

NPWS

Inishtrahull SAC
(site code: 000154)

**Conservation objectives supporting document-
Coastal habitats**

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Please note that this document should be read in conjunction with the following report: NPWS (2016) Conservation Objectives: Inishtrahull SAC 000154. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the Habitats Directive 92/43/EEC (European Commission, 2013). It is defined in positive terms, such that a habitat type or species must be prospering and have good prospects of continuing to do so.

Inishtrahull is situated 12.5km off the coast north-east of Malin Head in Co. Donegal. Inishtrahull SAC (000154) comprises the whole island as well as a group of smaller islands, the Tor Rocks and the intervening sea. The Tor Rocks, which lie 2km north-north-west of Inishtrahull, are the most northerly point of land in Ireland and comprise six rocky pinnacles rising up to 20m high, with about eight sub-tidal rocks clustered about them. The island of Inishtrahull (34ha) rises to 43m at its western end and extends west-east for some 1.5km. The island was formerly inhabited, but not since 1928 and there is an automated lighthouse on the island (NPWS, 2013).

The geology of the site is of Lewisian gneiss, which is considered to be the oldest rock in Ireland, and has affinities with the rocks of southern Greenland and some of the Hebridean Islands. The soils found on Inishtrahull are either thin glacial tills or peaty podzols. The vegetation of the interior of the island of Inishtrahull is predominantly grassland; trees are entirely lacking. Surveys of the flora between 1939 and 1942 list records for 119 vascular plant species (NPWS, 2013).

The SAC is important as it contains the most northerly example of vegetated sea cliffs in Ireland, which are extremely exposed. Vegetation of the cliffs is typical and the quality of the habitat is considered to be good, with no significant damaging activities occurring. For most of its length, the coastline of Inishtrahull consists of cliffs, which are indented by deep clefts (NPWS, 2013).

The site supports important colonies of breeding seabird species with a 1999 survey recording shag (*Phalacrocorax aristotelis*), herring gull (*Larus argentatus*), fulmar (*Fulmarus glacialis*), lesser black-backed gull (*Larus fuscus*), great black-backed gull (*L. marinus*), common gull (*L. canus*), kittiwake (*Rissa tridactyla*) and black guillemot (*Cephus grylle*). The shag, common gull and great black-backed gull populations are of national importance. Eider (*Somateria mollissima*) has also been recorded here in 1991/92 (the first Irish breeding site for the species) and is the largest population of breeding eider in Ireland (NPWS, 2013).

Inishtrahull SAC (site code: 000154) is selected for vegetated sea cliffs. This coastal habitat is the sole Qualifying Interest for the SAC:

1230 Vegetated sea cliffs of the Atlantic and Baltic coasts

2 Conservation Objectives

A conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of the objective will help to ensure that the habitat or species achieves favourable conservation status at a national level.

This supporting document sets out the conservation objective for vegetated sea cliffs in Inishtrahull SAC, which is defined by a list of parameters, attributes and targets. The main parameters are (a) Range (b) Area and (c) Structure and Functions, the last of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for vegetated sea cliffs are based primarily on the findings of the Irish Sea Cliff Survey (ISCS) (Barron *et al.*, 2011) and this document should be read in conjunction with that report.

The ISCS did not survey any sub-sites within Inishtrahull SAC (Barron *et al.*, 2011), however, the site was assessed in an earlier inventory of sea cliffs and coastal heath (Browne, 2005). Consequently, the targets set for the vegetated sea cliffs are based primarily on the general findings and approach of the ISCS. It should be noted however, that they are generic in nature and may be subject to change in light of future survey work.

3 Vegetated sea cliffs

Sea cliffs can be broadly divided into two categories: hard (or rocky) cliffs and soft (or sedimentary) cliffs, both of which are covered by the Annex I habitat 'vegetated sea cliffs of the Atlantic and Baltic coasts'. Hard cliffs are composed of rocks such as limestone, sandstone, granite or quartzite which are hard and relatively resistant to erosion. Soft cliffs are composed of softer rock such as shale or unconsolidated material such as glacial till. Vegetation of hard sea cliffs in exposed situations exhibits a strong maritime influence and is relatively stable. Soft cliff habitats are more prone to slope failure which results in the presence of fast-colonising pioneer species.

Defining the limits of what constitutes a sea cliff is problematic and a number of different interpretations have been used in the past (Fossitt, 2000; JNCC, 2004; Browne, 2005; European Commission, 2013). In order to address any inconsistencies, the following definition for sea cliffs was developed and used during the Irish Sea Cliff Survey (Barron *et al.*, 2011):

"A sea cliff is a steep or vertical slope located on the coast, the base of which is in either the intertidal (littoral) or subtidal (sublittoral) zone. The cliff may be composed of hard rock such as basalt, or of softer substrate such as shale or boulder clay. Hard cliffs are at least 5m high, while soft cliffs are at least 3m high. The cliff top is generally defined by a change to an obvious less steep gradient. In some cases the cliff may grade into the slopes of a hillside located close to the coast. In these cases the cliff is defined as that part of the slope which was formed by processes of coastal erosion, while the cliff top is where there is the distinct break in slope. Both the cliff and the cliff top may be subject to maritime influence in the form of salt spray and exposure to coastal winds. A cliff can ascend in steps with ledges, and the top of the cliff is taken to occur where erosion from wave action is no longer considered to have been a factor in the development of the landform. The cliff base may be marked by a change in gradient at the bottom of the cliff. Where the base is exposed it can be characterised by scree, boulders, a wave-cut platform or sand, among other substrates. During this survey where cliffs occur within the subtidal zone the base was considered to be the high water mark. A cliff is considered to have reached its end point where it is no longer over 5m high (hard cliffs) of 3m high (soft cliffs), or no longer has a steep slope. To be considered in this study, a

cliff had to be a minimum of 100m in length. Sea cliffs may support a range of plant communities such as grassland, heath, scrub and bare rock communities, among others.”

The sea cliffs at Inishtrahull are not particularly high, the highest point of the island being only 43m.

3.1 Overall Objective

The overall objective for ‘Vegetated sea cliffs of the Atlantic and Baltic coasts’ in Inishtrahull SAC is to ‘*maintain favourable conservation condition*’.

The objective is based on an assessment of the recorded condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings: (a) Area, (b) Range and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat length

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is that there is no decrease from the established baseline. Bearing in mind that coastal systems are naturally dynamic and subject to change, even within a season, this target is assessed subject to natural processes, including erosion and succession.

As cliffs are linear features on maps, their extent is measured in kilometres rather than hectares, as for other habitats. The total length of cliff in Inishtrahull SAC, as estimated by Browne (2005) is 4km. However, this figure for length of cliff is likely to be an underestimate due to mapping anomalies.

The target is that the area is stable, subject to natural processes, including erosion.

3.3 Range

3.3.1 Habitat Distribution

The distribution of sea cliffs throughout Inishtrahull SAC, as identified by Browne (2005), is presented in Appendix 1.

For most of its length, the coastline of Inishtrahull consists of cliffs. The highest point of the island at 43m occurs at the western end where the cliffs are best developed (NPWS, 2013).

The target is that there is no decline in distribution, subject to natural processes.

3.4 Structure and Functions

A fundamental aim of sea cliff conservation is to facilitate some degree of natural mobility through slumping. Sea cliffs can be of geomorphological interest, as well as ecological interest, and also erosion can expose geological features of interest.

3.4.1 Physical structure: functionality and hydrological regime

Coastal protection works can disrupt the natural integrity of a sea cliff. The health and on-going development of vegetated sea cliffs relies on natural processes, such as erosion, continuing without any impingement. This is generally a bigger issue for soft cliffs which require a degree of slumping and erosion to expose bare soil for pioneer species to colonise; otherwise the vegetation is replaced by hardy grasses and scrub of little conservation value can develop. In addition, cliff erosion provides an important sediment source to sites further along the coast (e.g. sand dunes). Preventing erosion at a cliff site can lead to beach starvation at another site.

Flushes can be associated with cliffs in areas where the groundwater seeps out onto the cliff face. This is more usually associated with soft cliffs where these flushes contribute to the natural instability of the ground and provide patches of wetland habitat.

The target is to maintain, or where necessary restore, the natural geomorphological processes without any physical obstructions, and the local hydrological regime including groundwater quality.

3.4.2 Vegetation structure: zonation

Ecological variation in this habitat type depends on a number of physical and biological factors, in particular climate, degree of exposure to sea-spray, geology and soil type, as well as the level of grazing and seabird activity. The rocky cliff flora often grades naturally into coastal heath vegetation and maritime grassland.

The target is to maintain the range of sea cliff habitat zonations, as well as transitional zones, including those to terrestrial communities, subject to natural processes.

3.4.3 Vegetation structure: vegetation height

A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. Grazing increases the species diversity and is particularly important for maritime grasslands and coastal heath, which are often associated with sea cliffs.

The quality of habitat at Inishtrahull SAC is considered good, with no significant damaging activities occurring (NPWS, 2013).

The target is to maintain the structural variation in the sward height.

3.4.4 Vegetation composition: typical species and sub-communities

Different sea cliff communities develop in a number of habitat zones related to the degree of maritime influence (exposure to wind and sea spray), geology and soil type. In general, Irish sea cliffs

display a range of zones running in a series of horizontal bands up the cliff face, each of which has its own distinct sub-communities including:

- Splash zone
- Pioneer zone
- Rock crevice/cliff ledge zone
- Maritime grassland zone
- Maritime heath zone
- Maritime slope flush zone

There is considerable variation, but the general pattern would be that the maritime influence is strongest near the base of the cliff and becomes gradually less dominant towards the cliff top. At the cliff base, vegetation is naturally very open and the species present have a high tolerance to salinity. The splash zone generally has a well-developed lichen flora dominated by species such as *Verrucaria maura*, *Ramalina* spp. and *Xanthoria* spp. These plant communities are dependent on rock crevices for rooting. Moving up the cliff, between the splash zone and the cliff top, vegetation on the cliff ledges is less open and can support some species which are not exclusively associated with coastal conditions. Closer to the cliff top maritime grasslands can occur. The plant communities and physical characteristics of maritime grasslands vary depending on the degree of exposure and whether or not grazing is a factor. Plant communities typical of seabird cliffs and maritime therophyte communities are exceptions to this horizontal zonation and can occur as a mosaic with the other plant communities.

The following tables present lists of species that are considered typical of the different zones associated with soft cliffs and hard cliffs by Barron *et al.* (2011).

Vegetation of soft cliffs:

Typical pioneer slope species on soft cliffs		
<i>Agrostis stolonifera</i>	<i>Equisetum</i> spp.	<i>Tussilago farfara</i>
<i>Daucus carota</i>	<i>Lotus corniculatus</i>	
Flush on soft cliffs		
<i>Equisetum</i> spp.	<i>Orchid</i> species	<i>Schoenus nigricans</i>
Coastal heath		
<i>Calluna vulgaris</i>	<i>Erica cinerea</i>	<i>Ulex gallii</i>
<i>Daboecia cantabrica</i>	<i>Erica tetralix</i>	<i>Vaccinium myrtillus</i>
<i>Empetrum nigrum</i>	<i>Scilla verna</i>	
Coastal grassland on soft cliffs		
<i>Agrostis stolonifera</i>	<i>Dactylis glomerata</i>	<i>Festuca rubra</i>
<i>Anthyllis vulneraria</i>	<i>Daucus carota</i>	<i>Lotus corniculatus</i>
<i>Arrhenatherum elatius</i>	<i>Elytrigia repens</i>	<i>Tussilago farfara</i>

Vegetation of hard cliffs:

Typical splash zone species on hard cliffs		
<i>Ramalina</i> spp.	<i>Verrucaria maura</i>	<i>Xanthoria</i> spp.
Typical crevice and ledge species on hard cliffs		
<i>Anthyllis vulneraria</i>	<i>Asplenium marinum</i>	<i>Armeria maritima</i>
<i>Aster tripolium</i>	<i>Atriplex prostrata</i>	<i>Beta vulgaris</i> ssp. <i>maritima</i>
<i>Catapodium marinum</i>	<i>Cerastium diffusum</i>	<i>Crithmum maritimum</i>
<i>Festuca rubra</i>	<i>Inula crithmoides</i>	<i>Lavatera arborea</i>
<i>Ligusticum scoticum</i>	<i>Limonium</i> spp.	<i>Plantago coronopus</i>
<i>Plantago maritima</i>	<i>Sedum anglicum</i>	<i>Sedum rosea</i>
<i>Silene uniflora</i>	<i>Spergularia rupicola</i>	
Typical coastal heath species		
<i>Calluna vulgaris</i>	<i>Daboecia cantabrica</i>	<i>Empetrum nigrum</i>
<i>Erica cinerea</i>	<i>Erica tetralix</i>	<i>Scilla verna</i>
<i>Ulex gallii</i>	<i>Vaccinium myrtillus</i>	
Typical maritime grassland species on hard cliffs		
<i>Anthyllis vulneraria</i>	<i>Armeria maritima</i>	<i>Crithmum maritimum</i>
<i>Daucus carota</i>	<i>Festuca rubra</i>	<i>Hyacinthoides non-scripta</i>
<i>Plantago coronopus</i>	<i>Plantago maritima</i>	<i>Scilla verna</i>
<i>Sedum anglicum</i>	<i>Silene uniflora</i>	<i>Spergularia rupicola</i>

The vegetation of the cliffs at Inishtrahull SAC contains plant species that are typically associated with maritime grassland, crevice and ledge species of hard cliffs. These include thrift (*Armeria maritima*), rock sea-spurrey (*Spergularia rupicola*), red fescue (*Festuca rubra*), common scurvygrass (*Cochlearia officinalis*), sea campion (*Silene vulgaris* subsp. *maritima*), sea spleenwort (*Asplenium marinum*), buck's-horn plantain (*Plantago coronopus*), sea plantain (*Plantago maritima*) and English stonecrop (*Sedum anglicum*) (NPWS, 2013).

In addition to these more common species, the cliff habitat supports the rare Red Data Book (Curtis and McGough, 1988) species Scots lovage (*Ligusticum scoticum*). This species was first discovered on the island in 1938 and has been recorded there as recently as 1997.

The target for this attribute is to ensure that the typical flora of vegetated sea cliffs is maintained, as are the range of sub-communities within the different zones.

3.4.5 Vegetation composition: negative indicator species

Negative indicator species can include non-native species (e.g. *Hebe* spp., *Carpobrotus edulis*, *Gunnera tinctoria*), species indicative of changes in nutrient status (e.g. *Urtica dioica*) and species not considered to be typical of the habitat (e.g. *Pteridium aquilinum*).

The target for this attribute is that negative indicator species (including non-native species) should make up less than 5% of the vegetation cover.

3.4.6 Vegetation composition: bracken and woody species

Encroachment of bracken (*Pteridium aquilinum*) and woody/scrub species on cliffs, particularly on maritime grasslands and coastal heath, leads to a reduction in species diversity.

The vegetation of the interior of the island of Inishtrahull is predominantly grassland; trees are entirely lacking (NPWS, 2013).

The target for this attribute is that in the case of maritime grassland and/or heath, bracken should make up less than 10% of the vegetation cover, while woody species should make up no more than 20% of the vegetation cover.

4 References

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NPWS (2013) Site Synopsis: Inishtrahull SAC (000154)

<https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000154.pdf>

Appendix I – Distribution map of Vegetated Sea Cliffs within Inishtrahull SAC

