake habitat 3110 requires WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in lake habitat 3110 should, therefore, be trace/absent (<5% cover). EPA phytobenthos can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, lake habitat 3110 requires high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for lake habitat 3110 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥0.90, as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009

Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. In Europe, acidification of isoetid lakes can lead to loss of isoetids and dominance by submerged *Sphagnum* mosses and *Juncus bulbosus* (Arts, 2002). The specific requirements of lake habitat 3110, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined. For lake habitat 3110, and adopting a precautionary approach based on Arts (2002), minimum pH should not be <5.5 pH units. Maximum pH should be <9.0 pH units, in line with the surface water standards established for soft waters (where water hardness is l00mg/l calcium carbonate). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50mg/l PtCo. Water colour can be very low (<20mg/l PtCo or even <10mg/l PtCo) in lake habitat 3110, where the peatland in the lake's catchment is intact
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet woodland that intergrade with and support the structure and functions of the lake habitat. In River Finn SAC, active blanket bog and heath, transition mire, fen, flush or grassland could also occur. Equally, fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves

4010 Northern Atlantic wet heaths with Erica tetralix

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with *Erica tetralix* has not been mapped in detail for River Finn SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 187ha, covering 3% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Wet heath occurs in association with blanket bog, upland grassland and exposed rock within the SAC. It occupies shallower peats and better drained slopes. It occurs quite widely at Owendoo/ Cloghervaddy (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of wet heath vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), three of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (*Erica tetralix*) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of *Cladonia* and *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (*Empetrum nigrum*) at least 15%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented

Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). The non-native moss *Campylopus introflexus* has been recorded from the SAC (Douglas et al., 1990), but this species cannot be assigned specifically to wet heath
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 (FPO) and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). There is a historic record for the FPO listed and Vulnerable marsh clubmoss (*Lycopodiella inundata*) (Wyse Jackson et al., 2016) from Lough Belshade in the SAC (NPWS internal files), but this species cannot be assigned specifically to wet heath

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (*if active bog) in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for River Finn SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 519ha, covering 9% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	Blanket bog is documented to occur throughout much of the upland areas of the SAC and along the edges of the river. The most extensive examples are found at Tullytresna and Owendoo/Cloghervaddy. A valley bog is present to the north-east of Lough Finn (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of blanket bog vegetation communities have been recorded in this SAC (Douglas et al., 1990; NPWS internal files), four of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). The non-native moss *Campylopus introflexus* has been recorded from the SAC (Douglas et al., 1990), but this species cannot be assigned specifically to blanket bog

Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 (FPO) and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). There is a historic record for the FPO listed and Vulnerable marsh clubmoss (*Lycopodiella inundata*) (Wyse Jackson et al., 2016) from Lough Belshade in the SAC (NPWS internal files), but this species cannot be assigned specifically to blanket bog

7140 Transition mires and quaking bogs

To restore the favourable conservation condition of Transition mires and quaking bogs in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Transition mires and quaking bogs have not been mapped in detail for River Finn SAC and thus total area of the qualifying habitat is unknown. Further details on this and the following attributes can be found in the River Finn SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat occurs at the interface between bog and waterbodies. An extensive area of this habitat is found at Owendoo/Cloghervaddy to the west of the Owendoo River. It is also though to occur in quaking areas associated with Cronakerny and Cronamuck. Other locations that support this habitat include Tullytresna and the lake edges of Lough Fad, Lough Finn, Lough Gulladuff and the small lakes south of Lough Belshade (Douglas et al., 1990; NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	A variety of transition mire vegetation communities have been recorded in this SAC (NPWS internal files), two of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: number of positive indicator species	Vegetation composition: number of positive indicator species	Number of positive indicator species at each monitoring stop is at least three for infilling pools and flushes and at least six for fens	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: number of core positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	At least one core positive indicator species present	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of positive indicator species is at least 25%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014)

Vegetation structure: height	Percentage of leaves/shoots at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%	Attribute and target based on Perrin et al. (2014). This attribute is only applicable to fen and flush examples of the habitat, not to infilling pool examples
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

1106 Salmon *Salmo salar*

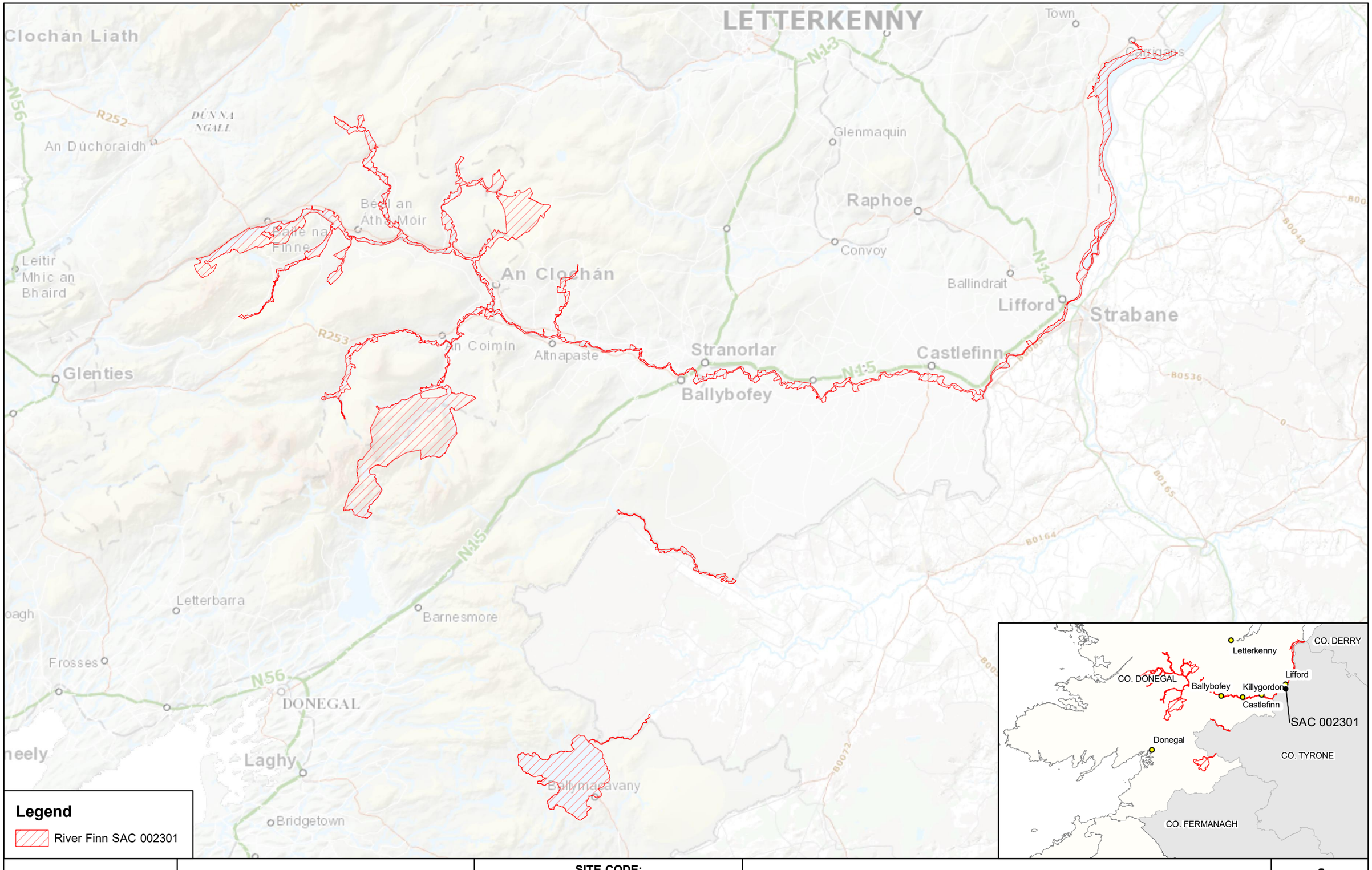
To maintain the favourable conservation condition of Atlantic Salmon in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee on Salmon (SSCS) annual model output of CL attainment levels. See SSCS (2016). Attainment of CL estimates are derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	The target is the threshold value for rivers currently exceeding their conservation limit (CL)
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice (*Lepeophtheirus salmonis*)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

1355 Otter *Lutra lutra*

To maintain the favourable conservation condition of Otter in River Finn SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. Favourable Conservation Status (FCS) target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 390ha along river banks/lake shoreline/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along river banks and around water bodies identified as critical for otters (NPWS, 2007)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 182.2km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 354ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk and Moorhouse, 1991; Kruuk, 2006)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase. For guidance, see map 4	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed



Legend

River Finn SAC 002301

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Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
RIVER FINN SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 002301; version 3.01
CO. DONEGAL

0 2 4 6 8 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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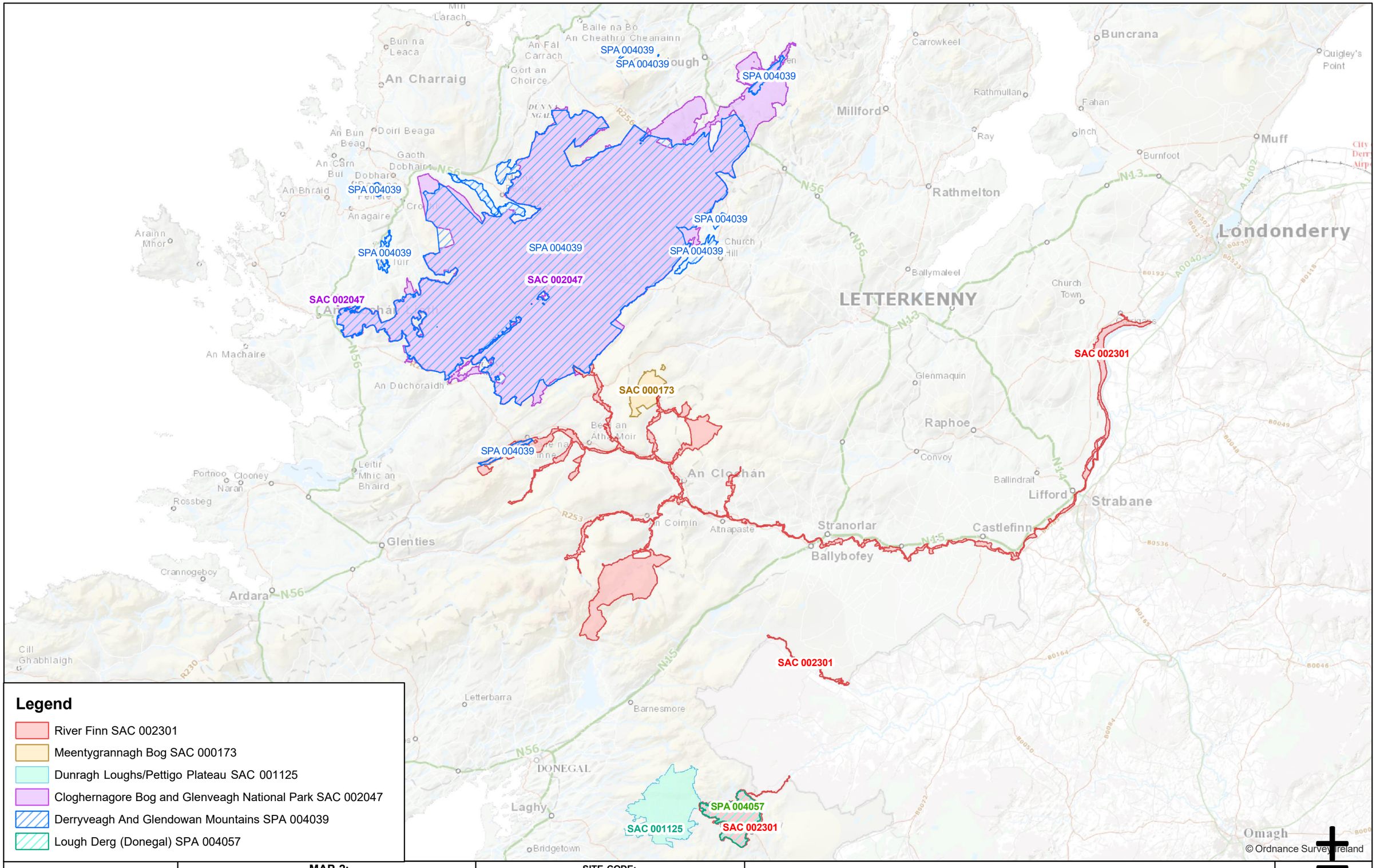
Níl sna teorainneacha ar na léarscáileanna ach nod garshuiomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas

Map Version 1
Date: May 2017



Legend

- River Finn SAC 002301
- Meentygrannagh Bog SAC 000173
- Dunragh Loughs/Pettigo Plateau SAC 001125
- Cloghernagore Bog and Glenveagh National Park SAC 002047
- Derryveagh And Glendowan Mountains SPA 004039
- Lough Derg (Donegal) SPA 004057

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Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 2:

RIVER FINN SAC CONSERVATION OBJECTIVES ADJACENT / ADJOINING AND OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 002301; version 3.01. SAC 000173; version 3.01.
SAC 002047; version 3. SAC 001125; version 3.
SPA 004039; version 3. SAC 004057; version 3.
CO. DONEGAL

0 3 6 9 12 15 km

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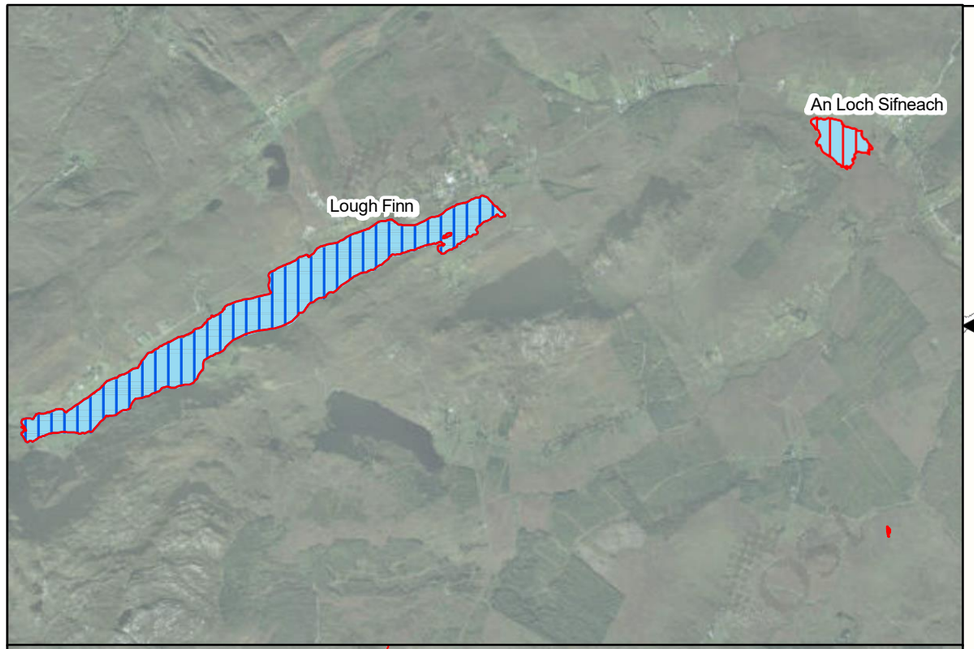
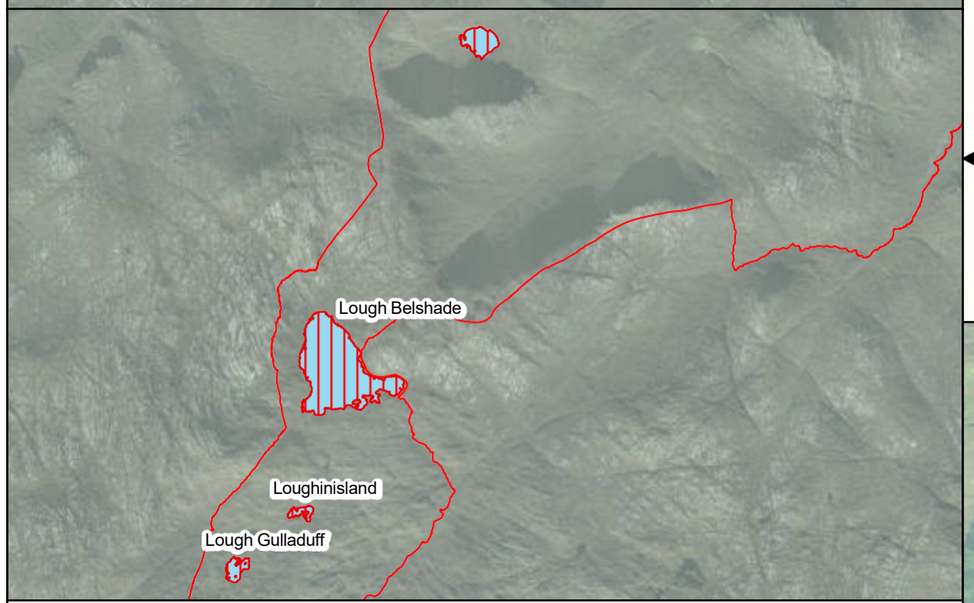
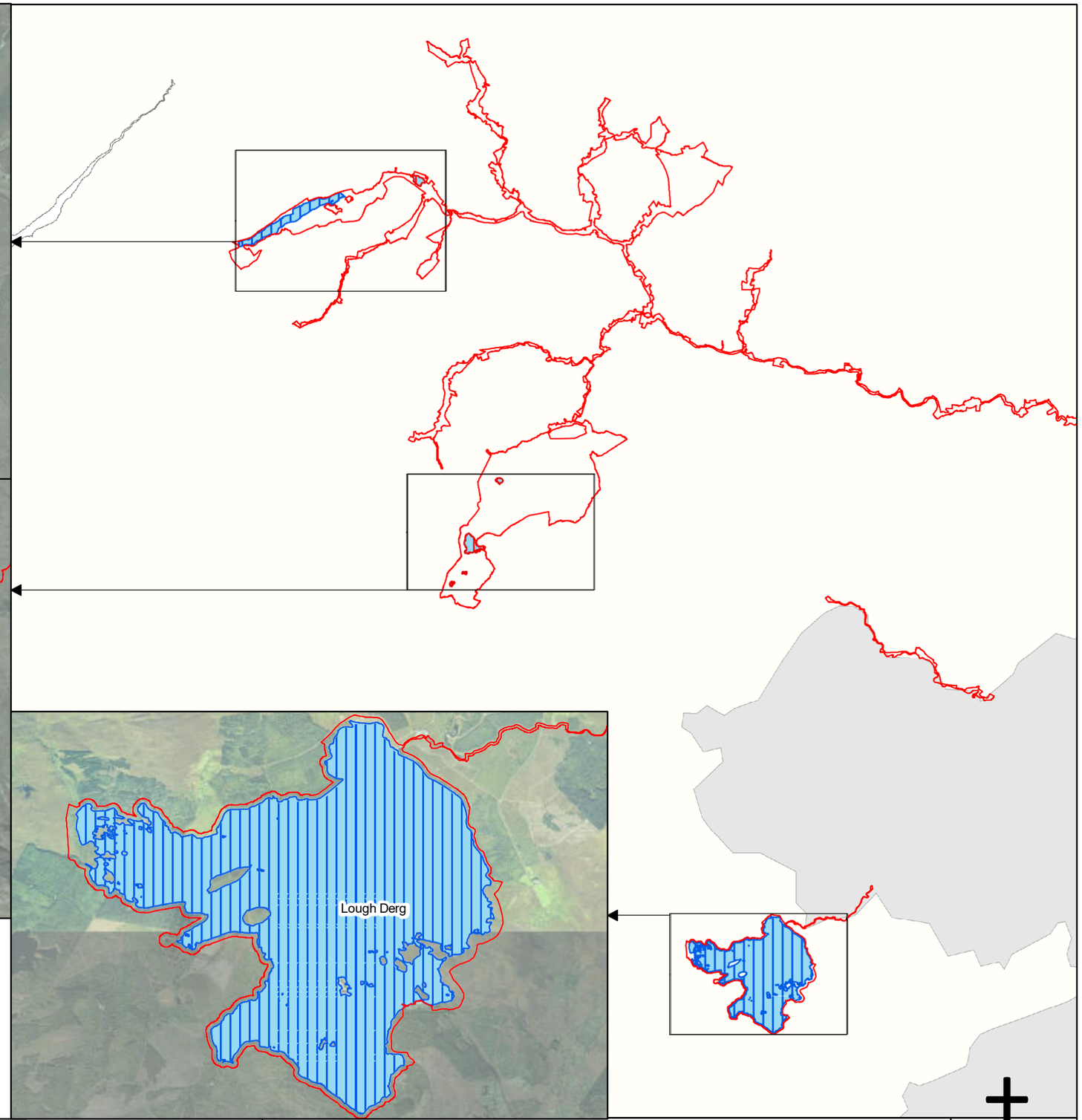
Map Version 1
Date: May 2017







Legend

- River Finn SAC 002301
- Potential 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- Potential 3110 / Potential 3130 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) / Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*

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MAP 3:

RIVER FINN SAC
CONSERVATION OBJECTIVES
INDICATIVE LAKE HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 002301; version 3.01.
CO. DONEGAL

0 2 4 6 8 10 km

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Map Version 1
Date: May 2017

Legend

- 1355 Otter *Lutra lutra* Commuting
- River Finn SAC 002301
- OSi Discovery Series County Boundary
- Northern Ireland

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Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 4:
RIVER FINN SAC
CONSERVATION OBJECTIVES
OTTER COMMUTING

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 002301; version 3.01
CO. DONEGAL

0 1.5 3 4.5 6 7.5 km

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Map Version 1
Date: May 2017

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Tamur Bog SAC 001992

An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (2017) Conservation Objectives: Tamur Bog SAC 001992. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

001992	Tamur Bog SAC
4010	Northern Atlantic wet heaths with *Erica tetralix*
7130	Blanket bogs (* if active bog)
7150	Depressions on peat substrates of the Rhynchosporion

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Tamur Bog SAC (site code: 1992) Conservation objectives supporting document- blanket bog and associated habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

4010 Northern Atlantic wet heaths with Erica tetralix

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Tamur Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Northern Atlantic wet heaths with *Erica tetralix* has not been mapped in detail for Tamur Bog SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 230ha, covering 18% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Tamur Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat is documented to occur on sloping ground and hillsides within the SAC. It is present on Mallygreen hill, Carnbeg hill, Tullynahushoge hill, the hillsides flanking the southern shores of Glaskeeragh Lough, and on hillsides to the north and north-west of Lough Avehy. Wet heath also occurs in patches throughout the blanket bog (NPWS internal files). Further information can be found within NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The diversity of wet heath communities within this SAC is unknown. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of monitoring stops	Cross-leaved heath (*Erica tetralix*) present within a 20m radius of each monitoring stop	Attribute and target based on Perrin et al. (2014)
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of *Cladonia* and *Sphagnum* species, *Racomitrium lanuginosum* and pleurocarpous mosses at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (*Empetrum nigrum*) at least 15%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Rhododendron (*Rhododendron ponticum*) and the moss *Campylopus introflexus* were recorded within the SAC at Glaskeeragh by Douglas et al. (1990), however, these non-native species cannot be assigned specifically to wet heath

Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (*Pteridium aquilinum*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (*Juncus effusus*) less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs (*if active bog) in Tamur Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Blanket bog has not been mapped in detail for Tamur Bog SAC but from current available data the total area of the qualifying habitat is estimated to be approximately 613ha, covering 48% of the SAC (NPWS internal files). Further details on this and the following attributes can be found in the Tamur Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat occurs throughout the SAC on flat, undulating and gently sloping terrain (NPWS internal files). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	See the blanket bogs and associated habitats supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the blanket bogs and associated habitats supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Douglas et al. (1990) recorded a variety of blanket bog vegetation communities in this SAC, four of which correspond to communities recorded in the National Survey of Upland Habitats and listed in the provisional list of vegetation communities described in Perrin et al. (2014). Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Rhododendron (*Rhododendron ponticum*) and the moss *Campylopus introflexus* were recorded within the SAC at Glaskeeragh by Douglas et al. (1990), however, these non-native species cannot be assigned specifically to blanket bog
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)

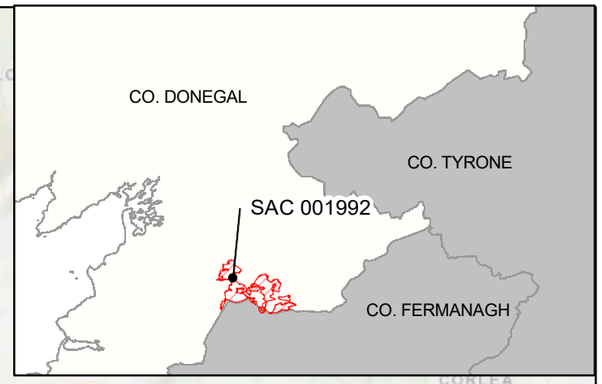
Vegetation structure: *Sphagnum* condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)

7150 Depressions on peat substrates of the Rhynchosporion

To restore the favourable conservation condition of Depressions on peat substrates of the Rhynchosporion in Tamur Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Depressions on peat substrates of the Rhynchosporion has not been mapped in detail for Tamur Bog SAC and thus the total area of the qualifying habitat is unknown. Further details on this and the following attributes can be found in the Tamur Bog SAC conservation objectives supporting document for blanket bogs and associated habitats
Habitat distribution	Occurrence	No decline, subject to natural processes	The habitat is associated with blanket bog particularly in wetter parts of the SAC, including those areas that support quaking lawns and pools/lakes. It is best represented close to the large lakes of Lough Vearty and Lough Awaddy in the south of the SAC, where deep, quaking peat basins have developed (NPWS internal files). Flats dominated by white beak-sedge (*Rhynchospora alba*) were reported west of Lough Garlagh Beg in the north-west of the SAC by Douglas et al. (1990). Further information can be found within Douglas et al. (1990), NPWS internal files and the blanket bogs and associated habitats supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the blanket bogs and associated habitats supporting document for further details
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species at each monitoring stop is at least five	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented
Vegetation composition: *Rhynchospora* spp.	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of white beaked sedge (*Rhynchospora alba*) and brown beaked sedge (*R. fusca*) at least 10%	Attribute and target based on Perrin et al. (2014)
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species individually less than 35%	Attribute and target based on Perrin et al. (2014). See the blanket bogs and associated habitats supporting document for the list of potential dominant species
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Rhododendron (*Rhododendron ponticum*) and the moss *Campylopus introflexus* were recorded within the SAC at Glaskeeragh by Douglas et al. (1990), however, these non-native species cannot be assigned specifically to this habitat
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: *Sphagnum*	Condition at a representative number of 2m x 2m monitoring stops condition	Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up	Attribute and target based on Perrin et al. (2014)

Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%	Attribute and target based on Perrin et al. (2014)
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is also presented
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Attribute and target based on Perrin et al. (2014)
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target based on Perrin et al. (2014)
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016)



Legend

Tamur Bog SAC 001992

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An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
TAMUR BOG SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001992; version 3.01
CO. DONEGAL

0 0.45 0.9 1.35 1.8 km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Map Version 1
Date: April 2017