Lough Swilly SAC (site code 2287)
Conservation objectives supporting document -coastal habitats

Version 1

March 2011

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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, 2003). 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.

Lough Swilly SAC is designated for a range of marine and coastal habitats. One of the qualifying interests of the site is the saltmarsh habitat 'Atlantic salt meadows' (ASM), which can be found in conjunction with other saltmarsh habitats such as '*Salicornia* and other annuals colonising mud and sand' and 'Mediterranean salt meadows'.

This backing document sets out the conservation objectives for ASM in Lough Swilly SAC, which is defined by a list of parameters, attributes and targets. The main parameters are (a) Area, (b) Range 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 are based primarily on the results of the Saltmarsh Monitoring Project (SMP) (McCorry, 2007; McCorry & Ryle, 2009) and this document should be read in conjunction with those reports.

During the Saltmarsh Monitoring Project (SMP) the following five sites from Lough Swilly were surveyed, mapped and assessed (McCorry, 2007):

1. Fahan
2. Green Hill
3. Lower Lough Swilly
4. Rathmelton
5. Ray

Detailed individual reports and habitat maps were produced for each site and these are included in a set of Appendices to this document.

The conservation objective for ASM within the entire SAC is based on a combination of the individual reports for each of these sites. There are additional areas of saltmarsh known to be present within the site. However, it is estimated that these five sites represent over 71% of the total area of saltmarsh within Lough Swilly SAC.

2 Conservation Objective

The conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of these objectives will help to ensure that the habitat or species achieves favourable conservation status at a national level.

3 Saltmarsh

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 maritimae*) (1330)
- Mediterranean salt meadows (*Juncetalia maritimi*) (1410)
- Mediterranean and thermo-Atlantic halophilous scrub (1420)

Atlantic salt meadows generally occupy the widest part of the saltmarsh gradient and are the dominant saltmarsh habitat in Lough Swilly SAC.

3.1 Overall Objective

The overall objective for Atlantic salt meadows in Lough Swilly SAC is to restore the favourable conservation condition. This objective is based on an assessment of the current condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area, (b) Range and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat 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 established baseline'*. Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion, accretion and succession.

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

The area of ASM within the SAC and the total area of ASM mapped by the SMP within the site are presented in the table below.

Site name	Total area (ha) of ASM (excluding mosaics) from SMP	Total area (ha) within SAC boundary (including mosaics)
Fahan	7.51	7.29
Green Hill	1.92	2.02
Lower Lough Swilly	8.46	8.44
Rathmelton	10.03	10.00
Ray	0.06	0.05
Totals	27.98	27.80

There are a number of differences in the two sets of figures above. Most of the differences are explained by the fact that the SMP mapped the total saltmarsh resource at each 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 include any mosaics when calculating their total areas. This explains why the total area in the SAC for Green Hill is higher than the recorded during the SMP. 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 Annexed habitat and a non-Annexed habitat, then the entire area was counted as the Annexed habitat.
2. Where a polygon was identified as a mosaic of two Annexed habitats, the area was divided 50:50 for each habitat.

In addition to the total area of ASM that was mapped within the SMP, an area of 11.177ha of potential ASM habitat was also identified through an examination of aerial photographs. This gives an estimated total area of 38.98ha of ASM within the SAC.

3.3 Range

3.3.1 Habitat distribution

Saltmarsh is known to display a widespread distribution throughout the Lough Swilly site, particularly in the inner sheltered areas and around Rathmelton. Atlantic salt meadows are the dominant habitat, but *Salicornia* mudflats and Mediterranean salt meadows are also known to occur.

There should be no decline or change in the distribution of ASM, 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 Atlantic salt meadows 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.

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

3.4.2 Physical structure: creeks and pans

Atlantic salt meadows can contain a distinctive topography with an intricate network of creeks and pans occurring on medium to large-sized saltmarshes. 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 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.

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. high 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 Lough Swilly where it occurs in a mosaic with other saltmarsh habitats, including '*Salicornia* and other annuals colonising mud and sand' and 'Mediterranean salt meadows'. In order to ensure the ecological functioning of the ASM habitat it is vital to maintain the zonations and transitions to other habitats.

The target is to maintain the range of saltmarsh habitats found in association with Atlantic salt meadow, as well as transitional zones, including those to terrestrial communities such as grassland, fen, brackish marsh and sand dune (e.g. Fahan).

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.

The target is to maintain structural variation within the sward.

3.4.6 Vegetation structure: vegetation cover

Vegetation cover can have a major effect on saltmarsh development by reducing the velocity 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

Atlantic salt meadows 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*), saltmarsh rush (*Juncus gerardii*)

The target for this attribute is to ensure that a typical flora of ASM is maintained, as are the range of sub-communities within the different zones. Below are lists of typical species for the different saltmarsh zones. Some of these species have a restricted distribution nationally, such as *Atriplex portulacoides* and *Seriphidium maritimum*, which are not likely to occur in the Lough Swilly area.

Typical species		
Lower marsh	**Low-mid marsh**	**Mid-upper marsh**
Salicornia spp. *Suaeda maritima* *Puccinellia maritima* *Aster tripolium*	*Puccinellia maritima* *Triglochin maritima* *Plantago maritima* *Atriplex portulacoides* *Aster tripolium* *Spergularia* sp. *Suaeda maritima*	*Festuca rubra* *Juncus gerardii* *Armeria maritima* *Agrostis stolonifera* *Limonium humile* *Glaux maritima* *Seriphidium maritimum**

	Salicornia spp. *Glaux maritima* Turf fucoids	*Plantago maritima* *Aster tripolium* *Juncus maritimus* *Triglochin maritima* *Blysmus rufus* *Eleocharis uniglumis* *Leontodon autumnalis* *Carex flacca* *Carex extensa* Turf fucoids

3.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species recorded on Atlantic salt meadows during the SMP was common cordgrass (*Spartina anglica*). Significantly large stands of *Spartina* have been recorded at Rathmelton, Lower Lough Swilly and Green Hill. The target is that negative indicators such as *Spartina* should be absent or under control. The aim is to prevent spread to new sites and to limit expansion at known sites to less than 1% per annum during a reporting cycle. The evidence suggests that there has been recent spread of *Spartina* at Green Hill and parts of Rathmelton, while it may have been planted at Lower Lough Swilly.

4 References

Commission of the European Communities (2003). Interpretation Manual of European Union Habitats – EUR 25. DG Environment-Nature and Biodiversity, Brussels.

McCorry, M. (2007). Saltmarsh Monitoring Project 2006. Unpublished report to the National Parks and Wildlife Service, Dublin.

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

Appendix I - Fahan site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Fahan**		SMP site code: **SMP0031**
Site name (Curtis list): **Fahan**		CMP site code: **174**
Site No: (Curtis list): **3**		
NPWS Site Name: **Lough Swilly**		Dates of site visit: **11/08/2006**
NPWS designation SAC: **2287** pNHA: **2287**		MPSU Plan: **old format available**
County: **Donegal**	Discovery Map: **2**	Grid Ref: **233220, 427380**
6 inch Map No: **Dg038**	Aerial photos (2000 series): **00147-c, 00168-a**	
Annex I habitats currently designated for Lough Swilly SAC: **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)**		
Other SMP sites within this SAC/pNHA: **Ray, Ramelton, Green Hill, Lower Lough Swilly**		
Saltmarsh type: **Sand flats**		Substrate type: **Sand**

2 SITE DESCRIPTION

Fahan saltmarsh is located midway along the eastern side of Lough Swilly in Co. Donegal, 4 km south of Buncrana. This saltmarsh is part of a larger coastal system, which includes Lisfannon beach (Blue Flag Beach) and sand dune system. The sandy beach is a popular destination for local people and day-trippers from the surrounding areas. The other coastal habitats were surveyed by the Coastal Monitoring Project. The site is relatively recent in origin having developed in the past 100 years. Its development has been related to the erosion of Lisfannon Point to the north and to the construction of embankments out to Inch Island to the south of Fahan (McKenna *et al.* 2003).

The sand dune and saltmarsh coastal ecosystem at Fahan (Lisfannon) has also been the subject of a detailed EU-LIFE study to test approaches to coastal management. This was conducted by Donegal County Council and University of Ulster. The coastal system developed quickly and has been relatively dynamic over the past 100 years with the seaward shoreline and sand dune system changing shape and position. This site is now being eroded and the coastal management is attempting to maintain the coastal system by a series of soft engineering techniques (McKenna *et al.* 2000).

The saltmarsh is situated in a sheltered area adjacent to the shoreline with the sand dune system forming a barrier along the seaward side. The site is located at the base of Gollan Hill. The landward side is steeply sloping with a rocky cliff face developing along the boundary towards the south part of the site. The embankment has been reinforced towards the northern end with rock armour. The R238 Buncrana-Burnfoot Road is located along the top of this cliff/embankment and has been cut into the hillside. The lower part of the

hillside has some mixed woodland, scattered dwellings and some recent residential development. Fahan Pier and marina is located to the south of the site. Buncrana Golf Course is located to the north of the site on some low-lying land adjacent to the shoreline. A railway line used to run along the landward side of this site is located to the south of the site next to the harbour.

A marina was constructed to the south of this site at Fahan Pier during the late 1990s. There has been some further reclamation on coastal land (2000-2005) between the marina and the rocky embankment/cliff that marks the base of the hillside. This reclamation has infilled a large coastal area within the SAC. A habitat map presented by the EU-LIFE study and aerial photo taken in 1995 showed that saltmarsh (and sand dune habitat) was situated in this area before the construction of the marina.

This saltmarsh has been destroyed by this construction and infilling. McKenna *et al.* (2003) describes the history of the construction of the marina. One Annex I habitat, Atlantic salt meadows (ASM) is found at this site. This habitat is listed as a qualifying interest for Lough Swilly SAC. Most of the saltmarsh habitat is situated within the SAC. A narrow strip 5-15 m wide has been excluded from the SAC un-intentionally. This is due to small errors in rectification between the 1920s 6 inch map and the 2000 aerial photos. The 1920's 6 inch map was used to draw the boundaries of the SAC around this site.

The site can be accessed easily via the R 238 Buncrana-Burnfoot Road. A car park has been built by Donegal County Council at the northern end of the site to service the beach.

3 HABITATS

3.1 General description

Only one saltmarsh habitat, Atlantic salt meadows, is present at this site (Table 3.1). This habitat is part of a larger coastal ecosystem with a sand dune system sheltering the saltmarsh habitat along the western seaward side. The saltmarsh is quite uniform and forms a generally flat plain filling the area between the sand dune system and the edge of the terrestrial land. This area is flooded from the southern side and is drained by one main creek. Fixed dune and saltmarsh form a complex mosaic along the western saltmarsh boundary. Saltmarsh extends along hollows (fingers) between higher fixed sand dunes. There are scattered mounds containing fixed dune grassland through the saltmarsh, mainly on the western side.

Table 3.1. Area of EU Annex I habitats listed at Fahan.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	7.51
	Total	**7.51**

At the northern side sand dunes become dominant but there is a narrow zone along the east landward side where the saltmarsh develops into brackish marsh and eventually freshwater marsh. A steep rocky embankment is situated along the landward boundary and this develops into a rocky cliff face.

3.2 Atlantic salt meadows (1330)

The saltmarsh is situated in one main block. This habitat is generally quite uniform and is dominated by a mid-upper marsh vegetation community. There is a low sward present that is dominated by Sea Pink (*Armeria maritima*) and Sea Plantain (*Plantago maritima*) with increasing amounts of Red Fescue (*Festuca rubra*) in places. Other species present include Sea Aster (*Aster tripolium*), Greater Sea-Spurrey (*Spergularia media*), Common Scurvygrass (*Cochlearia officinalis*), Long-Bracted Sedge (*Carex extensa*), Saltmarsh Rush (*Juncus gerardii*), Sea Milkwort (*Glaux maritima*), Annual Sea-blite (*Suaeda maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*). The latter two species are confined to some vegetated channels that drain the upper saltmarsh. The northern section of the saltmarsh has frequent low mounds present that are dominated by upper saltmarsh vegetation. Plant community zonation is related to elevation on these mounds. Red Fescue is dominant and Sea Pink and Sea Plantain are reduced in cover. Larger mounds contain fixed dune vegetation and there are natural transitions between the two habitats depending on elevation up the mound. Saltmarsh is dispersed in the lower hollows and plains around these mounds.

The fixed dune vegetation on the lower mounds is indicated by species such as Birdsfoot (*Lotus corniculatus*), but Sea Pink, Red Fescue and Creeping Bentgrass (*Agrostis stolonifera*) are also common. Long-Bracted Sedge is generally found in the upper saltmarsh zones and in the transitional zone between the saltmarsh and the fixed dune vegetation. The larger mounds contain species such as Marram (*Ammophila arenaria*).

Upper saltmarsh vegetation is also situated along narrow bands between taller sand dunes along the western side of the saltmarsh. This vegetation is dominated by Red Fescue with frequent Saltmarsh Rush, Sea Plantain and Sea Milkwort and occasional Sea Aster and Long-Bracted Sedge.

Towards the southern side of the saltmarsh Common Saltmarsh-grass and Annual Sea-blite become more common and Red Fescue disappears. The species assemblage is notable for the absence of Glasswort (*Salicornia* sp.) and Lax-flowered Sea Lavender (*Limonium humile*). The absence of these species is perhaps explained by the fact that this is a relatively new saltmarsh site and is somewhat isolated from other saltmarshes situated towards the head of Lough Swilly.

There is a seaward saltmarsh boundary along the southern edge of the saltmarsh. A sandy ridge has developed and this is colonised by a pioneer saltmarsh community. This area seems to be actively accreting. This community is dominated by Sea Plantain, Annual Sea-blite and Common

Saltmarsh-grass and has a significant bare substrate cover (60% bare sand). This zone transitions into embryonic dune towards the western side.

There is a small rock outcrop jutting into the saltmarsh towards the south-east boundary. South of this rock outcrop the saltmarsh transitions to rank grassland dominated by Sea Couch (*Elytrigia atherica*) and Marram on a low ridge. The saltmarsh adjacent to this ridge seems to be enriched from runoff. There are some houses situated on the embankment above the saltmarsh at this location. The saltmarsh is dominated by a tall sward dominated by Red Fescue that transitions into Creeping Bentgrass further up the ridge. The vegetation is rank and has a low diversity. This area shows up on the 2000 aerial photo as a brighter green area so nutrient enrichment is likely. Towards the southern side and along the eastern edge of the channel the ridge develops into dune grassland with Marram and some embryonic dune.

A drain/creek is located along the landward boundary at the base of the embankment. Clumps of Sea Club-rush (*Bolboschoenus maritimus*) appear in this creek and become more common towards the northern end. Sand dunes eventually enclose the northern side of the saltmarsh. There is a narrow low-lying zone between the sand dunes and the landward embankment. This develops into a wider low-lying area that has characteristics of dune slack. This is a brackish area and contains hummocks with Red Fescue. The lower hollows are dominated by Saltmarsh Rush and Creeping Bent-grass. Channels through this area contain Sea Club-rush.

The saltmarsh topography is relatively poorly developed. One main creek drains the saltmarsh and connects to the drain along the eastern boundary at the base of the embankment. There are only a few minor creeks draining into this main creek so the creek network is poorly developed. There are very few salt pans on the saltmarsh. The lack of the creeks and salt pans means that the lower saltmarsh community is poorly represented as there is less internal zonation around these features.

4 IMPACTS AND ACTIVITIES

Overall there are few major activities affecting this saltmarsh (Table 4.1). This site is not grazed by livestock although there is likely to be some grazing by wild animals and waterbirds. The sward height is naturally low (5-10 cm) in the mid-marsh areas and increases in the Red Fescue-dominated areas. Some of the impacts such as wheel ruts (501) and camp fires (608) are related to the amenity use of this site. Amenity use of the whole site is greater on the beach and sand dune system, but the saltmarsh is also used by walkers including dog walkers and cyclists (622).

A small saltmarsh area is likely to be affected by nutrient enrichment (420). This area has some houses situated adjacent to the saltmarsh on top of the embankment. Runoff from these houses has possibly created this enrichment. The nutrient enrichment has created rank grassland with low diversity. The rank grassland has developed in the absence of grazing livestock on the site.

There are further signs of enrichment along the drain/creek situated at the base of the embankment/rock armour and this is probably related to run off from the road and the surrounding land.

This is a quite dynamic site. The system has only developed in the past 100 years and studies have shown that the sand dune system is eroding at present. There is likely to be further natural transition from saltmarsh to sand dune habitats as the sand dunes migrate south (990) and these trends continue in the future. This will reduce the extent of the saltmarsh habitats. The aim of the EU LIFE project is to slow or reverse these trends and prevent the sand dune system (and associated saltmarsh) from eroding.

A small area of saltmarsh (about 2 ha) adjacent to the marina has now been infilled and destroyed (802). This saltmarsh was present in 1995 before the marina was built and was mapped on the EU-LIFE habitat map.

Activities adjacent to the site include leisure activities in the sand dune and beach area (622). The Buncrana-Burnsfoot road is situated adjacent to the eastern boundary of the site (502). There are several groups of houses along the road (402) mainly to the south-east of the site. A marina is present to the south of the site (504).

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1330	420	C	-1	0.18	Inside
1330	501	C	-1	< 0.01	Inside
1330	608	C	-1	< 0.01	Inside
1330	622	C	-1	< 0.01	Inside
1330	802	B	-2	2.0	Inside
1330	990	B	-2	N/A	Inside
1330	401	C	0	all	Outside
1330	502	C	0	all	Outside
1330	504	C	0	all	Outside
1330	622	C	0	all	Outside

1 EU codes as per Interpretation Manual. Code 13s is an additional code used to signify the entire saltmarsh habitat.
2 Description of activity codes are found in Appendix III summary report
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

5.1 Overall Conservation Status

The saltmarsh habitat is currently in good condition. However this site has an unfavourable conservation status due the loss of extent adjacent to the marina (Table 5.1).

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

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

5.2 Atlantic salt meadows (1330)

5.2.1 Extent

Overall, the extent of this habitat is assessed as *unfavourable.* This is because other information indicates that the previous extent of this habitat was greater. About 2 ha of saltmarsh was destroyed due the construction of the marina and the subsequent infilling of land behind the marina. This was located adjacent to the marina and south of the channel.

The remaining saltmarsh is part of a larger coastal ecosystem, which is eroding. The saltmarsh is not being eroded directly. However, the saltmarsh is likely to be subject to transitional pressures as small mounds of sand dune habitat have developed on the saltmarsh and the western boundary has a complex topography with a mosaic of saltmarsh and fixed dune. Due to the current erosional trends these sand dunes are likely to migrate south in the long-term and this will naturally reduce the extent of the saltmarsh due to the transition to another habitat. However, an examination of the 1995 and 2000 aerial photo series indicates that no habitat transition can be confirmed during this period.

5.2.2 Habitat structure and functions

The habitat structure and functions are assessed as *favourable*. Four monitoring stops were carried out in this habitat and they all passed. All the attributes reached their targets. There are few impacts on the saltmarsh at this site and the main impacts are related to amenity use of the overall site, so the intensity is low.

This site had a typical species diversity, although some species like Glasswort were not recorded on the site. There was some saltmarsh plant zonation with the main community being mid marsh. The relatively low extent of the lower saltmarsh zone can be related to the saltmarsh topography and the lack of creeks and pans on the site. Only one main creek drains the saltmarsh and there is no creek network. There are also very few salt pans. This may be related to the relative young age of the saltmarsh and the ontological stage of the saltmarsh. There is a small area of lower saltmarsh vegetation along a sand bank at the southern edge of the site.

The saltmarsh habitat is also part of a larger coastal ecosystem. The topography of the site has created mosaics of saltmarsh and fixed dune vegetation and there is transitional vegetation present between these two habitats. These transitional habitats add to the conservation value of the site.

The sward height was also taller compared to other sites around Lough Swilly due to the lack of grazing by livestock. This allows a diverse sward height structure to develop. A small area is probably been affected by nutrient enrichment via runoff and this has created a small patch or rank vegetation with low diversity. No Common Cordgrass (*Spartina anglica*) was recorded at this site although it is found in Lough Swilly at all the other saltmarshes. The absence of this invasive species increases the conservation value of the site.

5.2.3 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. This assessment does not take into account the possible negative impacts of long-term transitional change to sand dunes if erosion of the overall ecosystem is continued. However, the success of the EU Life project is likely to stabilise the system so that the saltmarsh habitats will be conserved.

6 MANAGEMENT RECOMMENDATIONS

Further examination of the small area being affected by nutrient enrichment in the south-east of the site to identify the source of the nutrient enrichment is required.

7 REFERENCES

McKenna, J., MacLead, M., Power, J. and Cooper, A. (2000). Rural Beach Management, a good practise guide. Donegal County Council.

McKenna, J., O'Hagan, AM, MacLead, M., Power, J. and Cooper, A. (2003). Obsolete maps and coastal management: case studies from northwest Ireland. Coastal Management, 31, 229-246.

Saltmarsh Monitoring Project

Fahan

SMP Code: **SMP0031**

Map produced by: **SMP 2006**

Map Version: **1**

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government. (Permit number 8953)

Ní mór teorainneacha ar an léarscáil seo a bheith mar thuiscint ghinearálta. Féadtar athbhreithniú a dhéanamh ar theorainneacha na gceantar comhaltachta. Machasamhail d'aithair na Suirbhéireachta Ordonáis le cead ón Rialtas. (Ceadúnas Uimh. 8953)

Lough Swilly cSAC (0002287)

0 0.1 0.2 0.3 0.4 Kilometers

Scale: **1:6000**

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Appendix II - Green Hill site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Green Hill**	SMP site code: **SMP0029**
Site name (Curtis list): **not on list**	CMP site code:
	Site No: (Curtis list): **not on list**
NPWS Site Name: **Lough Swilly**	Dates of site visit: **11/08/2006**
NPWS designation SAC: **2287**	MPSU Plan: **old format plan available**
pNHA: **2287**	
SPA: **Lough Swilly SPA 2287**	

County: **Donegal**	Discovery Map: **6**	Grid Ref: **221990, 413990**
6 inch Map No: **Dg053, Dg054**	Aerial photos (2000 series): **00261-a, 00261-b, 00261-c, 00261-d**	

Annex I habitats currently designated for Lough Swilly SAC:
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)

Other SMP sites within this SAC/pNHA: **Ray, Ramelton, Lower Lough Swilly, Fahan**

Saltmarsh type: **sandflats**	Substrate type: **mud/sand**

2 SITE DESCRIPTION

Green Hill saltmarsh is located along the west side of Lough Swilly in Co Donegal, 3 km north-east of Letterkenny. This site is situated in the lower part of Lough Swilly. The main part of the saltmarsh is situated in a small bay along the Lough Swilly shoreline. The bay is partially enclosed by old seawalls/embankments that surround intertidal mudflats and saltmarsh. There is a small opening at the centre of the embankment that allows tidal access. Farmland to the south of this area is enclosed by tall embankments. These embankments are well maintained and prevent the tide flooding this area. The Green Hill site was probably a failed attempt at land reclamation. Patches of Common Cordgrass (*Spartina anglica*) are scattered along this shoreline to the north and south of the Green Hill site with some coalescing to form dense swards and the intertidal flats. The landward boundary of this site slopes steeply up hillside along this area.

One Annex I habitat, Atlantic salt meadows (ASM) is found at this site. This habitat is listed as a qualifying interest for Lough Swilly SAC. The entire saltmarsh habitat is situated within the SAC boundary. Most of the site is also located within the Lough Swilly SPA. The boundary of the SPA is different to the SAC and is situated along the shoreline boundary with the intertidal mudflats. The intertidal mudflats adjacent to this site are noted for their use by wintering waders and wildfowl by the MPSU conservation plan.

This site is quite isolated. It can be accessed via a narrow lane down a steep hillside. This lane is connected to minor roads that can be accessed from

R245 Letterkenny-Rathmelton Road. Permission was sought from a farmer to access the saltmarsh by crossing farmland.

3 HABITATS

3.1 General description

Green Hill contains a relatively small area of Atlantic salt meadows (ASM) (Table 3.1). This habitat is situated along the shoreline at north-western side of the small bay. The bay is partially enclosed by low embankments that have been covered with mudflats. Small patches of stones indicate the embankment in places. The embankment is taller along the north side and lower towards the south. This area contains *Spartina* swards along the edge of these embankments and scattered clumps of Common Cordgrass on intertidal mudflats. The tide is likely to flood over the southern part of the embankment to inundate the *Spartina* sward. Some of the *Spartina* swards have developing into mosaics of ASM and *Spartina* swards. A thin band of brackish marsh is present along the landward side of the saltmarsh and this transitions into Alder-dominated scrub/woodland on the lower slope of the hillside.

The brackish marsh at the landward side of the saltmarsh contains patches of Grey Club-rush (*Schoenoplectus tabernaemontani*). There is a further transition to wet grassland on some higher patches containing Soft Rush (*Juncus effusus*), Creeping Bentgrass (*Agrostis stolonifera*), Marsh Arrow-grass (*Triglochin palustris*), Brackish Water-crowfoot (*Ranunculus baudotii*), Branched Bur-weed (*Sparganium erectum*) and Jointed Rush (*J. articulatus*).

A second tall wide embankment marks the south-eastern boundary of the coastal habitats. This embankment encloses a large flat area of farmland to the south of Green Hill that has been reclaimed form the estuary in the past. The embankment is partially marked on the 1860 1st edition 6 inch map. There is a thin band of saltmarsh with patches of ASM along the seaward side of this embankment and clumps of Common Cordgrass are scattered over the mudflats and adjacent to the embankment in this area. Further clumps of Common Cordgrass are scattered on the mudflats to the north of Green Hills.

Spartina swards and scattered clumps situated on the mudflats adjacent to this site have been mapped using aerial photos and views of the estuary from adjacent sites. The area mapped extends from Castlewray to the north, to Cornagill to the south. It should be noted that the Common Cordgrass is also present outside the surveyed area along the shoreline.

The land the ASM occupies is present on the 1860 1st edition 6 inch map so it did not develop after the construction of the embankments on the intertidal mudflats.

Table 3.1. Area of EU Annex I habitats listed at Green Hill.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1.92
	Spartina sward	15.1*
	Total (not including *Spartina* sward)	**1.92**

*note that saltmarsh habitat continues outside the surveyed site.

3.2 Atlantic salt meadows (H1330)

A small area of this habitat is present at this site. The ASM at this site is quite disturbed from moderate-heavy grazing and from older disturbance from drainage. The vegetation is dominated by mid-upper marsh dominated by Red Fescue (*Festuca rubra*) and Saltmarsh Rush (*Juncus gerardii*) with increasing amounts of Creeping Bent-grass towards the landward boundary. Other species present include Sea Plantain (*Plantago maritima*), Sea Pink (*Armeria maritima*), Sea Milkwort (*Glaux maritima*), Autumn Hawkbit (*Leontodon autumnalis*) and Common Arrow-grass (*Triglochin maritimum*). This area generally has a tall sward and is not grazed heavily be sheep. This area was drained in the past and there is some internal zonation of vegetation due to this old drainage. The upper parts of the drains contain Creeping Bentgrass while parts of the lower drains contain Common Saltmarsh-grass (*Puccinellia maritima*).

A typical middle marsh zone has developed in the north-east of the ASM and forms a narrow band towards the western side. This zone is dominated by Sea Pink and Sea Plantain with frequent Common Saltmarsh-grass. There are small amounts of Sea Aster (*Aster tripolium*), Sea Milkwort and Saltmarsh Rush. This zone is heavily grazed by sheep and that has created a typical low close-cropped sward. This zone eventually develops into a lower saltmarsh zone dominated by Common saltmarshgrass along the lower boundary of the ASM and the transition to *Spartina* swards, which are situated adjacent to the ASM. Other species present includes Sea Milkwort and Glasswort (*Salicornia* sp.). This zone has been badly damaged in places by poaching.

The saltmarsh topography has been significantly affected by the drainage that was carried out in the past. These drains are now partially infilled and are likely to continue to infill. There are no creeks and few salt pans on this ASM. There are some pools along the drains that act as salt pans and create internal plant zonation on the saltmarsh.

The boundary between the ASM and the *Spartina* swards is generally quite distinctive and is indicated by the appearance of Common Cordgrass. This boundary generally follows the old shoreline boundary so Common Cordgrass has not spread extensively on this part of the ASM. The boundary is distinctive on the 2000 aerial photo.

Within the *Spartina*-dominated areas there are patches of ASM vegetation. A mosaic has developed with *Spartina* sward and ASM. These ASM areas are

dominated by a low sward of Common Saltmarsh-grass. Other species present include Sea Pink, Sea Plantain, Sea Milkwort, Glasswort and Sea-spurrey sp.

There is a narrow band of ASM saltmarsh along the large embankment located along the south side of Green Hill. This band is dominated by Common Saltmarsh-grass. This zone was not mapped as it is quite narrow. This strip is heavily grazed but the poaching damage is localised. There are patches of Common Cordgrass along this zone and this species sometimes dominates.

3.3 *Spartina* swards

This habitat has developed on the mudflats within the old embankment that are situated adjacent to the ASM saltmarsh, and the tall embankment towards the south. The habitat is typically characterised by dense swards of Common Cordgrass with 75- 100% sward cover. The sward height was 0.5 m. Within the sward there is occasionally frequent Common Saltmarsh-grass, Sea Milkwort, Glasswort and Seaspurrey sp. These species are most frequent towards the landward side. The *Spartina* sward adjacent to the shoreline is grazed by Sheep and has created a low *Spartina* sward. Sheep tracks extend further into the *Spartina* sward towards the ASM patches in the mosaic area and there are signs that Sheep forage throughout most of the *Spartina* sward. Further seaward the sward breaks up somewhat as it is younger and this area was mapped as a *Spartina*/mudflat mosaic. There are no signs of Common Cordgrass seedlings or numerous small clumps indicating recent spread of this species.

A comparison of the 1995 and 2000 aerial photos shows that the *Spartina* sward within the low embankments increased in extent with new clumps appearing in this period.

There are scattered larger clumps of Common Cordgrass on the intertidal flats along this part of the shoreline. These were mapped using the aerial photos. These scattered clumps account for about 5% of the total area mapped. The area of Common Cordgrass within the *Spartina*/mudflat mosaic is estimated at 50%. A comparison of the 1995 and 2000 aerial photos shows that the *Spartina* sward and clumps have grown and spread somewhat during this period.

4 IMPACTS AND ACTIVITIES

There are few activities on this site as it is quite isolated (Table 4.1). The activity codes used in Table 4.1 are given in brackets in the following text. However, the main activity is sheep grazing and its intensity is moderate (140). The sheep have grazed the mid-lower zone heavily and there are also some badly poached areas in this zone (143). The sheep have also grazed the edge of the *Spartina* sward. However, the mid-upper zone is not

extensively grazed and has a higher sward height. The site has also been grazed by cattle and the cattle have poached small areas of saltmarsh.

Common Cordgrass, an invasive species, is present at this site and has formed extensive swards and scattered clumps on the adjacent mudflats. The earliest recorded date of its presence in Lough Swilly was in 1950, where it was recorded at Big Isle (Boyle 1972). However, it has not spread extensively on the main part of the ASM and the boundary between the two habitats is similar to the old seaward boundary for the ASM before the spread of Common Cordgrass. Clumps of Common Cordgrass do appear along the edge of the tall embankment and this was likely to have a narrow band of ASM along it. A small area along the tall embankment now contains a mosaic of Common Cordgrass and ASM and this area was likely to have been ASM in the past before Common Cordgrass was present.

The site has been drained in the past (810). These drains pre-date the 1995 aerial photos but are not marked on the 1920s 6 inch map. The site is recovering from this drainage with most of the drains being partially infilled. This drainage was probably related to land reclamation in conjunction with the old embankments that were placed on the mudflats and mark the seaward boundary of the *Spartina* sward (802). These impacts are not assessed as they occurred some time ago.

The main impacts and activities adjacent to the site include grazing of improved grassland (140) inside the tall embankments and extensive *Spartina* swards on the seaward side on the intertidal mudflats.

Table 4.1. Intensity of various activities on saltmarsh habitats at Green Hill.

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1330	140	C	-1	1.92	Inside
1330	143	A	-1	0.5	Inside
1330	954	C	-1	0.25	Inside
1330	140	C	0	1.92	Outside
1330	954	C	-1	1.92	Outside

1 EU codes as per Interpretation Manual. Code 13s is an additional code used to signify the entire saltmarsh habitat.
2 Description of activity codes are found in Appendix III summary report.
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

This site has an unfavourable-bad conservation status (Table 5.1). High levels of sheep grazing are having a significant impact on parts of the ASM. The site is also recovering from old attempts at land reclamation.

The medium-term future prospects of natural landward saltmarsh migration in response to sea level rise are poor. Green Hill saltmarsh is bordered by steeply sloping land at its landward boundaries. This means there are limited prospects for saltmarsh migration up-slope in response to sea level rise. Rises in sea level are likely to erode the seaward edge of the saltmarsh although the presence of the *Spartina* sward along the seaward boundary is likely to slow the rate of erosion. There will only be small narrow bands of new saltmarsh created and this will not compensate for habitat lost due to erosion at the seaward edges. However, Common Cordgrass may respond by spreading on the ASM due to its increased competitiveness up-slope.

This site is situated adjacent to a large area of low-lying farmland that was formerly reclaimed and is protected from tidal inundation by tall embankments. Any medium term sea level rise is not likely to impact on the embankment as they are being maintained. However, it may affect drainage of this area.

A conservation plan is available for the Lough Swilly SAC/SPA but this site is not specifically mentioned.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Green Hill.

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

5.1 Atlantic salt meadows (H1330)

5.1.1 Extent

Overall, the extent of this habitat is assessed as *favourable* in the absence of other accurate information on the previous extent of this habitat. There are no signs that the ASM is being affected by any erosion as the seaward boundaries have remained the same on the 1st edition 6 inch map, the 1920s 6 inch map and the 2000 series aerial photos. The spread of Common Cordgrass at this site has not significantly affected the extent of ASM. A small area (0.21 ha) has developed into a *Spartina*/ASM mosaic and this was likely to be ASM in the past.

5.1.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *unfavourable-bad*. Three monitoring stops were carried out at this site and two passed. These three stops reflect the status of the whole site. The failed stop was located in the lower marsh zone adjacent to the *Spartina* sward. This zone is heavily grazed and shows signs of heavy poaching. The rest of the saltmarsh has low-moderate levels of grazing. The mid-upper saltmarsh zones have a typical species diversity and plant community zonation is present. There is also a natural transition to some brackish marsh, wet grassland and scrub/woodland along the landward edge. The saltmarsh topography has been significantly affected by the drainage that was carried out in the past. These drains are now partially infilled and are likely to continue to infill. There are no creeks and few salt pans on this ASM.

5.1.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts continue in the near future. Heavy grazing pressure is having a significant impact on this site and is likely to continue in the future.

6 MANAGEMENT RECOMMENDATIONS

No management required for this site as it is quite small.

7 REFERENCES

Boyle, P.J. (1972). Two forms of *Spartina* in Donegal. Irish Naturalists Journal, 37, 239-240.


Legend
1330 Monitoring stops
SAC boundary
Habitats
Spartina swards
1330 Atlantic salt meadows
Atlantic/Spartina mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
Spartina dom, some 1330
other
Saltmarsh Monitoring Project
Green Hill
SMP Code: SMP0029
Map produced by: SMP 2006
Map Version: 1
Lough Swilly cSAC (0002287)
0 200 400 600 800 Meters
Scale: 1:9456
N

Appendix III – Lower Lough Swilly site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Lower Swilly**	SMP site code: **SMP0030**
Site name (Curtis list): **Lough Swilly complex**	CMP site code: **not surveyed**
	Site No: (Curtis list): **4**
NPWS Site Name: **Lough Swilly**	Date of site visit: **11/08/2006**
NPWS designation SAC: **2287**	MPSU Plan: **old format plan available**
pNHA: **2287**	
SPA: **Lough Swilly SPA 2287**	
County: **Donegal**	Discovery Map: **6** Grid Ref: **222130, 412700**
6 inch Map No: **Dg053, Dg054**	Aerial photos (2000 series): **00261-c, 00261-d**
Annex I habitats currently designated for Lough Swilly SAC: **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)**	
Other SMP sites within this SAC/pNHA: **Ray, Ramelton, Green Hill, Fahan**	
Saltmarsh type: **Estuary**	Substrate type: **Mud**

2 SITE DESCRIPTION

Lower Lough Swilly saltmarsh is located mainly along the east side of the lower Swilly Estuary in County Donegal, 4 km east of Letterkenny. The site is positioned high up the estuary. The survey site covers the townlands of Big Isle, Manorcunningham Churchland Isle, Drumardagh, Trimragh, Farsetmore and Glebe. This is a low-lying site and it is situated along flat farmland that was reclaimed in the past. This area now contains arable land and improved grassland in fields divided by deep drains. There is a tall wide embankment running along the shoreline in this area that prevents the tide flooding the farmland. The shoreline topography is dominated by this tall man-made embankment, which has long straight sections. This reclamation pre-dates the 1st edition 6 inch map (1860s), although the position of the embankments has changed at some locations and they have been maintained over the years. The farmland within the embankment has been improved since the 2nd edition 1920s six inch map was drawn as there are indications from the map that there was marshy land within parts of the embankment.

The saltmarsh is situated along the seaward side of the tall embankment. The majority of the saltmarsh is quite narrow and is a band of vegetation 5-10 m wide. There are several larger sections of saltmarsh where there are pieces of land extending out from the embankment and saltmarsh is also found around some small inlets.

Two Annex I habitats, Atlantic salt meadows (ASM) and *Salicornia* flats (1310), are found at this site. *Spartina* swards and clumps are also quite frequent. Only one habitat, Atlantic salt meadows, is listed as a qualifying

interest for Lough Swilly SAC. Most of the saltmarsh habitat is situated within the SAC boundary. There are some unintentional omissions as the SAC boundary was drawn from the 2nd edition 1920s 6 inch map along the marked embankment. There are small rectification errors between the 6 inch map and the 2000 aerial photo that mean some of the saltmarsh (and embankment) are outside the SAC boundary.

This site is also included within the Lower Swilly SPA. The SPA also covers some of the farmland (polderland) within the embankment. This area and the adjacent intertidal mudflats around Big Isle are noted in the MPSU conservation plan for their importance to several species of wintering waders and wildfowl including Whooper Swan and Greenland White-fronted Geese, Annex II species.

This site can be accessed via a new lane that accesses farmland in Drumardagh Townland. This lane is not present on the Discovery Map but is visible on the 2000 aerial photo. The lane can be accessed via minor roads that connect to the N13 Manorcunningham-Derry road. Permission was sought from a farmer to access the saltmarsh by crossing farmland.

3 HABITATS

3.1 General description

The Annex I saltmarsh habitats at this site are dominated by Atlantic salt meadows and there is only a small single patch of *Salicornia* flats (Table 3.1). The saltmarsh habitats are situated on the seaward side of the tall embankment. Generally the ASM is found along the edge of the embankment and the *Spartina* swards and clumps are scattered on the intertidal mudflats along the edge of the embankment. The ASM appears as a relatively long narrow band along the embankment. There are some relic sections of ASM on pieces of land that jut out from the embankment. These sections are somewhat better developed with occasional salt pans. The ASM transitions on the landward side to dry grassland generally dominated by Twitch (*Elytrigia repens*) higher on the embankment. The mudflats along the edge of the saltmarsh are very soft and slope steeply towards the River Swilly channel at the centre of the estuary.

The management of the saltmarsh area varies as the survey site is spread over a relatively long distance (2.7 km) and therefore covers several different farms or management units. Some of the saltmarsh is grazed while other sections are not grazed at all.

It should be noted that saltmarsh habitat extends outside the survey area upstream along the River Swilly channel (Table 3.1). The eastern side of the survey area shows the limit of saltmarsh extent in this area as the embankment becomes too steep to allow saltmarsh to develop. It was decided to limit the survey area due to time limits on fieldwork and the need to survey other sites in the area. A narrow band of saltmarsh appears again on

the eastern side of Big Isle in the Wee Swilly. A narrow saltmarsh is also present on the western side of the Swilly Estuary adjacent to the survey area. There are several small islands towards the west side of the estuary at Glebe. These islands were surveyed using the aerial photos and panoramic views over this part of the estuary from adjacent hillside and included within this habitat map.

Table 3.1. Area of EU Annex I habitats listed at Lower Lough Swilly.

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.01
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	8.46*
	Spartina swards and clumps	2.73*
	Total (not including *Spartina* swards)	**8.47**

*note that saltmarsh habitat continues outside the surveyed site.

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

This habitat was only present as a small patch at one location in the survey area. The dense patch of Glasswort (*Salicornia* sp.) plants is present on soft mud. This area is quite small. The patch is located at the edge of some ASM and *Spartina* sward. This sediment bank has built up along a channel that connects to the estuary channel. The mudflats adjacent to the saltmarsh slope relatively steeply down to the central channel. This steep slope in conjunction with tidal flow means that *Salicornia* flats can not develop on the mudflats in this area.

3.3 Atlantic salt meadows (H1330)

The ASM at this site is mainly quite narrow. This band is well developed in some parts and is up to 5-10 m wide. The fringe extends along most of the survey site but there are some sections where the ASM disappears because the embankment is so steep. These narrow sections have particularly good zonation of vegetation related to elevation along the embankment. The vegetation composition is dependant on the grazing regime. In the ungrazed areas the lower-mid saltmarsh zone is characterised by the dominance of Common Saltmarsh-grass (*Puccinellia martima*) and the presence of frequent Sea Aster (*Aster tripolium*). Other species present include Glasswort, Greater Sea Spurrey (*Spergularia media*), Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*). Along the grazed sections the lower saltmarsh zone is dominated by a low sward of Common Saltmarsh-grass with frequent Glasswort, and Sea Aster is much less prominent. Clumps of Common Cordgrass (*Spartina anglica*) are also frequently found in this zone, particularly along the seaward edge of the saltmarsh. Some of the larger sections of the saltmarsh where Common Cordgrass is frequent are mapped as a ASM/*Spartina* mosaic.

Intertidal mudflats occur along the seaward edge of the saltmarsh. The flats frequently have clumps or swards of Common Cordgrass growing on the intertidal mud adjacent to the ASM. There is sometimes a gradual slope along this transition between ASM and *Spartina* swards. The seaward edge of other ASM is marked by a low saltmarsh cliff and Common Cordgrass has developed along the bottom of this low cliff (0.3 m high) so there is a step down onto the *Spartina* sward.

The mid-upper zone of the ungrazed areas is characterised by the dominance of Red Fescue (*Festuca rubra*) and Saltmarsh Rush (*Juncus gerardii*). Other species present include Sea Plantain, Long-bracted Sedge (*Carex extensa*), Sea Milkwort (*Glaux maritima*) and Sea Arrowgrass (*Triglochin maritimum*). The upper zone is dominated by a band of Creeping Bentgrass (*Agrostis stolonifera*) with occasional Spear-leaved Orache (*Atriplex prostrata*) along the strandline. This zone transitions into rank grassland dominated by Twitch and herbaceous species such as Thistles (*Cirsium* spp.) and Nettle (*Urtica dioica*) above the high water mark.

There are some sheltered areas and knobs of land along the embankments where saltmarsh is more extensive. These irregular shaped sections probably reflect the old shoreline topography. At one location at the east side of the survey area there is a low seawall at the front of the saltmarsh that may have allowed saltmarsh to develop. In these areas the zones described above are more extensive. Generally the saltmarsh topography is poorly developed as the saltmarsh is relatively narrow. The narrow band of saltmarsh generally does not have any salt pans or creeks, although one section in a small sheltered area did have some salt pans.

The larger sheltered area towards the western side of the site contains the best developed saltmarsh zonation. This saltmarsh has developed in a small bay adjacent to a deep intertidal hollow. Several drains flood into this area via sluices. This area is connected to the main estuary by a deep channel. This saltmarsh area contains a lower saltmarsh zone dominated by Common Saltmarsh-grass and Sea Aster, a midmarsh zone dominated by Sea Pink and Sea Plantain, a mid-upper marsh zone dominated by Red Fescue and Saltmarsh Rush and a transitional zone along the strandline dominated by Creeping Bentgrass. The saltmarsh is ungrazed so the sward has a variable height range between 10-40 cm high. There are also frequent clumps of Common Cordgrass in the lower saltmarsh zone.

One of these knobs is a raised platform of saltmarsh separated from the embankment by *Spartina* swards and mudflats on lower lying mud. This section is dominated by upper saltmarsh with Creeping Bentgrass and Red Fescue being dominant. Some upper saltmarsh and transitional species that are present include White Clover (*Trifolium repens*), Autumn Hawkbit (*Leontodon autumnalis*), Silverweed (*Potentilla anserina*) and Grey Club-rush (*Schoenoplectus tabernaemontani*). There are also some clumps of Sea Rush (*Juncus maritimus*) (the only clumps noted in the survey site. There are also several patches of Soft Rush (*Juncus effusus*) and Creeping Buttercup

(*Ranunculus repens*) is present, indicating that a part of this area is not inundated and lies above the high water mark.

3.4 *Spartina* swards

Spartina swards and isolated clumps are present along the entire length of the survey site. The earliest recorded date of its presence in Lough Swilly was in 1950, where it was recorded at Big Isle (Boyle 1972). Common Cordgrass has spread mainly on the intertidal mud adjacent to the saltmarsh and the embankment. It is generally not distributed too far away from the embankment (< 40 m) as the intertidal flats slope relatively steeply down to the central channel. This habitat is characterised by dense swards or clumps of Common Cordgrass. There is usually other saltmarsh species present, particularly Common Saltmarsh-grass and Greater Sea Spurrey and occasional Lax-flowered Sea Lavender. The transition between *Spartina* swards and ASM is generally quite distinctive as the edge of the *Spartina* sward has frequent Common Cordgrass stems.

Some large areas of *Spartina* sward up to 100 m wide have developed at some locations. Common Cordgrass has also infilled some of the small channels between some of the small knobs of ASM and the embankment. There are few seedlings or small clumps of Common Cordgrass present indicating that it is not spreading significantly at the moment. Common Cordgrass also forms a mosaic in places with the lower saltmarsh zone dominated by Common Saltmarsh-grass.

There are some indications that this species was planted along parts of this embankment as one section has a row of regularly sized clumps regularly spaced apart. The *Spartina* sward is grazed by sheep in sections of the site where there is heavy grazing pressure.

4 IMPACTS AND ACTIVITIES

The main activity on this site is grazing (Table 4.1). The activity codes used in Table 4.1 are given in brackets in the following text. The intensity of grazing varies as the survey site is spread along several different farms. The impact of grazing also varies depending on whether cattle or sheep are grazing the saltmarsh. The eastern section is grazed by cattle and this has caused heavy levels of poaching in some localised areas. Part of the central area is heavily grazed by sheep. The grazing intensity is so high that the Common Cordgrass is also grazed creating a low sward. This area is also moderately poached. The western section is not grazed and has a relatively tall sward. The ungrazed areas may have a greater species diversity compared to the heavily grazed sections. Grazing may induce the spread of Common Cordgrass in the lower saltmarsh zone by affecting competition between it and Common Saltmarsh-grass.

There has been some old dumping of spoil at the western end of the survey site (811). Several vegetated mounds are present. This was related to

drainage works. This work happened some time ago based on the age of the mounds.

Table 4.1. Intensity of various activities on saltmarsh habitats at Lower Lough Swilly.

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1330	142	B	-1	0.11	Inside
1330	143	B	-1	1.82	Inside
1330	974	C	-1	8.47	Inside
13s	100	C	0	N/a	Outside
13s	120	C	0	8.47	Outside
13s	140	C	0	8.47	Outside
13s	870	C	0	8.47	Outside

1 EU codes as per Interpretation Manual. Code 13s is an additional code used to signify the entire saltmarsh habitat.
2 Description of activity codes are found in Appendix III summary report.
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.

The saltmarsh topography along this site has been affected significantly by the presence of the tall embankment (870). The development of this feature is likely to have had a major influence on the saltmarsh habitat at this location and saltmarsh is likely to have been much greater in extent in the past before this area was embanked. These old impacts are not assessed as they did not occur within the assessment period. This embankment has changed position at some locations in the past 80 years. There are several much small seawalls/embankments on parts of the saltmarsh (870). These are also quite old and are likely to be related to old attempts at further land reclamation.

Common Cordgrass has been present in Lough Swilly for a relatively long time (Nairn 1986). The earliest recorded date of its presence in Lough Swilly was in 1950, where it was recorded at Big Isle (Boyle 1972). This can be an invasive species. The 1994 NHA survey noted that clumps of Common Cordgrass were relatively common along this part of the estuary. The 1995 aerial photos series also shows that clumps and swards of Common Cordgrass were quite frequent. A comparison of the two sets of aerial photos and the current extent of Common Cordgrass as shown by the habitat map indicates that *Spartina* swards seems to have increased in extent along some parts of the shoreline during this period. The increases in extent are mainly on the intertidal mudflats. There are no indications that Common Cordgrass has spread significantly on to the ASM during this period. The MPSU conservation plan mentions that Common Cordgrass is present in the estuary but does not indicate that it is has been spreading significantly in the recent past.

It is difficult to assess how much the extent of Common Cordgrass has increased, as it does not show up well on the 2000 aerial photos. Large isolated clumps of Common Cordgrass are quite distinctive on the black/white aerial photos. However, these photos need to be ground-truthed to measure

the extent of Common Cordgrass accurately. It is estimated that Common Cordgrass has increased in extent by 10-20% on mudflats since 1995. The small patch of *Salicornia* flats (1310) has some Common Cordgrass situated adjacent to it. This habitat is vulnerable to further spread of Common Cordgrass (974).

The main activities adjacent to this saltmarsh are related to farming (100, 120, 140). Parts of the embankment are also grazed. The embankment is maintained to prevent flooding of the adjacent land (870).

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The overall conservation status of this site is assessed as *unfavourable-bad* (Table 5.1). The main activity is grazing and significant portions of the site are damaged by overgrazing and poaching. The saltmarsh has also been significantly modified in the past by the development of the tall embankment. Common Cordgrass is also frequently found along most of the saltmarsh, mainly in the lower saltmarsh zone, and is also present as swards or clumps on the adjacent intertidal mudflats. The short-medium term prospects of saltmarsh migration in response to sea level rise are poor as the entire landward boundary of the saltmarsh is a steep embankment. Any sea level rise may further narrow the band of saltmarsh and possibly induce further spread of Common Cordgrass in the ASM.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Lower Lough Swilly.

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

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

5.2.1 Extent

The extent of this habitat is assessed as *favourable*, in the absence of any information on the previous extent of this habitat. The small patch is situated on a small mud bank that has developed along the edge of a channel. This is a typical place for this habitat to develop. This channel is marked on the 1920s 6 inch map so its topography has not changed significantly. Small patches of *Salicornia* flats could be expected at other parts of the site in some of the sheltered areas along the seaward edge of the ASM. However, most of these areas also contain Common Cordgrass.

5.2.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. No monitoring stops were carried out in this habitat as its area was so small. However, no negative indicators were noted in the habitat such as erosion. Common Cordgrass is located adjacent to the habitat. This patch may have been larger in the past.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*. Common Cordgrass is located adjacent to the habitat and it is vulnerable to invasion by this species. The extent is very small so it could be covered with Common Cordgrass relatively quickly.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*, in the absence of accurate information on the previous extent of this habitat. There is likely to have been significant losses of extent of saltmarsh in the past related to the creation of the tall embankment and reclamation within the embankment, but this is not considered for the assessment. Curtis and Sheehy-Skeffington (1998) listed this general area (probably including the west side) as containing saltmarsh habitat and the NHA survey also listed ASM vegetation as being present along this part of the shoreline. Examination of the 1995 aerial photos series indicates that that has been no significant change in extent of ASM in the survey area. The only change is likely to have been some reclassification of ASM to *Spartina* sward due to the spread of Common Cordgrass on the ASM. This may have occurred in the ASM/*Spartina* mosaic area but it is difficult to assess how much spread of Common Cordgrass into the ASM there has been in this period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *unfavourable-bad*. Four monitoring stops were carried out in this habitat and two passed. The other two stops failed due to heavy poaching and high levels of grazing. The quality of this habitat varied significantly in different areas due to the management. The overall species diversity was typical of this habitat but the heavily grazed areas may have a lower diversity. (Some species may have been missed due to the lowness of the sward, which is tightly cropped.) The saltmarsh topography was poorly developed but this is typical of a narrow saltmarsh and is likely to have significantly been affected by the development of the embankment. Some of the relic knobs of saltmarsh jutting out from the embankment do still have some salt pans. The overall sward height is diverse due to the fact that some sections are ungrazed, some areas are moderately grazed and some areas are heavily grazed. This site has no natural transitions to other habitats on the landward side due to the presence of the embankment. Common Cordgrass is a notable feature at this site and while it is mainly found on the intertidal mudflats, it is also present as clumps within the lower zone of the ASM. There is sometimes a natural transition from ASM dominated by Common Saltmarsh-grass to *Spartina* sward.

Some large patches of this habitat are found on the islands at Glebe. These islands could not be surveyed as they were inaccessible. However, they are likely to be relatively good condition as they are not grazed. Common Cordgrass is present on and around these islands. *Spartina* swards may be greater in extent than indicated from the habitat map as this area was not ground-truthed.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts continue in the near future. Heavy grazing pressure is having a significant impact on parts of this site and is likely to continue in the future. Common Cordgrass also has the potential to spread further on the ASM in the lower saltmarsh zone.

6 MANAGEMENT RECOMMENDATIONS

Some moderation of grazing intensity is required to increase the conservation status of parts of this site.

7 REFERENCES

Boyle, P.J. (1972). Two forms of *Spartina* in Donegal. Irish Naturalists Journal, 37, 239-240.

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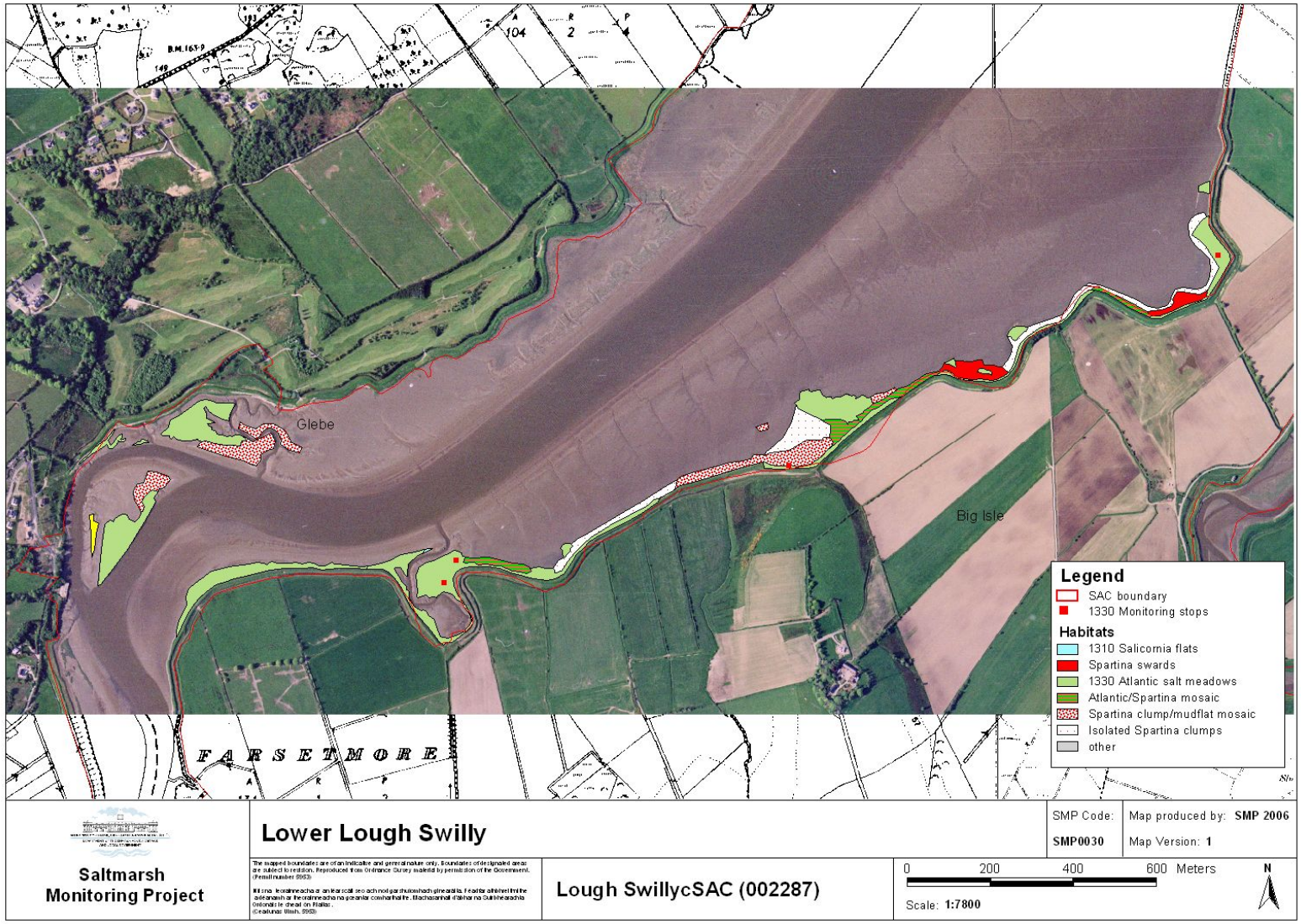
Nairn, R.G.W. (1986). *Spartina anglica* in Ireland and its potential impact on wildfowl and waders - a review. Irish Birds, 3, 215-258.


Glebe
Big Isle
FARSETMORE
Legend
SAC boundary
1330 Monitoring stops
Habitats
1310 Salicornia flats
Spartina swards
1330 Atlantic salt meadows
Atlantic/Spartina mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
other
Saltmarsh Monitoring Project
Lower Lough Swilly
SMP Code: SMP0030
Map produced by: SMP 2006
Map Version: 1
Lough SwillycSAC (002287)
0 200 400 600 Meters
Scale: 1:7800
N

Appendix IV - Rathmelton site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Rathmelton**	SMP site code: **SMP0028**	
Site name (Curtis list): **Rathmelton**	CMP site code: **not surveyed**	
	Site No: (Curtis list): **5**	
NPWS Site Name: **Lough Swilly**	Dates of site visit: **10/08/2006**	
NPWS designation SAC: **2287**	MPSU Plan: **old format available**	
pNHA: **2287**		
SPA: **Lough Swilly SPA 2287**		
County: **Donegal**	Discovery Map: **6**	Grid Ref: **224630, 422190**
6 inch Map No: **Dg046**	Aerial photos (2000 series): **00186-d, 00187-a, 00187-b, 00187-c, 00187-d**	

Annex I habitats currently designated for Lough Swilly SAC:
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)

Other SMP sites within this SAC/pNHA: **Ray, Lower Lough Swilly, Green Hill, Fahan**

Saltmarsh type: **Estuary** Substrate type: **Mud**

2 SITE DESCRIPTION

Rathmelton saltmarsh is located along the western side of Lough Swilly in County Donegal, 2 km east of Rathmelton Village. The saltmarsh is located along the southern side of the Rathmelton Channel, which is an estuary of the Leannan River and is an inlet off Lough Swilly. This is an area with low hills dominated by improved grassland. The coastline has an irregular topography along this area and there are several small bays such as Begirris Bay present. There is a small island called Aughnish Island towards the east side of the survey area. A causeway flooded at high tide links the island to the mainland and is only 150 m between the island and the mainland. The survey area extends from Aughnish Island 1.7 km westwards towards The Brows, a small peninsula. There are several other small islands (Craigs Islands) adjacent to the mainland at the western side of the survey area. Saltmarsh extends along this shoreline and varies in extent. There are some narrow stretches of saltmarsh towards the eastern side, while there are some larger sections of saltmarsh in some of the small sheltered bays and inlets.

Three Annex I habitats, *Salicornia* flats (1330), Atlantic salt meadows (ASM) 1330) and Mediterranean salt meadows (MSM) (1410) are present at this site. *Spartina* swards and clumps are also present on the saltmarsh and the adjacent intertidal mudflats. Only one Annex I habitat, Atlantic salt meadows, is listed as a qualifying interest for the Lough Swilly SAC. The entire saltmarsh habitat is situated within the SAC boundary. The SAC boundary around this

site is generally a boundary between the coastline area and the adjacent farmland.

Some of the saltmarsh is also included within the Lower Swilly SPA. The SPA has a different boundary with the edge of the shoreline (seaward edge of the saltmarsh) used as the boundary. The intertdal mudflats in the Rathmelton channel adjacent to this saltmarsh are noted as an important feeding and roosting area of wintering waders.

The site can be assessed via a minor road from Rathmelton to Aughnish Island. The shoreline can be accessed from the causeway.

3 HABITATS

3.1 General description

The main saltmarsh habitat is Atlantic salt meadows (ASM) (Table 4.1). This habitat is situated along the whole length of the survey area and is best developed in Begirris Bay. There are small patches of Mediterranean salt meadows (MSM) along the survey site. *Salicornia* flats are only located at the western side of the survey area on mud and sandflats between Craig's Islands.

Saltmarsh is also distributed around Craig's Islands. These are a group of small vegetated outcrops (< 50 in diameter) situated about 120 m from the shoreline. The largest island has scrub developed on the terrestrial part. Saltmarsh is present as a narrow band around the edge of the islands. These islands could not be surveyed directly as the mudflats between the islands and the saltmarsh were inaccessible. The saltmarsh around these islands was surveyed from distance on the saltmarsh adjacent to the islands and from the aerial photos.

Spartina swards and clumps are frequent on the survey area, mainly on the mudflats along the seaward edge of the saltmarsh. *Spartina* swards are most extensive to the west of the causeway. This area was not surveyed in detail with notes taken from the causeway. Clumps of Common Cordgrass (*Spartina anglica*) are present in the ASM. Common Cordgrass also forms a sward within the ASM located at Begirris Bay.

It should be noted that a narrow band of mainly ASM saltmarsh continues west towards Rathmelton Village and is likely to be present along the northern shoreline of the Rathmelton Channel (Table 4.1). A band of ASM/*Spartina* sward is also present along the shoreline east of the causeway, at the landward edge of the *Spartina* sward. This saltmarsh was not surveyed due to the constraints of the fieldwork. The aerial photo indicated that the survey area contained the most extensive saltmarsh.

The ASM saltmarsh generally transitions to very soft mudflats at the seaward edge of the saltmarsh. Some of the mudflats are rocky in places and the

substrate is mixed. There are small patches of brown algae (Fucoids) on these rocks and stones. The edge of the saltmarsh is marked by a saltmarsh cliff of variable height. The eastern side of the site has a saltmarsh cliff 0.2 m high. Further west of Begirris Point there is a tall saltmarsh cliff (1-2 m). These saltmarsh cliffs are eroding with mud balls at their base on the intertidal flats.

The landward boundaries of the saltmarsh vary and are generally marked by a low artificial embankment or ditch marking the edge of the farmland that are built along the high water mark. These ditches have hedges or tree lines in places. There are only small parts of the saltmarsh where there is a natural transition up slope to brackish habitats. These are situated in the sheltered low-lying areas such as Begirris Bay. These brackish habitats include patches of Common Reed (*Phragmites australis*) or patches of wet grassland. The saltmarsh is generally situated adjacent to improved grassland, although some fields contain rough grazing and could be classed as wet grassland. These fields are located on variable sloped hillsides along the coastline. Adjacent land to the western side of the survey area south of Craig's Islands is flatter and lower-lying.

The management of the saltmarsh area varies as the survey site is spread over a relatively long distance (1.5 km) and therefore covers several different farms or management units. Some of the saltmarsh is grazed heavily while other sections are not grazed at all.

Table 3.1. Area of EU Annex I habitats listed at Rathmelton.

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	1.24
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	10.03
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.53
	Spartina swards and clumps	4.79
	Total (not including *Spartina* swards)	**11.80***

*note that saltmarsh habitat continues outside the surveyed site.

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

This habitat is located at the western side of the survey site. The main patch is situated on mudflats between the saltmarsh and Craig's Islands. There is a smaller patch further out between two of the small islands. The habitat could only be viewed from distance because of the softness of the mudflats made this area inaccessible. The habitat is distributed on mudflats and is related to elevation. The areas that are colonised are slightly raised compared to the surrounding intertidal area.

There are dense single species swards of Glasswort (*Salicornia* sp.) on soft mudflats. There are no clumps of Common Cordgrass within this habitat, although the southern edge is situated along a band of *Spartina* sward and clumps. This habitat does not form a pioneer saltmarsh zone as it is separated from the main saltmarsh. There is a narrow band of bare mud

between these two habitats. The western side of this habitat is mixed substrate with rocks and muddy substrates. The eastern side is situated adjacent to soft mudflats. ASM saltmarsh and *Spartina* swards and clumps are also situated around the largest of the Craig's Islands.

3.3 Atlantic salt meadows (H1330)

This habitat is distributed along the entire length of the survey area. The width of the ASM varies between a narrow band 5-10 m wide to extensive flat areas up to 200 m wide such as in Begirris Bay.

3.3.1 Narrow band saltmarsh

A narrow band of saltmarsh towards the east of the survey area is dominated by Saltmarsh Rush (*Juncus gerardii*). There is some zonation evident in the vegetation as the lower seaward side contains frequent Sea Aster (*Aster tripolium*) and Common Saltmarsh-grass (*Puccinellia maritima*). Other species present include Glasswort, Sea Milkwort (*Glaux maritima*), Common Scurvygrass (*Cochlearia officinalis*) and Sea Arrowgrass (*Triglochin maritimum*). Towards the landward side the vegetation becomes dominated by Red Fescue (*Festuca rubra*) and there is a narrow band of Creeping Bentgrass (*Agrostis stolonifera*) along the strandline. Autumn Hawkbit (*Leontodon autumnalis*) is also present. Spear-leaved Orache (*Atriplex prostrata*) and Twitch (*Elytrigia repens*) appear along the strandline. As the saltmarsh widens the zonation in the vegetation becomes more prominent. Further west towards Begirris Bay there are occasional clumps of Sea Rush (*Juncus maritimus*). The saltmarsh contains occasional small clumps of Common Cordgrass (< 0.5 m diameter). There is a low saltmarsh cliff (0.2-0.3 m high) along the seaward edge of this ASM. There are occasional variable sized clumps of Common Cordgrass on intertidal mud in a narrow zone 10-20 m wide along this saltmarsh. The mudflats along this saltmarsh are quite rocky.

3.3.2 Begirris Bay

The largest section of ASM is located within Begirris Bay. The bay is enclosed by low hills on three sides and there is a stream/drain flowing into the bay. A significant part of this saltmarsh may have accreted in the past 80 years, as much of the bay contained open mudflats on the 1920s 6 inch map (or else it is a mistake on the 6 inch OS map). This area has a well-developed creek network that drains the bay. The creeks are quite deep and are lined with tall saltmarsh cliffs. There are several canalised creeks through this area. There are also frequent salt pans on the saltmarsh surface. There is a large pan or patch of mudflats enclosed by saltmarsh on the western side.

The vegetation in Begirris Bay is quite diverse and there are several different saltmarsh communities present, dependant on elevation. This area is not grazed. The bay is dominated by mid marsh and low-mid vegetation (in the recently developed areas). The lower mid zone is dominated by Common Saltmarsh-grass, Sea Aster and Sea Plantain with occasional Sea Pink. The

mid marsh zone is dominated by Sea Plantain. There is a lower marsh zone dominated by Common Saltmarsh-grass along the edges of the creeks. The older landward parts of the bay are dominated by grassy patches of Red Fescue, Creeping Bentgrass, White Clover and Saltmarsh Rush. Common Cordgrass is quite sparse in the eastern part of this bay. It is more frequent on the western side of the bay and is infilling some of the salt pans. There are several large patches dominated by Common Cordgrass within the bay. Only the largest patches were mapped as *Spartina* sward.

There are small patches of brackish and terrestrial habitats around the landward edges at the back of Begirris Bay. These include a large patch of Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*). Another section contains wet grassland dominated by Soft Rush (*Juncus effusus*) and also contains Devils-bit (*Succisa pratensis*) and Creeping Bentgrass. An old Flax Mill was located at the back of this bay.

3.3.3 Begirris Point and area affected by reclamation

Part of the saltmarsh west of Begirris Point has been affected by reclamation. There is an old ditch/embankment along the seaward edge, although it has been eroded in places and the tide can still flood the enclosed section. Hawthorn (*Crataegus monogyna*) is present on the ditch. The enclosed area has been drained in the past. This area still contains ASM along with some *Spartina* sward that colonised some of the large unvegetated areas within this section. The saltmarsh transitions to grassland along a gradual slope at the landward side, adjacent to a tall hedge.

This area is grazed by sheep with the grazing intensity being low-moderate. Some small patches along drainage channels are badly poached. The vegetation outside the embankment is dominated by a mid-upper saltmarsh zone. The vegetation is dominated by Red Fescue. Other species present include Creeping Bentgrass, White Clover (*Trifolium repens*), Sea Milkwort, Saltmarsh Rush and Autumn Hawkbit. The vegetation inside the embankment has been disturbed and there are several different zones present. There are several large patches of Common Cordgrass that have been mapped as *Spartina* sward. Some of the drains or bare mud strips have infilled and now contain strips of Common Saltmarsh-grass interspersed with strips dominated by Saltmarsh Rush. There are several large pare patches of mud within the area. Upper saltmarsh vegetation is present towards the landward side up a gradual slope. The area within the embankment is at a lower level than the seaward edge.

3.3.4 Western section of the survey site

This section of the saltmarsh south of Craig's Islands seems to have grown significantly since the 6 OS inch map was drawn. A drain/stream flows into the altmarsh and forms a channel that divides this section. The western side is grazed moderately while the eastern side is not grazed and these two sections are divided by a fence.

The eastern side contains an old low rocky embankment, midway up the saltmarsh. Upper saltmarsh vegetation is present above this embankment. This vegetation is dominated by Creeping Bentgrass, White Clover and Red Fescue. Other species present include Long-Bracted Sedge (*Carex extensa*) and Distant Sedge (*C. distans*). The saltmarsh below this embankment seems to have grown recently and contains mid marsh and lower marsh vegetation. There is a zone dominated by Common Saltmarsh-grass along the edge of the creek/channel and this transitions into vegetation dominated by Sea Plantain and Sea Pink adjacent to the low rock embankment.

The western section south of Craig's Islands is grazed by cattle and there are small areas that have been badly poached. Grazing intensity varies in the different saltmarsh zones. This area transitions to Gorse (*Ulex europaeus*) scrub along a boundary above the high water mark. This area contains several patches of MSM and some patches of *Spartina* swards. Clumps of Common Cordgrass are scattered through the lower part of the ASM. There are several zones present in the ASM. A low embankment is present towards the landward side and this separates the upper marsh vegetation dominated by Creeping Bentgrass and Red Fescue from the rest of the saltmarsh. Other species present include Sea Milkwort, Autumn Hawkbit and White Clover. The grazing intensity is high in this zone. The mid-upper marsh zone is poached to a moderate-heavy level. The lower-mid zone is poached and grazed lightly. This zone is dominated by a Sea Pink and Sea Plantain sward. Creeks and salt pans are well developed in this section. A saltmarsh cliff with signs of erosion is present along the seaward edge. The lower zone contains Annual Sea-blite (*Suaeda maritima*).

3.4 Mediterranean salt meadows (H1410)

A small patch of this habitat is located in the north-west section of Begirris Bay. This area is quite elevated and is situated towards the landward side of the saltmarsh. The vegetation is dominated by Sea Rush with frequent Red Fescue and Creeping Bentgrass. Other species present include Autumn Hawkbit, Sea Milkwort, White Clover, Common Scurvygrass, Sea Aster and Sea Arrowgrass. There are small salt pans present within this patch of habitat. There is a deep drain along the landward side of this area and a smaller drain connects this drain to a creek that empties this area.

A patch of this habitat located west of Begirris Point and this area has been fenced off and is grazed heavily. It is also badly poached. Bentgrass sp. are abundant including Creeping Bentgrass. There are small patches with terrestrial species such as Birdsfoot (*Lotus corniculatus*), Soft Rush (*Juncus effusus*), small Gorse bushes and the moss *Rhytidiadelphus squarrosus* within this section, as it is quite elevated and is probably situated close to the high water mark and not flooded often. There are several patches of this habitat close together that have developed at different elevations due to the topography of this area and the presence of a creek that drains this area. One side of the creek is higher than the other.

3.5 *Spartina* swards

The largest area of *Spartina* sward is located to the east of the causeway between Aughnish Island and the mainland. There is a very high Common Cordgrass stem density with occasional bare mud patches within the sward. The Common Cordgrass is mainly present on the intertidal mudflats. This area contains creeks amongst the *Spartina* sward. The densest part of the sward is adjacent to the causeway and the island. Further east the sward breaks up and large clumps of Common Cordgrass form a mosaic with intertidal mudflats along the seaward side of sward. There are occasional Glasswort plants amongst the Common Cordgrass and in some of the bare mud patches.

The sward has mainly developed on the east side of the causeway and there are only scattered clumps on the west side of the causeway on the mudflats. The clumps are spread in a zone 20 m from the shoreline but there are occasional clumps up to 50 m from the shoreline. The clumps range in size and there are frequent small clumps indicating that Common Cordgrass was reproducing recently. There is a break in the distribution of the Common Cordgrass and there is no Common Cordgrass along the seaward side of the Begirris Point. Further west of Begirris Point, large clumps of Common Cordgrass appear again. These clumps cover about 10-20% of the mapped area (mapped as scattered clumps on mud).

The abundance of Common Cordgrass increases towards the western side on the survey area. A small sward and associated scattered clumps has developed on mudflats between the saltmarsh and Craig's Island. The sward has developed on intertidal mud and there is no transition between the ASM and *Spartina* sward, and the *Spartina* sward and the *Salicornia* flats, located to the seaward side of the *Spartina* sward. There is a saltmarsh cliff along the edge of the ASM, with mudflats along the seaward edge.

Spartina sward is also present in Begirris Bay and is enclosed by ASM. This area is dominated by large coalesced clumps of Common Cordgrass. It also contains patches of ASM saltmarsh (20% of the mapped *Spartina* sward) similar to the adjacent ASM. Some of the clumps are monocultures of Common Cordgrass and have probably developed in salt pans. There is also mixed vegetation that is typical of a 1330/*Spartina* mosaic and this has probably developed when Common Cordgrass has spread into the adjacent ASM.

4 IMPACTS AND ACTIVITIES

The main activity on this site is grazing (140) (Table 4.1). However, the intensity of grazing is variable and significant parts of the site are not grazed. There are several enclosures that are badly poached by cattle, although cattle were not present during the survey (143). Other sections are grazed by sheep and the grazing intensity is low-moderate. These areas are not badly poached but may have some local heavy poaching. Grazing along a fence line shows

the impact grazing and poaching can have on the saltmarsh sward structure and the surface of the saltmarsh.

Common Cordgrass is present at this site (954). This is an invasive species. The earliest recorded date of its presence in Lough Swilly was in 1950, where it was recorded at Big Isle (Boyle 1972). Some of the ASM has frequent large clumps of Common Cordgrass present, although it generally does not make up more than 10% of the overall vegetation. There are several large patches within the ASM that have been classified as *Spartina* swards but it should be noted that much of the ASM has Common Cordgrass in it. There is no information on the previous extent of this species at this site. The 1995 aerial photos do show that it was present at this stage. The large area of *Spartina* sward east of the causeway has grown by about 10-20% between 1995 and 2000. Common Cordgrass also seems to have spread along the saltmarsh to the south of Craig's Islands since 1995, although not to the same extent. This area has frequent small clumps of Common Cordgrass, indicating that its extent on the mudflats is likely to increase in the near future

A comparison of the 6 inch OS map to the 2000 aerial photos indicates that the saltmarsh has grown in extent during this period (2.7 ha) (910). This seems to have occurred at two locations. The 6 inch OS maps indicate that Begirris Bay was not infilled with saltmarsh and the marked shoreline was much further back. There is also some difference between the 1st edition and 2nd edition 6 inch maps with the 2nd edition map showing the bay partly infilled with marshy ground. Saltmarsh now extends nearly to the mouth of the bay and there is a tall saltmarsh cliff at the seaward edge. The presence of a saltmarsh cliff at this location may indicate that the bay has not accreted and this in fact is an error on the 6 inch maps. It would be expected that this seaward boundary would be an accretional ramp or a lower saltmarsh cliff if this area was accreting. It is difficult to assess whether this saltmarsh is the result of fairly recent accretion.

There has also been accretion and growth of saltmarsh south of Craigs Islands (1.5 ha). An examination of the aerial photo shows that there have been several stages of accretion and saltmarsh growth. This saltmarsh growth is mainly westwards in a sheltered indentation along the coastline.

While there are indications from comparisons of the aerial photos and the 6 inch maps that there has been accretion and growth of parts of saltmarsh in the past 80 years, the saltmarsh cliff along the seaward edge currently shows some signs of erosion (900).

There have been attempts at reclamation of some of the saltmarsh along parts of the survey area. The largest area is west of Begirris Point. There is an old ditch/embankment along the seaward edge enclosing a large area (802). The embankment is now breached and the enclosed area is still flooded by the tide. A deep drain is present along the inside or the landward side of this embankment. This drain has been deepened or cleaned in the past few years (810). The enclosed area has possibly been drained in the past. Regular bare strips of mud are visible in parts of the enclosed area and are clearly seen

from the aerial photos. Most of these strips have revegetated. Turf may also have been taken from these strips. There are signs of reclamation at other locations with old rocky embankments present on the saltmarsh.

There has been some recent infilling of construction spoil on the coast line near the causeway (800). The saltmarsh has been infilled with spoil and this is within the SAC boundary. There are some tracks across the saltmarsh that are used to access the shoreline (501).

The main activities adjacent to the site are related to farming (100, 120, 140). There are several dwellings scattered along the shoreline close to the saltmarsh (401).

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
13s	140	C	-1	1.94	Inside
13s	143	A	-1	2.73	Inside
1330	501	C	-1	< 0.1	Inside
1330	800	C	-2	0.02	Inside
1330	810	C	-1	1.75	Inside
1330	900	C	-1	10.03	Inside
1330	954	C	-1	0.4	Inside
13s	100	C	0	1	Outside
13s	120	C	0	11.8	Outside
13s	140	C	0	11.8	Outside

1 EU codes as per Interpretation Manual. Code 13s is an additional code used to signify the entire saltmarsh habitat.
2 Description of activity codes are found in Appendix III summary report.
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

5.1 Overall Conservation Status

The overall conservation status of Rathmelton saltmarsh is assessed as *unfavourable-bad* (Table 5.1). This is because MSM was assessed as *unfavourable-bad*. However, most of the habitat is in relatively good condition. Grazing is the main activity on this saltmarsh but its intensity varies. A significant section with Begirris Bay is not grazed at all. There are small local patches of heavy grazing and poaching that are having a significant negative impact on species diversity, sward height and the surface of the saltmarsh.

The short-medium term prospects of saltmarsh migration in response to sea level rise are poor as most of the saltmarsh has a low embankment or ditch marking the beginning terrestrial habitats that extend up gentle-steep slopes of the surrounding hills. Any sea level rise may increase erosion of the

seaward edge of the saltmarsh and possibly induce further spread of Common Cordgrass in parts of the ASM.

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

Habitat	EU Conservation Status Assessment			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (1310)	Extent, Structure and functions, Future Prospects.			Favourable
Atlantic salt meadows (1330)	Extent,	Structure and functions, Future prospects		Unfavourable - Inadequate
Mediterranean salt meadows (1410)	Extent,		Structure and functions, Future prospects,	Unfavourable - Bad

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

5.2.1 Extent

The extent of this habitat is assessed as *favourable* in the absence of any other information on the previous extent of this habitat. This habitat was not listed as a qualifying interest for the SAC and there was no record of this habitat in the MPSU Conservation plan.

5.2.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. No monitoring stops were carried out in this habitat as the mudflats were inaccessible. However, no negative indicators were noted in the habitat such as erosion or clumps of Common Cordgrass. The distribution of the habitat is likely to be related to elevation and there are patches of *Spartina* sward situated at both sides of this habitat, probably on ground that is slightly elevated compared to the *Salicornia* flats.

5.2.3 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 no notable impacts or activities on this habitat. Common Cordgrass is located adjacent to the habitat and this habitat may be vulnerable to invasion by this species.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There is evidence that the saltmarsh has increased in extent between 1920 and 2006 from comparison of the 6 inch map and the 2000 aerial photos. This accretion and growth of saltmarsh is not considered in this assessment, as it was likely to have occurred prior to the period of assessment. Accretion and growth of saltmarsh is not occurring at present. There are signs of erosion along the saltmarsh cliffs at the seaward edge of the ASM. However, there is no indication from a comparison of the 1995 and 2000 aerial photos that erosion has reduced the extent of ASM since 1995.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Ten monitoring stops were carried out in this habitat and eight passed. The remaining two stops failed due to heavy poaching and significant amounts of exposed bare substrate. Generally all the other attributes reached their targets. The species diversity is typical of this habitat. All the typical ASM saltmarsh communities are present. There are good examples of zonation from the seaward cliff back to the landward boundary. There are small patches of natural transition from the ASM to brackish and terrestrial habitats with other sections being backed by a low embankment or boundary marking the beginning of the terrestrial habitats. The sward height is quite diverse with most of the ASM being grazed lightly or not at all. The lower-mid saltmarsh zones have a naturally low sward height.

The largest sections of the ASM contain a well-developed saltmarsh topography. There are frequent salt pans and a complex creek network in these larger sections. The central part of the survey area east of Begirris Point has been disturbed by old and more recent attempts at reclamation and land improvement. A larger area of saltmarsh was enclosed by an embankment that is now breached but a drain along the inside of the embankment has recently been deepened or cleaned. The enclosed area has also been drained or disturbed in the past with strips of bare mud present. The conservation status of this area is considered to be *unfavourable-bad* at present but is recovering from the old and more recent activities. This area is also grazed by sheep but the grazing intensity is low-moderate.

Common Cordgrass is present in this habitat. It is mainly confirmed to patches within salt pans, where the Common Cordgrass colonised bare mud. There are some larger patches that are classed as *Spartina* swards. There are small patches of mixed vegetation with Common Cordgrass spread through the ASM vegetation.

5.3.3 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. Heavy levels of grazing are affecting some of the saltmarsh with poaching disturbing the vegetation and the saltmarsh surface. However the grazing intensity is not uniform and most of the ASM is not grazed or is only grazed lightly.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable* in the absence of any information on the previous extent of this habitat. There are several small patches of this habitat scattered along the survey area. This habitat is not listed as a qualifying interest for this SAC. Swards of Sea Rush are noted in the MPSU Conservation plan around the shoreline of Lough Swilly and particularly in the brackish areas embanked by the old railway line located along the eastern side of Lough Swilly. However, there is no record of this habitat at this site.

5.4.2 Habitat structure and functions

The structure and functions of this habitat were assessed as *unfavourable-bad*. Only two monitoring stops were carried out in this habitat, with one stop passing. These stops reflect the general condition of the overall habitat, which has a variable conservation status. The eastern and western sections are in good condition with the western patches being grazed lightly. A significant area in the central section of the survey area is in poor condition due to poaching and high levels of grazing by cattle. The species diversity is typical of this habitat and the species found are generally all upper saltmarsh zone species such as Autumn Hawkbit and White Clover. Most of this habitat is situated at a high elevation and some patches also contain terrestrial species like Gorse indicating that some parts within the MSM are not inundated. The MSM does not have a typical saltmarsh topography, as the patches of habitat are quite small. There are no creeks and few salt pans within the habitat. Common Cordgrass is not present in this habitat.

5.4.3 Future prospects

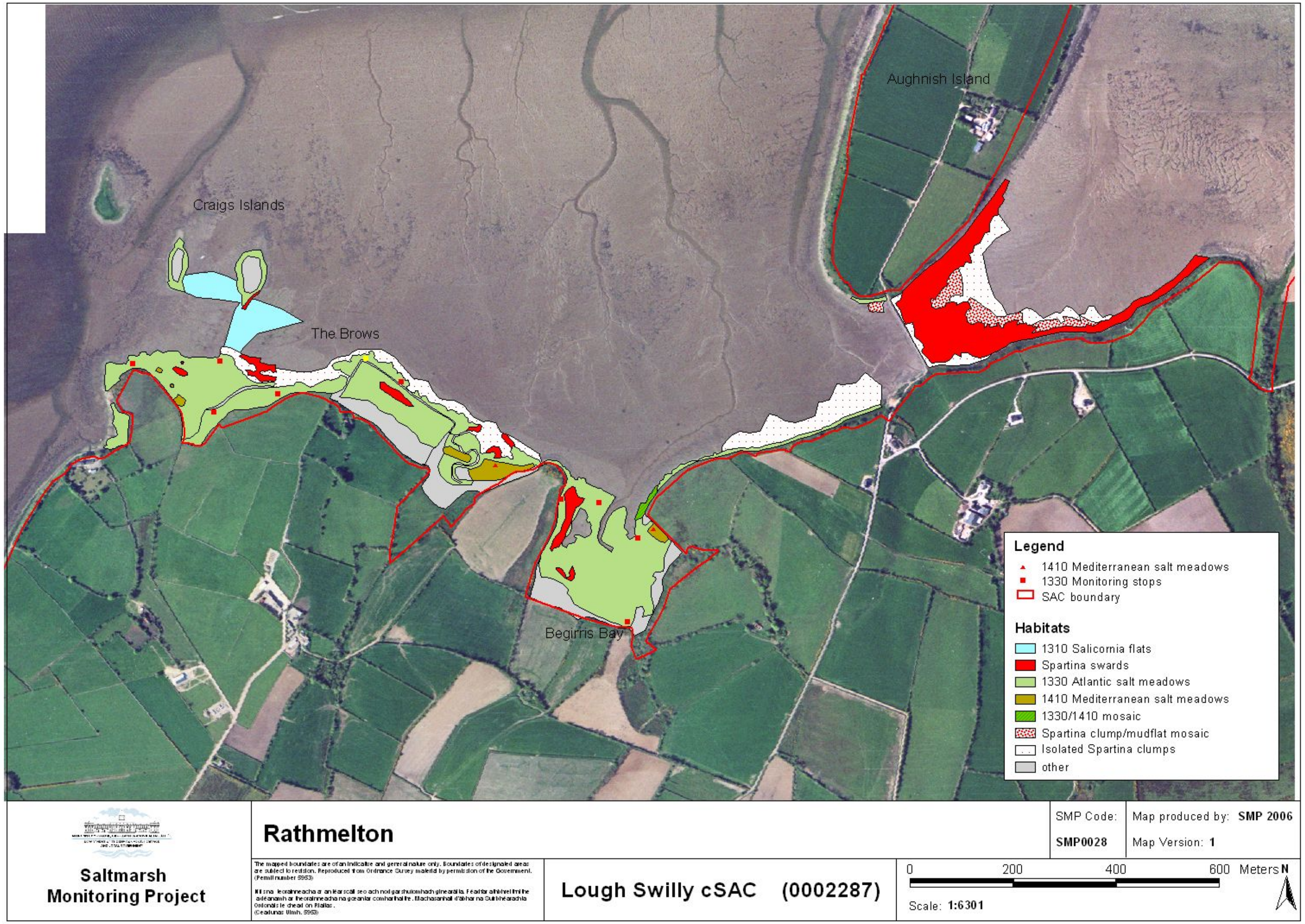
The future prospects of this habitat are assessed as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts continue in the near future. Cattle grazing is negatively affecting a significant portion of this habitat.

6 MANAGEMENT RECOMMENDATIONS

The grazing intensity on some parts of the site needs to be reduced to improve the conservation status of the site. However, this is not required for the whole of the site.

7 REFERENCES

Boyle, P.J. (1972). Two forms of *Spartina* in Donegal. Irish Naturalists Journal, 37, 239-240.


Aughnish Island
Craigs Islands
The Brows
Begirris Bay
Legend
1410 Mediterranean salt meadows
1330 Monitoring stops
SAC boundary
Habitats
1310 Salicornia flats
Spartina swards
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
other
Saltmarsh Monitoring Project
Rathmelton
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government. (Permit number 5953)
Lough Swilly cSAC (0002287)
SMP Code: SMP0028
Map produced by: SMP 2006
Map Version: 1
0 200 400 600 Meters
N
Scale: 1:6301

Appendix V - Ray site report and habitat map from SMP

1 SITE DETAILS

SMP site name: **Ray**	SMP site code: **SMP0027**	
Site name (Curtis list): **Ray**	CMP site code: **not surveyed**	
	Site No: (Curtis list): **6**	
NPWS Site Name: **Lough Swilly**	Dates of site visit: **12/08/2006**	
NPWS designation SAC: **2287**	MPSU Plan: **old format plan available**	
pNHA: **2287**		
SPA: **Lough Swilly SPA 2287**		
County: **Donegal**	Discovery Map: **2**	Grid Ref: **225769, 425308**
6 inch Map No: **Dg037**	Aerial photos (2000 series): **00166-b, 00166-c, 00166-d**	
Annex I habitats currently designated for Lough Swilly SAC: **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)**		
Other SMP sites within this SAC/NHA: **Green Hill, Ramelton, Lower Lough Swilly, Fahan**		
Saltmarsh type: **Estuary**	Substrate type: **Mud/sand/gravel**	

2 SITE DESCRIPTION

Ray saltmarsh is located along the western side of Lough Swilly in Co. Donegal, 4.5 south-west of Rathmullan. This site is located at the mouth of the Glenalla River where it meets the coastline at Ray. This area near to the shoreline is mainly low-lying and is dominated by improved grassland. The main Rathmullan-Ramelton road is situated along the shoreline at this location and is embanked on the seaward side. This road forms a boundary with extensive intertidal mud and sandflats. A road bridge crosses the Glenalla River. North of the road-bridge the coastline veers to the east. There are small patches of saltmarsh along the seaward edge of the road embankment, along the coastline to the east and along the shoreline upstream of the road bridge.

One Annex I habitat, Atlantic salt meadows (ASM), is found at this site. This habitat is listed as a qualifying interest for the Lough Swilly SAC. All of the saltmarsh habitat is situated within the SAC. The Lough Swilly SPA overlaps most of the SAC apart from the section upstream of the road bridge.

The site is easily accessed via the R247 Rathmullan-Ramelton road.

3 HABITATS

3.1 General description

The only saltmarsh habitat found at Ray is Atlantic salt meadow (ASM) (Table 3.1). This habitat is very poorly developed and is confined to a narrow band of saltmarsh about 5 m wide situated on both sides of the road bridge.

The saltmarsh to the west of the road bridge is dominated by Saltmarsh Rush (*Juncus gerardii*) and Common Saltmarsh-grass (*Puccinellia maritima*). Other species present include Sea Arrowgrass (*Triglochin maritimum*), Sea Aster (*Aster tripolium*), Sea Milkwort (*Glaux maritima*), Common Scurvygrass (*Cochlearia officinalis*), Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*). Some zonation is present. A band of Creeping Bentgrass (*Agrostis stolonifera*) is situated along the landward boundary. There is tidal litter covering part of the saltmarsh. There is no typical saltmarsh topography with salt pans and creeks, as the saltmarsh is so small.

The saltmarsh transitions into rank grassland dominated by Twitch (*Elytrigia repens*) on a steep embankment. Part of the shoreline further west upstream has been developed with a relatively new sea wall/embankment built along the shoreline and a single dwelling and gardens adjacent to this sea wall/embankment. A narrow band of saltmarsh is situated adjacent to a small tidal pool/ channel west of the road bridge.

The saltmarsh at the eastern (seaward side) of the road bridge is situated to the north of the river channel. This saltmarsh is quite eroded and patchy and forms a mosaic with a rocky shoreline. The patches of vegetation are similar to the western section. The intertidal mud and sandflats generally extend to the roadside embankment. There is a small piece of saltmarsh jutting out on the seaward side of the road to the south of the road-bridge.

The 1920s 6 inch map indicates saltings at two locations near Ray. (Saltings usually indicate saltmarsh vegetation.) Saltings are indicated upstream of the road bridge on the north side of the river, opposite the old post office. The edge of the river at this location has been developed. Further upstream there is a large patch of Common Reed (*Phragmites australis*) in a man-made pool along the river channel. This pond used to be an old corn mill pond and there is a causeway crossing the river bed allowing the pond to develop that prevents the tide flowing upstream to this location. The second location is along the Rathmullan-Ramelton road.

Table 3.1. Area of EU Annex I habitats listed at Ray.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.06
	Total	**0.06**

*note that saltmarsh habitat continues outside the surveyed site.

4 IMPACTS AND ACTIVITIES

There are few impacts and activities on the saltmarsh at this site (Table 4.1). The saltmarsh is not grazed. The saltmarsh seaward of the bridge seems to be n aturallyeroding (900).

Impacts adjacent to the saltmarsh habitats include roads (501) and scattered dwellings (403). The dwelling, embankment/seawall and garden development along the river bank upstream of the road bridge is outside of the SAC. The causeway and pool seem to be old features related to the old corn mill was formerly located at this site.

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1330	900	B	-2	0.02	Inside
1330	403	C	0	0.06	Outside
1330	501	C	0	0.06	Outside

1 EU codes as per Interpretation Manual. Code 13s is an additional code used to signify the entire saltmarsh habitat.
2 Description of activity codes are found in Appendix III summary report.
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

5.1 Overall Conservation Status

The overall conservation status is assessed as *unfavourable bad* (Table 5.1). This site was listed by Curtis and Sheehy-Skeffington (1998) and is the smallest site visited during this survey. There is no information on the previous extent of saltmarsh at this site. Examination of the 6 inch maps indicates that saltmarsh around this site was not significantly more extensive in the past. However, saltmarsh was noted at this site on the maps. The fact that it was listed by Curtis and Sheehy-Skeffington (1998) seems to indicate that the saltmarsh used to be greater in extent compared to today. There may have been more saltmarsh seaward of the road bridge where it is now eroding.

The structure and functions of this habitat are poor as the extent is so small. No monitoring stops were carried out due to the small size of the site. The species diversity is typical of ASM and there is some vegetation zonation related to elevation but there are no creeks and salt pans. The largest section is 5 m wide.

The future prospects of this site are assessed as *unfavourable-bad* as it is assumed that erosion of the saltmarsh seaward of the road bridge will continue.

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

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

6 MANAGEMENT RECOMMENDATIONS

There are no management recommendations for a site that is this small.

7 REFERENCES

Curtis, T.G.F.C. 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.


Legend
SAC boundary
Habitats
1330 Atlantic salt meadows
Saltmarsh Monitoring Project
Ray
SMP Code:
SMP0027
Map produced by: SMP 2006
Map Version: 1
Lough Swilly cSAC (0002287)
0 200 400 600 800 Meters
Scale: 1:9456
N