

NPWS

Aran Island (Donegal) Cliffs SAC  
(site code: 000111)

**Conservation objectives supporting document-  
Coastal habitats**

Version 1

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**Please note that this document should be read in conjunction with the following report: NPWS (2016) Conservation Objectives: Aran Island (Donegal) Cliffs SAC 000111. 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.

Aran Island is a large island (approximately 18km<sup>2</sup>) situated about 4km west of Burtonport in Co. Donegal. Aran Island (Donegal) Cliffs SAC encompasses the rocky sea cliffs, which form the north, west and part of the south coasts of the island. The cliffs are composed of Ards quartzites with some igneous intrusions, limestone and siliceous cliffs (NPWS, 2015).

The SAC is important for the presence of good examples of exposed western cliffs and associated habitats. The cliffs on Aran Island, which rise to 150m, are exposed and precipitous. They are well-indented, with predominantly north- and west-facing aspects. Numerous rocks and islets occur in the waters near the cliffs and these rocks, along with the surrounding waters, form part of the SAC (NPWS, 2015).

Dry heath occurs with the cliff vegetation and coastal grassland at the west of the SAC and especially the south-west. The heath component supports heather (*Calluna vulgaris*), wood-rushes (*Luzula* spp.), heath bedstraw (*Galium saxatile*), tormentil (*Potentilla erecta*) and mosses including *Rhytidiadelphus loreus*, *Hylocomnium splendens*, *Polytrichum* spp. and *Pseudoscleropodium purum* (NPWS, 2015).

The site is of ornithological importance for a number of bird species, including two which are listed under Annex I of the EU Birds Directive: peregrine (*Falco peregrinus*) and chough (*Pyrrhocorax pyrrhocorax*). On Aran Island, the exposed maritime situation coupled with sheep grazing has resulted in large areas of short sward suitable for foraging chough and the population on Aran is one of the largest concentrations in this region. The cliffs also have nesting seabird populations of the following species: fulmar (*Fulmarus glacialis*), great black-backed gull (*Larus marinus*), lesser black-backed gull (*L. fuscus*), herring gull (*L. argentatus*), kittiwake (*Rissa tridactyla*), shag (*Phalacrocorax aristotelis*), black guillemot (*Cepphus grylle*) and possibly manx shearwater (*Puffinus puffinus*). A cormorant (*Phalacrocorax carbo*) colony also nests on Torboy Island (NPWS, 2015).

Aran Island (Donegal) Cliffs SAC (site code: 000111) is selected for vegetated sea cliffs, European dry heaths, Alpine and Boreal heaths, calcareous rocky slopes, siliceous rocky slopes and sea caves. The following coastal habitat is included on the list of Qualifying Interests 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 Aran Island (Donegal) Cliffs 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 distribution of vegetated sea cliffs in Aran Island (Donegal) Cliffs SAC is presented in Appendix I. The ISCS identified sites and carried out a detailed assessment as per the methodology outlined in Barron *et al.* (2011). This included dividing the cliff length into a series of sections to reflect the variation within the site and to give a more accurate measurement for area. The following sub-site was surveyed and assessed in the field:

Ballintra, Aran Island (ISCS site ID: 03058)

The conservation objective for the vegetated sea cliff habitat within the SAC is extrapolated from Barron *et al.* (2011) and the sea cliff database, which was produced as part of that project. It is thought that the sub-site surveyed by the ISCS represents the total extent of vegetated sea cliffs within Aran Island (Donegal) Cliffs SAC.

### **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) or 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 present at Aran Island (Donegal) Cliffs SAC are of the hard cliff type, composed of quartzite bedrock with shallow, lithosolic-podzolic type soils with peaty topsoil.

### 3.1 Overall Objective

The overall objective for ‘Vegetated sea cliffs of the Atlantic and Baltic coasts’ in Aran Island (Donegal) Cliffs 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. During the ICS (Barron *et al.*, 2011), each cliff was divided into sections based on physical characteristics and vegetation cover. Breaks (i.e. non-cliff areas) of between 80m and 500m along the length of cliff were discounted from the calculations.

The total length of the cliff within the sub-site Ballintra, Aran Island (site ID: 03058) was estimated to be 23.04km. Discounting breaks, the total area/length of cliff sections in the sub-site is presented in the following table. The area/length of cliff sections that is located within the SAC boundary is also presented.

Site Name	Total area/length (km) of sea cliff sections from ICS	Total area/length (km) of sea cliff sections within SAC boundary
Ballintra, Aran Island	21.74	18.06

The difference between the two figures is explained by the fact that the ISCS mapped the total sea cliff resource at the site and not all of the sea cliff mapped is contained within the SAC boundary. The total length of cliff sections at the sub-site Ballintra, Aran Island was 21.74km. However when, this dataset was clipped to the boundary of Aran Island (Donegal) Cliffs SAC, 18.06km was included within the SAC boundary. This figure is likely to be an underestimate as the OSi six inch county boundary line was used to draw the line from the ISCS, while a different mapping dataset was used to draw the SAC boundary.

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 Aran Island (Donegal) Cliffs SAC, as identified by the Irish Sea Cliff Survey (Barron *et al.*, 2011), is presented in Appendix I.

The OSI Discovery Map lists the headlands of Aran Island (Donegal) Cliffs SAC as Torneady Point and Rinrawros Point. The sea cliffs extend north from Cladaghlahan Bay in the south-west to Bellachreesh Bay to the north-east.

The ISCS suggests that the Ballintra, Aran Island sub-site consists of hard cliffs that range in height from 10m to 140m (Barron *et al.*, 2011).

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.

Although the cliffs at this site are of the hard cliff type, the ISCS noted the presence of streams and cascades. The dry heath is interspersed with rocks and wet flush areas (Barron *et al.*, 2011).

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 SAC supports an excellent example of rocky cliff and associated vegetation habitats in a very exposed situation. The higher cliff vegetation in this SAC merges into alpine heath, which is also found along the top of the cliffs, particularly to the east of Torneady Point. Species present include juniper (*Juniperus communis*), bearberry (*Arctostaphylos uva-ursi*), crowberry (*Empetrum nigrum*), pale butterwort (*Pinguicula lusitanica*), Wilson's filmy-fern (*Hymenophyllum wilsonii*) and hay-scented buckler-fern (*Dryopteris aemula*) (NPWS, 2015).

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 cliff and alpine heath vegetation in the SAC is of good quality and not threatened in any significant way, due to their inaccessibility. However, the dry heath and coastal grassland communities have been damaged due to peat cutting and over-grazing by sheep (NPWS, 2015).

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:

<b>Typical pioneer slope species on soft cliffs</b>		
<i>Agrostis stolonifera</i>	<i>Equisetum</i> spp.	<i>Tussilago farfara</i>
<i>Daucus carota</i>	<i>Lotus corniculatus</i>	
<b>Flush on soft cliffs</b>		
<i>Equisetum</i> spp.	<i>Orchid</i> species	<i>Schoenus nigricans</i>
<b>Coastal heath</b>		
<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>	
<b>Coastal grassland on soft cliffs</b>		
<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:

<b>Typical splash zone species on hard cliffs</b>		
<i>Ramalina</i> spp.	<i>Verrucaria maura</i>	<i>Xanthoria</i> spp.
<b>Typical crevice and ledge species on hard cliffs</b>		
<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 of Aran Island is varied. Few plants survive on the sheer cliffs, while an interesting flora occurs on the fissures of limestone and siliceous cliffs. All the plants are tolerant of saline exposure, including sea campion (*Silene vulgaris* subsp. *maritima*), sea mayweed (*Tripleurospermum maritimum*), roseroot (*Rhodiola rosea*), common scurvygrass (*Cochlearia officinalis*), sea spleenwort (*Asplenium marinum*) and rock sea-spurrey (*Spergularia rupicola*). These species are typical species of splash zone and maritime grassland of hard cliffs (NPWS, 2015).

The very rare Hart's saxifrage (*Saxifraga rosacea* subsp. *hartii*; synonym *S. hartii*), an Alpine plant listed in the Red Data Book (Curtis and McGough, 1988), occurs on the cliffs. This species is legally protected through the Flora (Protection) Order, 2015 (Statutory Instrument No. 356 of 2015). Aran Island is the only known location for this plant, which is endemic to Ireland (NPWS, 2015).

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 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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Fossitt, J.A. (2000) A guide to habitats in Ireland. The Heritage Council, Kilkenny.

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<https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000111.pdf>

# Appendix I – Distribution map of Vegetated Sea Cliffs within Aran Island (Donegal) Cliffs SAC

