

National Parks and Wildlife Service

Conservation Objectives Series

Keel Machair/Menaun Cliffs SAC 001513



An Roinn
Cultúir, Oidhreachta agus Gaeltachta
Department of
Culture, Heritage and the Gaeltacht



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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

** indicates a priority habitat under the Habitats Directive*

001513	Keel Machair/Menaun Cliffs SAC
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1220	Perennial vegetation of stony banks
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1395	Petalwort <i>Petalophyllum ralfsii</i>
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21A0	Machairs (* in Ireland)
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4060	Alpine and Boreal heaths
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**Please note that this SAC is adjacent to Achill Head SAC (002268).
See map 2. The conservation objectives for this site should be used in
conjunction with those for the adjacent site as appropriate.**

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1998
Title :	Biomar survey of Irish machair sites 1996
Author :	Crawford, I.; Bleasdale, A.; Conaghan, J.
Series :	Irish Wildlife Manual No. 3
Year :	2009
Title :	Coastal Monitoring Project 2004-2006
Author :	Ryle, T.; Murray, A.; Connolly, K.; Swann, M.
Series :	Unpublished report to NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2013
Title :	Monitoring survey of Annex I sand dune habitats in Ireland
Author :	Delaney, A.; Devaney, F.M.; Martin, J.M.; Barron, S.J.
Series :	Irish Wildlife Manual No. 75
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2015
Title :	Monitoring methods for <i>Petalophyllum ralfsii</i> (Wils.) Nees & Gottsche (Petalwort) in the Republic of Ireland
Author :	Campbell, C.; Hodgetts, N.; Lockhart, N.
Series :	Irish Wildlife Manual No. 90
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Survey and assessment of vegetated shingle and associated habitats at 30 coastal sites in Ireland
Author :	Martin, J.R.; Daly, O.H.; Devaney F.M.
Series :	Irish Wildlife Manual No. 98
Year :	2018
Title :	Keel Machair/Menaun Cliffs SAC (site code: 1513) Conservation objectives supporting document: coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	2006
Title :	The vegetation of Irish machair
Author :	Gaynor, K.
Series :	Biology and Environment: Proceedings of the Royal Irish Academy, 106B(3): 311-321
Year :	2008
Title :	The phytosociology and conservation value of Irish sand dunes
Author :	Gaynor, K.
Series :	Unpublished Ph.D. Thesis, National University of Ireland, Dublin
Year :	2013
Title :	Conservation of selected legally protected and Red Listed bryophytes in Ireland
Author :	Campbell, C.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin

Spatial data sources

Year : 2017
Title : Vegetated Shingle Monitoring Project
GIS Operations : QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For : 1220, 21A0 (map 3)

Year : 2017
Title : NPWS rare and threatened species database
GIS Operations : Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For : 1395 (map 4)

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in Keel Machair/Menaun Cliffs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession	Based on data from the Vegetated Shingle Monitoring Project (VSM) (Martin et al., 2017). Perennial vegetation of stony banks was not recorded in the sub-site Trawmore, Keel (VSM site code 006) during the VSM and thus the total area of the qualifying habitat within Keel Machair/Menaun Cliffs SAC is unknown. Martin et al. (2017) did note extensive areas of shingle beach in the sub-site during the VSM; however, no areas of the shingle were vegetated. NB further unsurveyed areas may be present within the SAC. See the Keel Machair/Menaun Cliffs SAC conservation objectives supporting document for coastal habitats for further details
Habitat distribution	Occurrence	No decline, subject to natural processes, including erosion and succession	The full distribution of the habitat in the SAC is unknown at present. It is possible that the habitat on the shingle beach in the Trawmore, Keel sub-site has been temporarily lost due to natural erosion and will re-establish in the future (Martin et al., 2017). See the coastal habitats supporting document for further details. NB further unsurveyed areas may be present within the SAC
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain, or where necessary restore, the natural circulation of sediment and organic matter, without any physical obstructions	Rock armour is present within the Trawmore, Keel sub-site, but its impact on the formation of the habitat is considered to be minimal (Martin et al., 2017). See the coastal habitats supporting document for further details
Physical structure: disturbance	Percentage	No more than 20% of the habitat affected by disturbance	Based on data from Martin et al. (2017). Disturbance can include damage from heavy trampling, vehicle damage and removal of substrate. See the coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats, including transitional zones, subject to natural processes, including erosion and succession	Based on data from Martin et al. (2017). See the coastal habitats supporting document for further details
Vegetation composition: communities and typical species	Occurrence	Maintain the typical species within the range of vegetated shingle communities	Based on data from Martin et al. (2017) where information on the vegetated shingle communities and associated typical species lists are presented. See the coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage	Negative indicator species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops	Based on data from Martin et al. (2017) where the list of negative indicator species for the habitat is also presented. Negative indicators include species indicative of changes in nutrient status and species not considered characteristic of the habitat. See the coastal habitats supporting document for further details

Vegetation composition: non-native species	Percentage	Non-native species cover in any individual monitoring stop should not be more than 1%; non-native species should not be present in more than 20% of monitoring stops; cover of non-native species across the whole site should not be more than 1%	Based on data from Martin et al. (2017). See the coastal habitats supporting document for further details
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Conservation Objectives for : Keel Machair/Menaun Cliffs SAC [001513]

21A0 Machairs (* in Ireland)

To restore the favourable conservation condition of Machairs* in Keel Machair/Menaun Cliffs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For the sub-site mapped: Trawmore, Keel - 79.52ha. See map 3	Based on data from the Vegetated Shingle Monitoring Project (VSM) (Martin et al., 2017). Machair habitat was surveyed and mapped at the sub-site Trawmore, Keel (VSM site code 006) to give a total estimated area of 79.52ha within Keel Machair/Menaun Cliffs SAC. See the Keel Machair/Menaun Cliffs SAC conservation objectives supporting document for coastal habitats for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 3 for recorded distribution	Based on data from Martin et al. (2017). The habitat extends along the coast from Keel village in the west to just short of the foothills of Menaun cliffs in the south-east, and landwards to the shores of Keel Lough. See the coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Dunes are naturally dynamic systems that require continuous supply and circulation of sand. See the coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations (metres)	Maintain natural hydrological regime	Based on Crawford et al. (1998), Gaynor (2006, 2008), Ryle et al. (2009) and Martin et al. (2017). See the coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes, including erosion and succession	Based on Ryle et al. (2009), Delaney et al. (2013) and Martin et al. (2017). See the coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 5% of machair habitat, subject to natural processes	Based on Delaney et al. (2013) and Martin et al. (2017). See the coastal habitats supporting document for further details
Vegetation structure: sward height	Centimetres	Maintain structural variation within sward. The mean sward height should be at least 8cm in July/August	Based on Delaney et al. (2013) and Martin et al. (2017). A mean vegetation height of 2.2cm was recorded by the VSM in the habitat in the Trawmore, Keel sub-site indicating that grazing levels are too high. See the coastal habitats supporting document for further details
Vegetation composition: flowering/fruitlet	Percentage	Positive indicator species should be flowering or fruiting in more than 40% of monitoring stops	Based on Delaney et al. (2013) and Martin et al. (2017). The list of positive indicator species is presented in Delaney et al. (2013). See the coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Occurrence	Maintain range of sub-communities with typical species listed in Delaney et al. (2013)	See the coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage	Negative indicator species cover in any individual monitoring stop should not be more than 25%; no negative indicator species should be present in more than 60% of monitoring stops; cover of negative indicator species across the whole site should not be more than 5%	Based on Delaney et al. (2013) and Martin et al. (2017). Negative indicators include species indicative of changes in nutrient status and species not considered characteristic of the habitat. See the coastal habitats supporting document for further details

Vegetation composition: non-native species	Percentage	Non-native species should not be present in more than 20% of monitoring stops	Based on Delaney et al. (2013) and Martin et al. (2017). The non-native species New Zealand willowherb (<i>Epilobium brunnescens</i>) was recorded by the VSM within the machair habitat in the Trawmore, Keel sub-site. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on Delaney et al. (2013) and Martin et al. (2017). See the coastal habitats supporting document for further details
Vegetation composition: bryophytes	Percentage cover	Should always be at least an occasional component of the vegetation, with a minimum cover of 1% within each monitoring stop	Based on Ryle et al. (2009), Delaney et al. (2013) and Martin et al. (2017). The Annex II and Flora (Protection) Order, 2015 listed liverwort petalwort (<i>Petalophyllum ralfsii</i>) has been recorded from the machair in the SAC (see Campbell et al., 2015). See the coastal habitats supporting document for further details. See also the conservation objective for petalwort (1395) in this volume

Conservation Objectives for : Keel Machair/Menaun Cliffs SAC [001513]

4060 Alpine and Boreal heaths

To maintain the favourable conservation condition of Alpine and Boreal heaths in Keel Machair/Menaun Cliffs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Alpine and Boreal heath has not been mapped in detail for Keel Machair/Menaun Cliffs SAC and thus the total area of qualifying habitat is unknown. It is documented that the habitat occurs around the summit of Menaun in a mosaic with blanket bog with numerous rock outcrops. At lower altitudes, the habitat merges with extensive areas of dry heath dominated by ling (<i>Calluna vulgaris</i>) (NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See the notes on Habitat area above
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	Relevant nutrients and their natural ranges are yet to be defined. However, nitrogen deposition is noted as being relevant to this habitat (NPWS, 2013)
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	The entire diversity of Alpine and Boreal heath communities within this SAC is unknown. Information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three	Attribute and target based on Perrin et al. (2014). Alpine and Boreal heath is not necessarily rich in lichen and bryophyte species, but a minimum amount should still be present
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 66%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. Bearberry (<i>Arctostaphylos uva-ursi</i>), crowberry (<i>Empetrum nigrum</i>), juniper (<i>Juniperus communis</i> subsp. <i>nana</i>), bilberry (<i>Vaccinium myrtillus</i>) and the Near Threatened dwarf willow (<i>Salix herbacea</i>) (Wyse Jackson et al., 2016) have been reported from the Alpine and Boreal heath in this SAC (NPWS internal files)
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrub species at least 10%	Attribute and target based on Perrin et al. (2014). A lower cover of dwarf shrubs could indicate that the habitat is transitioning to another vegetation type such as grassland
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 10%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). Non-native species can be invasive and have deleterious effects on native vegetation. A low target is set as non-native species can spread rapidly and are most easily dealt with when still at lower abundances
Vegetation structure: signs of grazing	Percentage of leaves grazed at a representative number of 2m x 2m monitoring stops	Less than 10% collectively of the live leaves of specific graminoids showing signs of grazing	Attribute and target based on Perrin et al. (2014). The specific graminoids are stiff sedge (<i>Carex bigelowii</i>), wavy hair-grass (<i>Deschampsia flexuosa</i>), sheep's-fescue (<i>Festuca ovina</i>) and viviparous sheep's-fescue (<i>Festuca vivipara</i>). High levels of grazing of these species would be undesirable as grazing is not required to maintain this habitat
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry (<i>Empetrum nigrum</i>) showing signs of browsing	Attribute and target based on Perrin et al. (2014)

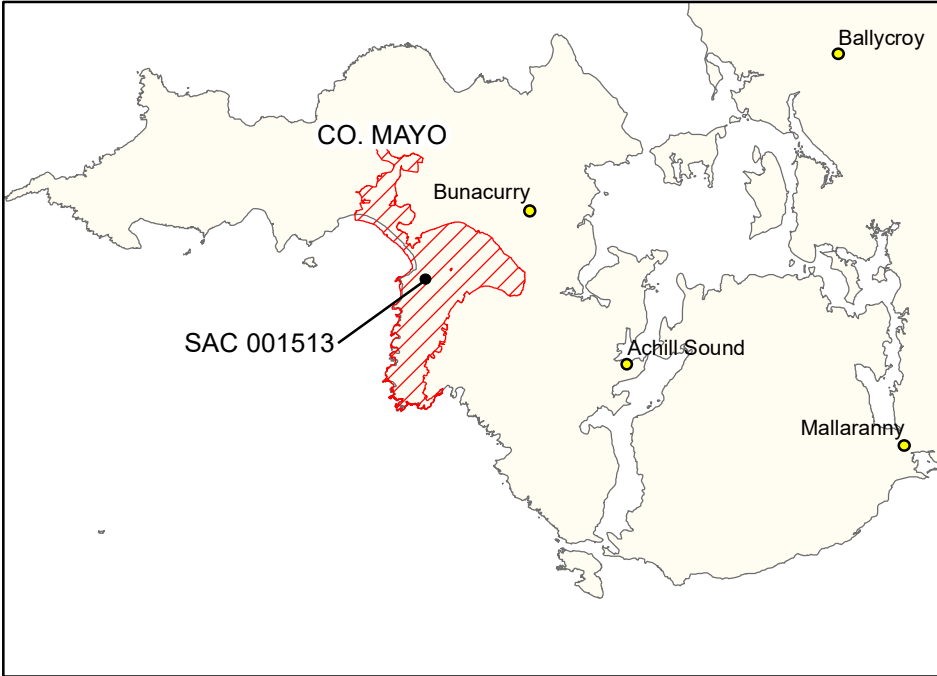
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning within the habitat	Attribute and target based on Perrin et al. (2014). Alpine and Boreal heath does not require burning for the maintenance of the habitat
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Attribute and target based on Perrin et al. (2014). Disturbance can include hoof marks, wallows, human footprints and vehicle and machinery tracks. Excessive disturbance can result in loss of characteristic species and presage erosion for heaths and peatlands
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat	This includes species listed in the Flora (Protection) Order, 2015 and/or the red data lists (Lockhart et al., 2012; Wyse Jackson et al., 2016). The Near Threatened dwarf willow (<i>Salix herbacea</i>) (Wyse Jackson et al., 2016) has been reported from the habitat in the SAC (NPWS internal files). Part of the heath vegetation on Menaun contains Northern Atlantic hepatic mat communities (NPWS internal files)

Conservation Objectives for : Keel Machair/Menaun Cliffs SAC [001513]

1395 Petalwort *Petalophyllum ralfsii*


To maintain the favourable conservation condition of Petalwort in Keel Machair/Menaun Cliffs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Number and geographical spread of populations	No decline, subject to natural processes. See map 4 for recorded locations	The known population of petalwort (<i>Petalophyllum ralfsii</i>) in Keel Machair/Menaun Cliffs SAC occurs at Keel Machair on tightly sheep-grazed turf on the edges of channelised and semi-natural water tracks and on small, partly bare patches of damp unshaded sand on the western and more calcareous side of the machair plain. Data from NPWS surveys (NPWS internal files). See Campbell et al. (2015) for further details
Area of suitable habitat	Hectares	No decline, subject to natural processes	The extent of suitable habitat at Keel Machair has not yet been accurately measured using GPS, but is estimated to be c.10,300m ² (1.03ha) based on NPWS surveys (NPWS internal files). See Campbell et al. (2015) for further details
Hydrological conditions: soil moisture	Occurrence of damp soil conditions	Maintain hydrological conditions so that the substrate is kept moist and damp throughout the year, but is not subject to prolonged inundation by flooding in winter	Petalwort (<i>Petalophyllum ralfsii</i>) grows on damp sandy substrate. Based on Campbell (2013) and Campbell et al. (2015)
Hydrological conditions: water table level	Centimetres in a representative number of 1m x 1m monitoring plots	Mean groundwater level should not be more than 80cm from ground surface	See Campbell et al. (2015) for further details
Physical structure: bare soil	Percentage cover in a representative number of 1m x 1m monitoring plots	Mean percentage cover of bare soil should be more than 5%	At Keel Machair, petalwort (<i>Petalophyllum ralfsii</i>) grows in compacted, sandy ground. There is some threat from potential over-use by vehicles, dumping and mowing at this location (NPWS internal files). See Campbell et al. (2015) for further details
Vegetation structure: vegetation height	Centimetres in a representative number of 1m x 1m monitoring plots	Mean vegetation height should be less than 6cm	Very short vegetation, heavily grazed by sheep, has been reported in petalwort (<i>Petalophyllum ralfsii</i>) habitat at Keel Machair (NPWS internal files). See Campbell et al. (2015) for further details
Vegetation composition: shrub cover	Percentage cover in a representative number of 1m x 1m monitoring plots	Mean percentage shrub cover should be less than 25%	See Campbell et al. (2015) for further details
Vegetation composition: grass cover	Percentage cover in a representative number of 1m x 1m monitoring plots	Mean percentage grass species cover should be less than 60%	Part of this site is managed as a 9-hole pitch and putt course; low intensity management, with only the greens and tees re-seeded, has enabled petalwort (<i>Petalophyllum ralfsii</i>) to survive. Any intensification or expansion should be discouraged (NPWS internal files). See Campbell et al. (2015) for further details



Legend

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MAP 1:
KEEL MACHAIR / MENAUN CLIFFS SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001513; version 3.02
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00.51.5

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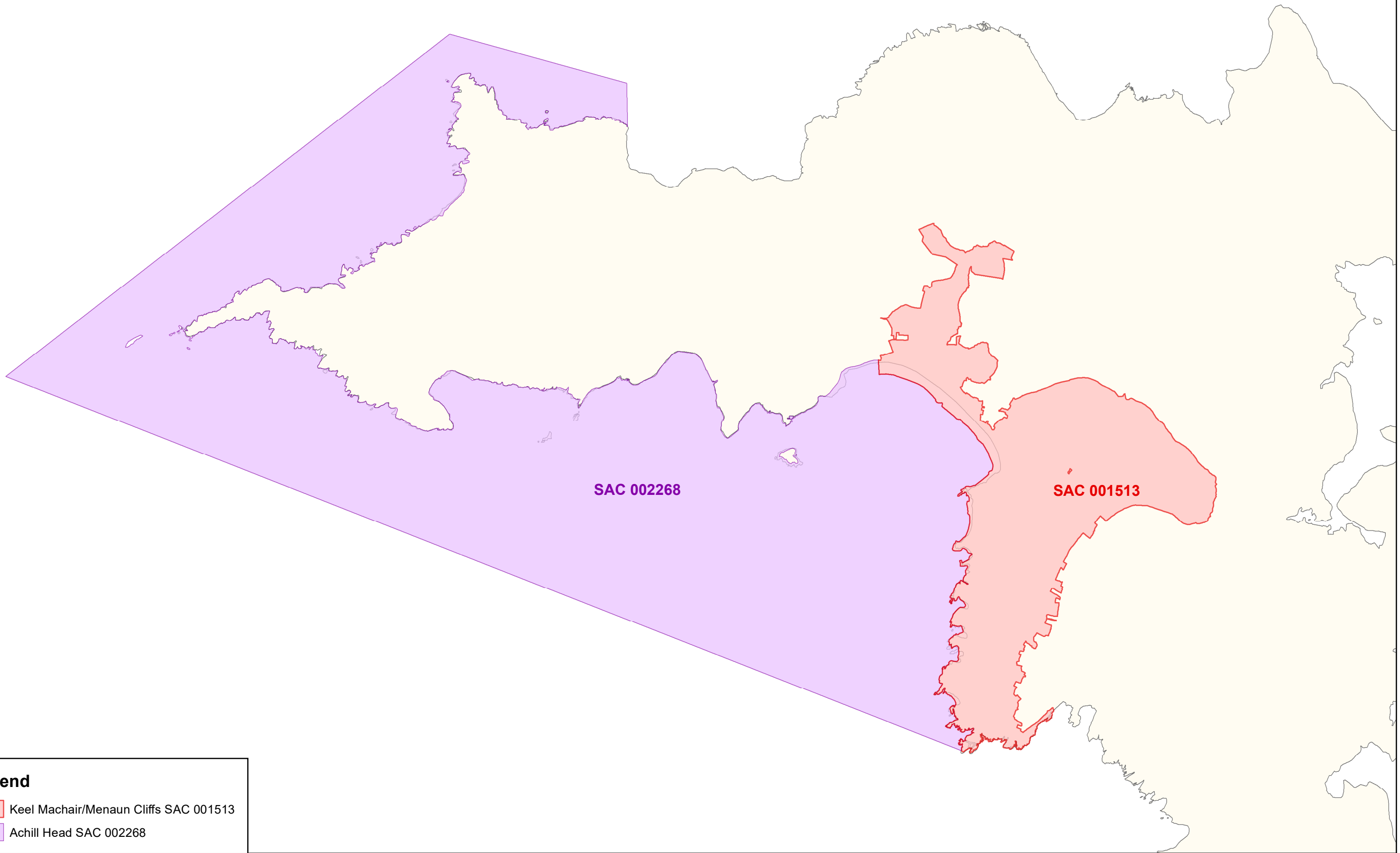
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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- Keel Machair/Menaun Cliffs SAC 001513
- Achill Head SAC 002268

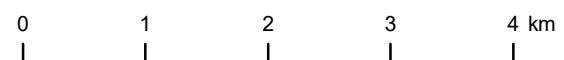


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MAP 2: KEEL MACHAIR/MENAUN CLIFFS SAC CONSERVATION OBJECTIVES ADJACENT / ADJOINING AND OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

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Keel Machair/Menaun Cliffs SAC 001513

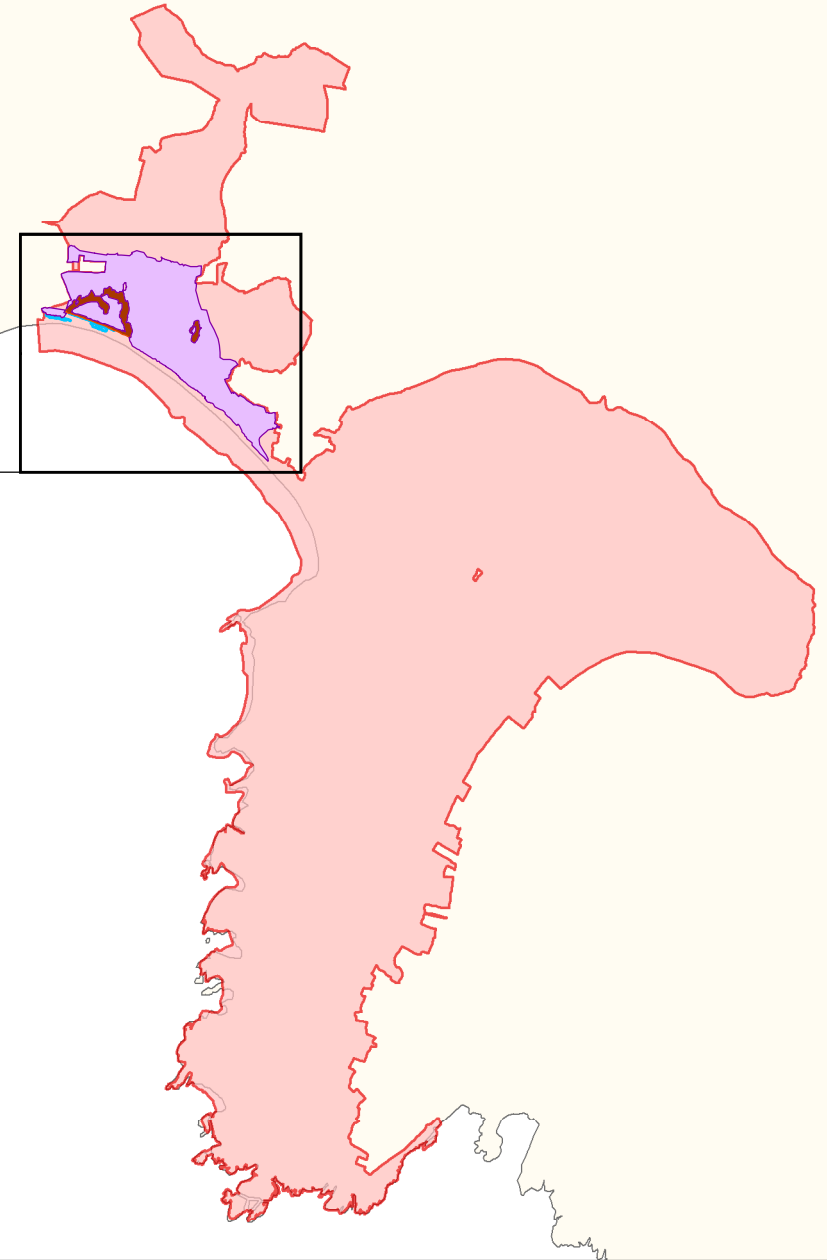
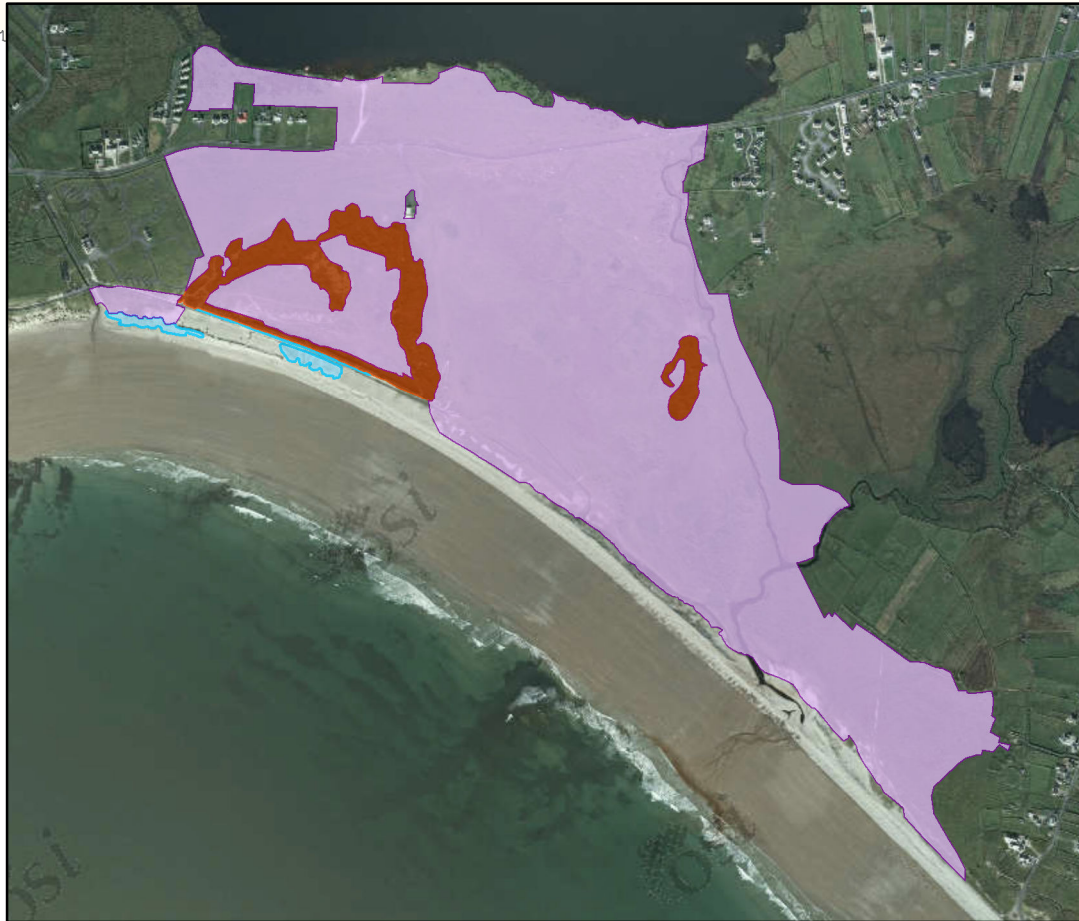
Annex I Qualifying Interest

21A0* Machair

Annex I Non Qualifying Interest

2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")

2130* Fixed dunes with herbaceous vegetation ("grey dunes")

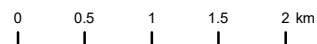


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MAP 3: KEEL MACHAIR/MENAUN CLIFFS SAC CONSERVATION OBJECTIVES COASTAL HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

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