NPWS

Lower River Suir SAC
(site code: 002137)

Conservation objectives supporting document - Coastal habitats

Version 1

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

Please note that this document should be read in conjunction with the following report: NPWS (2017) Conservation Objectives: Lower River Suir SAC 002137. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the Habitats Directive 92/43/EEC (European Commission, 2013). It is defined in positive terms, such that a habitat type or species must be prospering and have good prospects of continuing to do so.

The River Suir and its tributaries flow through the counties of Tipperary, Kilkenny and Waterford. Lower River Suir SAC consists of the freshwater stretches of the River Suir immediately south of Thurles, Co. Tipperary and the tidal stretches as far as the confluence with the Barrow/Nore in Co. Waterford, along with many tributaries, including the Clodiagh, Multeen and Aherlow. Much of the system flows over Carboniferous limestone, though towards Waterford the geology changes to Old Red Sandstone (NPWS, 2013).

Lower River Suir SAC (site code: 002137) is selected for the following Annex I habitats: salt meadows, floating river vegetation, eutrophic tall herb communities, alluvial forests, old oak woodlands and yew woodlands.

The following Annex II species are listed for Lower River Suir SAC: freshwater pearl mussel (*Margaritifera margaritifera*), white-clawed crayfish (*Austropotamobius pallipes*), sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), twaite shad (*Alosa fallax fallax*), Atlantic salmon (*Salmo salar*) and otter (*Lutra lutra*).

The following two coastal habitats are included in the list of Qualifying Interests for the SAC:

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
1410	Mediterranean salt meadows (*Juncetaliea maritimi*)

These two saltmarsh habitats are usually found in close association with each other.

2 Conservation Objectives

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

This supporting document sets out the conservation objectives for the two coastal habitats listed above in Lower River Suir SAC, which are defined by a list of parameters, attributes and targets. The main parameters are (a) Range (b) Area and (c) Structure and Functions, the last of which is broken down into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for saltmarsh habitats are based primarily on the results of the Saltmarsh Monitoring Projects (SMP) (McCorry, 2007; McCorry and Ryle, 2009) and this document should be read in conjunction with those reports. The SMP surveyed, mapped and assessed one sub-site within Lower

River Suir SAC: Little Island (SMP site ID: SMP0052). This is also the only saltmarsh site in the River Suir estuary that is listed on the Saltmarsh Inventory (Curtis and Sheehy Skeffington, 1998).

The distribution of saltmarsh habitats within Lower River Suir SAC is presented in Appendix I. As part of the SMP, detailed individual reports and habitat maps were produced for each sub-site and those produced for Little Island are included in Appendix II.

The conservation objectives for the saltmarsh habitats in Lower River Suir SAC are extrapolated from the findings of the SMP as the area surveyed represents only approximately 12% of the total area of saltmarsh within the SAC, as estimated from aerial photographs. Therefore, it is important to note that there are significant additional areas of saltmarsh known to be present within the SAC (these areas are mapped as potential saltmarsh in Appendix I).

Although Mediterranean salt meadow (MSM) habitat was not recorded at Little Island during the SMP, it is likely to be found elsewhere in the SAC. Consequently the conservation objective for the MSM habitat is generic in nature and subject to change in light of new information.

3 Saltmarsh habitats

Saltmarshes are stands of vegetation that occur along sheltered coasts, mainly on mud or sand, and are flooded periodically by the sea. They are restricted to the area between mid-neap tide level and high water spring tide level. In Ireland, there are four saltmarsh habitats listed under Annex I of the EU Habitats Directive 92/43/EEC (European Commission, 2013):

- *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 scrubs (Sarcocornetea fruticosi) (1420)

The last habitat is restricted in its distribution to sites in the south-east of the country. The habitats in bold, Atlantic salt meadow (ASM) and Mediterranean salt meadows (MSM), are listed as Qualifying Interests for Lower River Suir SAC. The distribution of saltmarsh habitats within Lower River Suir SAC is presented in Appendix I.

The SMP surveyed, mapped and assessed the following saltmarsh sub-site within Lower River Suir SAC (McCorry and Ryle, 2009):

Little Island (site ID: SMP0052; see Appendix II)

Little Island is identified as an estuary type saltmarsh (Curtis and Sheehy Skeffington, 1998).

3.1 Overall Objectives

The overall objective for 'Atlantic salt meadows' in Lower River Suir SAC is to '*restore the favourable conservation condition*'.

The overall objective for 'Mediterranean salt meadows' in Lower River Suir SAC is to '*restore the favourable conservation condition*'.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings: (a) Area (b) Range and (c) Structure and Functions. In the absence of detailed information on the current status of the MSM habitat in the SAC, the objectives and targets are generic and subject to change in light of new information.

3.2 Area

3.2.1 Habitat area

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

A baseline habitat map of all known saltmarsh in Lower River Suir SAC was produced based on the findings of the SMP (McCorry and Ryle, 2009). A total of 4.11ha of saltmarsh habitat was mapped by the SMP within Lower River Suir SAC at Little Island and an additional 29.32ha of potential saltmarsh habitat was identified using aerial photographs, to give a total estimated area of 33.43ha for Lower River Suir SAC (see Appendix I for distribution map).

The total area of ASM habitat within the sub-site as mapped by the SMP and the total areas of the habitat within the SAC boundary are presented in the following table.

There are a number of differences in the figures below. Most of the differences can be explained by the fact that the SMP mapped the total saltmarsh resource 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 that given in the SMP as the SMP did not include any mosaics when calculating their total areas. The following rules were applied when calculating the areas for the SAC's conservation objectives:

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

Source	Total area (ha) of ASM (excluding mosaics) from SMP	Total area (ha) of ASM within SAC boundary (including mosaics)
Sub-site: Little Island	3.62	4.11
Potential ASM		29.32
Total	**3.62**	**33.43**

Sea rush (*Juncus maritimus*) (an indicator species for MSM) was recorded at Grantstown in the SAC during the NPWS National ASI (Area of Scientific Interest)/NHA (National Heritage Area) Survey in the 1990s. However, no MSM habitat was recorded at the Little Island sub-site by McCorry and Ryle (2009).

The general target for each habitat is that the area should be stable or increasing, subject to natural processes, including erosion and succession.

3.3 Range

3.3.1 Habitat distribution

Lower River Suir SAC contains typical examples of saltmarsh habitat that has a significant estuarine influence. Saltmarsh occurs in the River Suir estuary downstream of Waterford City in old flood meadows where the embankment is absent, or has been breached, and along the tidal stretches of some of the inflowing channels below Little Island. Little Island is a small island in the River Suir estuary where the river channel splits in two and divides into a northern and a southern (Kings) channel (McCorry and Ryle, 2009).

The Kings Channel below Waterford City is quite deep and is lined with steep-sided intertidal mud banks. There are several small, narrow bands of saltmarsh extending along both banks of the channel. These saltmarsh areas are relic sites that have not been disturbed by reclamation. They contain substantial amounts of non-Annex I saltmarsh vegetation dominated by twitch (*Elytrigia repens*) and sea couch (*Elymus pycnanthus*) (McCorry and Ryle, 2009).

The area around the southern side of Kings Channel is quite low-lying and reclaimed farmland is situated behind a tall embankment. Saltmarsh would have originally covered the land behind this embankment. There is a narrow zone containing a strip of Atlantic salt meadow (ASM) and twitch (*Elytrigia repens*) dominated grassland along the intertidal zones of the embankment. There is a tall saltmarsh cliff along the seaward edge of this section of saltmarsh leading down to steep-sided intertidal mudflats that shelve into the Kings Channel. A relatively large area of saltmarsh has developed in low-lying land adjacent to the river channel at the north-west end of the Kings Channel (McCorry and Ryle, 2009).

A tall saltmarsh cliff is also present along the estuary side of the saltmarsh adjacent to intertidal mudflats. A low ridge is also present along the edge of the saltmarsh that contains a band of twitch (*Elytrigia repens*) dominated vegetation. This zone is about 15–20m wide in places. ASM vegetation is present at the landward side of this ridge and is an example of reverse zonation. This ridge may be

a natural phenomenon and related to sedimentation and flow of water off the saltmarsh (McCorry and Ryle, 2009).

Saltmarsh habitat is also found around Little Island, Ballycanvan Stream and Faithlegg. Saltmarsh has developed in low-lying land to the north of the Little Island slipway. There is generally a tall saltmarsh cliff along the seaward edge of the saltmarsh (McCorry and Ryle, 2009).

Other areas of saltmarsh are also seen along the south bank at Ballynakill and in three large salt meadows between Ballynakill and Cheekpoint, towards the mouth of the estuary in Co. Waterford. These saltmarsh areas can be divided into three different sections: Belmont House, Ballynakill and Grantstown (McCorry and Ryle, 2009).

The best example of Atlantic salt meadows (ASM) occurs at Ballynakill. Atlantic salt meadow (ASM) is present in association with substantial areas of grass-dominated saltmarsh habitat. This is typical of an estuary type saltmarsh and gives some indication of the freshwater/brackish influence on this saltmarsh, due to its presence in the River Suir estuary, compared to other types of saltmarsh (McCorry and Ryle, 2009).

There is a low ridge along parts of the seaward boundary along the Grantstown embankment containing twitch (*Elytrigia repens*) dominated vegetation. One notable feature of this saltmarsh is the absence of glasswort (*Salicornia* spp.), this may be attributed to the estuarine influence. The *Vulnerable* (Wyse Jackson *et al*., 2016) meadow barley (*Hordeum secalinum*) has been recorded on the saltmarsh in Grantstown, associated with the twitch (*Elytrigia repens*)/sea couch (*Elymus pycnanthus*) dominated grassland. Meadow barley is also legally protected through listing on the Flora (Protection) Order, 2015 (Statutory Instrument No. 356 of 2015). Several other clumps were recorded along the narrow grass-dominated saltmarsh zone between Grantstown and Ballynakill House (McCorry and Ryle, 2009).

Grantstown marsh also contains similar ASM vegetation to that at Ballynakill. The overall ASM topography is less developed in this area and grassy ASM vegetation forms mosaics with large twitch (*Elytrigia repens*) dominated patches. There are several patches dominated by a common saltmarsh-grass (*Puccinellia maritima*) sward. This mosaic does not seem to be related to the underlying topography of the saltmarsh. However, in some places the twitch-dominated vegetation is situated on slightly higher ridges or mounds with ASM vegetation being situated in shallow hollows.

The distribution of saltmarsh habitats within Lower River Suir SAC can be found in Appendix I.

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

3.4 Structure and Functions

The location, character and dynamic behaviour of saltmarshes are governed by sediment supply, tidal regime, wind-wave climate and sea level change. The slope of the saltmarsh allows the development of several ecological gradients such as tidal submergence and salinity, and this influences the development of distinctive zones of halophytic and salt-tolerant plant communities. Maintaining the favourable conservation condition of the saltmarsh habitat in Lower River Suir SAC 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 main activities adjacent to this SAC are urbanisation and use of the River Suir channel for navigation and access to Waterford Port. The area around the Little Island saltmarsh has been considerably modified in the past (McCorry and Ryle, 2009).

There is a tall saltmarsh cliff along most of the seaward boundary with some undercutting and cliff toppling along the southern side of the Kings Channel. There are no indications of any measurable loss of saltmarsh due to erosion. In fact, there are indications that the saltmarsh has grown somewhat into the channel. This may be related to dredging of the estuary channels at various times, which is related to shipping access to Waterford Port (McCorry and Ryle, 2009).

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

Saltmarshes can contain a distinctive topography with an intricate network of creeks and pans occurring on medium to large-sized sites. Creek density is influenced by vegetation cover, sediment supply and tidal influence. Creeks absorb tidal energy and assist with delivery of sediment into the saltmarsh. The efficiency of this process depends on creek pattern. Creeks allow pioneer vegetation to become established along their banks higher up into the saltmarsh system. Major erosion of saltmarsh is indicated by internal dissection and enlargement of the drainage network, ultimately leading to the creation of mud basins.

The saltmarsh at the Little Island sub-site contains a well-developed topography and large, deep creeks are present. A small stream flows through this saltmarsh through a deep channel at the southern side and links to the Kings Channel. Ballynakill House marsh contains the best developed saltmarsh topography with several large creeks draining the marsh. Some salt pans are also present (McCorry and Ryle, 2009).

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

3.4.3 Physical structure: flooding regime

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

Much of the shoreline along the Lower River Suir channel has been modified by embankments, infilling and drainage. Grassland is intensively managed and the rivers are therefore vulnerable to pollution from run-off of fertilisers and slurry (McCorry and Ryle, 2009).

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

3.4.4 Vegetation structure: zonation

Saltmarshes are naturally dynamic coastal systems. In order to ensure the ecological functioning of all of the saltmarsh habitats, it is vital to maintain the zonations and transitions to other habitats, including intertidal, shingle and sand dune habitats.

In the SAC, there are several saltmarsh communities present and zonation is moderately well-developed (McCorry and Ryle, 2009).

At Ballynakill, the saltmarsh transitions to a grassy bank on a moderate slope along a treeline. There are several patches of sea club-rush (*Bolboschoenus maritimus*) and grassy saltmarsh vegetation dominated by twitch (*Elytrigia repens*) and sea couch (*Elymus pycnanthus*) in this zone. These stands have been classified and mapped as non-Annex saltmarsh vegetation (McCorry and Ryle, 2009).

The transition to reedbeds that is found at Grantstown is noteworthy, as few of these transitions are seen in the south-east due to reclamation. The ASM forms a mosaic with a significant amount of grass-dominated habitat. This is typical of an estuary type saltmarsh with a significant freshwater influence (McCorry and Ryle, 2009).

The ASM habitat at Lower River Suir SAC shows several signs of freshwater influence due to its position in the River Suir estuary. There are several ASM saltmarsh zones present. However, saltmarsh zonation is complex in places. The ASM vegetation also forms mosaics with patches of twitch (*Elytrigia repens*)/sea couch (*Elymus pycnanthus*) dominated grassland on the saltmarsh. The twitch dominated patches are frequently found as bands of vegetation along some of the creeks and can also be found close to the seaward edge of the saltmarsh on low ridges along the creeks or along the seaward boundary (McCorry and Ryle, 2009).

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

3.4.5 Vegetation structure: sward 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.

Land use within Lower River Suir SAC consists mainly of agricultural activities including grazing, silage production, fertilisation and land reclamation. None of the sections of saltmarsh were grazed. Some of this marsh may have been grazed in the past when the adjacent land was farmed and before the development. As the site is not grazed, the sward height is lush and rank in places. However, the overall sward structure is still quite variable (McCorry and Ryle, 2009).

A small part of the ASM is likely to be affected by nutrient enrichment from sewage discharge at Grantstown. There is no significant negative impact from this discharge on the habitat. However, the ASM adjacent to the discharge is somewhat ranker. The sward height in both zones at Ballynakill House marsh is quite high and the marsh is ungrazed (McCorry and Ryle, 2009).

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

3.4.6 Vegetation structure: vegetation cover

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

A section of saltmarsh has been disturbed by the path of a new sewage/water pipeline. This area is mainly unvegetated, or revegetating, with ruderal species (McCorry and Ryle, 2009).

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

3.4.7 Vegetation composition: typical species and sub-communities

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

Below are lists of typical species for the different saltmarsh zones, although some of these species have a restricted distribution nationally and may not occur in the Little Island area of the Lower River Suir SAC:

Typical species

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

In the SAC, the saltmarsh at the north-west end of the Kings Channel is co-dominated by Atlantic salt meadows and substantial areas of grass-dominated saltmarsh habitat with twitch (*Elytrigia repens*) and sea couch (*Elymus pycnanthus*) dominated vegetation. There are also several smaller patches dominated by sea club-rush (*Bolboschoenus maritimus*) present (McCorry and Ryle, 2009).

The Atlantic salt meadows (ASM) habitat at Ballynakill House is dominated by a mid-upper marsh zone. This is dominated by red fescue (*Festuca rubra*) and creeping bent (*Agrostis stolonifera*), with frequent saltmarsh rush (*Juncus gerardii*) and occasional curled dock (*Rumex crispus*), autumn hawkbit (*Leontodon autumnalis*), sea aster (*Aster tripolium*), wild celery (*Apium graveolens*), spear-leaved orache (*Atriplex prostrata*) and thrift (*Armeria maritima*). The mid zone vegetation occasionally varies and becomes dominated by saltmarsh rush (*Juncus gerardii*) and sea arrowgrass (*Triglochin maritima*). The remaining saltmarsh habitat at Ballynakill House is dominated by ASM with smaller patches of saltmarsh vegetation dominated by twitch (*Elytrigia repens*) or sea couch (*Elymus pycnanthus*) (McCorry and Ryle, 2009).

This lower marsh zone at Ballynakill House is dominated by common saltmarsh-grass (*Puccinellia maritima*) with frequent sea aster (*Aster tripolium*), and minor amounts of common cordgrass (*Spartina anglica*) and creeping bent (*Agrostis stolonifera*). Spear-leaved orache (*Atriplex prostrata*), sea milkwort (*Glaux maritima*), sea arrowgrass (*Triglochin maritima*) and sea plantain (*Plantago maritima*) are also present in this zone (McCorry and Ryle, 2009).

Along the Grantstown embankment, most of the ASM is mid-upper ASM with red fescue (*Festuca rubra*) and creeping bent (*Agrostis stolonifera*) dominating, with sea plantain (*Plantago maritima*), sea arrowgrass (*Triglochin maritima*), curled dock (*Rumex crispus*), common saltmarsh-grass (*Puccinellia martima*), common scurvygrass (*Cochlearia officinalis*), sea aster (*Aster tripolium*), and spear-leaved orache (*Atriplex prostrata*). A small strip of ASM containing low-marsh vegetation is present behind this ridge (McCorry and Ryle, 2009).

Meadow barley (*Hordeum secalinum*) grows at the landward transition of the saltmarsh. This species is found in brackish situations and in unimproved lowland meadows close to estuaries (McCorry and Ryle, 2009).

The target for this attribute is to ensure that a typical flora of saltmarshes is maintained, as are the range of sub-communities within the different zones.

3.4.8 Vegetation composition: negative indicator species

The only invasive and non-native species recorded on saltmarshes during the SMP was common cordgrass (*Spartina anglica*) (McCorry, 2007; McCorry and Ryle, 2009).

Common cordgrass (*Spartina anglica*) is an invasive species of saltmarsh and mudflats. It is not known when this species first colonised the Lower Suir estuary, or if it was planted. Common cordgrass is not that extensive on the established saltmarsh. Overall it is quite rare, but is occasionally more frequently in low zone saltmarsh at several places and the SMP recorded 0.38ha of *Spartina* sward habitat. Common cordgrass is mainly found along the edge of the saltmarsh and the internal channels of the Lower River Suir SAC, where it has established on intertidal mud and clumps have coalesced to form swards (McCorry and Ryle, 2009).

These swards of common cordgrass are also found in the Kings Channel situated along the edge of the saltmarsh on the intertidal mudflats. However, the intertidal mudflats around the Kings Channel are not suitable for significant spread of common cordgrass as they are quite steep along the edges of the channel. A narrow band of common cordgrass sward is also present along the northern bank, where clumps have coalesced in places (McCorry and Ryle, 2009).

At Ballynakill House saltmarsh, common cordgrass (*Spartina anglica*) is present, but overall is rare on most of the marsh and is more occasionally found close to the intertidal mud along the edge of the saltmarsh. Common cordgrass forms small patches of ASM/common cordgrass mosaic in a low-lying section of saltmarsh (McCorry and Ryle, 2009).

Common cordgrass swards were also visible around Little Island. The swards are generally only in a zone between 5–10m wide. There are signs of minor spread of common cordgrass as it dominates down the intertidal flats at the eastern side of the Grantstown section of saltmarsh (McCorry and Ryle, 2009).

West of Grantstown, common cordgrass dominates small patches of this narrow saltmarsh strip at the seaward side of the embankment. It is only frequent on relatively small areas of saltmarsh and its presence in the ASM and ASM/common cordgrass mosaic is assessed as a low negative influence as it is not likely to spread in the future and affect this saltmarsh. There are no indications that the

spread of common cordgrass has resulted in any significant loss of ASM habitat (McCorry and Ryle, 2009).

There is some enrichment of the saltmarsh at the western side of Grantstown. Raw sewage was noted flowing along the drainage channel that passes through the large stand of common reed (*Phragmites australis*) and into the Kings Channel. The local sewage treatment plant discharges into the main channel at this point. The enrichment of the vegetation may account for the dominance of common reed (*Phragmites australis*) and the loss of sea rush (*Juncus maritimus*) in this part of the saltmarsh. Terrestrial species such as nettle (*Urtica dioica*) also occur (McCorry and Ryle, 2009).

The aim is that negative indicators, such as common cordgrass (*Spartina anglica*), should be absent or under control. The current target for this particular site is no significant expansion, with no new sites and an annual spread of less than 1% where it is already known to occur.

4 References

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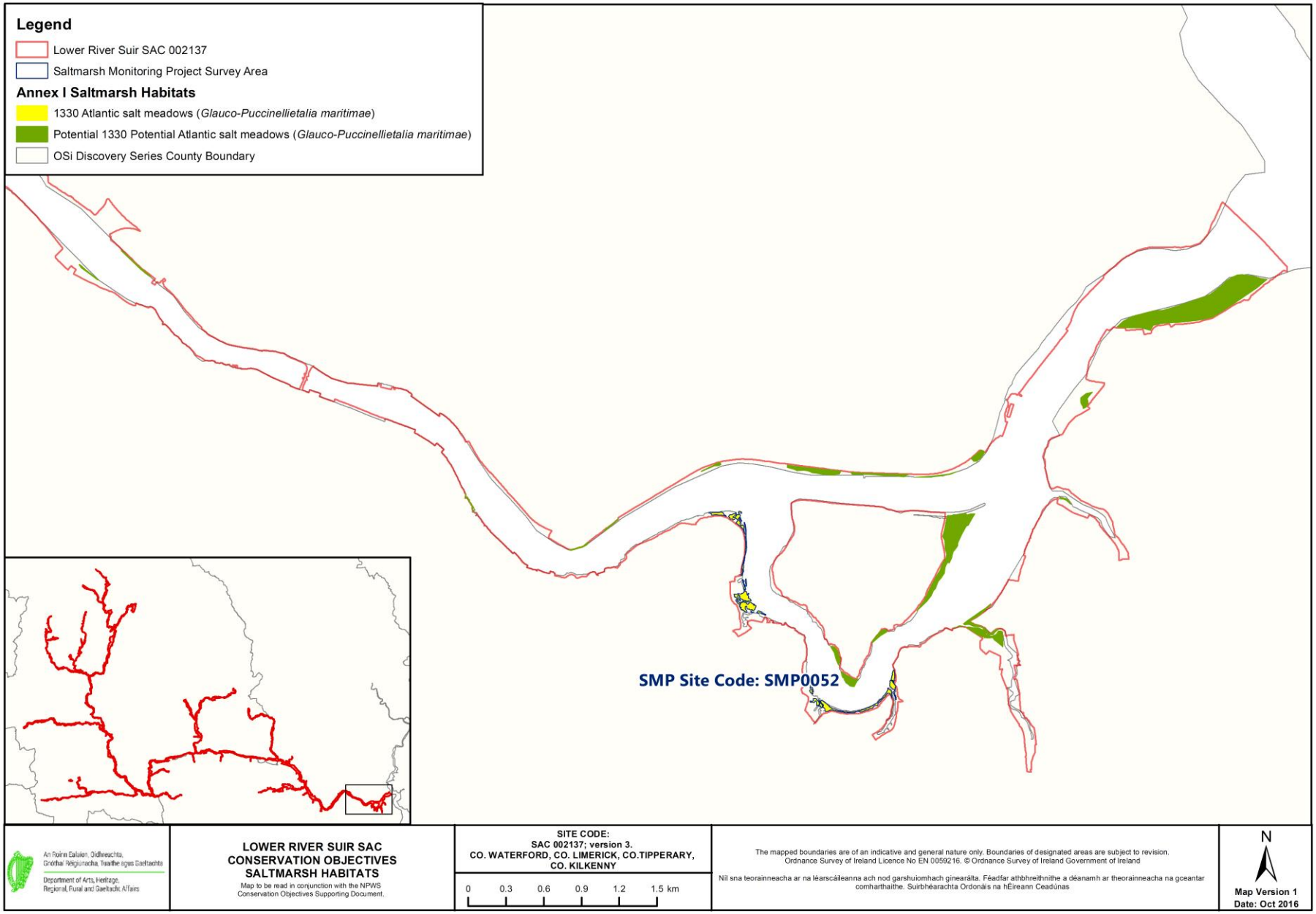
Appendix I – Distribution map of saltmarsh habitats within Lower River Suir SAC



Appendix II – Little Island site report and habitat map from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)

1 SITE DETAILS

SMP site name: Little Island	**SMP site code:** SMP0052
Dates of site visit: 25/09/2007	**CMP site code:** N/A
SM inventory site name: Little Island	**SM inventory site code:** 209
NPWS Site Name: Lower River Suir	
NPWS designation: cSAC: 002137 pNHA: 001702	**MPSU Plan:** N/A **SPA:** N/A
County: Waterford	**Discovery Map:** 76 **Grid Ref:** 26500, 11800
Aerial photos (2000 series): Wa 010, 018; Kk 046, 047	**6 inch Map No:** Wa 010, 018; Kk 046, 047

Annex I habitats currently listed as qualifying interests for Lower River Suir cSAC:

H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

H1410 Mediterranean salt meadows (Juncetalia maritimi)

Other SMP sites within this SAC/NHA: N/A

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

2 SITE DESCRIPTION

Little Island saltmarsh is located in the River Suir estuary, on the eastern side of Waterford City in Co. Waterford. Little Island is a small island in the River Suir estuary where the river channel splits in two and divides into a northern and southern (Kings) channel. The island is privately owned and houses a golf course and resort. The survey site extended along the southern shoreline of the Kings Channel from Belmont House in the west to Grantstown Townland in the east. The survey site contains several small separate saltmarshes. The Kings Channel is quite deep and is lined with steep-sided inter-tidal mud banks.

Little Island saltmarsh is the only site in the River Suir estuary that is listed on the SM inventory (Curtis & Sheehy-Skeffington 1998). Much of the shoreline along the river channel has been modified by embankments, infilling and drainage. However, saltmarsh habitat is also found around Little Island, Ballycanvan Stream, Faithlegg and Cheekpoint towards the mouth of the estuary on the Co. Waterford side of the estuary. Saltmarsh is also present on the Kilkenny side of the river, often behind some of the old embankments.

The area around the survey site has been considerably modified in the past. This area is now quite built up and urban land extends east from Waterford City adjacent to the west part of the site. Farmland is still present adjacent to the site along the east part of the site in Grantstown Townland. Construction of houses is continuing in this area and extending east into Grantstown. A sewage/water pipeline has been recently constructed along the river bank. This has affected the remaining saltmarsh habitats. The area around the southern side of Kings Channel (Grantstown) is quite low-lying and farmland is situated behind a tall embankment. The western area along the survey site (Blenheim Hill) is somewhat higher with low hills and elevated land close to the river channel. Small patches of

saltmarsh developed in low-lying land along the river channel and on the estuary side of the embankment.

The site is located within the Lower River Suir candidate Special Area of Conservation (cSAC 002137). Two sections of the site (Belmont House and Grantstown) were also designated as Kings Channel pNHA (1702). One Annex I habitat is present at this survey site, Atlantic salt meadows (ASM). This habitat is listed as a qualifying interest for the Lower River Suir cSAC. The NHA notes mention that stands of sea rush (*Juncus maritimus*) were present on the saltmarsh at Grantstown that could be an indication of the presence of Mediterranean salt meadows. However, stands of sea rush were not recorded at this site during the 2007 survey.

Most of the saltmarsh habitats mapped at this site is located within the cSAC boundary. There are several fragments of Annex I habitats located outside the boundary around the site. Some are unintentional exclusions, as the 6 inch map was used to draw the cSAC site boundary and there are some errors between this map and the actual ground as indicated from the aerial photos. Some of the habitat fragments have also been left out of the cSAC due to unintentional exclusions.

This site is notable for the presence of meadow barley (*Hordeum secalinum).* This species is listed on the Flora Protection Order and also listed in the Red Data Book (Curtis and McGough 1988). Meadow barley is found in brackish situations and in unimproved lowland meadows close to estuaries. This species is known from 21 10 km^2 squares in Ireland mainly distributed around the coastline (with some inland sites) since 1960 (Preston *et al.* 2002). The original NHA survey of Kings Channel (1993) and the Rare Plant Survey (1994) recorded this species from saltmarsh around Belmont House and in the saltmarsh at Grantstown. The NHA survey noted that some of these sites were under threat from disturbance from the adjacent housing development.

The saltmarsh around King's Channel was accessed from several locations. The river bank was accessed from adjacent housing estates.

3 SALTMARSH HABITATS

3.1 General description

The survey site can be divided into three different sections, Belmont House, Ballynakill and Grantstown. Atlantic salt meadow (ASM) is present at each of these sites in association with substantial areas of grassy Other Saltmarsh habitat (CM2) dominated by twitch (*Elytrigia repens*) and/or sea couch (*Elytrigia pycnanthus*), as well as patches dominated by sea club-rush (*Bolboschoenus maritimus*). This typical of an estuary type saltmarsh and gives some indication of the freshwater/brackish influence on this saltmarsh compared to other types of saltmarsh due to its presence in the Lower Suir Estuary. The new pipeline has affected each of these sub-sites. No *Salicornia* flats and Mediterranean salt meadow habitat was recorded at this site.

3.1.1 Belmont House

This saltmarsh is situated at the north-west end of the Kings Channel. A relatively large area of saltmarsh has developed in low-lying land adjacent to the river channel. This saltmarsh is co-dominated by ASM and patches of twitch and/or sea couch-dominated saltmarsh vegetation (CM2). This vegetation has been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. There are some large areas dominated by a sward of

sea couch and some mixed twitch and sea couch areas. This vegetation type also contains occasional or rare creeping bent-grass (*Agrostis stolonifera*), false fox sedge (*Carex otrubae*), sea aster (*Aster tripolium*), curled dock (*Rumex crispus*), sea plantain (*Plantago maritima*) and spear-leaved orache (*Atriplex prostrata*). There are also several smaller patches dominated by sea club-rush also present. A tall saltmarsh cliff is present along the estuary side of the saltmarsh adjacent to intertidal mudflats. A low ridge is also present along the edge of the saltmarsh that contains a band of twitch-dominated vegetation. This zone is about 15-20 m wide in places. ASM vegetation is present at the landward side of this ridge and is an example of reverse zonation. This ridge may be a natural phenomenon and related to sedimentation and flow of water off the saltmarsh.

A narrow band of *Spartina* sward is also present along the northern side of this area, where clumps of common cordgrass have coalesced in places. The saltmarsh habitats develop into narrow bands at the eastern ends of this area and the saltmarsh vegetation continues along the shoreline of the Kings Channel. This is a narrow zone containing a strip of ASM and twitch-dominated CM2 on a grassy bank and was mapped as a mosaic (ASAM/CM2 mosaic).

The land adjacent to this area is built up with housing development. The path of the new pipeline is situated along the upper boundary of this foreshore zone. The path of the pipeline has crossed ASM, upper grassy saltmarsh dominated by twitch (CM2) and some dry terrestrial grassland. Meadow barley was recorded from this zone by the Rare Plant Survey. A new low earth embankment has been constructed to house this pipeline and track is present on top of this embankment. This embankment is unvegetated (ED2/ED3). A new terrestrial transition is developing along this low pipeline embankment.

3.1.2 Ballynakill

This saltmarsh has developed in low-lying land to the north of the Little Island slipway (Ballynakill House). A significant portion of this saltmarsh has been infilled over the past 100 years at the northern and southern sides. Some of this infilling has occurred more recently. The remaining saltmarsh habitat is dominated by ASM with smaller patches of Other Saltmarsh vegetation generally dominated by twitch or sea couch. This saltmarsh contains a well-developed topography and large, deep creeks are present. A small stream flows through this saltmarsh through a deep channel at the southern side and links to the Kings Channel. There is generally a tall saltmarsh cliff along the seaward edge of the saltmarsh. Some clumps of common cordgrass are present on the intertidal mud along the edge of the saltmarsh. Common cordgrass is more frequent towards the northern end of this area, and there is a small section of ASM/*Spartina* mosaic in a low-lying section of saltmarsh.

The saltmarsh transitions to a grassy bank on a moderate slope along a treeline. This area has been disturbed by the path of the new pipeline. This area is mainly unvegetated (ED3) or re-vegetating with ruderal species. There are several patches of sea club-rush and grassy saltmarsh vegetation dominated by twitch/sea couch in this zone. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

3.1.3 Grantstown Townland

This saltmarsh is distributed along the southern side of the Kings Channel. The main sections of saltmarsh are located at either sides (the eastern and western sides). These sections are relic areas that have not been disturbed by reclamation in the past 100 years. Both contain substantial amounts of Other Saltmarsh vegetation (CM2) dominated by twitch/sea couch. The central section contains a

narrow band of saltmarsh along a grassy embankment. The embankment is covered with twitch-dominated grassland. Saltmarsh originally covered land behind this embankment. This area now contains reclaimed farmland. A stream flowing through a deep channel links to the Kings Channel at the eastern side of the embankment and narrow bands of saltmarsh are present along the intertidal zones along the embankment and the treeline that mark the terrestrial boundaries in this area.

There has been some recent housing development adjacent to the saltmarsh area at the western side. The path of the new water/sewage pipeline also crosses along transitional zone between the saltmarsh and the adjacent terrestrial land at the western side. This zone is unvegetated and is situated along a tarmac track along the back of the housing development. A large drain also flows into this section though a large stand of common reed.

There is a tall saltmarsh cliff along the seaward edge of this section of saltmarsh leading down to steep sided intertidal mudflats that shelve into the Kings Channel. There are several clumps of common cordgrass situated along the edge of the saltmarsh on the intertidal mudflats in the central section. These clumps coalesce to form a narrow band of *Spartina* swards alongside the more established saltmarsh further east.

The original NHA survey recorded meadow barley on the saltmarsh in Grantstown, associated with the twitch/sea couch dominated grassland (CM2) in the north-west section of this site. Several other clumps were recorded along the narrow CM2-dominated saltmarsh zone between Grantstown and Ballynakil House.

Table 3.1. Area of saltmarsh habitats mapped at Little Island.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	3.616
non-Annex	*Spartina* swards	0.378
	Total	**3.994**

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

3.2 Atlantic salt meadows (H1330)

The ASM habitat at this site shows several signs of freshwater influence due to its position in the Lower Suir Estuary. There are ASM several saltmarsh zones present. However saltmarsh zonation is complex in places. The ASM vegetation also forms mosaics with patches of twitch/sea couch dominated grassland on the saltmarsh. The twitch-dominated patches are frequently found as bands of vegetation along some of the creeks and can also be found close to the seaward edge of the saltmarsh on low ridges along the creeks or along the seaward boundary.

The ASM at Ballynakill House is dominated by a mid-upper marsh zone. This zone is dominated by red fescue (*Festuca rubra*) and/or creeping bent-grass with frequent saltmarsh rush (*Juncus gerardii*) and occasional or rare curled dock, autumn hawkbit (*Leontodon autumnalis*), sea aster, parsley water-dropwort (*Oenanthe lachenalii*), wild celery (*Apium graveolens*) and spear-leaved orache. Other species present include sea milkwort (*Glaux maritima*) and sea pink (*Armeria maritima*). Common cordgrass (*Spartina anglica*) is present but overall is rare on most of the marsh and is more occasionally found close to the seaward edge of marsh. Common cordgrass forms small patches of ASM/*Spartina* mosaic in places. The mid zone vegetation occasionally varies and becomes

dominated by saltmarsh rush and or sea arrowgrass. This marsh contains the best developed saltmarsh topography with several large creeks draining the marsh. Some salt pans are also present.

A second saltmarsh zone is present at Ballynakill House marsh. This zone is a lower marsh zone and is dominated by common saltmarsh-grass (*Puccinellia martima*) with frequent sea aster and minor amounts of common cordgrass, and creeping bent. Spear-leaved orache, sea milkwort, sea arrowgrass (*Triglochin maritimum*) and sea plantain may also be present in this zone. The sward height in both zones is quite high and the marsh is ungrazed.

The ASM at Grantstown marsh also contains similar ASM vegetation. The overall ASM topography is less developed in this area and grassy ASM vegetation forms mosaics with large twitch-dominated patches. There are several patches dominated by a common saltmarsh-grass sward. Most of the ASM is dominated by mid-upper ASM with red fescue and creeping bent dominant, and sea plantain, sea arrowgrass, curled dock, common scurvygrass, sea aster and spear-leaved orache also present. This mosaic does not seem to be related to the under-lying topography of the saltmarsh. However, in some places the twitch-dominated vegetation is situated on slightly higher ridges or mounds with ASM vegetation being situated in shallow hollows.

There is a low ridge along parts of the seaward boundary along the Grantstown embankment containing twitch-dominated vegetation. This zone also contains creeping bent-grass and spear-leaved orache. Terrestrial species such as nettle (*Urtica dioica*) are also present in places. A small strip of ASM containing low-marsh vegetation is present behind this ridge. This ASM zone contains common saltmarsh-grass, sea aster, spear-leaved orache, common cordgrass and creeping bent-grass. Further west, common cordgrass dominates small patches of this narrow saltmarsh strip at the seaward side of the embankment. One notable feature of this saltmarsh is the absence of glasswort (*Salicornia* sp.) and this may be attributed to the estuary influence.

3.3 *Spartina* swards

There are several small patches of this habitat on this site. It is mainly found along the edge of the saltmarsh where common cordgrass has established on intertidal mud and clumps have coalesced to form swards. These swards are found along the edge of the saltmarsh in the main River Suir channel and in the Kings Channel. *Spartina* swards were also visible around Little Island, but these were not mapped. The *Spartina* swards are generally only in a zone between 5-10 m wide. There are signs of minor spread of common cordgrass down the intertidal flats at the eastern side of the Grantstown section of saltmarsh.

Common cordgrass is not that extensive on the established saltmarsh. Overall it is quite rare but is occasionally more frequently in low zone saltmarsh at several places.

4 IMPACTS AND ACTIVITIES

Little Island saltmarsh is impacted by several different impacts and activities (Table 4.1). The main impact has been related to development and various sections have been infilled or reclaimed (802). Much of the infilling occurred before the current monitoring period. The saltmarsh at Belmont and Grantstown has also been disturbed by housing development in adjacent land. The threat from this development has been noted in the NHA survey notes and in the Natura 2000 Form explanatory notes for the ASM and MSM habitats. The NHA survey noted that soil had been dumped on the saltmarsh at Belmont at several places (1993) and that this dumping threatened the meadow barley sites. Part of

the saltmarsh site at Grantstown has been infilled since 1995. The infilled area was situated south of the large stand of common reed. No ASM habitats are likely to have been infilled at this location.

More recently (within the monitoring period), the saltmarsh has been disturbed by the construction of a new sewage/water pipeline along the shoreline (512). The pipeline extends from the western side of the Grantstown section of saltmarsh along the Kings Channel north around the Belmont House saltmarsh. The track and low embankment around the Belmont House section predate 2000. The NHA notes mention that a track was also being built along the upper shoreline in 1993 and that extension of this track east could destroy the meadow barley sites. There is also some current development at the end of the small channel that flows into Ballynakill House saltmarsh. This may be related to the pipeline.

The destruction and or disturbance of habitat by infilling related to reclamation, adjacent development and the construction of a new pipeline has mainly affected the grassy CM2 vegetation, generally dominated by twitch and not the ASM vegetation. However, this was the main habitat for meadow barley. Some of the pipeline path may recover in the future.

Two sections of the marsh at Ballynakill House have been infilled in the past 100 years. This infilling occurred prior to 1995 and appears on the 1995 aerial photos. This infilling is not assessed as it occurred prior to the current monitoring period. The main development occurred adjacent to Belmont House saltmarsh between 1995-2000. Housing development also occurred adjacent to Grantstown saltmarsh between 1995-2005.

None of the various sections of saltmarsh were grazed (140). The sward height of all the sections was generally quite lush and rank in places. Some of this marsh may have been grazed in the past when the adjacent land was farmed and before the development. Some of the saltmarsh is used by walkers and for fishing in the Kings Channel, although access to the shoreline may not be authorised. The section along Belmont House was fenced off to prevent access.

Common cordgrass is present at this site, but *Spartina* swards are not a significant feature of the site. Common cordgrass is an invasive species of saltmarsh and mudflats (954). It is not known when this species first colonised the Lower Suir estuary, or if it was planted. However, it was known to be present in Waterford Harbour since 1960 (Nairn 1986). A comparison of the OSI 1995, 2000 and 2005 series aerial photographs does not indicate any significant expansion or change in the cover of *Spartina* swards in the estuary. Much of the *Spartina* sward mapped in 2007 is visible in the 1995 aerial photos. There were some signs of minor spread of common cordgrass (several metres) on mudflats at the eastern side of Grantstown. It is only frequent on relatively small areas of saltmarsh and its presence in the ASM and ASM/*Spartina* mosaic is assessed as a low negative influence. However, the intertidal mudflats around the Kings Channel are not suitable for significant spread of Common cordgrass in the future as they are quite steep along the edges of the channel.

There is some enrichment of the saltmarsh at the western side of Grantstown. Raw Sewage was noted flowing along the drainage channel that passes through the large stand of common reed and into The Kings Channel (424). The NHA survey notes mention that a local sewage treatment plant discharges into the main channel at this point. The enrichment of the vegetation may account for the dominance of common reed and the loss of sea rush in this part of the saltmarsh.

Erosion at this site is not significant (900). There is a tall saltmarsh cliff along most of the seaward boundary. There is some undercutting and cliff toppling along the southern side of the Kings Channel. There are no indications of any measurable loss of saltmarsh due to erosion from a

comparison of the OSI 2nd edition 6 inch map to the OSI 2000 series aerial photos. In fact there are indications that the saltmarsh has grown somewhat into the channel during the past 100 years. This may be related to dredging of the estuary channels at various times, which is related to shipping access to Waterford Port. There is also no measurable loss of saltmarsh within the current monitoring period.

Table 4.1. Intensity of various activities on saltmarsh habitats at Little Island.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	512	A	-2	0.050	Inside
1330	802	A	-2	0.050	Inside
1330	900	C	0	3.616	Inside
1330	954	C	-1	0.5	Inside
1330	424	B	-2	0.500	Outside

[1] EU codes as per Interpretation Manual.
[2] Description of activity codes are found in Appendix III, Summary Report 2007-2008.
[3] Intensity of the influence of an activity is rated as A = high, B = medium, C = low influence and D unknown.
[4] Impact is rated as –2 = irreparable negative influence, -1 = reparable negative influence, 0 = neutral, +1= natural positive influence and +2 = strongly managed positive influence.
[5] Location of activity: Inside = activities recorded within and directly impacting the saltmarsh habitat, outside = activities recorded outside but adjacent to saltmarsh habitat that are impacting the saltmarsh habitat.

Saltmarsh at Grantstown saltmarsh has been reclaimed in the past 100 years (802). The current embankment predates 1995 and the former saltmarsh is now agricultural grassland situated behind the embankment. Old six inch maps indicate that there was an old embankment situated further south of the current embankment that marked the old terrestrial boundary of the saltmarsh. The old six inch maps indicate that saltmarsh or brackish marsh is likely to have extended along the small stream draining the eastern side of area towards Blenheim Hill down to Knockboy Townland.

The original NHA survey recorded stands of sea rush in the Grantstown saltmarsh section in 1989. These would have been mapped as Mediterranean salt meadows vegetation. However, no sea rush was recorded in this area.

The main impacts and activities adjacent to the site are continuous urbanisation (401), use of the Suir river channel for navigation and access to Waterford Port (509), access to little Island across Kings Channel (509) and leisure fishing (220). Cultivation (100), fertilization (120) and the grazing of livestock (140) related to farming practises also takes place adjacent to the saltmarsh at Grantstown.

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the NHA survey, the 1995, 2000 and 2005 OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There are some more detailed descriptions of the saltmarsh from information in the NPWS Rare Plant Survey.

The overall conservation status of the Little Island survey site is assessed as *unfavourable-bad* (Table 5.1). While the assessment of the ASM is more favourable, the impacts and activities around the site have had considerably more impact on other saltmarsh vegetation including the CM2 habitat dominated by twitch and or sea couch. The NHA notes also mention that sea rush, (and it is likely MSM), was present at the site at Grantstown. This habitat was not mapped at the site and so its loss is significant. The loss of MSM has been related to disturbance in the upper zone of the saltmarsh from the adjacent development and/or the construction of the pipeline. It may also be linked to the sewage discharges and nutrient enrichment promoting other vegetation communities at the expense of the sea rush zone.

Meadow barley has been recorded from this site in two of the sub-sites in the past. This species was generally recorded in transitional grassland or vegetation dominated by twitch or sea couch that has been mapped as CM2. This habitat of this species has been significantly disturbed by development in adjacent land and by the construction of the new pipeline. This species was not recorded in 2007 survey. While it is a rare species, it is not considered an indicator of local distinctiveness for ASM habitat, as it is found in more terrestrial land.

The saltmarsh surveyed at this site has few notable features. The three sub-sites are quite small. They have been quite disturbed from infilling and adjacent development in the past. However, the site does contain typical examples of saltmarsh habitat with a significant estuarine influence.

The assessment of *unfavourable-bad* is related to the negative impact of adjacent development, infilling of saltmarsh habitat and disturbance from the construction of the pipeline on the overall saltmarsh, the potential loss of MSM habitat and on the rare species meadow barley, and not just on the ASM.

This site is located within the Lower River Suir cSAC. A NPWS conservation plan is not available for this cSAC. Most of the saltmarsh habitat is situated within the cSAC boundary.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Little Island.

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-inadequate**

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of this habitat is assessed as *unfavourable-inadequate*. There are no indications of any measurable loss of habitat due to erosion and natural habitat change within the current monitoring period. There are some physical signs of erosion along the southern part of the Kings Channel. This site has been affected by infilling and adjacent development. These activities are not likely to have affected the extent of ASM significantly, but minor amounts of habitat have possibly been modified.

Common cordgrass is present at this site but there are no indications that the spread of this species has resulted in any significant loss of ASM habitat during the current monitoring period.

Some ASM saltmarsh has been lost prior to the current monitoring period at Ballynakill and at Grantstown. However, these losses have not been assessed.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Eight monitoring stops were carried out in this habitat and all the stops passed. All of the attributes required for the structure and functions of this habitat reached their targets. The ASM habitat is generally in good condition. There are several saltmarsh communities present and zonation is moderately well-developed. The best example of ASM saltmarsh is present at Ballynakill. This saltmarsh also has the best developed topography. The Natura 2000 explanatory notes mention that the transition to reedbeds that is found at Grantstown is noteworthy, as few of these transitions are seen in the south-east due to reclamation. The ASM forms a mosaic with a significant amount of CM2 habitat. This is typical of an estuary type saltmarsh with a significant freshwater influence.

The site is not grazed and the sward height is lush and rank in places. However the overall sward structure is still quite variable. A small part of the ASM is likely to be affected by nutrient enrichment from sewage discharge at Grantstown. There is no significant negative impact from this discharge on the structure and functions of the habitat. ASM adjacent to the discharge is somewhat ranker. This is the main reason for the assessment of structure and functions as *unfavourable-inadequate*. The impacts of development adjacent to the site and the construction of the pipeline are quite low on the remaining intact habitat. Common cordgrass is present but is not a prominent feature in the ASM. It does form some small mosaics with lower zone ASM in places. However, the impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

5.2.3 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. Development adjacent to the site has the potential to disturb the ASM habitat in the future. Continuing sewage discharges have the impact to promote the spread of common reed and sea club-rush stands at the expense of ASM habitat. Common cordgrass is not likely to spread in the future and affect this saltmarsh. Erosion at the site is not significant. The section along the southern side of the King Channel that is being eroded is only a narrow strip of habitat anyway, so any loss in the short-term will be minor.

6 MANAGEMENT RECOMMENDATIONS

There are no specific recommendations for this site. The sewage discharge should be investigated.

7 REFERENCES

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APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	**SM habitat description**	**Mapped Area (ha)**	**Area (ha)**				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards	0.378					0.378
3	1330 Atlantic salt meadow	3.111		3.111			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic	0.117		0.059			
7	1330/other SM (CM2) mosaic	0.892		0.446			
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	5.719					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)						
12	pioneer 1330/1310/*Spartina* mosaic						
13	1410/other SM (CM2) mosaic						
14	*Spartina* sward dominated, with some ASM						
15	1310/*Spartina* mosaic						
16	ASM dominated with some *Spartina*						
17	1330/sand dune mosaic						
18	Other SM (CM2)	5.122					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**15.339**		**3.616**			**0.378**

Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Little Island (Map 1 of 2)

Lower Suir River SAC (002137)

SMP code: SMP0052

This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are subject to revision. Produced from Ordnance Survey material by permission of the Government (Permit number 5953)

0 60 120 180 240 300 Meters

Date of production: 20/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:5000

N

National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Little Island (Map 2 of 2)

Lower River Suir SAC (002137)

SMP code: SMP0052

0 50 100 150 200 250 Meters

N

This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are subject to revision. Produced from Ordnance Survey material by permission of the Government (Permit number 5953)

Date of production: 20/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:4000