

NPWS

Ardmore Head SAC  
(site code: 002123)

**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: Ardmore Head SAC 002123. 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.

Ardmore Head SAC is situated on a small headland to the east of the village of Ardmore on the west Waterford coastline. The SAC consists of sea cliffs and associated coastal habitats. The cliffs are of moderate height (up to 40m), continuous and precipitous. They are well-indented, and have numerous small ledges which support breeding seabirds. The aspect of the cliffs is mostly east and south-facing, but there is a small section facing north. In places below the cliffs, there are boulder and some shingle shorelines. Small rocky islets, which are continuously washed over, also occur (NPWS, 2013).

The site is underlain by slightly metamorphosed siltstones of the Old Red Sandstone formation, which form part of the Ardmore Syncline. Geologically the sandstone has been removed, either through erosion or faulting, from the east of the site. Large sections of these layered sediments, which have been folded into dramatic undulating formations, can be viewed from the cliff walk. The sea cliffs are affected by erosion caused by wave action, resulting in the formation of numerous sea stacks and small islets (NPWS, 2005).

On Ardmore Head, dry grassland is often interspersed with the heath areas creating a rough grassland/heath mosaic. Dry heath formation in the north-west corner of the SAC grades into scrub. In some of the headland areas between Ardmore and Ram Head, western gorse (*Ulex gallii*) forms a dominant part of the vegetation (NPWS, 2005).

The low cliffs with many ledges are very suitable for important numbers of nesting kittiwake (*Rissa tridactyla*) and also for fulmar (*Fulmarus glacialis*), shag (*Phalacrocorax aristotelis*), cormorant (*P. carbo carbo*), herring gull (*Larus argentatus*), great black-backed gull (*Larus marinus*), guillemot (*Uria aalge*) and razorbill (*Alca torda*). The site is noted for the presence of chough (*Pyrrhocorax pyrrhocorax*), which were recorded nesting on the southern cliffs west of Ram Head. (NPWS, 2013). A non-breeding flock of this species has also been recorded. Chough is listed under Annex I of the EU Birds Directive.

Ardmore Head SAC (site code: 002123) is selected for vegetated sea cliffs and European dry heath. The following coastal habitat is one of the two 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 Ardmore Head 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 cliff sites in Ardmore Head 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 associated with Ardmore Head SAC was surveyed and assessed in the field:

Ardmore (ISCS site ID: 10002)

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 Ardmore Head 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) 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.”

### 3.1 Overall Objective

The overall objective for ‘Vegetated sea cliffs of the Atlantic and Baltic coasts’ in Ardmore Head 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 ISCS (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 area/length of the cliff sections within the Ardmore sub-site (site ID: 10002) is presented in the following table. The area/length of cliff sections located within the SAC boundary is also presented.

Site Name	Total area/length (km) of sea cliff sections from ISCS	Total area/length (km) of sea cliff sections within SAC boundary
Ardmore	7.39	2.29

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 in the ISCS sub-site Ardmore is 7.39km. When this dataset was clipped to the SAC boundary, only 2.29km was included within the SAC. 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 Ardmore Head SAC, as identified by the Irish Sea Cliff Survey (Barron *et al.*, 2011), is presented in Appendix I.

The SAC contains two main headlands, Ardmore Head and Ram Head, and a 1km stretch of steep to vertical cliffs, which are intact and largely undisturbed. There are numerous sea islets, sea stacks and areas of fallen bedrock adjacent to the cliffs, particularly on the south side of the SAC, the most exposed part (NPWS, 2005).

The ISCS suggests that the Ardmore Head sub-site consists of hard cliffs that range in height from 10m to 40m (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.

The only surface water present within the site comes from small springs. Two holy wells have been developed over these springs - St. Declan's well just outside Ardmore village and Fr. O'Donnell's well on the western side of the site, along the coastal walk.

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 dry heath merges into the cliff vegetation, but also into dry grassland, especially at Ardmore Head.

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 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>Daucus carota</i>	<i>Equisetum</i> spp. <i>Lotus corniculatus</i>	<i>Tussilago farfara</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>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>
<b>Coastal grassland on soft cliffs</b>		
<i>Agrostis stolonifera</i> <i>Anthyllis vulneraria</i> <i>Arrhenatherum elatius</i>	<i>Dactylis glomerata</i> <i>Daucus carota</i> <i>Elytrigia repens</i>	<i>Festuca rubra</i> <i>Lotus corniculatus</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>Aster tripolium</i> <i>Catapodium marinum</i> <i>Festuca rubra</i> <i>Ligusticum scoticum</i> <i>Plantago maritima</i> <i>Silene uniflora</i>	<i>Asplenium marinum</i> <i>Atriplex prostrata</i> <i>Cerastium diffusum</i> <i>Inula crithmoides</i> <i>Limonium</i> spp. <i>Sedum anglicum</i> <i>Spergularia rupicola</i>	<i>Armeria maritima</i> <i>Beta vulgaris</i> ssp. <i>maritima</i> <i>Crithmum maritimum</i> <i>Lavatera arborea</i> <i>Plantago coronopus</i> <i>Sedum rosea</i>
<b>Typical coastal heath species</b>		
<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>	
<b>Typical maritime grassland species on hard cliffs</b>		
<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>



In the SAC, cliff vegetation includes species such as sea-spurrey (*Spergularia* spp.), sea campion (*Silene vulgaris* subsp. *maritima*), thrift (*Armeria maritima*), buck's-horn plantain (*Plantago coronopus*) and scurvy grass (*Cochlearia* spp.). Other flora includes sea beet (*Beta vulgaris* subsp. *maritima*), yarrow (*Achillea millefolium*) and wild carrot (*Daucus carota*) (NPWS, 2013). On cliffs tops and on some of the ledges, the vegetation includes rock samphire (*Crithmum maritimum*) and sea lavender (*Aster tripolium*) (NPWS, 2005).

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

Barron, S., Delaney, A., Perrin, P., Martin, J. and O'Neill, F. (2011) National survey and assessment of the conservation status of Irish sea cliffs. Irish Wildlife Manuals, No. 53. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

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

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# Appendix I – Distribution map of Vegetated Sea Cliffs within Ardmore Head SAC

