

**Great Island Channel SAC (site code 1058)
Conservation objectives supporting document
-coastal habitats**

NPWS

Version 1

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Please note that the opinions expressed in the site reports from the Saltmarsh Monitoring Project (SMP) are those of the authors and do not necessarily reflect the opinion or policy of NPWS.

Please note that this document should be read in conjunction with the following report: NPWS (2014). Conservation Objectives: Great Island Channel SAC 001058. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

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 (Commission of the European Communities, 2007). 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.

Great Island Channel SAC stretches from Little Island to Midleton in County Cork, with its southern boundary formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The main habitats of conservation interest at this site are, the sheltered tidal sand and mudflats and Atlantic salt meadows. The saltmarshes of Great Island Channel are scattered through the site and are all of the estuarine type on mud substrate.

While the main land use within the site is aquaculture (Oyster farming), the greatest threats to its conservation significance comes from road works, infilling, sewage outflows and possible marina developments.

The following coastal habitat is included in the qualifying interests for the SAC (* denotes a priority habitat):

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (ASM) (1330)

This backing document sets out the conservation objective for the coastal habitat listed above in Great Island Channel 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 latter of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for the **saltmarsh habitats** are based primarily on the results of the Saltmarsh Monitoring Project (SMP) (McCorry & Ryle, 2009) and this document should be read in conjunction with that report.

The SMP surveyed, mapped and assessed a total of two sub-sites within Great Island Channel SAC (McCorry & Ryle, 2009):

1. Bawnard
2. Carrigatohil

As part of the SMP detailed individual reports and habitat maps were produced for each sub-site and these are included in a set of Appendices to this document (Appendix II and III). The conservation objective for the saltmarsh habitat in Great Island are based on a combination of the findings of the individual reports for each of these sub-sites. There are additional areas of saltmarsh known to be present within the site, including 16.84ha of potential ASM that was identified from an examination of aerial photographs. It is estimated that the two sub-sites as surveyed by the SMP represents approximately 7% of the total area of saltmarsh within Great Island Channel SAC.

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.

3 Saltmarsh habitats

Saltmarshes are stands of vegetation that occur along sheltered coasts, mainly on mud or sand, and are flooded periodically by the sea. They are restricted to the area between mid neap tide level and high water spring tide level. In Ireland, there are four saltmarsh habitats listed under Annex I of the EU Habitats Directive (92/43/EEC):

- *Salicornia* and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) (ASM) (1330)
- Mediterranean salt meadows (*Juncetalia maritimi*) (MSM) (1410)
- Mediterranean and thermo-Atlantic halophilous scrub (1420)

Only Atlantic salt meadows are listed as a Qualifying Interest for Great Island Channel SAC. The SMP recorded *Salicornia* flats at Carrigatohil however this habitat is not listed as a qualifying interest for this SAC. Detailed descriptions of each habitat in the two sub-sites recorded by McCorry & Ryle (2009) in Great Island can be found in Appendices II & III.

The SMP surveyed, mapped and assessed a total of two sub-sites within Great Island Channel SAC (McCorry & Ryle, 2009):

- 1 Bawnard (Appendix II)
- 2 Carrigatohil (Appendix III)

Atlantic salt meadows were recorded at both sub-sites by the SMP. *Salicornia* flats were also recorded at the Carrigtohil sub-site.

Bawnard saltmarsh is located in the north-eastern part of Cork Harbour, 3.4km south of Midleton in Co. Cork. This part of Cork Harbour is quite sheltered and forms the estuary of the Dungourney River, flowing from Midleton. Bawnard is found in the small sheltered bay isolated from the main estuary. The saltmarsh habitat fringes around the shoreline of the small bay at Bawnard. Most of the habitat is found at the head of the bay. There are two small shingle spits extending from the northern and southern sides of the bay that shelter much of this bay. The entire bay empties at low tide to expose intertidal mudflats (McCorry & Ryle, 2009).

Carrigtohil saltmarsh is located in Cork Harbour along the northern side of Foaty Island and 1km east of Carrigtohil Village. This part of Cork Harbour is called Slatty Water and is part of the secondary branch of the estuary that is positioned between little Island and Foaty Island. The saltmarsh habitat is mainly found fringing the southern Slatty Water shoreline (the northern shoreline of Foaty Island) (McCorry & Ryle, 2009).

Two other saltmarshes that are listed on the Saltmarsh Inventory (Curtis & Sheehy-Skeffington, 1998) also occur in Great Island Channel SAC but were not surveyed by the SMP, namely, Harper's Island and Foaty Island (McCorry & Ryle, 2009).

3.1 Overall Objectives

The overall objective for 'Atlantic salt meadows' in Great Island Channel SAC is to '*restore the favourable conservation condition*'.

This objective is based on an assessment of the current condition of each 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 extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is no decrease in extent from the baseline which was established by McCorry and Ryle (2009). Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion and succession.

Baseline habitat maps were produced for the saltmarsh in Great Island during the SMP. These maps are included with the individual site reports in the Appendices at the end of this document.

The total areas of each saltmarsh habitat within the SAC and the total area of the habitat within each sub-site as mapped by the SMP are presented in the following tables.

There are a number of differences in the figures below. Most of the differences can be explained by the fact that the SMP mapped the total saltmarsh resource at each sub-site and not all of the saltmarsh mapped is contained within the SAC boundary. In addition, the total area within the SAC can be greater than given in the SMP as the SMP did not always include mosaics when calculating their total areas. The following rules were applied when calculating the areas for the site's conservation objectives:

1. Where a polygon was identified as a mosaic of an Annex I habitat and a non-Annex I habitat, then the entire area was counted as the Annex I habitat.
2. Where a polygon was identified as a mosaic of two Annex I habitats, the area was divided 50:50 for each habitat.

Sub-site	Total area (ha) of ASM (excluding mosaics) from SMP	Total area (ha) of ASM within SAC boundary (including mosaics)
Bawnard	0.388	0.29
Carrigatohill	1.245	1.01
Potential ASM	17.604	17.60
Total	19.237	1890

The target for the Atlantic salt meadow habitat is that the area should be increasing, subject to natural processes, including erosion and succession.

3.3 Range

3.3.1 Habitat distribution

In the national inventory of saltmarshes in Ireland, Curtis and Sheehy Skeffington (1998) list four saltmarsh sites within Great Island Channel SAC:

1. Harpers Island
2. Carrigtohil
3. Foaty
4. Bawnard

All of the saltmarshes within the site are estuarine on a mud substrate. The CMP surveyed two of these sites at Bawnard and Carrigatohil. Saltmarshes occur elsewhere in the site, mostly as narrow fringes along the shoreline or in sheltered inlets such as Rossmore Bay. While no specific saltmarsh is particularly extensive in area, saltmarsh habitat is considered well represented.

The target is that there should be no decline or change in the distribution of these saltmarsh habitats, unless it is the result of natural processes, including erosion, accretion and succession.

3.4 Structure and Functions

The location, character and dynamic behaviour of saltmarshes are governed by sediment supply, tidal regime, wind-wave climate and sea level change. The slope of the saltmarsh allows the development of several ecological gradients such as tidal submergence and salinity, and this influences the development of distinctive zones of halophytic and salt tolerant plant communities. Maintaining the favourable conservation condition of the saltmarsh habitats in Great Island in terms of its structure and functions depends on a range of attributes for which targets have been set as outlined below.

3.4.1 Physical structure: sediment supply

Accretion and erosion are natural elements of saltmarsh systems. Maintaining the sediment supply is vital for the continued development and natural functioning of a saltmarsh system. Interruption to the sediment circulation through physical structures can starve the system and lead to accelerated erosion rates.

At Bawnard, there are no indications of any significant erosional trend. The SMP noted some signs of erosion along the lower saltmarsh boundary but these are not significant. This area is quite sheltered resulting in low erosional pressure. The SMP also noted that the saltmarsh habitat at this site had been modified or destroyed in the past due to land use changes and reclamation. The most obvious is the sea wall along the eastern side of the bay which was probably built in the 18th-19th centuries. Part of the shoreline along the southern side has also been infilled in the past (McCorry & Ryle, 2009).

At Carrigatohil, the northern and eastern shorelines of the Slatty Water have been significantly modified by road construction. Part of the saltmarsh has also been infilled (probably between 2001-2005). This saltmarsh was visible on the 2000 series aerial photos but is now completely destroyed and covered in spoil. The SMP noted that there were no indications of significant erosional trend at Carrigatohil (McCorry & Ryle, 2009).

The target is to maintain the natural circulation of sediment and organic matter, without any physical obstructions.

3.4.2 Physical structure: creeks and pans

Saltmarshes can contain a distinctive topography with an intricate network of creeks and pans occurring on medium to large-sized sites. Creek density is influenced by vegetation cover, sediment supply and tidal influence. Creeks absorb tidal energy and assist with delivery of sediment into the saltmarsh. The efficiency

of this process depends on creek pattern. Creeks allow pioneer vegetation to become established along their banks higher up into the saltmarsh system. Major erosion of saltmarsh is indicated by internal dissection and enlargement of the drainage network, ultimately leading to the creation of mud basins.

The ASM topography at Carrigatohil is poorly developed, though some of the larger sections do contain salt pans. The smaller sections of saltmarsh tend to be quite uniform in topography. Several sections are drained by small creeks leading from drainage channels from the adjacent woodland (McCorry & Ryle, 2009).

The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features (McCorry & Ryle, 2009).

The target is to maintain creek and pan networks where they exist and to restore areas that have been altered.

3.4.3 Physical structure: flooding regime

The regular ebb and flow of the tide brings salinity, but also nutrients, organic matter and sediment, which are central to the development, growth and indeed survival of saltmarshes. Saltmarsh vegetation consists of a limited number of halophytic (salt-tolerant) species that are adapted to regular immersion by the tides. Species in the lowest part of the saltmarsh require regular inundation, while those higher up on the marsh can only tolerate occasional inundation.

At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats (McCorry & Ryle, 2009).

The target is to maintain a flooding regime whereby the lowest levels of the saltmarsh are flooded daily, while the upper levels are flooded occasionally (e.g. highest spring tides).

3.4.4 Vegetation structure: zonation

Saltmarshes are naturally dynamic coastal systems. As is the case on the majority of Irish saltmarshes, ASM is the dominant saltmarsh habitat at Great Island where it occurs in a mosaic with other saltmarsh habitats, including '*Salicornia* and other annuals colonising mud and sand'. In order to ensure the ecological functioning of all of the saltmarsh habitats it is vital to maintain the zonations and transitions to other habitats, including inter-tidal, shingle and sand dune habitats.

At Bawnard, the saltmarsh located behind the eastern seawall at the northern side exhibits typical succession from ASM saltmarsh to brackish saltmarsh dominated by tall reeds and then to wet grassland at the back of the field. There is also a transition from typical ASM to a stand dominated by sea club-rush (*Bolboschoenus maritimus*). Also at Bawnard, there is a natural unmodified habitat zonation to intertidal mudflats along the lower saltmarsh boundary where there is no *Spartina* sward (McCorry & Ryle, 2009).

At Carrigatohil there is a natural vegetation succession from ASM pioneer vegetation community to patches of *Salicornia* flats. There are also transitions at the lower saltmarsh boundary to soft intertidal mudflats (McCorry & Ryle, 2009).

The target is to maintain the range of coastal habitats, including transitional zones, subject to natural processes including erosion and succession.

3.4.5 Vegetation structure: vegetation height

A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. Grazing is often used as a tool for maintaining structural diversity in the sward but stocking levels need to be appropriate. Overgrazing can lead to loss of species and destruction of the vegetation cover, while undergrazing can lead to a loss of plant diversity due to competitive exclusion.

At Carrigatohil, the sward height (10-20cm) is quite tall due to the lack of grazing (McCorry & Ryle, 2009).

At Bawnard, part of the site is grazed by cattle. The ASM behind the eastern seawall is grazed and there are signs of heavy poaching in places. The saltmarsh found around the other shorelines is not accessible to livestock and is not grazed (McCorry & Ryle, 2009).

The target is to maintain structural variation within the sward. A general guideline is that there should be a sward ratio of 30% tall:70% short across the entire saltmarsh.

3.4.6 Vegetation structure: vegetation cover

Vegetation cover can have a major effect on saltmarsh development by reducing the velocity of the tide and thereby enhancing the deposition of sediment. Excessive bare mud, however, is often a sign of overuse by livestock or humans and can lead to destabilisation and accelerated erosion of the system.

The target is to maintain 90% of the area outside of the creeks vegetated.

3.4.7 Vegetation composition: typical species & sub-communities

Saltmarshes contain several distinct zones that are related to elevation and frequency of flooding. The lowest part along the tidal zone is generally dominated by the most halophytic (salt-tolerant) species including common saltmarsh-grass (*Puccinellia maritima*) and species more usually associated with *Salicornia* muds. The mid-marsh zone is generally characterised by sea thrift (*Armeria maritima*), sea plantain (*Plantago maritima*) and sea aster (*Aster tripolium*). This mid-zone vegetation generally grades into

an herbaceous community in the upper marsh, dominated by red fescue (*Festuca rubra*), sea milkwort (*Glaux maritima*) and saltmarsh rush (*Juncus gerardii*).

The target for this attribute is to ensure that a typical flora of saltmarshes is maintained, as are the range of sub-communities within the different zones. Below are lists of typical species for the different saltmarsh zones, although some of these species have a restricted distribution nationally and may not occur in the Great Island area.

Typical species		
Lower marsh	Low-mid marsh	Mid-upper marsh
<i>Salicornia</i> spp.	<i>Puccinellia maritima</i>	<i>Festuca rubra</i>
<i>Suaeda maritima</i>	<i>Triglochin maritima</i>	<i>Juncus gerardii</i>
<i>Puccinellia maritima</i>	<i>Plantago maritima</i>	<i>Armeria maritima</i>
<i>Aster tripolium</i>	<i>Atriplex portulacoides</i>	<i>Agrostis stolonifera</i>
	<i>Aster tripolium</i>	<i>Limonium humile</i>
	<i>Spergularia</i> sp.	<i>Glaux maritima</i>
	<i>Suaeda maritima</i>	<i>Seriphidium maritimum</i>
	<i>Salicornia</i> spp.	<i>Plantago maritima</i>
	<i>Glaux maritima</i>	<i>Aster tripolium</i>
		<i>Juncus maritimus</i>
		<i>Triglochin maritima</i>
		<i>Blysmus rufus</i>
		<i>Eleocharis uniglumis</i>
		<i>Leontodon autumnalis</i>
		<i>Carex flacca</i>
		<i>Carex extensa</i>

3.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species recorded on saltmarshes during the SMP was common cordgrass (*Spartina anglica*). This species was recorded in Great Island Channel SAC by the SMP (McCorry & Ryle, 2009).

At Bawnard, *Spartina* sward distribution is patchy and is mainly scattered along the shoreline. Most of the *Spartina* at this site is found adjacent to the ASM (McCorry & Ryle, 2009).

At Carrigatohil, the *Spartina* sward is not extensive and is mainly formed from coalescing large clumps of *Spartina* growing on soft mud (McCorry & Ryle, 2009).

The aim is that negative indicators such as *Spartina* should be absent or under control. The current target for this particular site is no significant expansion and an annual spread of less than 1%.

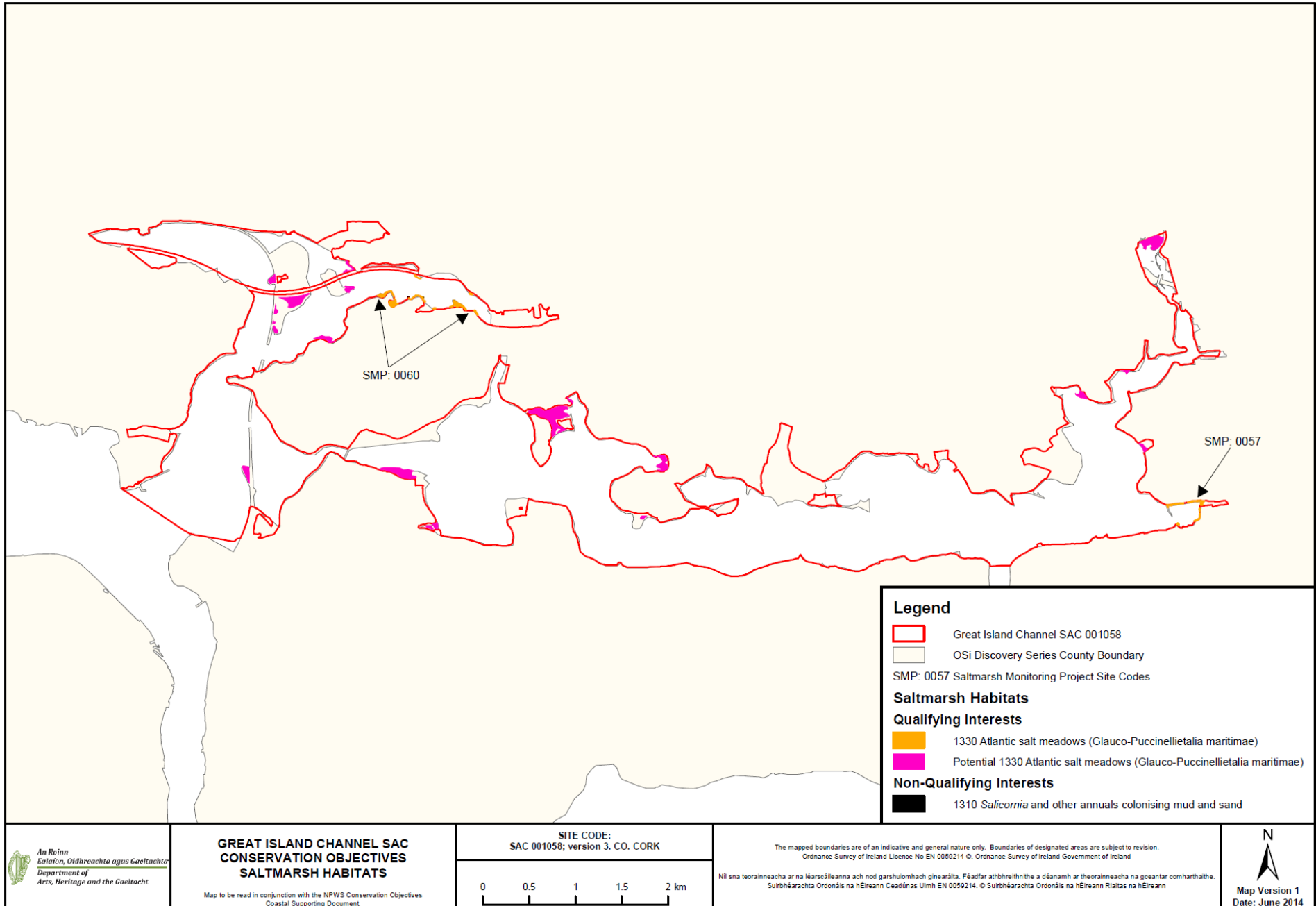
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Commission of the European Communities (2007). *Interpretation Manual of European Union Habitats – EUR 27*. DG Environment – Nature and Biodiversity, Brussels.

Curtis, T.G.F. and Sheehy Skeffington, M.J. (1998). The saltmarshes of Ireland: an inventory and account of their geographical variation. *Biology and Environment, Proceedings of the Royal Irish Academy* 98B: 87-104.

McCorry, M. & Ryle, T. (2009). *Saltmarsh Monitoring Project 2007-2008*. Unpublished report to the National Parks and Wildlife Service, Dublin.

Appendix I – Distribution map of saltmarsh habitats within Great Island Channel SAC

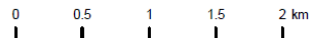


An Roinn
Eolaíochta, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

**GREAT ISLAND CHANNEL SAC
CONSERVATION OBJECTIVES
SALTMARSH HABITATS**

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

SITE CODE:
SAC 001058; version 3. CO. CORK



The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Map Version 1
Date: June 2014

Appendix II – Bawnard site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: Bawnard	SMP site code: SMP0057
Date of site visit 16/06/2008	CMP site code: N/A
SM inventory site name: Bawnard	SM inventory site code: 198
NPWS Site Name: Great Island Channel	
NPWS designation cSAC: 1058	MPSU Plan: N/A
pNHA: 1058	SPA: 4030
County: Cork	Discovery Map: 81 Grid Ref: 188160, 070095
Aerial photos (2000 series): O 6432-D; O 6433-C; O 6474-B	6 inch Map No: Co 088
Annex I habitats currently listed as qualifying interests for Great Island Channel cSAC: H1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	
Other SMP sites within this SAC/NHA: Carrigatohil	
Saltmarsh type: Estuary	Substrate type: Mud

2 SITE DESCRIPTION

Bawnard saltmarsh is located in the north-eastern part of Cork Harbour, 3.4 km south of Midleton, in Co. Cork. This part of Cork Harbour is quite sheltered and forms the estuary of the Dungourney River, flowing from Midleton. Bawnard is found in a small sheltered bay isolated from the main estuary. The landscape to the north of the site is low-lying while there is a large hill along the southern side. The area is dominated by agricultural land. There are scattered houses and other buildings along roads to the east and the south of the site. Great Island is located to the west of the site.

The saltmarsh habitat fringes around the shoreline of the small bay at Bawnard. Most of the habitat is found at the head of the bay. There are two small shingle spits extending from the northern and southern sides of the bay that shelter much of this bay. The entire bay empties at low tide to expose soft intertidal mudflats. There were some green algal mats on the mudflats during the survey. The shoreline has been modified around the bay in the past and there is a low seawall along the eastern shore. Some of the land behind this seawall is inundated by the tide and contains saltmarsh. Saltmarsh also appears along the base of the seawall. Some of the southern shore has been infilled and is utilized for industrial use.

One Annex I saltmarsh habitat is found at Bawnard saltmarsh, Atlantic salt meadow (ASM). There is also some development of *Spartina* swards within this site, although this is not considered to qualify as an Annex I habitat. Atlantic salt meadow is the only saltmarsh habitat listed as a qualifying interest for this cSAC. Several of the other nearby saltmarshes are listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and were also surveyed during the Saltmarsh Monitoring Project (Carrigatohil located north-west of this site). Two other sites listed on the SM inventory and found in this cSAC, (Harper's Island and Foaty Island), were not surveyed during the SMP.

Most of saltmarsh habitat mapped at this site is located within the cSAC boundary. However there are several small patches located outside the boundary. This is mainly due to the fact that saltmarsh habitat extends above the upper shoreline boundary on the OSI 6 inch map, which was used to draw some of the cSAC boundaries. Therefore saltmarsh habitat was excluded in error.

The shoreline was accessed via private property towards the south-west of the site. Permission was sought to access the shoreline.

3 SALTMARSH HABITATS

General description

Bawnard is a very small saltmarsh site. The main Annex I saltmarsh habitat found at this site is Atlantic salt meadows (Table 3.1). There is also some development of *Spartina* swards on mudflats and adjacent to ASM along the shoreline. The majority of the saltmarsh habitat is located behind an old seawall with several breaches. A narrow band of ASM vegetation or patches of *Spartina* sward develops along the base of this seawall in places. There are also several larger isolated patches of *Spartina* sward further out on the mudflats. ASM continues along the northern shoreline where it is quite narrow and also extends along the back of the shingle spit. There is also a continuous narrow band of *Spartina* sward along the seaward side of the ASM on the northern shoreline. Both ASM and *Spartina* sward are also quite patchy in distribution along the southern shoreline.

Two of the largest patches of ASM are found behind the old seawall in the north-eastern and south-eastern corners of the small bay that form the outer parts of several fields. The land behind the seawall is somewhat low-lying. Most of this saltmarsh habitat found behind the old seawall is actually brackish and contains other saltmarsh communities such as stands of Sea Club-rush (*Bolboschoenus maritimus*), Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*) and mixed transitional brackish and wet grassland vegetation. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project. Twitch (*Elytrigia repens*)-dominated grassland was also classified as other saltmarsh (CM2). Saltmarsh located behind the eastern seawall at the northern side does have some typical vegetation succession from ASM saltmarsh to brackish saltmarsh dominated by tall reeds and then to wet grassland at the back of the field. There is a transition from typical ASM to a stand dominated by Sea Club-rush and also containing Sea Plantain, Creeping Bent, Red Fescue, Sea Milkwort and Common Survey-grass. Sea Club-rush becomes more dominant towards the landward side of the reeds.

The southern section has developed on a steeper topography so the vegetation successions are more abrupt and there is development of mixed wet grassland, brackish reed communities and some ASM. This vegetation community contains Sea Club-rush, Red Fescue, grey Club-rush, Celery-leaved Buttercup (*Ranunculus sceleratus*), Creeping Bent, Sea Rush, Hard Rush (*Juncus inflexus*). There are several patches of more typical ASM vegetation within this area that are dominated by Sea Plantain (*Plantago maritima*) and Red Fescue (*Festuca rubra*) but these are very minor in area and are found along the low-lying channel that drains this area and allows the tide to inundate it. The total area of the brackish (CM2 type) saltmarsh is greater than the ASM found at the site. While Sea Rush was recorded at this site it was not considered to form a typical Mediterranean salt meadow (MSM) community and its cover was limited.

There is a natural unmodified habitat zonation to intertidal mudflats along the lower saltmarsh boundary where there is no *Spartina* sward. Most of the ASM has developed on thin substrate and there is mixed substrate along the seaward boundary. This boundary is marked by the edge of the saltmarsh substrate and there is no SM cliff. Some of the lower ASM boundary is marked by a transition from ASM to *Spartina* sward. Some of the *Spartina* sward has developed on the mixed substrate around the shoreline. The substrate contains more shingle and pebbles towards the northern shingle bar. Some of the ASM has grown over this shingle behind the bar. Some of the lower ASM boundary has been modified in the past by the construction of the seawalls.

The upper saltmarsh boundaries have also been significantly modified by reclamation around the site in the past. Saltmarsh that has developed on the northern and southern shorelines is usually located adjacent to a

treeline or hedgerow positioned on a low earth bank along the shore. The southern shoreline has been significantly modified by construction of houses and other building close to the shoreline and parts have been infilled in the past. There is some development of upper non-Annex habitat vegetation dominated by Twitch (*Elytrigia repens*) and Sea Couch-grass (*Elytrigia pycnanthus*) along the upper boundary of the ASM located in the south-east corner, in front of the seawall. This vegetation type also contains Sea Beet (*Beta maritima*), Curled Dock (*Rumex crispus*) and Red Fescue.

Table 3.1. Area of saltmarsh habitats mapped at Bawnard.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)	0.388
non-Annex	<i>Spartina</i> swards	0.246
	Total	0.634

*note that saltmarsh habitat may continue outside the mapped area.

Atlantic salt meadows (H1330)

The ASM at this site is relatively poorly developed with only small narrow portions of habitat present. However, due to a variety of shoreline topography and impacts of disturbance there are several vegetation communities present. Most of the ASM has developed on a thin layer of mud and some of the saltmarsh has developed on mixed substrate. The ASM found in the fields at the eastern side of the bay is grazed has a low sward height and sections are badly poached with a high cover of bare mud substrate. ASM found around northern and southern sides of the bay and along the seaward side of the seawall is not grazed and has a variable sward height related to the community type.

The saltmarsh found along the base of the seawall is not grazed and contains Lax-flowered Sea Lavender, Sea Plantain, Sea Milkwort, Sea Purslane, Sea Arrowgrass and Common Saltmarsh-grass. There are also some clumps of Common Cordgrass but the cover of this species within the ASM is minor. This ASM is quite limited in area being only several metres wide. There is some minor zonation of species in several sections, although there is no development of different communities. Some of the ASM along the seawall is a pioneer community with species such as Annual Sea-blite, Lax-flowered Sea Lavender and Common Saltmarsh-grass dominating the vegetation. This community is quite open and is colonising mixed gravelly substrate along the base of the seawall.

ASM saltmarsh found at the north-eastern corner of the site and behind the seawall is heavily poached. The vegetation is dominated by Common Saltmarsh-grass, Sea Arrowgrass, Creeping Bent, Saltmarsh Rush, Sea Aster, Sea Milkwort and Greater Sea-spurrey. This vegetation community is not typical and may be related to the heavy poaching damage with colonisation of the ground by grasses such as Creeping Bent and common Saltmarsh-grass. There is a band of dry grassland (GS1) along the seaward side adjacent to the seawall. This area is flooded via a small breach in the seawall. There is some zonation of the ASM vegetation along this ridge with Creeping Bent and White Clover becoming dominant. There is also some development of a sward dominated by Saltmarsh Rush and also by Red Fescue towards the landward side of this area. There is no Common Cordgrass within the ASM behind the seawall.

The narrow band of ASM found along the northern shoreline is heavily shaded by the adjacent tree-line. The vegetation is dominated by Lax-flowered Sea Lavender and is quite open with frequent cover of green algae. The ASM becomes dominated by Sea Purslane towards the north-western corner of the site and where the shingle spit meets the shoreline.

The saltmarsh topography at this site is poorly developed with few typical saltmarsh features. Most of the saltmarsh is quite narrow so typical salt pan and creek features would not be expected to develop.

***Spartina* swards**

A small amount of *Spartina* sward is found in this site and its patchy distribution, mainly scattered around the shoreline. Most of the *Spartina* sward is found adjacent to ASM vegetation. The narrow band of *Spartina* sward (< 5 m wide) along the northern shoreline is quite diffuse in places and is represented by scattered clumps of Common Cordgrass. There is a natural unmodified transition between the *Spartina* sward and the ASM. Lax-flowered Sea Lavender, Sea Plantain and Common Saltmarsh-grass appear in the upper part of the *Spartina* sward. There are also several isolated patches of *Spartina* sward located on the mudflats. There are also scattered isolated small clumps along the seaward edge of the eastern seawall and the southern shoreline. There were no indications of any significant spread of Common Cordgrass in the recent past.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 4.1). Part of the site is grazed by cattle (140). The ASM and non-Annex saltmarsh located behind the eastern seawall is grazed and there are signs of heavy poaching in places (143). Saltmarsh found around the other shorelines is not accessible to livestock and is not grazed. There has also been some recent infilling (803) around the site within the current monitoring period. Some of this infilling is located north-west of the shingle spit and does not affect any saltmarsh habitat. There has also been some infilling behind the eastern seawall at one location adjacent to the ASM but the ASM has not been affected.

Common Cordgrass is present at this site. This is an invasive species of saltmarsh (954). It was planted in Cork Harbour at Inchera House, Little Island in 1925 (Glavin 1947) although it is not known when it appeared in this part of the estuary. Common Cordgrass does not form a significant part of the ASM vegetation and its overall cover is quite low (< 5%). Therefore the impact of its presence is assessed as neutral. The *Spartina* sward cover is quite low relative to the cover of ASM saltmarsh and the remaining intertidal mudflats. There are no indications that it has spread significantly during the current monitoring period from the survey or from an examination of the aerial photos. There are also no indications that it has spread at the expense of ASM habitat. Common Cordgrass does form extensive swards in other parts of Cork Harbour.

There are no indications of any significant erosional trend at this site (900). There are some signs of erosion along the lower saltmarsh boundary but these are not significant. This area is quite sheltered so it is likely that erosional pressure in this area is quite low. A comparison of the OSI 2nd edition 6 inch map to the current OSI 2005 series aerial photos shows that there have been no significant changes to the shoreline during this period. A comparison of the 1995, 2000 and 2005 OSI aerial photos also shows that there has been no measurable loss of saltmarsh habitat by erosion during the monitoring period. The impact of erosion is assessed as neutral.

There is evidence around this site that saltmarsh habitat has been modified or destroyed in the past due to land use changes and reclamation. The most visible sign of these modifications is the seawall along the eastern side of the bay, probably built in the 18th-19th centuries (871). Part of the shoreline along the southern side of the bay has also been infilled in the past (803). 1995 series aerial photos are not available for this area so it is not known if this infilling occurred during the current monitoring period. However a visual assessment indicated that infilling probably occurred prior to the current monitoring period.

The main Impacts and activities adjacent to the site are related to agriculture. Improved grassland adjacent to the site is grazed (140) and some is also fertilised (120) and cut (102) for cattle fodder. Other impacts and activities include dispersed habitation (403) and roads (502). Part of the shoreline is used by a waste disposal company and there is some run-off from this site into the bay (424). There is also a discharge pipe in the centre of the bay. The impact of these discharges is likely to be limited. There is also some recent housing development around the site (402). The agricultural activities have little or no measurable impact on the saltmarsh habitats.

Table 4.1. Intensity of various activities on saltmarsh habitats at Bawnard.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	803	C	-1	0.388	Inside
1330	900	C	0	0.002	Inside
1330	954	C	0	0.388	Inside

¹ EU codes as per Interpretation Manual.

² Description of activity codes are found in Appendix III, Summary Report 2007-2008.

³ Intensity of the influence of an activity is rated as A = high, B = medium, C = low influence and D unknown.

⁴ Impact is rated as -2 = irreparable negative influence, -1 = reparable negative influence, 0 = neutral, +1= natural positive influence and +2 = strongly managed positive influence.

⁵ Location of activity: Inside = activities recorded within and directly impacting the saltmarsh habitat, outside = activities recorded outside but adjacent to saltmarsh habitat that are impacting the saltmarsh habitat.

5 CONSERVATION STATUS

Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the 1995, 2000 and 2005, OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There are no specific notes in the NHA survey for the saltmarsh at this site.

Bawnard saltmarsh is a relatively small site with few features of conservation interest. The overall conservation status of this site is assessed as *unfavourable- inadequate* (Table 5.1). The saltmarsh is relatively poorly developed and the main sections have been modified in the past by the construction of a seawall along the shoreline. Most of the saltmarsh is in relatively good condition although some parts are badly poached. Common Cordgrass is present at this site but does not form a significant area of *Spartina* sward on the adjacent mudflats and does not form a significant part of the ASM vegetation either.

The medium-term future prospects of natural landward saltmarsh migration in response to sea level rise are moderate. ASM is located behind a seawall and there is a natural un-modified transition to brackish reed communities and transitional wet grassland vegetation. There are some prospects for ASM development in the north-east and south-east corner of the site into these brackish and transitional communities.

This site is located within the Great Island Channel cSAC and pNHA. A NPWS Conservation management plan is not available for this cSAC.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Bawnard.

Habitat	EU Conservation Status Assessment			Overall EU conservation status assessment
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad	
Atlantic salt meadows (1330)	Extent	Structure and functions, Future prospects		Unfavourable - Inadequate

Atlantic salt meadows (H1330)

Extent

The extent of this habitat is assessed as *favourable* even though the total area of habitat is relatively low. There are no indications of any loss of habitat due to land-use changes, erosion or the spread of Common Cordgrass within the current monitoring period. ASM may have been more extensive in the past before the construction of the seawall around the eastern side of the site. However, the impact of the seawall is not assessed as it was constructed prior to the current monitoring period.

Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Four monitoring stops were carried out in this habitat and only one of these stops failed. Most of the attributes required for the structure and functions of this habitat reached their targets for each monitoring stop. The stop that failed was located in an area of ASM that was severely poached. However, most of the habitat is in relatively good condition and is not grazed. The sward height is diverse and sward cover of most of the habitat is largely intact. The ASM contains several different vegetation communities, although zonation is poorly developed because the habitat is quite small. The diversity of the ASM is related to modifications to the site in the past and the construction of the seawall. This led to the development of saltmarsh at two different levels, at the base of the wall and in parts behind the seawall. The diversity of the vegetation was typical of this habitat.

Common Cordgrass is present within this habitat but only a few clumps are present and it does not form a significant part of the ASM habitat. The impact of its spread is assessed as neutral.

The saltmarsh topography at this site is poorly developed but this is typical of a small site. There is some zonation and un-modified transition to *Spartina* swards at the lower ASM boundary. However, much of the upper boundary of the saltmarsh has been modified in the past. There are also some natural vegetation successions to wet grassland and brackish reed communities present.

Future prospects

The future prospects of this habitat are assessed as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts continue in the near future. There are few impacts significantly affecting this site. The most significant impact was poaching in some of the saltmarsh located behind the seawall. There has been some infilling around the site but this does not affect any saltmarsh habitat. The site may be vulnerable to infilling in the future. This assessment assumes there will be no further infilling of saltmarsh although portions may be vulnerable to further infilling in the future. Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities.

6 MANAGEMENT RECOMMENDATIONS

There are no management recommendations for this site.

7 REFERENCES

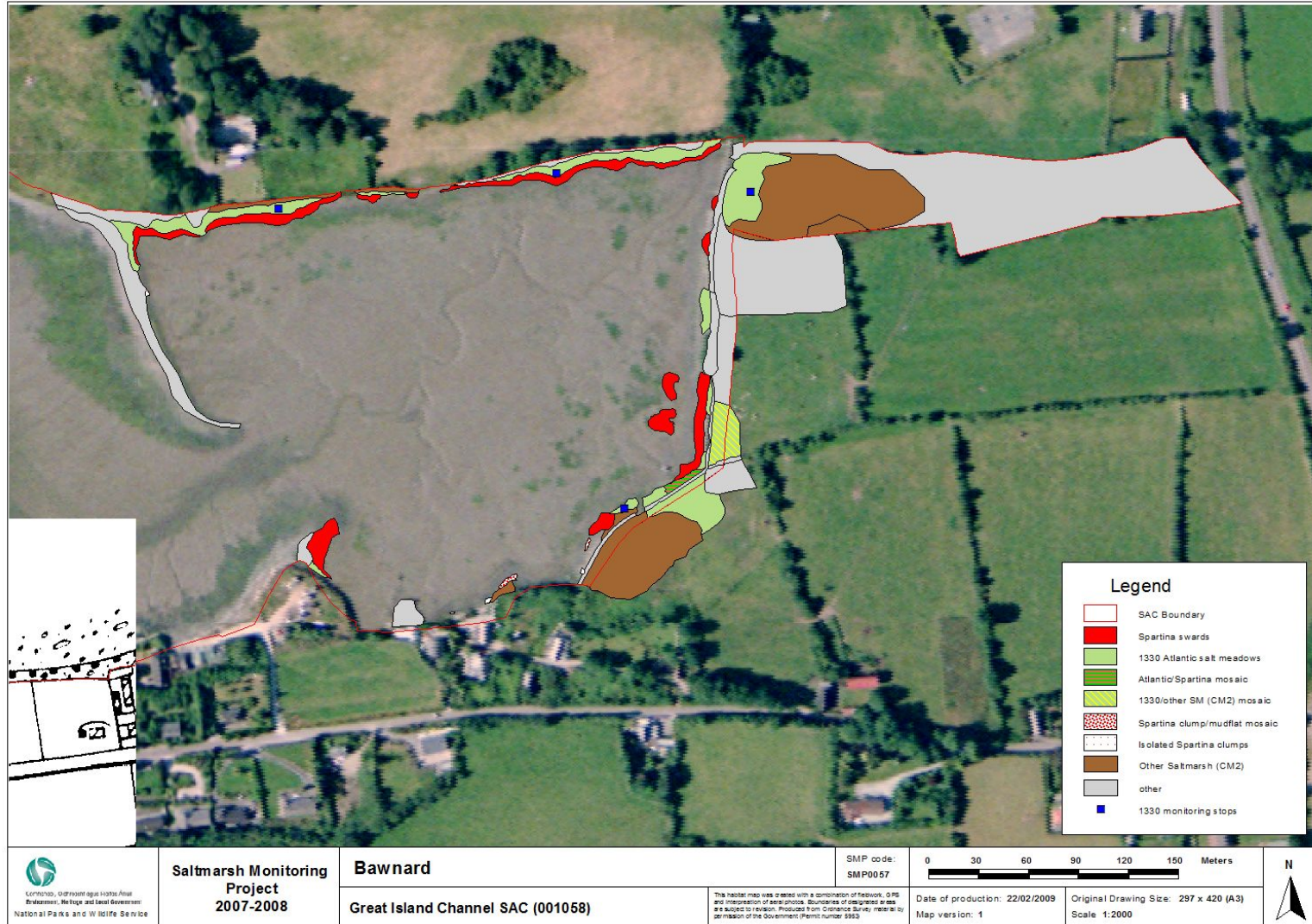
Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The salt marshes of Ireland: An inventory and account of their geographical variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Glavin, H. (1947). *Spartina townsendii* H. and J. Groves - an experiment in reclamation. *Irish Naturalists' Journal*, **9**, 74-75.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 <i>Salicornia</i> flats						
2	Spartina swards	0.239			0.239		
3	1330 Atlantic salt meadow	0.356		0.474			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/ <i>Spartina</i> mosaic	0.009		0.005	0.005		
7	1330/other SM (CM2) mosaic	0.055		0.028			
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	1.699					
10	<i>Spartina</i> clump/mudflat mosaic (50/50)	0.004			0.002		
11	Isolated <i>Spartina</i> clumps on mud (5%)	0.003			0.000		
12	pioneer 1330/1310/ <i>Spartina</i> mosaic						
13	1410/other SM (CM2) mosaic						
14	<i>Spartina</i> sward dominated, with some ASM						
15	1310/ <i>Spartina</i> mosaic						
16	ASM dominated with some <i>Spartina</i>						
17	1330/sand dune mosaic						
18	Other SM (CM2)	0.679					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	3.044		0.506	0.246		



Appendix III – Carrigatohill site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: Carrigatohil	SMP site code: SMP0060
Date of site visit 04/06/2008	CMP site code: N/A
SM inventory site name: Carrigatohil	SM inventory site code: 196
NPWS Site Name: Great island Channel	
NPWS designation cSAC: 001058	MPSU Plan: not available
pNHA: 001058	SPA: 004030
County: Cork	Discovery Map: 81/87 Grid Ref: 179225, 072456
Aerial photos (2000 series): O 6340-A; O 6385-B; O 6386-A	6 inch Map No: Co 075
Annex I habitats currently listed as qualifying interests for Great Island Channel cSAC: H1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	
Other SMP sites within this SAC/NHA: Bawnord	
Saltmarsh type: Estuary	Substrate type: Mud

2 SITE DESCRIPTION

Carrigatohill saltmarsh is located in Cork Harbour along the northern side of Foaty Island and 1 km east of Carrigatohill Village. This part of Cork Harbour is called Slatty Water and this is part of a secondary branch of the estuary that is positioned between Little Island and Foaty Island. The landscape of this area is fairly low-lying and dominated by improved habitats. Some of the surrounding land has been significantly modified and built up in places. The N25 Cork-Waterford dual-carriageway is positioned adjacent to northern side of the Slatty Water on a tall embankment and forms the shoreline along this side of the estuary. A secondary road accessing Foaty Island forms the eastern boundary of the estuary. Adjacent land to the east of this secondary road is farmed. There is a strip of mature mixed woodland along the northern side of Foaty Island. This island also contains a golf course and a recently constructed hotel and other leisure facilities. There are several smaller islands towards the west of the Slatty Water (Browns Island and Harper's Island) and the dual-carriageway has been constructed across these two small islands.

The saltmarsh habitat is mainly found fringing the southern Slatty Water shoreline (the northern shoreline of Foaty Island). The northern and eastern shorelines of the Slatty Water have been significantly modified by road construction. While these shorelines probably contained saltmarsh in the past, there is very little intact saltmarsh left. A secondary road that forms the eastern boundary of the estuary has cut off a small part of the original estuary. This area now contains open water, Reedbeds and fringing scrub with some tidal influence. The Slatty Water drains at low tide exposing a significant area of intertidal mudflats.

The majority of the site is located within the Great Island Channel cSAC and pNHA. This estuarine cSAC is dominated by intertidal flats and also contains some patches of saltmarsh at other locations. It is also important for wintering waders and wildfowl within Cork Harbour. Two Annex I saltmarsh habitats are present at Foaty Island saltmarsh, *Salicornia* flats (1310) and Atlantic salt meadow (ASM). There is also some development of *Spartina* swards within this site, although this is not considered to qualify as an Annex I habitat. Atlantic salt meadow is the only saltmarsh habitat listed as a qualifying interest for this cSAC. Several of the other saltmarshes are listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and

were also surveyed during the Saltmarsh Monitoring Project (Bawnard located further south). Two other sites listed on the SM inventory, (Harper's Island and Foaty Island), were not surveyed during the SMP. Foaty Island saltmarsh includes much of the saltmarsh that has developed around the southern sides of the island.

Most of saltmarsh habitat mapped at this site is located within the cSAC boundary. However there are several small patches located outside the boundary. This is mainly due to the fact that saltmarsh habitat extends above the upper shoreline boundary on the OSI 6 inch map, which was used to draw some of the cSAC boundaries. Therefore saltmarsh habitat was excluded in error.

The site was accessed from Foaty Island via the Sheraton-Fota hotel complex. Permission was sought to access the site via this private land.

3 SALTMARSH HABITATS

General description

The main Annex I saltmarsh habitat found at this site is Atlantic salt meadow (ASM) (Table 3.1). Several small patches or bands of *Salicornia* flats were also recorded at this site. Common Cordgrass (*Spartina anglica*) is also present and there were several small patches of *Spartina* sward mapped at this site. The saltmarsh is mainly distributed in several small patches that have developed in sheltered areas along the north side of Foaty Island and are separated from each other. Saltmarsh has developed behind a low shingle ridge in one section. There are also several small patches that are located along the northern side the Slatty Water, adjacent to the dual-carriageway embankment.

Other saltmarsh type vegetation (not mapped as Atlantic salt meadows) is also present. These stands have been classified and mapped as CM2 or other non-Annex saltmarsh vegetation in accordance with the SMP project. This mainly includes patches of Twitch (*Elytrigia repens*)-dominated vegetation along low gravel ridges. There are natural vegetation successions between the ASM at its upper boundary and this vegetation community in places. These are positioned above the ASM vegetation. Some Common Reed Beds (*Phragmites australis*) located in the brackish area east of the road bridge have also been classified as other saltmarsh (CM2). There are signs of brackish influence on the vegetation in this section with other species such as Sea Pink (*Armeria maritima*), Spear-leaved Orache (*Atriplex prostrata*) and Sea Plantain (*Plantago maritima*) also appearing along the edge of the intertidal area. However, the tidal influence on this section is restricted and this may act more like a brackish lagoon during spring tides, dependant on restricted flow under the road-bridge. This area probably drains to expose bare mudflats during neap tides.

One notable aspect about this site is that the saltmarsh is shaded by tall woodland along Foaty Island. These trees and mature Rhododendron scrub overhang the intertidal zone in places and significantly shade some of the saltmarsh vegetation. There are upper transitions from saltmarsh to old stone embankments along the edge of the woodland. A band of transitional Twitch-dominated vegetation may appear along this boundary. There are transitions at the lower saltmarsh boundary to soft intertidal mudflats for the most part. Some of the adjacent mudflat area is mixed with cobbles and pebbles. The lower saltmarsh boundary is marked by a low saltmarsh cliff or ledge. Clumps of *Spartina* sward have developed along the lower saltmarsh boundary in places. One section of saltmarsh has a narrow band of *Salicornia* flats developed on mixed substrate along the lower ASM boundary.

Table 3.1. Area of saltmarsh habitats mapped at Carrigatohil.

EU Code	Habitat	Area (ha)
1310	<i>Salicornia</i> and other annuals colonizing mud and sand (1310)	0.038
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	1.245
non-Annex	<i>Spartina</i> swards	0.162

	Total *	1.445
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*note that saltmarsh habitat may continue outside the mapped area.

3.1 *Salicornia* and other annuals colonizing mud and sand (H1310)

This habitat only forms a very small area in total at this site and is found in several small patches. A band of *Salicornia* flats has generally developed on mixed or mixed substrate. There is a natural vegetation succession from an ASM pioneer vegetation community to the patches of *Salicornia* flats. This habitat is only several metres wide. It is dominated by Glasswort (*Salicornia* sp.). Lax-flowered Sea Lavender (*Limonium humile*) and Common Saltmarsh-grass (*Puccinellia maritima*) are also present but are rare. Common Cordgrass is present at this site but is not found within any of the patches of this habitat.

Atlantic salt meadows (H1330)

This is the dominant saltmarsh habitat at this site. Several ASM communities are present. Some of the ASM is dominated by an unusual low-mid vegetation community dominated by Sea Aster (*Aster tripolium*). This community also contains Red Fescue (*Festuca rubra*), Common Scurvy-grass (*Cochlearia officinalis*), Common Saltmarsh-grass, Lax-flowered Sea Lavender and Sea Plantain. The saltmarsh contains some small salt pans vegetated with Spear-leaved Orache. This vegetation type may be influenced by shade from the adjacent tall woodland. The sward height is quite tall due to the lack of grazing (10-20 cm). The ASM also contains some clumps of Common Cordgrass in several pans but its cover within the ASM is rare.

A second unusual vegetation type dominated by Lax-flowered Sea Lavender and Sea Milkwort (*Glaux maritima*) is present. This is a lower saltmarsh community and also contains Sea Spurrey (*Spergularia media*), Sea Plantain and Buck's-horn Plantain (*Plantago coronopus*). There are some signs of zonation between different ASM communities and zonation is also indicated by the dominance of Common Saltmarsh-grass around some of the salt pans and along the edges of creeks within other saltmarsh vegetation. A sward of Common Saltmarsh-grass has developed to dominate one section of the ASM.

A more typical grassy vegetation community is also present. This community is dominated by Red Fescue and is found along the upper SM zone of some of the narrower bands of saltmarsh. This community also contains Creeping Bent (*Agrostis stolonifera*), Sea Milkwort, Sea Aster and Sea Plantain.

A pioneer ASM vegetation community is present along some of the lower ASM boundary. Pioneer vegetation is developing on shingle rich substrate with Lax-flowered Sea Lavender prominent and also containing Common Saltmarsh-grass, Annual Sea-blite (*Suaeda maritima*) and some Glasswort. This community is quite open with abundant bare substrate and green algae cover. It has developed on part of the saltmarsh with a relatively steep slope. There is no significant SM cliff along the edge of this community.

The saltmarsh topography is poorly developed at this site, but this is typical of relatively small portions of habitat. Some of the larger sections do contain salt pans but the smaller sections are generally quite uniform in topography. Several sections are drained by small creeks leading from drainage channels from the adjacent woodland. There are some dead tree trunks lying on the saltmarsh.

Spartina swards

There are several small patches of *Spartina* swards mapped at this site. The *Spartina* sward is not extensive and is mainly formed from coalescing large clumps of Common Cordgrass growing on soft mud. The *Spartina* sward is much less extensive compared to the ASM. The *Spartina* sward is dominated by Common Cordgrass and there are few other saltmarsh species appearing within these patches. There are some signs of die-back within the *Spartina* sward in places. Common Cordgrass is also present within the ASM. There are no indications that *Spartina* sward has developed on former saltmarsh at this site. It has developed on bare mudflats.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 4.1). This site is not grazed (140) by livestock but signs of natural grazing of saltmarsh vegetation, possibly by rabbits, were noted. The site is relatively inaccessible so it is not used for amenity use.

Part of the saltmarsh has been infilled (803) during the current monitoring period, probably between the period 2001-2005. The saltmarsh had developed behind a stone embankment. This saltmarsh was visible on the 2000 series aerial photos but is now completely destroyed and covered in spoil. This infilling is probably related to recent construction and development of the adjacent hotel, golf and leisure complex. The infilling may be disposal of construction and demolition waste. Some wheel ruts (501) were noted on a second portion of saltmarsh.

Common Cordgrass is present at this site. This is an invasive species of saltmarsh (954). It was planted in Cork Harbour at Inchera House, Little Island in 1925 (Glavin 1947) although it is not known when it appeared in this part of the estuary (Slatty Water). Common Cordgrass does not form a significant part of the ASM vegetation. The *Spartina* sward cover is quite low relative to the cover of ASM saltmarsh and the remaining intertidal mudflats. There are no indications that it has spread significantly during the current monitoring period from the survey or from an examination of the aerial photos. Common Cordgrass has formed extensive swards to the south of Foaty Island but these swards are not considered within the current site. There is very little Common Cordgrass in the ASM or *Salicornia* flats, so the impact of its presence is assessed as neutral.

There are no indications of any significant erosional trend at this site (900). A saltmarsh cliff is present but signs of erosion are not significant. An accretion ridge is present along one part of saltmarsh. This area is quite sheltered so it is likely that erosional pressure in this area is quite low. A comparison of the OSI 2nd edition 6 inch map to the current OSI 2005 series aerial photos shows that there have been no significant changes to the shoreline during this period. A comparison of the 1995, 2000 and 2005 OSI aerial photos also shows that there has been no measurable loss of saltmarsh habitat by erosion during the monitoring period. The impact of erosion is assessed as neutral on a portion of the ASM.

There is evidence around this site that saltmarsh habitat has been modified or destroyed in the past due to land use changes and reclamation. The dual carriageway has been built on an embankment along the northern side of the Slatty Water shoreline. This construction may have destroyed some minor saltmarsh habitat, but no significant habitat was lost along this shoreline. The construction of a sluice at the Slatty Bridge at an earlier date (19th century) cut off part of the intertidal zone including some saltmarsh habitat. This area now contains brackish habitat. An old stone embankment has been built around the Foaty Island shoreline and this embankment was built across the front of one of the saltmarsh sections, now infilled recently. These impacts are not considered during the current monitoring period.

Impacts and activities adjacent to the site include agriculture (140), discontinuous habitation (402), a dual-carriageway (502), a water treatment plant (424) and a golf course (601). The presence of the golf course and associated leisure development has probably led to infilling of one section of saltmarsh but this has already been assessed. The presence of the dual-carriageway so close to the site has also impacted on saltmarsh habitat in the past, but direct impact of habitat loss are likely to have occurred outside the current monitoring period. Related impacts such as runoff from the road may have some impact on the saltmarsh but these impacts are low or not detected.

Table 4.1. Intensity of various activities on saltmarsh habitats at Carrigatohil.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	954	C	0	0.038	Inside
1330	501	C	-1	0.001	Inside

1330	803	A	-2	0.800	Inside
1330	900	C	0	0.06	Inside
1330	954	C	0	1.245	Inside

¹ EU codes as per Interpretation Manual.

² Description of activity codes are found in Appendix III, Summary Report 2007-2008.

³ Intensity of the influence of an activity is rated as A = high, B = medium, C = low influence and D unknown.

⁴ Impact is rated as -2 = irreparable negative influence, -1 = reparable negative influence, 0 = neutral, +1= natural positive influence and +2 = strongly managed positive influence.

⁵ Location of activity: Inside = activities recorded within and directly impacting the saltmarsh habitat, outside = activities recorded outside but adjacent to saltmarsh habitat that are impacting the saltmarsh habitat.

5 CONSERVATION STATUS

Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the 1995, 2000 and 2005, OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There are no specific notes in the NHA survey for the saltmarsh at this site.

The overall conservation status of this site is assessed as *unfavourable-bad* (Table 5.1). This assessment takes account of the relatively significant area of saltmarsh that has been infilled during the current monitoring period. However the remaining saltmarsh is in relatively good condition. Common Cordgrass is present at this site but does not form a significant area of *Spartina* sward and does not form a significant part of the ASM vegetation either. It is not known why Common Cordgrass has spread significantly on mudflats to form mature swards to the south of Foaty Island but has not spread significantly in the Slatty Water.

A Local Area Development Plan for the Carrigatohil area published by Cork County Council (Cork County Council 2005) states that there are plans to replace the sluice at the Slatty Bridge with a pumping station to pump water at any time from the Slatty Pond. This is not likely to affect the existing saltmarsh habitat along the northern side of Foaty Island but may impact on the brackish vegetation east of Slatty Bridge.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Carrigatohil.

Habitat	EU Conservation Status Assessment			Overall EU conservation status assessment
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad	
<i>Salicornia</i> flats (1310)	Extent Structure and functions	Future prospects		Unfavourable - Inadequate
Atlantic salt meadows (1330)	Structure and functions, Future prospects		Extent	Unfavourable - Bad

5.1 *Salicornia* and other annuals colonizing mud and sand (H1310)

Extent

The extent of this habitat is assessed as *favourable*. It does not form a significant part of the saltmarsh at this site. There are no indications of any loss of habitat due to land-use changes, erosion or the spread of Common Cordgrass within the current monitoring period. This habitat is found in typical pioneer areas adjacent to the ASM. There is no indication that *Salicornia* flats were more extensive in the past.

Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. No monitoring stops were carried out in this habitat due to its relatively small extent. However, a visual assessment indicated that this habitat is in relatively good condition. The small patches of habitat only form a very minor portion of the overall saltmarsh habitat. They have a typical species assemblage and have developed adjacent to pioneer ASM vegetation and form part of the greater saltmarsh zonation. Common Cordgrass is present at this site but this invasive species is not yet present within the small patches of *Salicornia* flats.

Future prospects

The future prospects of the habitat are assessed as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts continue in the near future. Common Cordgrass is present at this site. This species has the potential to continue to spread in the future at the expense of *Salicornia* flats, although there are no indications that it is spreading at the moment. There are few other impacts or activities that can negatively affect this habitat.

Atlantic salt meadows (H1330)

Extent

The extent of this habitat is assessed as *unfavourable-bad*. There has been a significant loss of habitat (0.8 ha) due to infilling within the current monitoring period. This represents a loss of roughly 40% of the original habitat at this site. There are no signs of any erosional trend at this site. There is no evidence that a significant area of habitat has been lost during the current monitoring period due to erosion.

Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Four monitoring stops were carried out in this habitat and all the stops passed. All of the attributes required for the structure and functions of this habitat reached their targets for each monitoring stop. This habitat is in relatively good condition and contains several different vegetation communities. Some of these vegetation communities are unusual in a national context and may be influenced by shading from adjacent trees. The diversity of the vegetation was typical of this habitat. Zonation is present and there is zonation to pioneer and *Salicornia* flats vegetation.

The saltmarsh topography is poorly developed but this is typical of these small patches of habitat. Common Cordgrass is present in this habitat. This is a negative indicator but it is only found rarely (< 1%) on the ASM. Therefore the impact of its spread is assessed as neutral. There is some natural un-modified transition to other vegetation communities dominated by Twitch along the upper ASM boundary in places, although much of the actual upper saltmarsh boundary has been modified in the past.

Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts continue in the near future. There are few impacts significantly affecting this site. The most significant impact was the infilling of a large section of saltmarsh. This assessment assumes there will be no further infilling of saltmarsh although portions may be vulnerable to

further infilling in the future. Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities. This site is inaccessible and unlicensed infilling would be difficult to detect without direct site access.

Common Cordgrass is present at this site but does not form a significant part of the ASM vegetation. There may be some potential for the spread of this species into this habitat in the future. However, not all the ASM is vulnerable to the spread of this species.

6 MANAGEMENT RECOMMENDATIONS

There are no management recommendations for this site. The area of saltmarsh damaged by infilling has been completely infilled and it would be very difficult to restore this habitat.

7 REFERENCES

Cork County Council (2005). The Carrigatohil special draft Local Area Development Plan. <http://www.corkcoco.ie/co/pdf/604991653.pdf>

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8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 <i>Salicornia</i> flats	0.038	0.038				
2	Spartina swards	0.159					0.159
3	1330 Atlantic salt meadow	1.230		1.23			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/ <i>Spartina</i> mosaic	0.002		0.001			0.001
7	1330/other SM (CM2) mosaic	0.027		0.014			
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	4.891					
10	<i>Spartina</i> clump/mudflat mosaic (50/50)	0.003		0.003			0.0015
11	Isolated <i>Spartina</i> clumps on mud (5%)						
12	pioneer 1330/1310/ <i>Spartina</i> mosaic						
13	1410/other SM (CM2) mosaic						
14	<i>Spartina</i> sward dominated, with some ASM						
15	1310/ <i>Spartina</i> mosaic						
16	ASM dominated with some <i>Spartina</i>						
17	1330/sand dune mosaic						
18	Other SM (CM2)	1.141					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	7.491	0.038	1.245			0.162



Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- Atlantic/Spartina mosaic
- 1330/other SM (CM2) mosaic
- Spartina clump/mudflat mosaic
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops

<p style="font-size: small; text-align: center;">Linnéanna, Oidhreacht agus Ioslach Árainn Bhailiúcháin, Meáil agus Léinn Gníomhaíochta National Parks and Wildlife Service</p>	<p>Saltmarsh Monitoring Project 2007-2008</p>	<p>Carrigtoohil</p> <p>Great Island Channel SAC (001058)</p>	<p>SMP code: SMP0060</p>	<p>0 60 120 180 240 300 Meters</p>	<p>N</p>
<p>This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are a subject for revision. Produced from Ordnance Survey data by permission of the Government (Permit number: 5553)</p>			<p>Date of production: 22/02/2009</p>	<p>Original Drawing Size: 297 x 420 (A3) Scale 1:4500</p>	
			<p>Map version: 1</p>		