

NPWS

Three Castle Head to Mizen Head SAC
(site code: 000109)

**Conservation Objectives supporting document-
Coastal Habitats**

Version 1

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Appendix I – Distribution map of Vegetated Sea Cliffs within Three Castle Head to Mizen Head SAC10

Please note that this document should be read in conjunction with the following report: NPWS (2016) Conservation Objectives: Three Castle Head to Mizen Head SAC 000109. 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.

Three Castle Head to Mizen Head SAC lies at the end of the Schull/Goleen peninsula in West Cork, and is the most south-westerly part of the Irish mainland. The headlands consist of two ridges of Old Red Sandstone separated by a low-lying area which culminates in Dunlough Bay (NPWS, 2013). The bedrock consists of continental redbed facies; sandstone, conglomerate and siltstone. The soils consist of shallow, well-drained, lithosolic-podzolic type soils, potentially with peaty topsoil (parent material mainly non-calcareous) (Barron *et al.*, 2011)

Seabirds nest along the coast, particularly at Illaunnacaheeragh. Breeding colonies of fulmar (*Fulmarus glacialis*), cormorant (*Phalacrocorax carbo*), shag (*P. aristotelis*), herring gull (*Larus argentatus*), lesser black-backed gull (*L. fuscus*), great black-backed gull (*L. marinus*), kittiwake (*Rissa tridactyla*), puffin (*Fratercula arctica*), guillemot (*Uria aalge*) and razorbill (*Alca torda*) are present (NPWS, 2013).

The site is important for chough (*Pyrrhocorax pyrrhocorax*) with Mizen Head cliffs holding some of the highest concentrations of breeding pairs in Ireland (Grey *et al.*, 2003).

Three Castle Head to Mizen Head SAC (site code: 000109) is designated for vegetated sea cliffs and European dry heaths. 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 Three Castle Head to Mizen 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 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 Three Castle Head to Mizen Head SAC is presented in Appendix 1. 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 not surveyed in the field but was assessed as part of a desk study:

Three Castle Head to Mizen Head (ISCS site ID: 02013)

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 assessed by the ISCS represents the total extent of vegetated sea cliffs within Three Castle Head and Mizen 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) 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."

There are two main types of sea cliff present at Three Castle Head to Mizen Head SAC. One consists of almost vertical bedding of the sandstones, where slabs of rock hang above the sea. The other is

composed of the ends of the rock strata, where the rock is much more friable, allowing pockets of scree and soil to develop.

3.1 Overall Objective

The overall objective for ‘Vegetated sea cliffs of the Atlantic and Baltic coasts’ in Three Castle Head to Mizen 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 length of cliff within the sub-site Three Castle Head to Mizen Head (ISCS site ID: 02013) was estimated to be 32.42km. 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 ISCS	Total area/length (km) of sea cliff sections within SAC boundary
Three Castle Head to Mizen Head	31.72	18.15

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. In addition, the OSi six inch county boundary line was used to draw the line for the ISCS, while a different mapping dataset was used to draw the SAC boundary. As a result, the length of cliff inside the SAC boundary may be underestimated. The total length of cliff sections at the Three Castle Head to Mizen Head sub-site was 31.72km. When this dataset was clipped to the SAC boundary, 18.15km

was included within the SAC. However, in reality this figure is likely to be higher as a result of these 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 vegetated sea cliffs, as identified during the Irish Sea Cliff Survey (ISCS) (Barron *et al.*, 2011), is shown on a map in Appendix I.

Browne (2005) noted that sea cliffs occur along most of the seaward side of this very exposed site. The headlands of Three Castle Head and Mizen Head SAC consist of two ridges of Old Red Sandstone separated by a low-lying area at Dunlough Bay (NPWS, 2013). The two sections of sea cliff extend north from Dunlough Bay to Toor Point, including Three Castle Head, and south from to Dunlough Bay to Mizen Head (Barron *et al.*, 2011).

The ISCS states that the Three Castle Head to Mizen Head sub-site consists of hard cliffs that range in height from 10m to 130m. At Mizen Head, the cliffs are up to 130m, those at Three Castle Head being up to 100m. Sea stacks and islets are frequent (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.

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 main vegetation on the hills at Three Castles to Mizen Head SAC is a peaty heath where grazing restricts the cover of the woody species (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>Daucus carota</i>	<i>Equisetum</i> spp. <i>Lotus corniculatus</i>	<i>Tussilago farfara</i>
Flush on soft cliffs		
<i>Equisetum</i> spp.	<i>Orchid</i> species	<i>Schoenus nigricans</i>
Coastal heath		
<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>
Coastal grassland on soft cliffs		
<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:

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>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>
Typical coastal heath species		
<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>
Typical maritime grassland species on hard cliffs		
<i>Anthyllis vulneraria</i> <i>Daucus carota</i> <i>Plantago coronopus</i> <i>Sedum anglicum</i>	<i>Armeria maritima</i> <i>Festuca rubra</i> <i>Plantago maritima</i> <i>Silene uniflora</i>	<i>Crithmum maritimum</i> <i>Hyacinthoides non-scripta</i> <i>Scilla verna</i> <i>Spergularia rupicola</i>

At the cliff line in Three Castle Head to Mizen Head SAC, kidney vetch (*Anthyllis vulneraria*), thrift (*Armeria maritima*), rock seaspurrey (*Spergularia rupicola*) and common scurvygrass (*Cochlearia officinalis*) occur. The cliff top is also the location for a prostrate form of broom (*Cytisus scoparius*) and occasional plants of the locally rare juniper (*Juniperus communis*) (NPWS, 2013).

These species occur on cliffs that are of the hard variety (Barron *et al.*, 2011).

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 main vegetation at the cliff top at Three Castles to Mizen Head SAC is a peaty heath where grazing restricts the cover of the woody species. Gorse-dominated heath and rough grassland also occurs within the SAC.

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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<https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000109.pdf>

Appendix I – Distribution map of Vegetated Sea Cliffs within Three Castle Head to Mizen Head SAC

