

NPWS

Howth Head SAC
(site code: 000202)

**Conservation objectives supporting document-
Coastal habitats**

Version 1

December 2016

Contents

| | | |
|-------|--|----|
| 1 | Introduction | 2 |
| 2 | Conservation Objectives | 3 |
| 3 | Vegetated sea cliffs..... | 3 |
| 3.1 | Overall Objective..... | 4 |
| 3.2 | Area | 4 |
| 3.2.1 | Habitat length | 4 |
| 3.3 | Range..... | 5 |
| 3.3.1 | Habitat Distribution..... | 5 |
| 3.4 | Structure and Functions | 5 |
| 3.4.1 | Physical structure: functionality and hydrological regime | 5 |
| 3.4.2 | Vegetation structure: zonation | 5 |
| 3.4.3 | Vegetation structure: vegetation height | 6 |
| 3.4.4 | Vegetation composition: typical species and sub-communities..... | 6 |
| 3.4.5 | Vegetation composition: negative indicator species | 8 |
| 3.4.6 | Vegetation composition: bracken and woody species | 8 |
| 4 | References..... | 9 |
| | Appendix I – Distribution map of Vegetated Sea Cliffs within Howth Head SAC..... | 10 |

Please note that this document should be read in conjunction with the following report: NPWS (2016) Conservation Objectives: Howth Head SAC 000202. 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.

Howth Head is a rocky peninsula situated on the northern side of Dublin Bay. The peninsula is composed of Cambrian slates and quartzites, joined to the mainland by a post-glacial raised beach. Limestone occurs on the north-west side, while glacial drift is deposited against the cliffs in places (NPWS, 2013). Howth Head SAC occupies the eastern portion and summit of Howth. Most of the coast consists of cliffs, reaching 30m or higher (NPWS, 2013).

The climate of Howth Head is dry and warm by Irish standards and this is reflected in the flora and fauna. The flora is very diverse with several red-listed species and species of very restricted Irish distribution. The dry heath and sea cliff vegetation is extensive and well-developed (NPWS, 2013).

Red Data Book (Curtis and McGough, 1988) plant species that have been recorded in Howth Head SAC include green-winged orchid (*Orchis morio*), bird's-foot (*Ornithopus perpusillus*), hairy violet (*Viola hirta*), rough poppy (*Papaver hybridum*), pennyroyal (*Mentha pulegium*), heath cudweed (*Omalotheca sylvatica*) and betony (*Stachys officinalis*). The latter five species are legally protected under the Flora (Protection) Order, 2015 (Statutory Instrument No. 356 of 2015). Curved hard-grass (*Parapholis incurva*) was found at Red Rock in 1979 and as recently as 1998 (Doogue *et al.*, 1998). This species had not previously been recorded in Ireland (NPWS, 2013).

The cliffs are of national importance for breeding kittiwake (*Rissa tridactyla*). Other seabirds that nest on the cliffs include fulmar (*Fulmarus glacialis*), shag (*Phalacrocorax aristotelis*), great black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*), guillemot (*Uria aalge*), razorbill (*Alca torda*) and black guillemot (*Cepphus grylle*). The cliffs also support a breeding pair of peregrine falcons (*Falco peregrinus*) (NPWS, 2011).

A number of rare invertebrates have been recorded from the SAC, including the ground beetle *Trechus rubens* (Order: Coleoptera), which is found on storm beaches below the eastern cliffs (NPWS, 2013).

Howth Head SAC (site code: 000202) is selected 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

The distribution of vegetated sea cliffs within Howth Head SAC is presented in Appendix I.

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 Howth 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 ISCS did not survey any sub-sites within Howth Head SAC (Barron *et al.*, 2011). However, the site was assessed in an earlier inventory of sea cliffs and coastal heath (Browne, 2005) and the extent of the sea cliffs was reviewed by the ISCS using the methodology outlined in Barron *et al.* (2011).

The targets set for the vegetated sea cliffs in Howth Head SAC 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 sub-tidal 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.”

3.1 Overall Objective

The overall objective for ‘Vegetated sea cliffs of the Atlantic and Baltic coasts’ in Howth 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. Browne (2005) estimated that sea cliffs at Howth Head extended for 6km, but while this site was not surveyed by the ISCS, the site was identified and the length of cliffs was provisionally estimated by the ISCS using the methodology outlined in Barron *et al.* (2011). The ISCS estimated the total length of cliff at Howth Head to be 9.7km and when clipped to the SAC boundary, the length of cliff within the SAC is estimated to be 8.22km. This figure is likely to be an underestimate as the OSi six inch county boundary 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 Howth Head SAC, as estimated by Barron *et al.* (2011), is presented in Appendix I.

Vegetated sea cliffs at Howth Head SAC extend for approximately 8.22km. The greater part of Howth Head SAC consists of heathland and sea cliffs. Most of the cliffs are sheer with many reaching 30m or higher.

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.

At Howth Head SAC, European dry heath occurs on the slopes above the sea cliffs, which merges into dry grassland (NPWS, 2013).

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:

| 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. | Orchid 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> |

At Howth Head SAC, the cliffs in places comprise fairly sheer, exposed rock faces. Here plants such as rock sea-spurrey (*Spergularia rupicola*), samphire (*Crithmum maritimum*) and biting stonecrop (*Sedum acre*) are found (NPWS, 2011).

The maritime flora at Howth Head SAC is of particular interest as a number of scarce and local plants have been recorded including golden-samphire (*Inula crithmoides*), sea wormwood (*Artemisia maritima*), grass-leaved orache (*Atriplex littoralis*), frosted orache (*Atriplex laciniata*), sea spleenwort (*Asplenium marinum*), bloody crane's-bill (*Geranium sanguineum*), spring squill (*Scilla verna*), sea stork's-bill (*Erodium maritimum*) and three uncommon clover species: knotted clover (*Trifolium striatum*), bird's-foot clover (*T. ornithopodioides*) and western clover (*T. occidentale*) (NPWS, 2013).

A mosaic of heathland vegetation occurs on the slopes above the sea cliffs. This is dominated by western gorse (*Ulex gallii*), ling (*Calluna vulgaris*), bell heather (*Erica cinerea*) and localised patches of bracken (*Pteridium aquilinum*). In more open areas, species such as English stonecrop (*Sedum anglicum*), wood sage (*Teucrium scorodonia*) and navelwort (*Umbilicus rupestris*) occur (NPWS, 2013).

Rock outcrops that are important for lichens are distributed widely around Howth Head. The Earlscliffe area is of national importance for lichens for black, yellow and grey lichen zonation (NPWS, 2013).

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*).

Hottentot fig (*Carpobrotus edulis*) is a popular garden plant from South Africa and an aggressive invader of coastal habitats that poses a serious ecological threat. It forms vast mats to the exclusion of all other plants. The first record for hottentot fig in the wild in Ireland is from Howth Head with an Atlas record for 1962 (Reynolds, 2002) and since then it grew into patches up to 40 metres across – a steady rate of one metre per year. An intensive programme to control and ultimately eradicate hottentot fig at Howth Head was undertaken by the National Botanic Gardens in 2010 and results have been encouraging with the re-establishment of native species such as golden samphire (*Inula crithmoides*) and rock samphire (*Crithmum maritimum*) occurring in the first year post-treatment (<http://www.botanicgardens.ie/herb/research/carpedul.htm>).

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.

Patches of scrub, mostly hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), willow (*Salix* spp.) and downy birch (*Betula pubescens*), occur in places on the heath (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

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.

Browne, A. (2005) National inventory of sea cliffs and coastal heaths. Unpublished report to the National Parks and Wildlife Service, Dublin.

Curtis, T.G.F. and McGough, H.N. (1988) The Irish Red Data Book 1. Vascular Plants. The Stationery Office, Dublin.

Doogue, D., Nash, D., Parnell, J., Reynolds, S. and Wyse Jackson, P. (1998) Flora of County Dublin. The Dublin Naturalists' Field Club, Dublin.

European Commission (2013) Interpretation Manual of European Union Habitats – EUR 28. DG Environment - Nature and Biodiversity, Brussels.

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

JNCC (2004) Common standards and monitoring guidance for maritime cliff and slope habitats. Joint Nature Conservation Committee, Peterborough, UK.

NPWS (2011) Site Synopsis: Howth Head Coast SPA (004113).

<https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004113.pdf>

NPWS (2013) Site Synopsis: Howth Head SAC (000202).

<https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000202.pdf>

Reynolds, S.C.P. (2002) A catalogue of Alien Plants in Ireland. National Botanic Gardens, Glasnevin, Ireland.

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

