Saltmarsh Monitoring Project 2007-2008

Volume 5

Contract reference D/C/227

Final Report (2009)

Mark McCorry & Tim Ryle

A Report for Research Branch, National Parks and Wildlife Service

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government

Table of Contents
Site Reports Volumes 2-5

Volume number	County	Coastal Sitename	Coastal Sitecode
3	Galway	Mannin Bay	102

Volume number	County	Coastal Sitename	Coastal Sitecode
3	Galway	Oranmore North	576
3	Galway	Roscom West and South	577
3	Galway	Seaweed Point	578
3	Galway	Tawin Island	509
3	Galway	Teeranea	580
3	Galway	Turloughbeg	585
3	Galway	Tyrone House - Dunbulcaun Bay	574
3	Kerry	Ballyheige	078
3	Kerry	Carrigafoyle	561
3	Kerry	Cromane	558
3	Kerry	Dereen House	554
3	Kerry	Dinish	555
3	Kerry	Emlagh East	560
3	Kerry	Inch	070
3	Kerry	Rossbehy	068
3	Kerry	Tahilla	556
3	Kerry	West Cove	557
3	Kerry	Whitegate, Fybagh	559
3	Kilkenny	Ringville	544
3	Kilkenny	Rochestown	543
3	Limerick	Barrigone, Aughinish	562
3	Limerick	Beagh	563
3	Louth	Baltray	002
3	Louth	Dundalk	532
4	Mayo	Aasleagh Falls	587
4	Mayo	Annagh Island	519
4	Mayo	Aughness	591
4	Mayo	Bartragh Island	523
4	Mayo	Bartraw	520
4	Mayo	Bellacragher Bay	521
4	Mayo	Bunnahowen	593
4	Mayo	Caraholly South	517
4	Mayo	Dooaghtry	510
4	Mayo	Kiladangan	518
4	Mayo	Lackan	522
4	Mayo	Leam Lough	125
4	Mayo	Mallaranny	511
4	Mayo	North Achill Sound	588
4	Mayo	Owenduff, Corraun	590
4	Mayo	Rockfleet Castle	515
4	Mayo	Rosharnagh East	516
4	Mayo	Rosmurrevagh	513
4	Mayo	Ross	524
4	Mayo	Rusheens	525
4	Mayo	Saleen Harbour	594
4	Mayo	Salia West	589
4	Mayo	Srah South	121
4	Mayo	Tierna	514
4	Mayo	Tooreen	512
4	Mayo	Trawboy	117
4	Mayo	Tullaghan Bay	592
4	Meath	Mornington	003
4	Sligo	Ballysadare Bay	595
4	Sligo	Castleconor	526
4	Sligo	Cummeen Strand	596
4	Sligo	Drumcliff Bay	597

Volume number	County	Coastal Sitename	Coastal Sitecode
4	Sligo	Strandhill	133
4	Sligo	Streedagh Point	137
5	Waterford	Cunnigar Point	050
5	Waterford	Kinsalebeg	546
5	Waterford	Little Island	545
5	Waterford	Tramore	046
5	Wexford	Ballyteige Burrow	041
5	Wexford	Bannow Island	042
5	Wexford	Castlebridge	534
5	Wexford	Clonmines	536
5	Wexford	Dunbrody Abbey	541
5	Wexford	Duncormick	506
5	Wexford	Ferrycarrig	535
5	Wexford	Fethard	540
5	Wexford	Gorteens	539
5	Wexford	Grange	043
5	Wexford	Killowen	542
5	Wexford	Rosslare	036
5	Wexford	Saltmills	538
5	Wexford	Taulaght	537
5	Wicklow	Kilcoole	013

Dungarvan Bay

1 SITE DETAILS

SMP site name: **Dungarvan Bay**		SMP site code: **SMP0053**
Dates of site visit **26/09/2007**		CMP site code: **50**
SM inventory site name: **Dungarvan Bay**		SM inventory site code: **205**
NPWS Site Name: **Dungarvan Bay**		
NPWS designation	cSAC: **N/A**	MPSU Plan: **N/A**
	pNHA: **663**	SPA: **Dungarvan Harbour 4032**
County: **Waterford**		Discovery Map: **76** Grid Ref: **227000, 090000**
Aerial photos (2000 series): **O 6071-A,B,C,D; O 6116-A,B**		6 inch Map No: **Wa 031, 036**

Annex I habitats currently listed as qualifying interests.

None (not designated as a cSAC)

Other SMP sites within this NHA: **Brickey River, Abbeyside**

Saltmarsh type: **Sandflats** Substrate type: **Sand/Mud**

2 SITE DESCRIPTION

Dungarvan saltmarsh is located in Dungarvan Bay in Co. Waterford. The inner part of Dungarvan Bay is a large bay containing intertidal sand and mudflats, which is enclosed by a long sand spit that contains a sand dune system (Cunnigar Point). Saltmarsh habitat is found along the sheltered side of this spit and around other parts of the inner Dungarvan Bay shoreline. The SM inventory lists a second site within the bay called Brickey River. This site is located at the south-west corner of Dungarvan Bay and covers much of the saltmarsh along the Brickey River estuary. A third SM inventory site (Abbeyside) is located along the Colligan River estuary, which enters the north side of Dungarvan bay at Dungarvan Town.

The survey site covers the saltmarsh along the western side of Cunnigar Point and along the southern shoreline of the inner bay at Ballynacourtney Lower and Gortnadiha Lower Townlands. Cunnigar Point is a quite isolated sand spit with intertidal habitats on both sides. Dungarvan Town is positioned at the north side of the inner bay. There is a narrow outlet between the tip of the sand spit and the mainland close to the town. There is extensive beach habitat and sandflats on the eastern side of the spit. Saltmarsh is also found along the southern side of the bay where the land is low-lying and affected by the tide. This side of the bay is quite rural with moderate slopes extending southwards towards the uplands of Slieve Grainn. Cunnigar Point was surveyed by the Coastal Monitoring Project (Ryle *et al.* 2009) in 2005.

The survey site is part of Dungarvan Bay pNHA (663) and Dungarvan Harbour SPA (4032). Three Annex I habitats are present at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). The survey site also contains some *Spartina* swards. Dungarvan Bay is notable for extensive Eelgrass beds that are found in the inner part of the bay and attract wintering waders and wildfowl.

The saltmarsh at this site is notable for the presence of Sharp Rush (*Juncus acutus*). This species is much more rarely found on saltmarshes compared to Sea Rush (*Juncus maritimus*). Stands of saltmarsh vegetation dominated by either Sea Rush or Sharp Rush can be classified as MSM. There are few saltmarshes in Ireland with the rarer MSM sub-type dominated by Sharp Rush present. Sharp Rush is found along the upper boundary of the saltmarsh/fixed dune interface and clumps are also found scattered over the fixed dune and the dune slack areas of Cunnigar Point.

The site was accessed from a car park at the base of Cunnigar Point. Permission was requested from private landowners to cross saltmarsh along the southern shoreline of the bay adjacent to farmland.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh in the survey site can be split into two sub-sites, saltmarsh along Cunnigar Point and saltmarsh along the southern side of the inner bay – Ballynacourtey. These two areas display different characteristics.

3.1.1 Cunnigar Point

Saltmarsh has developed as a continuous band along the sheltered western side of Cunnigar Point. This is the main saltmarsh section and Dungarvan Bay saltmarsh was classified as a Sandflats type saltmarsh due to this sand spit. The spit is 2.5km long but saltmarsh development only occupies over half of its length, mainly in the northern half. The southern section of the spit is quite narrow with no saltmarsh development. The development of saltmarsh varies along the northern section with a narrow band of saltmarsh several metres wide expanding into a zone of saltmarsh up to 140 m wide towards the northern end. Much of the saltmarsh is protected at the seaward side by a low single ridge about 5 m wide and the saltmarsh vegetation has developed behind this low ridge. The low shingle ridge is situated along intertidal sand flats and there are occasionally small patches of Eelgrass (*Zostera* sp.) situated close to the shingle ridge and the saltmarsh. Sea Purslane and Sand Couch (*Elytrigia juncea*) is frequently found on this low shingle bar. Saltmarsh vegetation including Sea Milkwort (*Glaux maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Rush (*Juncus maritimus*) on a thin band of sediment occasionally encroaches over this low ridge along the seaward boundary of the saltmarsh.

The saltmarsh is generally dominated by ASM although there are significant amounts of MSM dominating the central section. There are several very small patches of the rarer MSM sub-type dominated by Sharp Rush present. Some of the ASM forms complex mosaics with dune habitats towards the northern end, where saltmarsh is found in narrow channels and hollows between patches of fixed dune grassland dominated by Marram Grass (*Armeria maritima*). Signs of old reclamation can be seen in the saltmarsh, although the reclaimed land has since reverted back to saltmarsh. A large area of ASM saltmarsh was enclosed by an embankment at the northern end of the saltmarsh. Gorse (*Ulex europaeus*) has colonised along the top of this embankment. Several enclosures and an old dwelling are present on Cunnigar Spit. Midway along this saltmarsh section there are several large bare salt pans situated behind the shingle ridge. These salt pans contain narrow bands or small patches of *Salicornia* flats around their edges.

There are some signs of reverse zonation along Cunnigar Point. This has mainly resulted from the saltmarsh developing between a low shingle bar and the sand dunes. Towards the northern end of the spit MSM typical of upper saltmarsh is present along the shingle bar and behind this zone (or landward towards the sand dunes) ASM saltmarsh is present. There is also a large section where MSM saltmarsh has developed along the western side of the sand spit adjacent to a fixed dune grassland ridge. Further east on the other side of the dune ridge there is ASM and MSM development in the central part of the sand spit. This is the reverse of the typical zonation between these two habitat types and is probably related to the underlying geomorphology and geomorphological processes acting on the sand spit.

Spartina swards are found in this saltmarsh. This vegetation type is mainly found at the northern end of the saltmarsh where Common Cordgrass (*Spartina anglica*) has colonised on softer intertidal mudflats. The *Spartina* swards are associated with a relatively large area of *Salicornia* flats at this location. Common Cordgrass also appears along the outer zone of the saltmarsh further south but only scattered clumps are present and it is not extensive.

3.1.2 Ballynacourtey

This section of saltmarsh extends along the south-east part of the inner bay, from Cunnigar Point west to a small inlet where a small stream enters the bay. The saltmarsh along this shoreline is somewhat different in structure compared to the saltmarsh along the sand spit. This saltmarsh has developed on deep mud. This saltmarsh contains relatively large areas of ASM and MSM, with MSM being dominant towards the west. ASM is distributed in a narrow band along the seaward edge of the much of the MSM in typical saltmarsh zonation. There is a relatively tall saltmarsh cliff (0.5-1 m high) along the seaward edge and the saltmarsh transitions to intertidal mudflats. A small band of shingle and pebble is present along the edge of the intertidal flats. Small sections of the saltmarsh cliff are undercut. There are several clumps of Common Cordgrass distributed along the edge of this saltmarsh on the soft intertidal mudflats.

The saltmarsh transitions to improved grassland, wet grassland and Gorse scrub along the landward side. The upper boundary between the terrestrial and saltmarsh habitats is sometimes indistinct in places further west. There are some diverse transitions where MSM habitat transitions to wet grassland and MSM may extend landward along drainage ditches. Some of this transitional area has been disturbed in the past by reclamation. Parts of the upper landward boundary of the saltmarsh are represented by low embankments around the recently built holding ponds in the eastern section. A large stand of Common Reed (*Phragmites australis*) has developed at the landward side of the small inlet in Gortnadiha Lower Townland with some transition to MSM in a seaward direction. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. The patch of Common Reed seems to have spread out onto the mudflats since the 2000 aerial photo was taken.

Table 3.1. Area of saltmarsh habitats mapped at Dungarvan Bay.

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.541
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	8.212
1410	Mediterranean salt meadows (Juncetalia maritimi)	7.046
non-Annex	*Spartina* swards	0.175
	Total	**15.974**

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

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

This habitat is present at several locations on the survey site. Several different sub-types are present. The largest area of habitat is situated at the northern end of the saltmarsh. This is the typical form of the habitat and it is dominated by a sward of Glasswort (*Salicornia europaea*) on muddy sand. *Salicornia pusila* is also present. Several other smaller patches of this habitat are associated with the *Spartina* swards in this area and along a creek draining this area.

This habitat is also present further south along the saltmarsh of Cunningar Point. Several bare mud pans have developed between the edge of the MSM saltmarsh and the low shingle bank along the seaward edge of the saltmarsh. Parts of these salt pans are vegetated with narrow bands of Glasswort and Annual Sea-blite. Other species present include Common Saltmarsh-grass (*Puccinellia martima*) and Greater Sea-spurrey (*Spergularia media*). Some small salt pans are covered by Annual Sea-blite within the ASM. This vegetation can be considered pioneer saltmarsh vegetation. Some of these pans are disturbed by cattle poaching.

3.3 Atlantic salt meadows (H1330)

This habitat contains typical ASM communities similar to other sites along the southern coastline. Several different communities are present. The habitat is generally in good condition and zonation is well-developed in places.

The Ballynacourtey ASM is dominated by mid zone and upper zone communities further west. The mid-marsh zone is well-developed in the Ballynacourtey section. This zone is dominated by Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*) with smaller amounts of Sea Arrowgrass (*Triglochin maritimum*) and Common Saltmarsh-grass. Typical large salt pans have developed in this zone and the topography is fairly flat. The upper saltmarsh vegetation is dominated by Red Fescue (*Festuca rubra*) with frequent Saltmarsh Rush (*Juncus gerardii*) and Creeping Bent (*Agrostis stolonifera*). The sward height is generally high in this area. This section of saltmarsh also contains the best developed saltmarsh creek topography.

Much of the MSM found in the Ballynacourtey area has a narrow band of lower zone ASM along the seaward side dominated by Sea Purslane (*Atriplex portulacoides*), Common Saltmarsh-grass, Red Fescue and Sea Plantain. This band of ASM is situated along a saltmarsh cliff. There is also some lower zone vegetation dominated by Common Saltmarsh-

grass along the creeks draining this area. The eastern section close to the sand spit contains a large area of low zone vegetation dominated by Common Saltmarsh-grass and Sea Aster (*Aster tripolium*). This area is somewhat poached and damaged by cattle grazing. Other creeks are lined with Sea Purslane and these extend into the MSM area. Some sections associated with MSM where the cover of Sea Rush is 5-10% are classified as ASM.

The ASM is also well-developed along Cunnigar Point and several different communities are present. This is related to the sand dune influence and the influence of former reclamation. There are frequent natural transitions to MSM and to sand dune vegetation along the sand spit. Mid zone and mid-upper zone vegetation communities are most prominent. The presence of a low shingle bank along the seaward boundary of the saltmarsh has led to the development of some reverse zonation of ASM communities.

A large generally flat area of ASM has developed in a formerly enclosed area on mud overlaying sand at the northern end of Cunnigar Point. The saltmarsh topography is poorly developed and there are few typical saltmarsh features present like salt pans. Any pans that are present are more like bare mud patches. This type of featureless saltmarsh may be the result of former reclamation and modification of this area (as it was a former enclosure). This area contains several ASM zones and is quite distinctly different from adjacent saltmarsh containing Sea Rush and saltmarsh grasses. The zonation is related to subtle changes in the ground level. Pioneer type vegetation is found along some of the creeks and drains that are situated along the embankment. This zone contains frequent Glasswort, Annual Sea-blite, Common Saltmarsh-grass and Lax-flowered Sea Lavender (*Limonium humile*). Several shallow pans contain Glasswort. A low marsh zone has developed with sparse Sea Purslane and Common Saltmarsh-grass. This zone transitions to a typical mid marsh *Armeria-Plantago* sward. Common Cordgrass is present in this area but is rare.

A notable complex mosaic of ASM and fixed dune habitat is found towards the northern end of the sand spit. This area contains bands of ASM habitat is low-lying channels between mounds or ridges containing fixed dune dominated by Marram. The ASM is dominated by vegetation communities that are not extensively found elsewhere. This includes a low sward dominated by Saltmarsh Rush and containing Sea Milkwort, Sea Plantain and Sea Pink. The close cropped sward is grazed by Rabbits. A second upper marsh community is dominated by Red Fescue and Sea Pink with some Creeping Bentgrass.

Upper saltmarsh has developed in an area close to an old dwelling on Cunnigar Point that was formerly reclaimed and enclosed by a low embankment, but now breached. This area contains old lazy bed features and the old embankment or ridge separates the upper saltmarsh from the lower saltmarsh.

Some of the vegetation found in the salt pans and classified as *Salicornia* flats can be considered a pioneer saltmarsh community. There is a narrow transitional zone along the edge of this habitat (along the edge of the salt pans) that can be considered pioneer ASM vegetation. This zone is dominated by Common Saltmarsh-grass, Glasswort, Annual Sea-blite with less frequent Lax-flowered Sea Lavender and Sea-spurrey. Sea Purslane is also present.

3.4 Mediterranean salt meadows (H1410)

This habitat is found in both sub-sites and dominates the Ballynacountey section. The MSM is generally dominated by Sea Rush but a rarer sub-type dominated by Sharp Rush is also present and is much lower in extent.

The MSM habitat found in the Ballynacourtey section is generally dominated by Sea Rush with cover values of 50-75%. Other species present include frequent or abundant Red Fescue and Creeping Bent. Saltmarsh Rush, Sea Milkwort, Sea Aster, Autumn Hawkbit (*Leontodon autumnalis*), Parsley-leaved Dropwort (*Oenanthe lachenalii*), Sea Arrowgrass, Common Scurvygrass (*Cochlearia officinalis*), White Clover (*Trifolium repens*) and Sea Plantain may also be present at low cover values. Some zonation is present within the MSM and the cover of Sea Plantain and Lax-flowered Sea Lavender increases towards the lower habitat and the cover of grasses increases towards the landward side.

Small patches of ASM with no Sea Rush can be found within the area mapped as MSM. Zonation in this area is dependant on gentle slopes from the upper to the lower boundary. There is also some internal zonation along creeks and around some low mounds in this area. Zonation of the vegetation can also be seen in the small patches of ASM habitat. There small patches are generally dominated by mid zone Sea Plantain dominated sward or a mid-upper zone with Red Fescue and Saltmarsh Rush dominant. The MSM forms a complex mosaic with ASM in places.

There is a subtle transition to wet grassland and Gorse scrub at the landward side of the western Ballynacourtey section. Fleabane (*Pulicaria dysenterica*), Curled Dock (*Rumex crispus*), Purple Moor-grass (*Molinia caerulea*), Silverweed (*Potentilla anserina*), Creeping Bent, Autumn Hawkbit, Distant Sedge (*Carex distans*) and Birdsfoot (*Lotus corniculatus*) are present in this brackish transitional zone along with Sea Rush. Sea Rush seems to extend higher than the strandline boundary in places. MSM vegetation also extends along some drains into the wet grassland habitat. Wet grassland and scrub also extends into the saltmarsh on the top of old ditches or earth banks marking field boundaries.

The MSM is grazed and poached lightly and the sward height is quite high (0.4-0.5 m). The creek structure is well-developed in the Ballynacourtey section with some deep creeks. Salt pans are also present. Sea Purslane is found along the edges of creeks within the MSM. Some of the creeks have been canalised by old drainage works and connect drains draining adjacent land to the intertidal flats.

The MSM located along Cunnigar Point contains a similar vegetation assemblage to that described above. The MSM has developed on mud, but it is not as deep as along Ballynacourtey. The saltmarsh creek topography is less developed, as the saltmarsh is generally narrower in width. There are some creeks and pans present. This MSM generally transitions to fixed dune at the landward side of the sand spit. There is a narrow transitional zone where Sea Rush and Marram are found together. There are also natural transitions between MSM and ASM on the sand spit. Signs of old reclamation works are still visible in the saltmarsh topography in places. Old low embankments often mark boundaries between different habitats, indicating former management of certain sections. .

A much rarer MSM sub-type with large clumps of Sharp Rush is present at this site. The main part of this habitat is found close the boundary of the sand dunes and the saltmarsh close to the aquaculture facility. About 50 clumps of Sharp Rush are distributed in this area along the upper saltmarsh boundary with the fixed dune habitat. The actual boundary

between these two habitats is indistinct. Sharp Rush seems to be distributed in close proximity in both the upper saltmarsh zone and the adjacent fixed dune zone. The substrate is quite sandy. Large clumps of Sharp Rush are found in association with Sea Rush in the lower zone. Dune species found in the upper zone of this habitat include Birdsfoot, Sand Sedge (*Carex arenaria*) and Long-leaved Plantain (*Plantago lanceolata*). Creeping Thistle (*Cirsium arvense*), Harebell (*Campanula rotundifolia*), Curled Dock, Mouse-ear (*Cerastium fontanum*) and Yorkshire Fog (*Holcus lanatus*)

A second small patch containing Sharp Rush is located further north along Cunnigar Point. This patch is found adjacent to some Sea Rush and is also positioned on the upper saltmarsh boundary adjacent to fixed dune dominated by Marram. Several clumps of Sharp Rush are also distributed along the upper boundary of the saltmarsh and the lane connecting the aquaculture area crossing the sand dunes and onto the sand flats in the south-east corner of the survey site.

3.5 *Spartina* swards

The main section of this habitat is located at the northern end of the saltmarsh on Cunnigar Point. A patch of *Spartina* sward has developed on mudflats sheltered behind a small shingle spit that has developed in this area. There are signs that Common Cordgrass may be spreading in this area at the expense of Salicornia flats and mudflats (but the area is minor). There are several sections where the clumps have not coalesced and a mosaic has developed with *Salicornia* flats. *Spartina* sward transitions to small patches of *Salicornia* flats along parts of the seaward boundary and along a creek draining this area. There is some natural transition to ASM vegetation along the embankment at the south side of this habitat. This area contains a narrow zone of *Spartina*/ASM mosaic where there is the transition between the habitats. Species such as Common Saltmarsh-grass, Sea Purslane, Lax-flowered Sea Lavender and Sea Aster are spreading into the *Spartina* sward. The *Spartina* sward has developed in the muddiest section and further north-east towards the sand spit there is some development of Salicornia flats.

There are several other smaller patches of Common Cordgrass in bare mud pans on the saltmarsh along Cunnigar Point. However, it has not colonised on the intertidal mud and sand flats. Several isolated clumps are present on intertidal mud flats along the southern boundary of the saltmarsh and there is no significant area of sward.

4 IMPACTS AND ACTIVITIES

Several impacts and activities impact on this site (Table 4.1). The main impact is grazing (140). Cattle graze the dunes and saltmarsh of Cunnigar Point. The grazing level is low-moderate and the sward height and cover is generally in good condition. The saltmarsh along Cunnigar Point is also grazed by rabbits. Sections of the saltmarsh along the southern side of the survey site are also being grazed but the intensity varies across several enclosures with different management. Some of this area is not being grazed. There are several areas patches of moderate poaching damage in this area (143). The poaching damage is mainly seen in the ASM. Disturbance by grazing animals is likely to be beneficial to *Salicornia* flats habitat located in some of the pans, as the disturbance keeps these areas open and favourable to pioneer vegetation like 1310. The NHA survey notes mention that there was some damage from overgrazing noted on Cunnigar Point in 1993.

Common Cordgrass is present at this site and is an invasive species of saltmarsh (954). Several clumps are present on the mudflats adjacent to the southern section of saltmarsh. The largest area of *Spartina* swards in the survey site is situated at the northern end of Cunnigar Point. Guiry and Kilty (1972) noted that the main threat to Eelgrass beds present in the inner part of the bay was invasion by Common Cordgrass. The main Eelgrass beds were mapped by Guiry and Kilty (1972) and are located in the intertidal sandflat area at the south-east corner of the inner estuary. Common Cordgrass has not spread in this area and Eelgrass is still present. It is not known when Common Cordgrass colonised the Barrow River Estuary and if it was planted, but it was known to be present in Dungarvan Bay since 1960 (Nairn 1986). Larger areas of *Spartina* swards are associated with the mouth of the Brickey River estuary in the south-west corner of the inner bay. There are no indications of any significant spread of Common Cordgrass during the period 1995-2000 from a comparison of OSI aerial photos. The spread of Common Cordgrass has had no impact on the MSM, very little impact on the ASM, but has probably has had some negative impact on the extent of *Salicornia* flats. The impact of its presence on the *Salicornia* flats is assessed as moderately negative while its impact on ASM is neutral.

There are several tracks along the saltmarsh of Cunnigar Point (501). There is some vehicle use of the track by users of the sand spit including fishermen. Vehicle use across the saltmarsh has occasionally caused rutting on the saltmarsh surface (501). The tracks and saltmarsh are used by walkers (622).

The saltmarsh situated in the south-eastern corner of the survey site has been impacted by the aquaculture industry in this area (200). Two holding ponds for shellfish were developed in the upper saltmarsh area. Earth embankments that are now grassy have been built around these holding ponds. There is some dumping of old machinery along these embankments (422). Some drains (810) have also been dug around these holding ponds and across the saltmarsh to link to the intertidal flats. Some development of the two holding ponds and some of the drainage occurred during the period 1995-2000, from a comparison of OSI aerial photos. However, the NHA survey notes also recorded one of the holding ponds as being present in 1993. This area is excluded from the NHA. There has been no significant change to these holding ponds since the 2000 aerial photos.

Erosion at this site is not significant (900). A saltmarsh cliff is present along the saltmarsh along the southern side of the bay. A comparison of the OSI 2nd edition 6 inch map to the OSI 2000 series aerial photos indicates there has been no significant erosion or accretion of the saltmarsh during this period. There have been some minor changes in the saltmarsh along Cunnigar Point that can be related to small breaches in the associated low shingle bank creating small pans or open mud areas. There has also been some growth of shingle and the northern end of the saltmarsh and the *Salicornia* flats and *Spartina* sward habitat has developed behind this shingle spit. A comparison of the 1995 and 2000 aerial photos indicates that there has been no measurable erosion during this period. The impact of erosion is assessed as neutral.

There are frequent signs of old reclamation on the saltmarsh along Cunnigar Point (802). Several areas have been protected by low embankments and some saltmarsh has also been drained in the past, particularly at the northern end of the site where there is a large salt meadow area in a formerly reclaimed area. Evidence of old enclosures, ditches and lazy beds are still present along the saltmarsh. These impacts are not assessed as they occurred outside the current monitoring period.

The main impacts and activities adjacent to the southern side of the survey site are cultivation (100), fertilization (120) and the grazing of livestock (140) related to farming practises. A large area on the sandflats east of Cunnigar Point is used for shellfish aquaculture. The base for this industry is located adjacent to the saltmarsh in Ballynacourtey Lower. Other impacts and activities around the site include dispersed habitation (403), amenity use of the beach and sand dunes (622), and leisure fishing (220). Dungarvan Town is also situated close to the end of the spit (401). The direct impact of these activities and impacts is difficult to access accurately.

Table 4.1. Intensity of various activities on saltmarsh habitats at Dungarvan Bay.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	140	C	0	0.541	Inside
1310	954	B	-1	0.541	Inside
1330	140	B	0	7.212	Inside
1330	143	B	-1	1.000	Inside
1330	422	C	-1	0.001	Inside
1330	501	C	-1	0.500	Inside
1330	810	C	-1	0.500	Inside
1330	900	C	0	0.4	Inside
1330	954	C	0	8.212	Inside
1410	140	C	0	7.046	Inside
1410	501	C	-1	0.500	Inside
1410	810	C	-1	0.500	Inside
1410	900	C	0	0.35	Inside
1330	200	C	-1	8.212	Outside
1410	200	C	-1	7.046	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.

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.

The Dungarvan Bay survey site contains saltmarsh habitats with significant notable interest. The vegetation zonation and structural diversity is high and pioneer communities are present. There is some reverse zonation of saltmarsh vegetation along Cunnigar Point. The presence

of Sharp Rush on the saltmarsh/dune transition can be considered a feature of local distinctiveness. This species is an indicator of a rarer MSM sub-type. The Annex I saltmarsh habitats are part of a larger more complex coastal ecosystem. There are natural transitions between the saltmarsh habitats and these other habitats, which add to the diversity of the site. The transition between saltmarsh and dunes also quite natural and unmodified in places. There are still signs of former reclamation still present on the saltmarsh but these features add to the complexity of the saltmarsh topography.

The overall conservation status of Dungarvan Bay is assessed as *unfavourable-inadequate* (Table 5.1). This is due to the some damage of ASM saltmarsh by poaching and the presence of Common Cordgrass in the *Salicornia* flats habitat. Some saltmarsh has been lost by the creation of holing ponds for aquaculture, but the majority of this damage seems to have occurred prior to the current monitoring period. However, most of the saltmarsh is in good condition (> 90%).

The medium-term future prospects of natural landward saltmarsh migration in response to sea level rise are moderate. Some of the saltmarsh has landward transitions to wet grassland and therefore provides some scope for natural landward transition. The saltmarsh along Cunnigar Point may be vulnerable to erosion if the sand spit is eroded. However, these are very general predictions.

This site is located within the Dungarvan Bay pNHA. A NPWS management plan is not available for this pNHA.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Dungarvan Bay.

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-inadequate
Atlantic salt meadows (1330)	Extent	Structure and functions, Future prospects		Unfavourable-inadequate
Mediterranean salt meadows (1410)	Extent Structure and functions, Future prospects			Favourable

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

5.2.1 Extent

The extent of this habitat is assessed as *favourable*. A relatively large area of this habitat is found at this site compared to other sites. This habitat is found in typical pioneer areas on mudflats adjacent to the saltmarsh and in salt pans within the saltmarsh. There are no indications of any loss of habitat due to erosion or to land-use changes during the current monitoring period. Common Cordgrass is found within this habitat on the mudflats located at

the northern end of Cunnigar Point. There are some indications of minor spread of Common Cordgrass at the possible expense of *Salicornia* flats but the absence of accurate and detailed baseline data means this impact is not assessed.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Five monitoring stops were carried out in this habitat and they all passed. Most of the habitat is dominated by Glasswort. Common Cordgrass is also found in this habitat and there are small areas close to the *Spartina* sward where there is a *Spartina* clump/*Salicornia* flat mosaic. There are some indications that Common Cordgrass is spreading with small clumps present in this habitat. There are few other impacts or activities directly impacting on this habitat. A second community is present with some vegetation in pans dominated by Annual Sea-blite. Disturbance of bare mud pans by cattle may be beneficial for this habitat as it creates a favourable substrate.

5.2.3 Future prospects

The future prospects of this habitat are assessed *unfavourable-inadequate*. The main impact acting on this habitat is the presence of Common Cordgrass, an invasive species. This species has the potential to spread in the future at the expense of *Salicornia* flats. Not all the current extent of *Salicornia* flats is vulnerable to the spread of Common Cordgrass. The substrate of the largest area at the northern end of the saltmarsh varies from being quite muddy close to the shingle spit, to becoming sandier towards the dunes. The sandier substrate is not a vulnerable to the spread of Common Cordgrass.

The open mud pans found on the saltmarsh along Cunnigar Point are also less vulnerable to the spread of Common Cordgrass and none of the pans that contain *Salicornia* flats also contain Common Cordgrass. The habitat found in these pans may be somewhat ephemeral and dependant on disturbance from grazing animals plus changes on geo-morphology of the shingle bank along the edge of the saltmarsh. In time, some of these pans may naturally fill and develop into ASM.

The spread of Common Cordgrass is likely to be quite slow. There are no indications of any significant spread of Common Cordgrass during the period 1995-2000 from a comparison of OSI aerial photos. Guiry and Kilty (1972) noted that the main threat to Eelgrass beds present in the inner part of the bay was invasion by Common Cordgrass. However this species has not spread significantly and is not found in the sandier flats where the beds of Eelgrass are found. There are no other impacts acting significantly on this habitat.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to erosion or to land-use changes within the current monitoring period. The development of the oyster holding ponds in the Ballynacourtey area may have resulted in some minor loss of ASM habitat. The major part of this development may have occurred prior to the current monitoring period. However, there is no indication what this area was like prior to the development of these ponds.

Common Cordgrass is present at this site but does not form any significant patches on ASM.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Sixteen monitoring stops were carried out in this habitat are two failed. Most of the attributes required for the structure and functions of this habitat reached their targets. The main reason for the failed stops was overgrazing and poaching damage. However, the ASM area damaged by poaching by cattle mainly contains a lower-zone community, which is more vulnerable to this type of damage. The area affected by damage is about 20% of the total habitat area. Most of the ASM habitat is in good condition. The NHA survey noted that the habitats found on Cunnigar Point suffered from overgrazing, but the grazing intensity seems to have been reduced in this area.

Several typical ASM communities were recorded on this site and zonation was evident with upper mid and lower zone saltmarsh communities. In addition some pioneer ASM vegetation is present at this site. The saltmarsh topography is well-developed in this habitat and is quite varied due to the presence of saltmarsh along the sand spit and saltmarsh along the southern shore of the inner bay. There are natural transitions to MSM, *Salicornia* flats, stony bank and sand dune communities. The presence of these transitions increase the diversity and conservation value of the habitat at this site.

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 such as grazing continue in the near future. The most significant impact affecting this habitat is grazing and this is most intensive in the south-east corner of the Ballynacourtey area. Increased grazing could have the potential to damage this habitat in the future. Common Cordgrass is present in this habitat but is not a significant feature. This species is unlikely to significantly spread in this habitat in the future. The sandy influence on this habitat along Cunnigar Point does not suit this species. Much of the ASM contains mid and upper zone vegetation, which does not favour this species. The area of ASM in the south-east corner is more vulnerable to the spread of Common Cordgrass. There are few prospects for the loss of habitat due to erosion in the future.

Most of the habitat is located within the pNHA boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to erosion or to land-use changes within the current monitoring period. The development of the oyster holding ponds in the Ballynacourtey area may have resulted in some minor loss of MSM habitat. The major part of this development may have occurred prior to the current monitoring period. However, there is no indication what this area was like prior to the development of these ponds.

5.4.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Twelve stops were carried out in this habitat and they all passed. Dungarvan Bay is notable for the presence of a rarer type of MSM dominated by Sharp Rush. This species can also be considered a species

of local distinctiveness. This vegetation type is much rarer than the more typical MSM vegetation type dominated by Sea Rush. Clumps of Sharp Rush are occasionally found in other parts of the saltmarsh. This habitat is grazed but damage from poaching is minor. The sward structure is quite varied over the site due to various different grazing levels. The saltmarsh topography is also well-developed in this habitat. This habitat does show some signs of disturbance from former reclamation around this site. The MSM is part of a larger coastal ecosystem and there are several different transitions to terrestrial and sand dune habitat that increase the diversity and conservation value of the site.

Common Cordgrass is not associated with this habitat.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The main impact on this site is grazing and this activity is not having a significant impact on this habitat. Some of the MSM is not being grazing at all. Common Cordgrass is not considered to be a significant threat to this habitat. There are few prospects for the loss of habitat due to erosion in the future.

Most of the habitat is located within the pNHA boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Guiry, M.D. Kilty, G.M. (1972). *Zostera* beds at Dungarvan, Co. Waterford, *Irish Naturalists Journal*, **17**, 186-193.

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

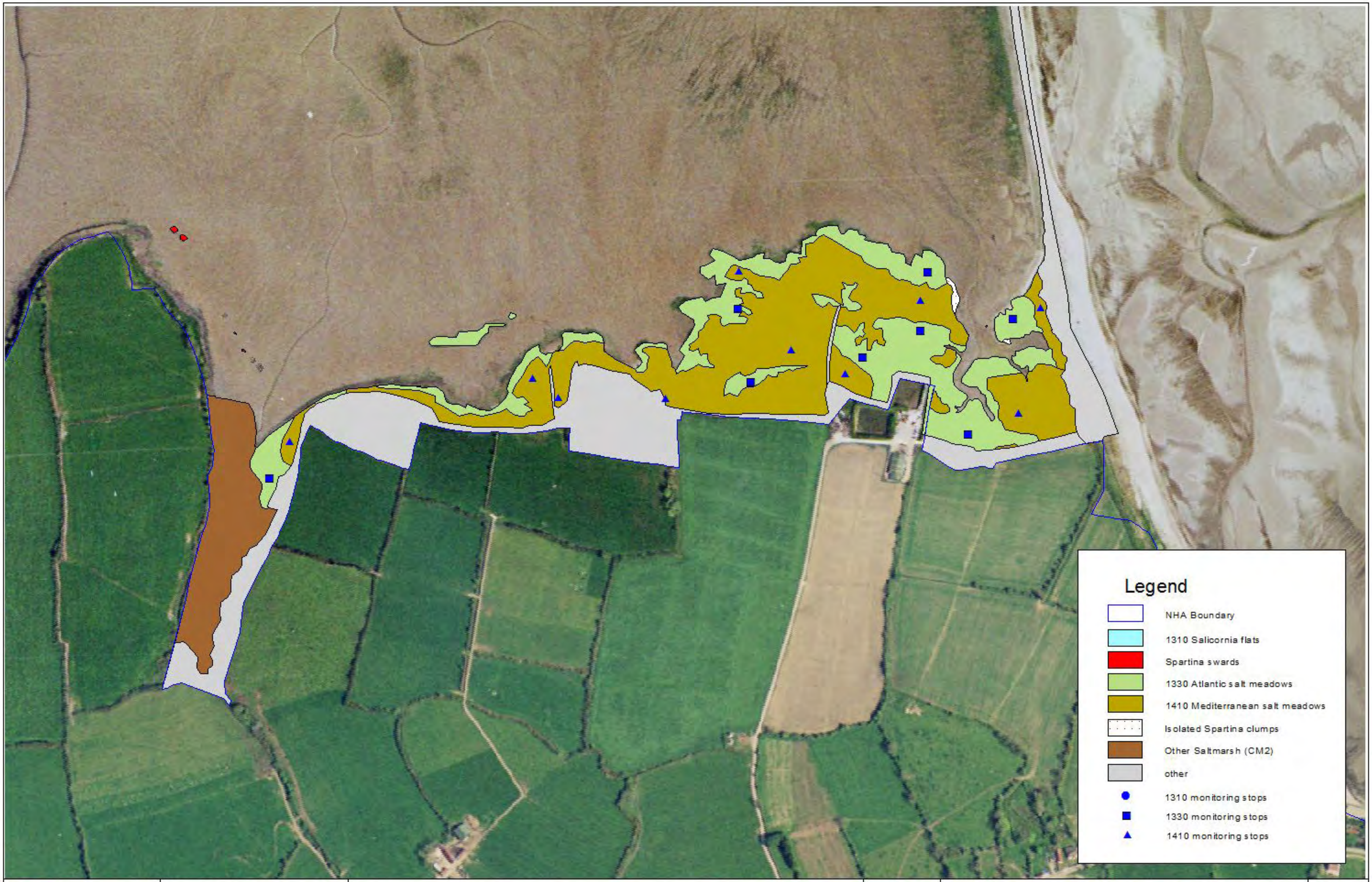
NHA database (1993). Information from files of pNHAs held by NPWS.

Ryle, T., Connolly, K., Murray, A. & Swann, M. (2009). *Coastal Monitoing Project 2004-2006*. Report to the National Parks and Wildlife Service, Dublin.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats	0.541	0.541				
2	Spartina swards	0.174					0.174
3	1330 Atlantic salt meadow	8.212		8.212			
4	1410 Mediterranean salt meadow	7.046			7.046		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	15.979					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)	0.030					0.001
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)	1.581					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**33.563**	**0.541**	**8.212**	**7.046**		**0.175**



Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Dungarvan (Map 1 of 3)

SMP code: SMP0053

0 40 80 120 160 200 Meters

N

Dungarvan Bay NHA (000663)

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

Legend

- NHA Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- Isolated Spartina clumps
- Other Saltmarsh (CM2)
- other
- 1310 monitoring stops
- 1330 monitoring stops
- 1410 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Dungarvan (Map 2 of 3)

Dungarvan Bay NHA (000663)

SMP code: SMP0053

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 50 100 150 200 250 Meters

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

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

N

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Dungarvan (Map 3 of 3)

Dungarvan Bay NHA (000663)

SMP code: SMP0053

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 1:4000

N

Kinsalebeg

1 SITE DETAILS

SMP site name: **Kinsalebeg**		SMP site code: **SMP0054**
Dates of site visit **27/09/2007**		CMP site code: **N/A**
SM inventory site name: **Kinsalebeg**		SM inventory site code: **203**
NPWS Site Name: **Blackwater River (Cork/Waterford)**		
NPWS designation	cSAC: **2170**	MPSU Plan: **N/A**
	pNHA: **72**	SPA: **4028**
County: **Waterford**		Discovery Map: **76** Grid Ref: **212500, 794000**
Aerial photos (2000 series): **O 6254-C; (O 6253-D)**		6 inch Map No: **Wa 037**

Annex I habitats currently listed as qualifying interests for Blackwater River (Cork/Waterford) cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

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

Saltmarsh type: **Bay** Substrate type: **Mud**

2 SITE DESCRIPTION

Kinsalebeg saltmarsh is located on the western border of Co. Waterford with Co. Cork, in the Blackwater River Estuary. This site is located 3 km from Youghal on the east side of the river. Kinsalebeg is a small inlet connected to the main estuary that drains at low tide and exposes extensive saltmarsh. The N25 Cork-Waterford road is positioned 1 km north of this estuary. The surrounding landscape is low-lying and is dominated by farmland. There is scattered habitation in the area and there is some recent housing development along the minor road between Kinsalebeg and Moord's Cross-roads close to the site.

The main inlet forks into two separate smaller inlets with a mainly east-westerly orientation. Both inlets are quite sheltered from the main river estuary. Saltmarsh is found around the shoreline of both inlets and is generally quite narrow, but is best developed in the southern inlet. Small streams flow into the head of both inlets. The saltmarsh fringes soft intertidal mudflats.

The majority of the site is located within the Blackwater River (Cork/Waterford) cSAC and pNHA. This is large cSAC that includes many riparian and riverine habitats along the River Blackwater and its tributaries and also includes a large part of the river estuary. Kinsalebeg is an important roosting site for the wintering waterfowl that use the Blackwater River estuary. Three Annex I saltmarsh habitats have been listed as qualifying interests for this cSAC; *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). However, only two of these habitats are present at Kinsalebeg saltmarsh, ASM and MSM. *Spartina* swards have also developed within the estuary and particularly in the Tourig River estuary, but this habitat was not recorded at Kinsalebeg. There are two other saltmarshes

located within this estuary that are listed on the SM inventory (Curtis and Sheehy-Skeffington 1998), Tourig Hall and Ballintray House, but these were not surveyed during the SMP.

Nearly all of saltmarsh habitat mapped at this site is located within the cSAC boundary. A small amount of saltmarsh habitat has been excluded from the digital boundary from the small offset between the aerial photo series and the OSI 6 inch map series. A small difference between these two map series means that some of the very narrow saltmarsh along the shoreline is excluded. Saltmarsh has also been excluded from the southern inlet due to a small realignment of the shoreline at the mouth of this inlet.

3 SALTMARSH HABITATS

3.1 General description

This saltmarsh is dominated by Atlantic salt meadows (Table 3.1). The saltmarsh is best developed in the southern inlet. Saltmarsh has developed on mud in this inlet and it is generally relatively flat with a moderately developed saltmarsh topography. Mediterranean salt meadows are found on both sides of this inlet in small patches. Some of the saltmarsh is quite dissected and there are several sections that are isolated and are 'islands'. Common Cordgrass (*Spartina anglica*) is present at this site but is quite rare. Several clumps were recorded on the saltmarsh and also on the mud.

There are tall steep saltmarsh cliffs along the lower saltmarsh boundary, adjacent to soft intertidal mudflats. The saltmarsh seems to be perched quite high above the intertidal mudflats compared to other sites. There is very little transitional vegetation along the upper saltmarsh boundaries. There are several small patches of Sea Club-rush (*Bolboschoenus maritimus*) along the upper saltmarsh boundary around the site. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. A fringe of wet grassland vegetation dominated by Hard Rush (*Juncus inflexus*) appears adjacent to the saltmarsh in places. Several small sections of the shoreline are protected from grazing by dense scrub and are note grazed and Sea Club-rush is spreading into these areas. The saltmarsh in the southern inlet is situated adjacent to improved grassland on both sides. A hedge marks the boundary between the saltmarsh and the terrestrial zone.

A narrow band of saltmarsh vegetation is present along both sides of the northern inlet and along the shoreline between these two inlets. Much of this saltmarsh is less than 5 m wide. Much of this saltmarsh is a mosaic of ASM and MSM. However, there are some sections with some typical zonation and a band of Sea Rush (*Juncus maritimus*) along the back of the ASM. Sea Rush is also spreading on the mudflats along the edge of the saltmarsh in places, forming an open mono-specific sward.

Table 3.1. Area of saltmarsh habitats mapped at Kinsalebeg.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	3.187
1410	Mediterranean salt meadows (Juncetalia maritimi)	1.591
	Total*	**4.778**

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

3.2 Atlantic salt meadows (H1330)

There are several vegetation communities present on this saltmarsh. The main saltmarsh is dominated by mid and mid-upper ASM communities. The larger sections have a typical extensive mid marsh *Armeria-Plantago* sward. These areas also have well-developed salt pan development in the mid marsh. Other species present include Sea Milkwort (*Glaux maritima*), Common Scurvy-grass (*Cochlearia officinalis*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritimum*) and Creeping Bent (*Agrostis stolonifera*). The larger sections have a well-developed zonation within some shallow hollows and around salt pans. These hollows contain some increased Common Saltmarsh-grass (*Puccinellia martima*) cover that forms a sward in places, particularly along the southern side. These hollows also contain Glasswort (*Salicornia* sp.). Small mounds in the larger sections contain grassier vegetation dominated by Red Fescue (*Festuca rubra*) or Saltmarsh Rush (*Juncus gerardii*). Some of the ASM also contains Sea Rush at low densities. Sea Purslane (*Atriplex portulacoides*) is present in this habitat but is rather rare in occurrence. Long-bracted Sedge (*Carex extensa*) appears in the saltmarsh along the upper boundary. The sward height is quite low due to moderate-heavy grazing levels.

The ASM saltmarsh towards the head of the southern inlet is dominated by Red Fescue and contains several transitional species such as Celery-leaved Buttercup (*Ranunculus sceleratus*), Wild Celery (*Apium graveolens*), and Brookweed (*Samolus valerandi*).

A narrow fringe of ASM/MSM mosaic is found along much of the northern shoreline. This vegetation contains Sea Rush at various densities intermixed with species such as Red Fescue, Sea Plantain, Sea Arrowgrass and Creeping Bent. There is very little zonation within this narrow band of vegetation. However Sea Rush is spreading along the saltmarsh on the soft intertidal mud.

3.3 Mediterranean salt meadows (H1410)

The MSM found at this site is a mid-upper marsh type and forms mosaics with the ASM in places. The MSM has variable cover of Sea Rush, which can be quite sparse in places. There is no significant topographical difference in height between the ASM and the MSM. There are frequent indicators of low marsh communities present in some of the MSM such as Sea Aster and Common Saltmarsh-grass, indicating the development of MSM in low-mid zone. Most of the MSM is dominated by grasses such as Red Fescue. Other species present include Sea Pink, Sea Milkwort, Common Scurvy-grass, Greater Sea-spurrey (*Spergularia media*), Sea Arrowgrass and Long-bracted Sedge. The habitat is generally in better condition compared to the ASM and it has a variable sward height. Some of the MSM is not grazed as it is isolated on small mud 'islands'. The saltmarsh topography is moderately well-developed within this habitat and is quite dissected.

Another MSM-type vegetation is developing at this site with the spread of Sea Rush on the soft mud at the seaward edge of the established saltmarsh. Clumps of Sea Rush are spreading on the mud in the absence of any other saltmarsh species.

3.4 *Spartina* swards

While Common Cordgrass is present at this site there has been no development of *Spartina* swards on the mudflats or the saltmarsh yet.

4 IMPACTS AND ACTIVITIES

The main impact affecting this site is grazing (Table 4.1). Both sides of the main saltmarsh in the southern inlet are overgrazed. The southern side is grazed by sheep (142) while the northern side is grazed by cattle (143). The northern side is quite poached. There are some negative indicators present such as frequent green algae cover and bare substrate cover in badly damaged sections. Both sides contain some isolated 'islands' of saltmarsh which are cut off from the main saltmarsh by creeks and are not grazed. The sward height is much higher compared to the adjacent grazed sections. The MSM is less intensively grazed compared to the MSM. There is open access from adjacent fields on both sides onto the saltmarsh. Some of the saltmarsh is quite dissected and this may be related to long-term heavy grazing and poaching-induced erosion along the creek edges.

Common Cordgrass is present at this site. This is an invasive species of saltmarsh (954). It is not known when it was planted or when it colonised this estuary (Nairn 1986). Common Cordgrass was first recorded in Co. Waterford in 1958 (Green 2008). Common Cordgrass does not form a significant part of the ASM vegetation and only a few clumps were recorded. It does not form *Spartina* swards on the mudflats either. The *Spartina* sward cover is quite low relative to the cover of ASM saltmarsh and the remaining intertidal mudflats. There are no indications that it has spread significantly during the current monitoring period. There is potential for this species to spread on the mudflats at this site in the future.

This has been some infilling around the site at several locations (803). This infilling is probably related to dumping of construction and demolition waste. Infilling has occurred at the head of the southern inlet and is now re-vegetating. More recent infilling also occurred along the shoreline between the two inlets. This infilling is not likely to have destroyed much saltmarsh as only a narrow fringe of saltmarsh is present at both locations in adjacent undisturbed sections.

There are some indications of an erosional trend at this site (900). A tall saltmarsh cliff is present along the lower saltmarsh boundary and some of the saltmarsh is quite dissected. The outer saltmarsh along the shoreline between the two inlets does display some signs of erosion such as exposed mud tussocks. However, Sea Rush is also spreading in places along the more established saltmarsh and this may be an indication of the future expansion of saltmarsh in places. This area is quite sheltered so it is likely that erosional pressure in this area is quite low. A comparison of the OSI 2nd edition 6 inch map to the current OSI 2005 series aerial photos shows that there have been some loss of saltmarsh along the southern side of the main marsh during this period (about 0.1 ha). However, a comparison of the 1995, 2000 and 2005 OSI aerial photos shows that there has been no measurable loss of saltmarsh habitat by erosion during the monitoring period. Therefore the impacts of erosion are assessed as neutral.

There are signs of former land-use of the saltmarsh at this site. Several small boat quays are marked on the saltmarsh in the old maps but there is no sign of these quays now. A Corn Mill was built at the head of the upper inlet (marked on the 1st edition 6 inch map). This construction probably destroyed some saltmarsh in the past. There was also some infilling of saltmarsh and mudflats at the head of the southern inlet in the 19th century.

Impacts and activities adjacent to the site include dispersed habitation (403), agriculture (102, 120, 140) and roads (502). These activities have little or no measurable impact on the saltmarsh habitats.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	B	0	1.0	Inside
1330	142	B	-1	1.5	Inside
1330	143	B	-1	0.6	Inside
1330	803	B	-2	0.001	Inside
1330	900	C	0	0.15	Inside
1330	954	C	0	3.187	Inside
1410	140	C	0	1.591	Inside
1410	803	B	-2	0.001	Inside
1410	900	C	0	0.025	Inside

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

5 CONSERVATION STATUS

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

Kinsalebeg is a saltmarsh with few features of significant conservation interest. The overall conservation status of this site is *unfavourable-bad*. The main impact at this site is grazing and there are frequent signs of heavy grazing damage around the site. Common Cordgrass is present at this site but does not form a significant area of *Spartina* sward and does not form a significant part of the ASM vegetation either.

This site is located within the Blackwater River cSAC. A NPWS management plan is not available for this cSAC.

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

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
Mediterranean salt meadows (1410)	Extent Structure and functions, Future prospects			Favourable

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to land-use changes or erosion within the current monitoring period. There is not likely to have been a significant loss of saltmarsh habitat due to infilling at this site during the current monitoring period (< 0.001 ha). There are signs of an erosional trend at this site but the rate of loss of saltmarsh due to erosion (that may be poaching enhanced) is likely to be very low.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*. Eight monitoring stops were carried out in this habitat and two failed (25%). Most of this habitat is grazed at a moderate to heavy intensity and this has caused some damage in places. The sward height is generally quite low, but higher on some ungrazed inaccessible 'island'. There are negative indicators such as frequent green algae and bare substrate cover present. The habitat diversity is typical of ASM and there are several ASM communities present with typical zonation. The saltmarsh topography is moderately well-developed. There is no significant transitional vegetation between the saltmarsh and the adjacent terrestrial vegetation.

5.2.3 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. The main impact affecting this site is heavy grazing. There is no updated NPWS conservation plan for this site. Most of the saltmarsh habitat is located within an SAC so the site should be protected from negative impacts such as infilling or development that require licensing from local authorities or NPWS. In spite of this there has been some infilling around the site and this is likely to have been unlicensed.

Common Cordgrass, an invasive species, is present at this site, although it is quite rare. Some sections of the ASM are vulnerable to the spread of Common Cordgrass in the future, as there are low marsh communities are heavily grazed and are under significant pressure.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to land-use changes or erosion within the current monitoring period. There is not likely to have been a significant loss of saltmarsh habitat due to infilling at this site (< 0.001 ha). The MSM is much less vulnerable to erosion compared to the ASM, due to its position on the saltmarsh.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Five monitoring stops were carried out in this habitat and they all passed. All of the attributes required for the structure and functions of this habitat reached their targets for each monitoring stop. The MSM is generally in good condition and is less intensively grazed compared to the surrounding ASM. Species diversity is typical and the site displays a good example of zonation with several MSM communities present.

5.3.3 Future prospects

The structure and functions of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts continue in the near future. The main impact affecting this site is heavy grazing but this does not affect the MSM to the small extent as the ASM. There is no updated NPWS conservation plan for this site. Most of the saltmarsh habitat is located within an SAC so the site should be protected from negative impacts such as infilling or development that require licensing from local authorities or NPWS. In spite of this there has been some infilling around the site and this is likely to have been unlicensed.

6 MANAGEMENT RECOMMENDATIONS

There are no management recommendations for this site.

7 REFERENCES

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Green P. (2008). Flora of Co. Waterford.

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

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	3.031		3.031			
4	1410 Mediterranean salt meadow	1.435			1.435		
5	ASM/MSM mosaic (50/50)	0.311		0.155	0.155		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	2.001					
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)						
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**6.778**		**3.187**	**1.591**		

Legend

- SAC Boundary
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- other
- 1330 monitoring stops
- 1410 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Kinsalebeg

Blackwater River (Cork/Waterford) SAC (002170)

SMP code: SMP0054

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: 02/03/2009
Map version: 1

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

N

Little Island

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: **2137**	MPSU Plan: **N/A**
pNHA: **1702**	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 2137). 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 Bentgrass (*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 CM2dominated 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 Bentgrass 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 Bentgrass 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 Bentgrass. 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

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

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

NHA database (1993). Information from files of pNHAs held by NPWS.

Preston, C.D. Pearman, A. & Dines, D. (2002). *New atlas of the British and Irish Flora*. Oxford University Press.

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *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**

Comhshaol, Oidhreacht agus Rialtas Áitiúil
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

Legend

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

Department of Arts, Heritage and the Gaeltacht
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Little Island (Map 2 of 2)

Lower River Suir 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 50 100 150 200 250 Meters

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

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

N

Tramore

1 SITE DETAILS

SMP site name: **Tramore**		SMP site code: **SMP0007**
Site name (Curtis list): **Tramore**		CMP site code: **46**
		Site No: (Curtis list): **208**
NPWS Site Name: **Tramore dunes and Backstrand**		Dates of site visit: **27-28/06/2006**
NPWS designation	cSAC: **671**	MPSU Plan: **old format plan available**
	pNHA: **671**	
	SPA: **Tramore Back Strand SPA 671**	
County: **Waterford**		Discovery Map: **76** Grid Ref: **260110, 100940**
6 inch Map No: **Wa026, Wa027**		Aerial photos (1995 series): **05915-b, 05915-c, 05915-d, 05916-a, 05916-b, 05916-d**
		Aerial photos (2000 series): **05915-b, 05915-c, 05915-d, 05916-a, 05916-b, 05916-d**
		Aerial photos (2005 series): **0658600, 0658602, 0660600, 0660602, 0662600, 0662602,**

Annex I habitats currently designated for Tramore dunes and Back Strand cSAC:

***Salicornia* and other annuals colonizing mud and sand (1310)**
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)
Mediterranean salt meadows (Juncetalia maritimi) (1410)

Saltmarsh type: **Lagoon**	Substrate type: **Mud/gravel**

2 SITE DESCRIPTION

This site is located at the head of Tramore Bay, Co. Waterford. A large sand and shingle spit crosses the head of Tramore Bay and encloses a large intertidal area behind it called the Back Strand, which is 3.7 km wide. This area is connected to Tramore Bay by narrows along the east side of the bay. Tramore Town is located to the west of the Back Strand and the coastal barrier. A large sand dune system called the Burrow has developed on the coastal barrier and a sandy beach is situated along the front of the spit. This coastal system was surveyed by the Coastal Monitoring Project in 2005. The sandy beach is an important amenity area and Tramore Burrow is also popular for walkers. The area between Tramore Town and the sand and shingle spit has been developed mainly for amenity use and a large promenade has been built. Tramore landfill is located along the west side of the Back Strand and this dump was built on the intertidal flats.

There are several patches of saltmarsh around the shoreline of the Back Strand with the main section being situated along the back of the sand/shingle spit within the area enclosed by the embankment. There are two smaller patches of saltmarsh along the northern side of the Back Strand, one of which is connected to the embankment (Tramore Intake). There is a very small patch of saltmarsh within the sand dune system near the end of the Burrow.

The landscape around the head of Tramore Bay contains low hills and cliffs begin to form south of Tramore Town. The northern side of the Back Strand contains several hills that separate low-lying areas. Rivers flow into the Back Strand at the north-west and north-east corners. The land around Tramore Bay is dominated by farmland. The Back Strand has changed substantially in the past 150 years. The first edition 6 inch map shows that the intertidal flats were much greater in extent. A large area has now been infilled in the south-western corner between the spit and the mainland and this area contains Tramore Infill. A tall embankment (called the Malcolmson embankment after the family who built it) was built across the western side of the Back Strand and was completed in 1863 (McGrath 2001). There is a small opening near the centre that allows the tide to flood the intertidal flats around the landfill to the west of Malcolmson embankment. This embankment was breached in 1911. A large intertidal area along the north side of the Back Strand (Lisselan Intake) was enclosed by a tall embankment in the 19th century and now contains improved grassland. A second large area in the north-east corner of the Back Strand (Kilmacleague West) was also enclosed by a tall embankment and the lands behind the embankment are now improved. This land reclamation occurred in the 19th century and has substantially changed the landscape around the Back Strand.

Three Annex I habitats, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM), are found at this site. All three habitats are listed as qualifying interests for the Tramore dunes and Back Strand cSAC. *Spartina* swards are also present at this site. Most of the saltmarsh habitat is situated within the cSAC. A large patch of *Spartina* sward with an adjoining narrow band of ASM is located north of the dump in an area excluded from the cSAC due to its proximity to the landfill.

Some of the saltmarsh located at Lisselan is also situated within the Tramore Back Strand SPA. The Back Strand is used by internationally important populations of Brent Geese and nationally important populations of other wintering waders and wildfowl such as Red-breasted Merganser, Golden Plover, Grey Plover, Lapwing, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank and Greenshank. The saltmarsh is used by some of these and other species for feeding and roosting. However, the largest areas of saltmarsh are located within the Malcolmson embankment and are excluded from the SPA, as the embankment is used as the boundary.

The saltmarsh along the back of the sand spit is easily accessed via paths leading out to The Burrow. Saltmarsh along the north side of the Back Strand can be accessed using lanes that access the surrounding farmland. Permission was sought to cross land at Lisselan.

3 HABITATS

3.1 General description

Atlantic salt meadows (ASM) dominate the saltmarsh vegetation (Table 3.1). The total area includes a small amount of ASM/*Spartina* sward mosaic and ASM/MSM mosaic (50% of mapped areas). This mosaic habitat is found in all of the largest patches of saltmarsh.

There is nearly an equivalent area of *Spartina* swards and clumps. The *Spartina* area includes 50% of the area mapped as *Spartina* clump/mudflat mosaic and 5% of the area mapped as scattered clumps on mud.

3.1.1 The Cush

The largest area of saltmarsh is situated along the back of the shingle/sand spit, adjacent to the western side and within the area enclosed by the Malcolmson embankment. This area is known as The Cush. This ASM saltmarsh transitions to disturbed coastal grassland on the sand/shingle spit. Fixed dune vegetation develops along the landward side further east towards the Malcolmson embankment, where the sand/shingle spit is less disturbed. There is a small area of ASM saltmarsh along the

east side of the embankment. Extensive *Spartina* swards have developed on intertidal mudflats along the seaward side of the ASM within the Malcolmson embankment. Further seaward, small patches of *Salicornia* flats (1310) have developed on intertidal mudflat banks.

3.1.2 Tramore Intake

Two small patches of saltmarsh are situated along the northern side of the Back Strand. The western section is located in Tramore Intake and is a complex mosaic of several habitats. The Malcolmson embankment is situated along the eastern side. Within the embankment there is an area containing ASM, *Spartina* swards, a mosaic of ASM and *Spartina* swards (1330/*Spartina*) and small patches of Mediterranean salt meadows (MSM) along with some scrub and dry grassland on low mounds above the high tide line. Most of the saltmarsh is situated west of a low ridge above the high water mark that divides this patch of saltmarsh.

3.1.3 Lisselan

The second area of saltmarsh along the northern boundary of the Back Strand is located towards the eastern side in Lisselan Townland. This area is marked on the 6 inch OS map as being "covered by spring tides". This area also contains several saltmarsh habitats. The main section is a mosaic of ASM and patches of MSM, with ASM dominating. There is a tall saltmarsh cliff along the seaward boundary adjacent to intertidal sandflats. Patches of *Spartina* sward and scattered clumps are situated along the intertidal flats. Common Cordgrass (*Spartina anglica*) is further distributed towards the west along the northern side of the Back Strand. There are several small patches of *Salicornia* flats situated on the intertidal flats between the clumps of the intertidal flats and the saltmarsh cliff and on narrow mud banks along some of the large creeks within the saltmarsh. The saltmarsh transitions to a narrow band of wet grassland on a low bank around the landward edge and this coastal area is enclosed by overgrown hedgerows. The saltmarsh vegetation transitions to grassland containing Black Bog-rush (*Schoenus nigricans*), Devils Bit (*Succisa pratensis*) and Soft Rush (*Juncus effusus*), indicating that the soil has a peaty influence.

3.1.4 Other saltmarsh

There is a small circular patch of ASM located in a low-lying area within tall sand dunes at the eastern side of the Burrow.

A large patch of *Spartina* sward on intertidal mudflats is located to the north of the dump. A narrow band of ASM vegetation 2-5 m wide is located around the landward edge of the *Spartina* sward. This band of ASM is situated on a steep bank alongside the western side of the Back Strand. This area is being developed and contains a mixture of urban land and farmland. The ASM is discontinuous and there are several narrow bands along the eastward side of the small inlet at the mouth of the Garraun Stream. This inlet contains several small patches of *Spartina* swards on the intertidal mudflats. Towards the head of the inlet there are patches of brackish habitat including Common Reed (*Phragmites australis*).

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

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.99
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	29.55
1410	Mediterranean salt meadows (Juncetalia maritimi)	1.76
	Spartina swards and clumps	28.71
	Total (not including *Spartina* swards and clumps)	**32.3**

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

This habitat is found at two locations, on mudflats partially enclosed by the Malcolmson embankment in the south-west section of the Back Strand, and along the edge of the saltmarsh at Lisselan in the north-east section. There are several raised banks of mud within the embankment that contain dense patches of Glasswort (*Salicornia* sp.). These patches are generally mono-specific swards with occasional small clumps of Common Cordgrass (*Spartina anglica*). The largest patches are isolated from the rest of the saltmarsh habitats and only connect to the *Spartina* sward along the banks of one of the large creeks that drains this area. There are several small narrow patches of this habitat along one of the steep banks of the large creeks in this area that are not mapped. There are several other smaller patches along the seaward edge of the *Spartina* sward adjacent to the south end of the embankment.

There are occasional unmapped patches of this habitat that are situated between the edge of the ASM and the *Spartina* sward. These patches at located on a low saltmarsh cliff that divides these two habitats. Some of these small patches are dominated by Annual Sea-blite (*Suaeda maritima*) and could be considered a pioneer saltmarsh zone.

This habitat is also found on the saltmarsh at Lisselan. Several patches of *Salicornia* flat are located on some shallow sediment banks within the large channelised creeks that drain this area. Sea Purslane, Common Saltmarsh-grass and Annual Sea-blite are also colonising these strips and this can be considered a pioneer saltmarsh zone. A small patch is also situated along the seaward side of the saltmarsh, at the bottom of an eroded saltmarsh cliff.

3.3 Atlantic salt meadows (H1330)

This habitat is described by area.

3.3.1 The Cush

This is the largest area of ASM. It has developed along the back of the shingle/sand spit that forms Tramore Burrow. The main area of ASM is located within the area enclosed by the Malcolmson embankment. The saltmarsh is situated on a gentle slope at the back of the spit and this has allowed a distinctive zonation to develop. These zones are visible as bands along the saltmarsh. The saltmarsh (and the various zones) are narrowest at the western side and further east the saltmarsh widens and there are wide flat mid-marsh plains.

There is a low ridge containing fixed dune vegetation extending into the saltmarsh at the westward side. The saltmarsh east of this section has a more complex topography with a series of low mounds and hollows. The vegetation zonation is more complex with patches of upper marsh vegetation on these mounds surrounded by bands of mid marsh vegetation in the hollows and channels between the mounds. Some of the mounds are raised above the high water level and contain transitional strandline species such as Sea Beet (*Beta maritima*) and Curled Dock (*Rumex crispus*). Lower marsh vegetation including bands of Sea Purslane (*Atriplex portulacoides*) extend along the creeks that drain this area. This saltmarsh is not grazed by livestock and has

a diverse sward height structure. There is probably some grazing of the lower zones by wintering waders and wildfowl.

The upper saltmarsh zone is dominated by Red Fescue (*Festuca rubra*) and patches of Saltmarsh Rush (*Juncus gerardii*). The upper part of the saltmarsh at the west end contains frequent scattered cobbles that are probably from the storm beach along the back of the sandy beach at the front of the spit. Other species present include Sea Purslane, especially along creeks, Sea Pink (*Armeria maritima*), Sea Milkwort (*Glaux maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Distant Sedge (*Carex distans*) and Long-bracted Sedge (*C. extensa*). There are only several small clumps of Sea Rush (*Juncus maritimus*) in this saltmarsh.

Golden Samphire (*Inula crithmoides*) is present on this saltmarsh. Only one plant was recorded along the west side of the marsh but it is occasionally frequent in the upper saltmarsh zone near the Malcolmson embankment (see Info Points). This is a species of local distinctiveness. This species is only found in seventeen 10 km^2 squares in Ireland (Preston *et al.* 2002). This site is notable for the presence of this species on the saltmarsh as it is usually found on rocky shores and cliffs.

The mid marsh zone is dominated by Sea Pink and Sea Plantain with frequent Red Fescue appearing in some places, particularly along the upper side. Other species include Lax-flowered Sea Lavender (*Limonium humile*), Sea Purslane, Common Saltmarsh-grass (*Puccinellia maritima*) and Sea Arrowgrass (*Triglochin maritimum*).

The lower saltmarsh zone is dominated by Sea Purslane and Common Saltmarsh-grass. There is occasionally frequent Common Cordgrass spread in this zone. Other species present include Lax-flowered Sea Lavender, Sea Aster (*Aster tripolium*), Sea Plantain and Greater Sea-spurrey.

There is a distinctive transition between the ASM and the *Spartina* swards. This transitional zone is situated on a gentle slope between these habitats. There is natural low saltmarsh cliff marking the edge of the ASM at the western side. The vegetation is characterised by a co-dominance of Common Cordgrass and Sea Purslane. Common Saltmarsh-grass is also frequent and there is occasional Lax-flowered Sea Lavender. Further seaward the cover of Sea Purslane is reduced and Common Cordgrass forms a dense mono-specific sward. There are small patches further out in

the *Spartina* sward that contain clumps of Sea Purslane and can be classed as transitional vegetation (1330/*Spartina* sward) but these are not mapped. A saltmarsh cliff does appear towards the eastern side between the two habitats.

The west side of the saltmarsh does not contain many salt pans and the topography is quite uniform. The saltmarsh topography has been damaged by old drainage works. Some of the creeks have been canalised (or are old drains that have become more natural). Some of the old natural creeks have infilled as the newer drains took over their function or the development of the *Spartina* sward affected the drainage off the saltmarsh. The seaward boundary of the ASM has also been disturbed by drainage carried out the past. Deep creek-like drains were dug on the mudflats. This drainage was probably carried out in association with the infilling around the dump. These drains have assisted the spread of Common Cordgrass into the lower saltmarsh zone along some of the drains.

The west side closest to the promenade and adjacent to an infilled area is quite disturbed and this affects the transition zone along the landward boundary. There are several tracks along the landward boundary of the saltmarsh and this transitions into disturbed coastal grassland. There is a low ridge with small mounds at the back of the saltmarsh at the western side that may be the remains of spoil or substrate dumped on the saltmarsh in the past. These mounds contain dune species such as Birdsfoot (*Lotus corniculatus*), Curled Duck and Sea Mayweed (*Tripleurospermum maritimum*). The mounds also contain transitional species such as Red Fescue, Creeping Bentgrass (*Agrostis stolonifera*), Sea Beet, Spear-leaved Orache (*Atriplex prostrata*), Frosted Orache (*A. lacinata*) and Silverweed (*Potentilla anserina*). The sandy substrate above the landward boundary contains frequent Buck's-horn Plantain (*Plantago coronopus*), Birdsfoot and frequent bare substrate.

3.3.2 Lisselan saltmarsh

Atlantic salt meadows (ASM) dominate the saltmarsh at Lisselan. The ASM saltmarsh at Lisselan has an unusual topography, as there is a band of upper saltmarsh vegetation along the seaward edge of the saltmarsh. This may be related to the presence of an old embankment, now eroded, along the seaward edge. This allows reverse zonation of saltmarsh vegetation behind the embankment with the saltmarsh at the back of the embankment having a slightly higher elevation. The ASM at Lissalen

is dominated by typical mid marsh vegetation in a relatively flat plain. Sea Pink and Sea Plantain are both dominant. Other species present include Lax-flowered Sea Lavender, Sea Aster, Common Saltmarsh-grass, Glasswort, Sea Arrowgrass, and Sea Purslane. There are rare clumps of Common Cordgrass scattered through this saltmarsh and are mainly distributed in the creeks and in some of the salt pans. Sea Purslane is mainly distributed along the edges of the creeks and some of the pans, but it is not a prominent part of the vegetation.

The mid-upper marsh zone is present along the seaward side and around the landward edges of the saltmarsh. This zone is dominated by Red Fescue and Saltmarsh Rush. Other species present include Sea Milkwort, Sea Plantain and Sea Arrowgrass. Patches of MSM vegetation dominated by Sea Rush are also prominent in this zone. A narrow band along the eastern landward boundary is mapped as a MSM/ASM mosaic. This area contains a complex mosaic of clumps of Sea Rush interspersed with mid and mid-upper ASM saltmarsh vegetation.

There is a mid-lower saltmarsh zone with Common Saltmarsh-grass prominent along some of the creek edges. This zone is also present at the seaward edge (Monitoring Stop 4) on a terrace along the edge of the saltmarsh and also contains frequent Sea Arrowgrass and Red Fescue.

Golden samphire (*Inula crithmoides*) is present on this saltmarsh. This is a species of local distinctiveness.

The saltmarsh topography in this area is well developed with a complex creek structure and a series of large salt pans both present. The salt pans are generally bare with no vegetation. There are occasional clumps of Common Cordgrass in some of the pans. Parts of the main creeks along the eastern side of this saltmarsh have been canalised in the past. These creeks were straightened and probably widened to increase drainage. These drains are marked on the 6 inch OS map. This area has a diverse sward height and was not grazed at the time of the survey. There are signs that cattle has grazed on this site in previous years with signs of old poaching present. However, the saltmarsh surface is in very good condition. The MPSU conservation plan noted that this area was grazed intensively by waders and wildfowl. A track is present along the landward side of the saltmarsh adjacent to the north-east boundary.

There is a small area of saltmarsh on the east side of the Malcolmson embankment. This area is dominated by a mid-upper saltmarsh zone. The saltmarsh vegetation transitions to fixed dune vegetation along the landward boundary. A ridge dominated by Sea Purslane is present along the seaward boundary on some shingle, which is adjacent to intertidal sand flats. Behind the ridge, typical mid-marsh vegetation has developed with Sea Pink and Sea Plantain and there is some development of creeks and salt pans draining this area. Lower zone vegetation dominated by Common Saltmarsh-grass and containing Glasswort and Annual Sea-blite is present along the edges of the creeks.

3.3.3 Tramore Burrow

A small patch of saltmarsh is located at the eastern end of Tramore Burrow. There is a small circular low-lying area nearly enclosed by tall sand dunes that contains the saltmarsh. The substrate is sandy. This area is dominated by Sea Purslane. Other species present include Common Saltmarsh-grass, Sea Plantain, Common Scurvygrass and Sea Pink. A narrow creek drains this area and Glasswort and Annual Sea-blite are present on sand along this channel. There is a very narrow band of Red Fescue and Creeping Bentgrass around the landward boundary and the saltmarsh transitions to Marram (*Ammophila arenaria*)-dominated vegetation along steep sandy slopes. Sand Couch (*Elytrigia juncea*) forms patches on the saltmarsh and is present around the edges. No Common Cordgrass is present. There are patches within this area with bare sand and single.

3.3.4 Tramore Intake

A small area of ASM is located at the north side of the Malcolmson embankment. This area has been modified by the construction of the embankment. There is a deep channel adjacent to the embankment, and alongside this channel a ridge is present containing upper saltmarsh vegetation and a band of dry grassland above the high water mark. Most of the saltmarsh is found on the west side of this ridge. A deep drain is also present along the northern side of the saltmarsh.

The vegetation of a large section of this saltmarsh is characterised by the co-dominance of Common Cordgrass intermixed with lower saltmarsh vegetation dominated by Sea Purslane. Other species present in the mosaic area include

Common Saltmarsh-grass, Sea Aster, Sea Plantain, Sea Arrowgrass, Sea Pink, Lax-flowered Sea Lavender, Glasswort and Greater Sea Spurrey.

There are patches within the mosaic of denser Common Cordgrass and patches of ASM vegetation with Common Cordgrass absent. However, the distribution of Common Cordgrass is complex so the whole area was mapped as a mosaic. The cover of Common Cordgrass ranges between 20-80% but overall is about 50%. Common Cordgrass has infilled some of the old salt pans in this area but has also spread into the ASM vegetation. This area is a transition between ASM vegetation and *Spartina* sward, which occurs seaward of this area. The *Spartina*/ASM mosaic area is surrounded by a narrow band of ASM. This ASM contains less frequent Common Cordgrass < (20% cover). The *Spartina* sward (100% cover) has developed in a small sheltered area that was previously mudflats.

Upper marsh vegetation dominated by Red Fescue is present on the upper parts of the ridge that crosses the saltmarsh and along the northern landward boundary. This area is ungrazed and has a diverse sward height and structure.

3.3.5 Narrow saltmarsh

A narrow band of saltmarsh is present at various locations around the edge of the Back Strand. A narrow band of saltmarsh is also present along the edge of the *Spartina* sward to the north of the dump. This saltmarsh is dominated by Saltmarsh Rush, Sea Rush and Red Fescue. The band of saltmarsh is around is 5-7 m wide. Other species present include Sea Aster, Sea Milkwort and Common Scurvygrass. A narrow band of Creeping Bentgrass is present along the landward boundary, which is a low steep bank. The bank is vegetated by Twitch (*Elytrigia repens*). This band is mapped as a mosaic between ASM and MSM (1330/1410). There is a low saltmarsh cliff down onto the *Spartina* sward.

3.4 Mediterranean salt meadows (H1410)

The habitat is found on the main saltmarsh areas along the northern side of the Back Strand at Tramore Intake and Lisselan. There are only a few small clumps of Sea Rush on the main saltmarsh along the back of the shingle/sand spit and these are too small to map as MSM.

3.4.1 Lisselan saltmarsh

The MSM at Lisselan is characterised by the variable sized patches of Sea Rush. These large patches are dominated by Sea Rush but frequently have a lower stem density of < 50% cover compared to this habitat at other sites. The sward height is about 0.4 m high. This habitat contains occasionally frequent amounts of Red Fescue, Saltmarsh Rush, Sea Plantain and sometimes Sea Purslane. Other species present include Sea Aster, Sea Pink, Lax-flowered Sea Lavender and Sea Arrowgrass. There is no significant zonation in this habitat. However, some clumps present at lower elevations tend to have increased amounts of Sea Pink and Sea Purslane while those patches in the mid upper zones tend to contain more Red Fescue and Saltmarsh Rush. Both Curled Dock and Creeping Bentgrass are present in the habitat close to the landward boundary. Sea Rush may extend in some cases to just above the high water mark, particularly along the eastern boundary.

This habitat generally does not have its own separate topography as it forms patches amongst ASM. However, some creeks pass through this habitat and there are salt pans present. MSM is present along the canalised creek at the eastern side of Lisselan.

Lisselan saltmarsh also contains a patch of Sharp Rush (*Juncus acutus*) (Info Point 15). This is a species of local distinctiveness. This species is confined to the eastern and south-eastern coastal of Ireland and has a distunct distribution on sandy and muddy shores. Webb *et al.* (1997) describes this species as rather rare although it is not listed in the Red Data Book (Curtis and McGough 1988).

3.4.2 Tramore Intake saltmarsh

This saltmarsh contains a small area of MSM (0.4 ha). It is situated around the edges of a small mound at the south-west end of this saltmarsh and is mainly found on more elevated land compared to the adjacent ASM on the western side. The vegetation is dominated by dense Sea Rush with frequent Red Fescue. Other species present include Sea Purslane, Sea Milkwort, Saltmarsh Rush, and Lax-flowered Sea Lavender. One the eastern side of the mound the MSM extends to lower levels and also contains frequent Common Saltmarsh-grass and occasional Common Cordgrass. A band of saltmarsh dominated by Sea Rush has developed along the seaward side.

This habitat does not contain any creeks but does contain some small creeks. The MSM transitions to scrub and rank grassland along the upper boundary.

3.5 *Spartina* swards

This habitat is present at several locations around the Back Strand. The largest area is within the partially enclosed Malcolmson embankment to the west of the Back Strand, south of the dump. Dense *Spartina* sward has developed on soft mudflats in this area at the seaward side of the ASM. This area has been disturbed in the past by the creation of deep drains crossing the mudflats. Some natural creeks have developed within the *Spartina* sward and connect to these deep drains. There are patches of ASM vegetation towards the landward side of the sward. These patches are dominated by Sea Purslane and also contain Common Saltmarsh-grass and Lax-flowered Sea Lavender. These ASM patches occasionally develop along the better drained banks of the creeks. These patches were not mapped as this area was inaccessible due to the softness of the mud and the deep drains. *Spartina* sward has also developed along the northern side adjacent to the edge of the dump.

Spartina swards and clumps are also present along the saltmarsh at Lisselan. These occur on firm muddy sandflats at the seaward edge of the saltmarsh. There are several small patches of swards and scattered clumps at various densities and the clumps may be quite sparse (< 1% cover in places). The clumps have created a mosaic of sandflats and *Spartina* clumps in places. Some clumps are quite isolated from the saltmarsh and are scattered up to 200 m from the shoreline. There is occasionally some Eelgrass (*Zostera* spp.) in pools between the clumps of Common Cordgrass on the sandflats. There is no real transition from ASM or MSM to *Spartina* sward at Lisselan as a tall saltmarsh cliff marks the boundary between these two habitats and the *Spartina* swards and clumps may not necessarily be present along the bottom of the saltmarsh cliff. A small sheltered area at the east side of Lisselan saltmarsh near the large creeks does contain some transition from *Spartina* sward to ASM and MSM. The *Spartina* swards have spread along the northern side of the Back Strand, west towards the Malcolmson embankment.

There is a small patch with several clumps of Common Cordgrass along the south-east side of the Malcolmson embankment.

There is a large area of *Spartina* sward north of the dump. Common Cordgrass has colonised very soft mudflats in this area. Much of the *Spartina* sward is inaccessible. This sward is up to 250 m wide and there is a complex network of creeks within this sward. There are scattered clumps at the seaward edge creating a *Spartina* clump/mudflat mosaic. There is no sign of Glasswort within or at the seaward edge of this sward. Eelgrass (*Zostera* spp.) is present at the seaward edge of the *Spartina* sward amongst some of the clumps of Common Cordgrass and in some of the channels within the *Spartina* sward.

Spartina sward is also present on mudflats on the small inlet/channel at the north-west corner of the Back Strand. These swards have developed since 1993.

4 IMPACTS AND ACTIVITIES

This site has a range of varied activities, which is typical of a large site with several habitats that are quite spread out in several segments (Table 4.1). The saltmarsh habitats have been disturbed in the past by activities associated with reclamation around the Back Strand. These impacts are still having some residual impacts but have not been assessed as the activities occurred prior to 1993.

The main saltmarsh along The Cush at the back of the shingle/sand spit was partially infilled between the 1st and 2nd edition 6 inch OS maps (1840-1920). This infilling at the western side adjacent to the new promenade is associated with the development of the dump. A small embankment was built along the western side of the current saltmarsh to connect to the dump and this encloses a small patch of mudflats. Most of this area has now been infilled and contains recolonising bare ground (ED3).

Deep drains were dug across the mudflats (pre-dating the 1920s 2nd edition OS 6 inch map) within the area enclosed by the Malcolmson embankment. These drains are still visible on the 2000 aerial photos. Drains were also dug across the saltmarsh along The Cush. Some of these drains have facilitated the spread of Common Cordgrass into parts of the upper zone saltmarsh. The drains have also affected the creek function of this saltmarsh, with some creeks infilling. Part of the seaward edge of the ASM has also been disturbed by this drainage. This disturbance has also probably helped the spread of Common Cordgrass into the lower saltmarsh zone.

The development of the large Malcolmson embankment to partially enclose a large area of mudflats to the west of the Back Strand probably affected sedimentation in this area. The distribution of *Salicornia* flats and the spread of Common Cordgrass in this area were likely to be indirectly influencing by affecting sedimentation. The development of this embankment also reduced the extent of ASM along The Cush.

The other patches of saltmarsh have also been disturbed by old reclamation and drainage works. The saltmarsh at Lisselan is likely to have an embankment along the seaward side that have now been eroded away, and some of the creeks have been canalised. The saltmarsh at Tramore Intake has also been affected by drains dug in the past and the embankment was built across the eastern side.

Saltmarsh around the edge of the intertidal area within Lisselan Intake and Kilmacleague Townlands has also been reclaimed when these areas were embanked and drained (pre-dating the 1920s 2nd edition OS 6 inch map). These sheltered intertidal areas are likely to have contained *Salicornia* flats.

There are signs of erosion along the seaward edge of the saltmarsh at Lisselan (900). There is a high saltmarsh cliff 1 m high along the edge of the mudflats. On top of this saltmarsh cliff there is a bare mud ramp 1-3 m wide where the vegetation has eroded away to create a terrace. A comparison of the 6 inch map to the 2000 aerial photos indicates that a band of saltmarsh 20-30 m wide (about 1.5 ha) has eroded away from the seaward edge. This erosion may be in response to the changes in the shoreline geomorphology on both sides of this saltmarsh, with large intertidal areas enclosed by embankments built in the past 150 years. There are no indications of any loss of extent of saltmarsh between 1995 and 2005 from an examination of aerial photos.

There are also signs that the saltmarsh at Lisselan had a low embankment along the seaward edge. Most of this embankment is now eroded but there are still signs that an embankment had been present as there are upper marsh saltmarsh communities along the seaward side and this saltmarsh displays some reverse zonation. There are signs of an embankment marked on the 1920s 6 inch OS map and the fountains are present on the 2000 aerial photos. Due to the current evidence, it is assumed that erosion is still occurring along this saltmarsh (900).

A small area of saltmarsh (< 0.25 ha) located at the eastern end of The Burrow, noted by the NHA survey in 1993 has now disappeared (see Info Point 23) (900). This saltmarsh occurred between sand dune ridges and is likely to have been eroded or covered by shifting sand dunes.

The saltmarsh at The Cush is currently being used for amenity purposes. There are several tracks across the landward boundary and transition area (501). These tracks are used by walkers, dog-walkers, cyclists and horse riders (622). An old track is present along the landward side of Lisselan saltmarsh adjacent to the north-east boundary. None of the saltmarsh was grazed by livestock at time of the survey. There are signs that Lisselan saltmarsh was grazed in the past by cattle with signs of old poaching. However, these signs of poaching were light. The MPSU conservation plan noted that parts of the saltmarsh were grazed (pre 2005).

Common Cordgrass is a significant part of the saltmarsh and intertidal flats around the Back Strand. This is an invasive species (954). Common Cordgrass has been present at this site since the 1960s and Nairn (1986) noted that it had increased significantly in extent during this period.

Common Cordgrass does not show up very well on the aerial photos. However, a comparison of the aerial photos between 1995 and 2005 indicates that Common Cordgrasss has spread somewhat north of the dump. *Spartina* swards south of the landfill seem to be static during this period. No conclusions can be made about Common Cordgrass along the north of the Backstrand during this period as the clumps are unclear. However, there are indications that Common Cordgrass has increased in extent in this area since 1993, as its presence at this location was not noted during the NHA survey. The MPSU conservation plan discusses the spread of Common Cordgrass in this area and one of the objectives mentions that Common Cordgrass in this area should be controlled. All of the increases in extent of *Spartina* swards since 1995 have been on intertidal mud/sandflats and not at the expense of saltmarsh (ASM/MSM). *Salicornia* flats may have been present in these areas prior to the spread of Common Cordgrass, although there is no information about the former extent of *Salicornia*.

An examination of the extent of Common Cordgrass and the 1920s 6 inch OS map indicates that the former saltmarsh boundary along the seaward edge of The Cush is quite similar to the current boundary between *Spartina* swards and ASM. Common Cordgrass is present in the lower zone of the ASM but is not dominant with cover generally less than 10%. This indicates that habitat dominated by Common Cordgrass has not replaced ASM habitat but that most of the current *Spartina* sward established on intertidal mudflats. In fact a large area of former intertidal flats to the east now contains ASM and this could be related to colonisation of Common Cordgrass and the subsequent transition of this habitat to ASM (Common Cordgrass present but not dominant). There are small patches of ASM vegetation (not mapped) within the *Spartina* sward and this may indicate that further transition from *Spartina* sward to ASM may take place in the future. This may also be related to sedimentation and disturbance related to the creation of the embankment, as the 1st edition 6 inch map (1860s) shows saltmarsh to be even more extensive in this area compared to its current extent.

Common Cordgrass has also spread extensively on the saltmarsh at Tramore Intake to the north of the Malcolmson embankment. The area currently mapped as *Spartina* sward was formerly a small sheltered bay containing mudflats. However, the area mapped as mosaic was formerly ASM. ASM on this saltmarsh has probably been depleted by the spread of Common Cordgrass, but as this was noted in the NHA survey, it is not considered during the current assessment, as the spread of Common Cordgrass occurred prior to 1993.

The main activities around the site include farming (120, 140), reclamation and infilling (803), waste disposal (420), urban areas (401) and amenity use (608, 622) of The Cush and Tramore Burrow (Table 4.1).

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1310	900	C	+1	0.01	Inside
1310	954	C	-1	0.99	Inside
13s	140	C	0	9.5	Inside
1330	501	B	-1	7	Inside
1330	622	B	-1	7	Inside
1330	954	C	0	0	Inside
13s	120	C	0	32.3	Outside
13s	140	C	0	32.3	Outside
13s	401	C	0	32.3	Outside
13s	420	D	-1	32.3	Outside
13s	608	C	0	32.3	Outside
13s	622	C	0	32.3	Outside
13s	803	D	0	32.3	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 the site is *favourable* (Table 5.1). The saltmarsh around the Back Strand has been affected by reclamation and related works in past and these activities are probably still having a residual impact. However, the saltmarsh is slowly recovering from this disturbance and is quite natural in character. There are several species present such as Golden Samphire and Sharp Rush, which add to the conservation value. Part of the saltmarsh is affected by amenity pressure but this only affects a small area. *Spartina* swards are extensive around the site, but this habitat has mainly developed on intertidal mudflats. It has spread significantly in the saltmarsh at the Tramore Intake. The impacts of Common Cordgrass on the mudflats and Eelgrass communities are not considered with this assessment. *Spartina* swards may have replaced *Salicornia* flats in some areas but there is no accurate information about the previous extent of Glasswort on the mudflats.

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

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 - inadequate
Atlantic salt meadows (1330)	Extent, Structure and functions, Future prospects			Favourable
Mediterranean salt meadows (1410)	Extent, Structure and functions, Future prospects,			Favourable

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

5.2.1 Extent

The extent of this habitat (0.99 ha) is assessed as *favourable* in the absence of any accurate information on the previous extent of this habitat. The largest patches of this habitat are situated on mudflats within the area partially enclosed by the Malcolmson embankment. The NHA survey notes mention that Glasswort is present in salt pans on the saltmarsh at Lisselan. Most of the salt pans were unvegetated during the current survey but some patches of *Salicornia* flat were noted within some of the large creeks and along the seaward edge of the saltmarsh. Some similar patches of *Salicornia* flats were also noted in the creeks and channels of The Cush saltmarsh close to the Malcolmson embankment, but these were not mapped. Small patches of this habitat are also situated along the edge of the ASM saltmarsh cliff and these also were not mapped. Therefore, the current area of this habitat is likely to be slightly greater than the area mapped.

The spread of Common Cordgrass has probably negatively affected the extent of this habitat but as most of the *Spartina* sward established prior to 1995 it is not considered during this assessment. Eelgrass beds were noted along the edge of the *Spartina* sward north of the landfill so it is unlikely that there were *Salicornia* flats were located in this area prior to the spread of Common Cordgrass in this area since 1995.

Part of the mudflats within this area was formerly within the cSAC although it has since been excluded as the landfill extended to the north. This area of mudflats was vegetated by *Spartina* swards.

Glasswort was noted as part of the lower saltmarsh zone on The Cush and is also present in lower zone saltmarsh vegetation that occurs around the edges of creeks and pans. However, this plant community is considered to be part of the ASM.

5.2.2 Habitat structure and functions

The habitat structure and function of this habitat is assessed as *favourable*. Two monitoring stops were carried out in this habitat and all passed. The largest patches of this habitat adjacent to The Cush saltmarsh were mono-specific swards of Glasswort similar to those seen at Bull Island and Malahide. Small clumps of Common Cordgrass and some Fucoids are the only other species present within these patches. However, the overall cover of Common Cordgrass within the habitat is less than 1%. There are no other major activities or impacts on this habitat.

Small patches of this habitat located along The Cush ASM saltmarsh cliff are dominated by Annual Sea-blite. These patches are also situated adjacent to *Spartina* swards on the seaward side. This habitat is established on bare mud that has not been colonised by Common Cordgrass.

Patches of this habitat found at Lisselan can be classed as pioneer zone saltmarsh and there are already some Sea Purslane, Common Saltmarsh-grass and Annual Sea-blite established within this habitat. However, these patches are quite small and narrow.

Several species of Glasswort have been recorded at Tramore in the past including *Salicornia pusilla*, *Salicornia ramosissma*, *Salicornia fragilis* and *Salicornia dolichostachya* (Ferguson 1995). No classification could be made of individual Glasswort species could be made during the current survey due to its timing in early summer when Glasswort is poorly developed.

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. This habitat is vulnerable to the invasion of Common

Cordgrass. Whilst the cover of Common Cordgrass is low within this habitat, there are frequent clumps occurring around the habitat, especially on the mudflats adjacent to The Cush. There are no other activities or impacts affecting this habitat. This habitat is prone to natural changes in distribution and extent in response to erosion and accretion of sediment banks within creeks and along the seaward saltmarsh cliffs.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. The extent of this habitat has been affected in the past by reclamation, infilling and drainage around the Back Strand, but these impacts are not assessed as they occurred prior to the current period of assessment.

A comparison of the 1920s 6 inch OS map and the 2000 aerial photos indicates that erosion has reduced the area of Lisselan saltmarsh. There are signs of erosion along the seaward edge of this saltmarsh. However there are no indications that the extent of saltmarsh has been reduced by erosion during the period 1995-2005 from a comparison of aerial photos.

Some of the former ASM on Tramore Intake saltmarsh is now a mosaic of *Spartina* sward and ASM. However the spread of Common Cordgrass in this area occurred prior to the current period of assessment.

There are no indications that common Cordgrass has spread into the ASM along the Cush and transformed former ASM to *Spartina* sward. Common Cordgrass is present in the lower zone of the ASM but does not dominate. A comparison of the former extent of saltmarsh (ASM) from the 1920s 6 inch OS map to the current habitat extent indicates that a relatively large area of mudflats (2 ha) is now ASM.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Sixteen monitoring stops were carried out in this habitat and they all passed. All the attributes reached their targets. Species diversity is typical of this habitat. The presence of Golden Samphire on the saltmarsh is also very rare and this is a species of local distinctiveness. Saltmarsh zonation is particularly well-developed along The Cush.

Mid and upper saltmarsh zones are particularly well-developed. Lower zone saltmarsh is present along The Cush and Tramore Intake and is characterised by the dominance of Sea Purslane and Common Cordgrass. Patches dominated by Common Saltmarsh-grass and containing Glasswort are situated along the edges of creeks and pans but are less common in extent compared to other sites. The sward height structure is quite diverse and the surface of the saltmarsh is in good condition due to the lack of grazing.

The ASM around this site has been affected by reclamation works and these activities are still having a residual impact. Some creeks on The Cush saltmarsh have infilled and this may be related to drains dug across this saltmarsh. However, the saltmarsh is recovering from this disturbance. The Cush saltmarsh has few salt pans. However, the saltmarsh topography at Lisselan is well developed and this area has a complex creek and salt pan structure. This variation in saltmarsh topography is likely to be related to variation in ontological development of both saltmarshes. The gradient of the Lisselan saltmarsh is flatter (very gentle slope) compared to The Cush saltmarsh. The impacts of reclamation and associated disturbance are not considered as they occurred prior to the current period of assessment.

The transition zone along the landward boundary of The Cush saltmarsh is being disturbed by amenity pressure. This disturbance is most severe towards the western end, but there are natural transitions to fixed dune grassland towards the eastern end close to the Malcolmson embankment. There is also some transition to a narrow band of wet grassland on Lisselan saltmarsh. Most of the northern saltmarsh is situated adjacent to embankments or natural boundaries with farmland, so the extent of transition habitats is low. This diminishes the conservation value of the site.

Pioneer vegetation not containing Common Cordgrass is quite rare. There is a natural transition along the seaward edge of the ASM mainly to *Spartina* swards. There are small fragments of *Salicornia* flats along the ASM seaward edge and these form a pioneer zone habitat. The saltmarsh at Lisselan has a tall saltmarsh cliff along the seaward edge and is probably being eroded, although the rate of erosion is quite low. Pioneer patches of *Salicornia* flats are present within some of the creeks and along reworked sediment along the seaward boundary. There are frequent patches of ASM vegetation within the *Spartina* sward along The Cush.

The lower saltmarsh zone on the Cush does contain frequent Common Cordgrass and the ASM transitions to *Spartina* sward along the seaward boundary. There is no information to indicate Common Cordgrass is increasing or decreasing its cover on the ASM. However, its extent on the mudflats is fairly static. Common Cordgrass is a prominent feature of the ASM at Tramore Intake and is so abundant that this area was mapped as a mosaic of *Spartina* sward and ASM. The presence of Common Cordgrass can be considered a negative indicator, especially if it invades ASM and transforms it to a *Spartina*-dominated habitat, like that at Tramore Intake. However, the presence of Common Cordgrass is not considered during this assessment as the spread of Common Cordgrass into the ASM at both these locations occurred prior to the current assessment period.

5.3.3 Future prospects

The future prospects of this habitat is assessed as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts continue in the near future.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. This habitat is found on Lisselan and Tramore Intake saltmarshes. There is limited information on the previous extent of this habitat, although it was noted at these two site during the NHA survey (1993). The former extent of Mediterranean salt meadows is likely to have been affected by reclamation around the Back Strand but these impacts occurred prior to the current period of assessment.

5.4.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Six monitoring stops were carried out in this habitat and they all passed. This habitat has a typical species diversity and its presence increases the sward height diversity of the overall saltmarsh habitat. It generally forms a mosaic with ASM as patches of Sea Rush-dominated vegetation are scattered around Lisselan saltmarsh. Some plant zonation was noted in this habitat and this is related to elevation on the salt marsh.

These patches vary in extent but are generally quite small and do not contain their own saltmarsh topography. However they do contain some salt pans and are found along creeks. Some of this habitat is situated along the eastern boundary of Lisselan saltmarsh and there is a natural transition on a moderate slope to grassland. The distribution of Sea Rush extends slightly above the high water mark. This grassland contains species such as Black Bog-rush, Tormentil (*Potentilla erecta*) and Devils-bit, which indicates there is a peat influence. This transition increases the conservation value of this habitat. Grazing on the saltmarsh at Lisselan is not having a significant impact on this habitat. There are few other impacts on this habitat. Common Cordgrass is present in some patches of this habitat on the Tramore Intake saltmarsh, but its cover is minor and is confined to the seaward edges of these patches.

Sharp Rush (*Juncus acutus*) is present in this habitat at Lisselan. One clump was noted towards the western side of the saltmarsh. This is a species of local distinctiveness on saltmarshes and its presence on this site increases the conservation value of this habitat. It was recorded at Tramore in the past (no indication of what saltmarsh section) (MPSU conservation plan).

5.4.3 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 major impacts or activities affecting this habitat. The largest area of this habitat is located at Lisselan and this area is grazed by cattle, although grazing intensity is light. This habitat is not vulnerable to the further spread of Common Cordgrass, as it generally occurs at elevations where Common Cordgrass is un-competitive. This species may colonise in the salt pans within this habitat but should not spread into the Sea Rush-dominated areas.

6 MANAGEMENT RECOMMENDATIONS

The extent of *Spartina* swards and clumps should be monitored regularly, particularly along the northern side of the Back Strand, to record any trends in the expansion of Common Cordgrass quickly.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). The Irish Red Data Book. Stationary Office, Dublin.

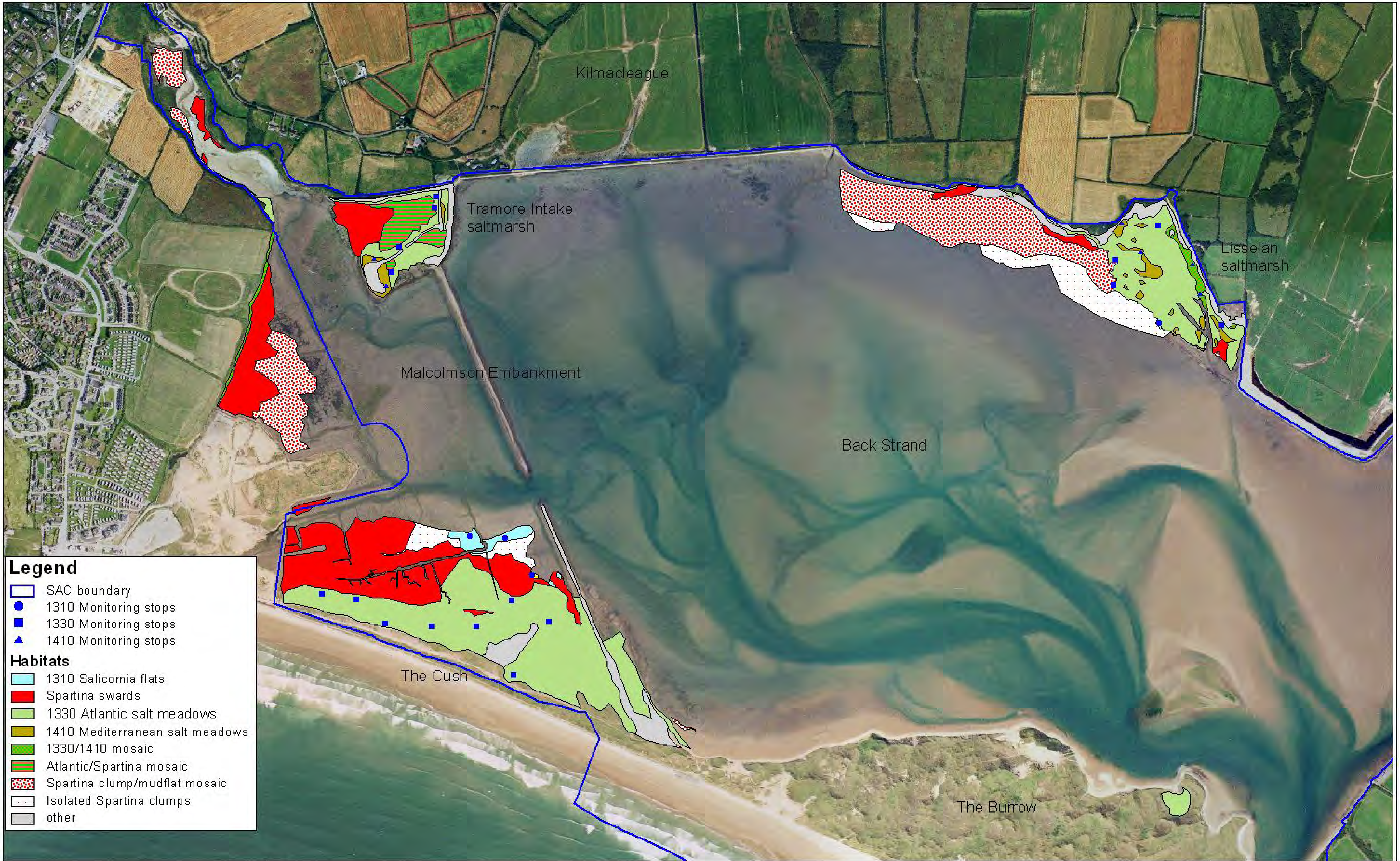
Ferguson, I.K. (1995). *B.S.B.I. meeting report.* B.S.B.I. News 69: p. 64.

McGrath, D. (2001). Tramore Bay, dunes and Backstrand. The Heritage Council.

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

Preston, C.D. Pearman, A. & Dines, D. (2002). New atlas of the British and Irish Flora. Oxford University Press.

Webb, D.A., Parnell, J. & Doogue, D. (1996). An Irish Flora (7th revised Ed.). Dundalgan Press, Dundalk.



Kilmacleague
Tramore Intake saltmarsh
Lisselan saltmarsh
Malcolmson Embankment
Back Strand
The Cush
The Burrow
Legend
SAC boundary
1310 Monitoring stops
1330 Monitoring stops
1410 Monitoring stops
Habitats
1310 Salicornia flats
Spartina swards
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
Atlantic/Spartina mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
other
0 0.2 0.4 0.6 0.8 Kilometers
N

Saltmarsh Monitoring Project

Tramore

Tramore Dunes and Backstrand cSAC (000671)

SMP Code: **SMP0007**

Map produced by: **SMP 2006**

Map Version: **1**

Scale: **1:10493**

Ballyteige Burrow

1 SITE DETAILS

SMP site name: **Ballyteige**		SMP site code: **SMP0005**
Site name (Curtis list): **Ballyteige**		CMP site code: **46**
		Site No: (Curtis list): **222**
NPWS Site Name: **Ballyteige Burrow**		Dates of site visit: **29-30/06/2006**
NPWS designation	cSAC: **696**	MPSU Plan: **new format plan available**
	pNHA: **696**	
	SPA: **Ballyteige Burrow SPA**	
	Nature Reserve: **Ballyteige Burrow (S.I. no 279 of 1987 and 8 of 1990)**	
County: **Wexford**		Discovery Map: **77** Grid Ref: **293100, 106570**
1st ed 6 inch Map No: **Wx046, Wx051**		Aerial photos (1995 series): **not available**
2nd ed 6 inch Map No: **Wx046, Wx051**		Aerial photos (2000 series): **05780-a, 05780-b, 08780-d, 05781-a, 05781, c, 05781-d, 05851-a, 05851-b**
		Aerial photos (2005 series): **0688606, 0688608, 0690606, 0690608, 0692606, 0692608, 0694604, 0694606**

Annex I habitats currently designated for Ballyteige Burrow cSAC:

- ***Salicornia* and other annuals colonizing mud and sand (1310)**
- ***Spartina* swards (Spartinion maritimae) (1320)**
- **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)**
- **Mediterranean salt meadows (Juncetalia maritimi) (1410)**
- **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) (1420)**

Other SMP sites within this cSAC/pNHA: **Duncormick**

Saltmarsh type: **Lagoon**	Substrate type: **Mud/sand/shingle**

2 SITE DESCRIPTION

Ballyteige Burrow is a long sand/shingle spit located along the southern coast of County Wexford. The spit extends approximately 8.5 kilometres in a westerly direction from Forlorn Point at Kilmore Quay and encloses a shallow estuary and intertidal area along the western half. Land along the back of eastern part of the spit was been reclaimed as polder land, and a seawall and pumping station was built at The Cull Bank. Saltmarsh has developed along the back of the spit in the sheltered intertidal area and also behind the seawall and along some of the channels that drain this polder land. The sand/shingle spit contains a complex sand dune system with several Annex I habitats and these habitats were surveyed in 2004 by the Coastal Monitoring Project.

The area around Ballyteige is generally low lying and land around the site is dominated by farmland. There is a small area of saltmarsh along the northern side of the intertidal area and estuary at Duncormick and this was surveyed as a separate saltmarsh site. Other parts of the northern side have a seawall around the shoreline protecting farmland. The intertidal area (The Cull) drains at low tide leaving wide expanses of sand and mudflats and the estuary habitat is confined to sometimes narrow sub-tidal channels in the centre of the intertidal area. This site was classified as a lagoon type saltmarsh (Curtis & Sheehy-Skeffington 1998) due to the unique tidal regime within the intertidal area and this varies significantly to tides outside The Cull. Polder land behind the sea wall built at The Cull is now farmed.

The following four Annex I habitats are found at this site: *Salicornia* flats, Atlantic salt meadows (ASM), Mediterranean salt meadows (MSM), and Mediterranean and thermo-Atlantic halophilous scrubs. This site is notable for the presence of this latter saltmarsh habitat (1420), which is only found at two sites in Ireland. All four habitats are listed as qualifying interests for the Ballyteige Burrow cSAC. *Spartina* swards are also present at this site and this habitat is also currently listed as a qualifying interest for this site. Nearly all the saltmarsh habitat is situated within the cSAC. There is a small area of Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM) located north of Cull Island along the northern side of the estuary excluded from the cSAC.

This site is protected by several designations. Ballyteige Burrow SPA covers most of the sand spit and the saltmarsh habitats along the edge of the intertidal area. Most of Ballyteige Burrow is also a Nature Reserve, owned by NPWS, and this includes most of the saltmarsh habitats. Some of the saltmarsh located behind The Cull Bank seawall is excluded from the SPA. Saltmarsh located east of the Cull Bank is located outside the Nature Reserve designation. NPWS have entered into a management agreement with a local landowner to allow a limited number of cattle to graze on Ballyteige Burrow during the winter. The objective of the grazing is to promote habitat diversity and maintain a species-rich short turf in the sand dune habitats.

The saltmarsh can be accessed from The Cull via tracks across farmlands which access the Cull Bank pump house. The OPW manages the pump house at The Cull.

3 HABITATS

3.1 General description

Most of the saltmarsh habitat is found along the back of the Ballytiege Burrow, west of the Cull Bank. Atlantic salt meadows form a long narrow band of habitat that extends nearly to the end of the spit and is the dominant habitat (Table 3.1). There are several breaks in its distribution towards the western side of Ballyteige Burrow where the adjacent sand dunes form the boundary with the intertidal flats and no saltmarsh has developed. Mediterranean and thermo-Atlantic halophilous scrub (1420) is also found along this band of saltmarsh and forms a mosaic with the ASM.

Spartina swards have developed on the mudflats along the edge of the ASM and are most prevalent near to the Cull Bank. *Spartina* swards also form patches of habitat within some of the larger saltmarsh areas that have developed in low-lying sheltered parts of Ballyteige Burrow. Mosaics of *Spartina* sward and ASM are also present. Narrow bands of *Salicornia* flats have also developed along the edge of the ASM and the *Spartina* swards. Small isolated patches of *Salicornia* flats develop along the edge of the intertidal flats towards the western end of Ballyteige Burrow. There is a small mosaic of *Spartina* sward and *Salicornia* flat.

There is a small amount of ASM and MSM along the northern side of the intertidal area, along the mainland shoreline, north of Cull Island. This saltmarsh is situated adjacent to a sea wall. Cull Island also contains a ring of ASM around its shoreline and a band of *Spartina* sward around part of the island.

Mediterranean salt meadows also form a large patch of saltmarsh in a low-lying area behind the Cull Bank. This area also contains some *Spartina* sward and some bare mudflat. ASM and some MSM have developed on low-lying land along the edge of the channel that drains the landward side of this part of Ballyteige Burrow.

The ASM generally transitions to fixed dune grassland on its landward side. There may be a narrow band of bare substrate (sand and shingle) at the landward boundary of the saltmarsh along the strandline. The MSM located behind the Cull Bank embankment transitions to wet grassland. Further east, saltmarsh along the north side of the channel transitions to rank grassland.

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

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	2.86[1]
1320	*Spartina* swards and clumps	6.37[2]
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	21.15
1410	Mediterranean salt meadows (Juncetalia maritimi)	3.04
1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0.73
	Total	**34.15**

[1] this total includes 50% of the 1310/1320 mosaic
[2] this total includes 50% of the *Spartina* sward/mudflats mosaic and 5% of the area mapped as scattered clumps of *Spartina*.

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

This habitat is found along the edge of the saltmarsh west of the Cull Bank. It generally forms a narrow band 2-5 m wide at the seaward edge of the saltmarsh. Occasionally this band widens, depending on the topography of the adjacent salt marsh and dunes and patches develop that are up to 40 m wide. These patches develop on soft mud. They are dominated by an almost mono-specific sward of Glasswort. Some of this habitat located at the western end of the spit contains a mixture of Annual Sea-blite (*Suaeda maritima*) and Glasswort (*Salicornia* sp.).

Common Cordgrass (*Spartina anglica*) is found in this habitat along most of the Burrow and in some of the patches towards the western end, although it is generally found at low cover values (< 1-5%) and the clump sizes are small. There are several patches of *Salicornia* flats towards the western end of the spit that do not contain any Common Cordgrass.

This habitat is developing in the more sheltered area on an accretional ramp. There is a natural transition from ASM communities to vegetation dominated by Glasswort. Low saltmarsh cliffs 10-20 cm high may develop along some of this saltmarsh in slightly less sheltered areas. Seaward of the *Salicornia* flats there is a very gentle slope to adjacent intertidal flats. Further west, this habitat is found in sheltered areas in isolation from other saltmarsh habitats in bends along the edge of the sand dunes. These patches develop in flat platforms with a steep gradient down to the intertidal flats along the seaward side. The gradient from saltmarsh to intertidal flats also becomes greater towards the western end.

There are frequent narrow bands of vegetation (< 1 m wide) dominated by Annual Sea-blite, and containing occasional Greater Sea-spurrey (*Spergularia media*) and rare Lax-flowered Sea Lavender (*Limonium humile*) that occur on muddy shingle/pebble banks. These bands of vegetation are situated at the extremities of ASM, as the ASM transitions to narrow shingle/pebble banks. Where the substrate is dominated by mud or sand, these bands of vegetation can be classified as this habitat. Small narrow bands may not be mapped.

Patches of Glasswort also form mosaics with *Spartina* sward on mudflats adjacent to the saltmarsh. Glasswort is present throughout this area and is also present within the clumps of Common Cordgrass. The Common Cordgrass cover is 50-60% in this area.

3.3 *Spartina* swards (H1320)

This habitat is characterised by dense swards and isolated clumps of Common Cordgrass that have mainly developed on intertidal mudflats. These swards have colonised bare mud adjacent to the ASM close to the Cull Bank. Large clumps have coalesced together to form a sward of dense Common Cordgrass. There are small amounts of Common Saltmarsh-grass (*Puccinellia maritima*) and rare Lax-flowered Sea Lavender within the dense swards of Common Cordgrass. There are patches of bare mud within the *Spartina* sward (75% cover).

Other areas are mapped as *Spartina* sward/mudflat mosaic (30-50% *Spartina* cover) and scattered clumps of *Spartina* on mud (1-5% *Spartina* cover) depending on the density of Common Cordgrass. Scattered clumps are frequently present along the boundary between the saltmarsh and the mudflats and these coalesce in places to form a narrow strip of *Spartina* sward. Some sections of the mudflats adjacent to the *Spartina* sward and mapped as scattered clumps of *Spartina* on mud have occasionally frequent seedlings of Common Cordgrass, indicating that this species is spreading on the mudflats and the extent of *Spartina* sward is likely to increase in the future.

This species is also part of the ASM, *Salicornia* flats and Mediterranean scrub saltmarsh vegetation. Its occurrence within these habitats is described more detail in those sections. Common Cordgrass is sometimes found quite frequently within these habitats and forms mosaics or transition habitats between these Annex I habitats. It is

distributed along the most of the saltmarsh west of the Cull Bank and is found in ASM close to the western tip of the spit, although it is most abundant within the more sheltered part of the intertidal area close to the Cull Bank. It is also found in a small area east of the Cull Bank embankment where it is colonising bare mudflats in a pool.

Ballyteige Burrow cSAC is one of only two sites in Ireland with *Spartina* swards currently listed as a qualifying interest. Several more sites were listed but have subsequently not been selected for this habitat. The EU Habitats Manual (Commission of the European Communities 2003) describes this habitat as being dominated by *Spartina maritima*, *S. townsendi*, *S. anglica* and *S. alterniflora*. However, preference should be given to areas supporting rare of local *Spartina* spp., particularly *S. maritima* and *S. alterniflora.* These two species are not found in Ireland and the *Spartina* swards in Ireland are predominately made up of *S. anglica*. The *Spartina* sward at Ballyteige does qualify as Annex I habitat, although it is dominated by *S. anglica*. This Annex I habitat was probably listed to protect the rarer forms of *Spartina* and not *S. anglica*. Confusion about this habitat has probably been exacerbated by confusion about the classification of this genus in Ireland.

3.4 Atlantic salt meadows (H1330)

This habitat is situated at several locations along Ballyteige Burrow. The different sections have varying characteristics and are described separately.

3.4.1 ASM west of the Cull Bank

This is the largest area of ASM on the site. A band of ASM has developed along the back of the sand dune system on a very gentle slope. This has allowed a distinctive zonation of ASM vegetation communities to develop, particularly at the eastern end adjacent to the Cull Bank. Further west the ASM breaks up and only develops in the more sheltered areas. There are several large sections present within sheltered lips along the sand-dune system and these may be connected by narrower strips depending on the topography of the sand dunes. Towards the western end of Ballyteige Burrow, saltmarsh develops on gently sloped mud platforms and there is a steep slope from the seaward edge towards the intertidal flats and the central estuarine channel.

An upper marsh zone is dominated by Red Fescue (*Festuca rubra*) and occasionally frequent Saltmarsh Rush (*Juncus gerardii*), and may be quite narrow, developing

where the saltmarsh begins to slope and transition to fixed dune. It also contains Long-bracted Sedge (*Carex extensa*), Sea Pink (*Armeria maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey and Buck's-horn Plantain (*Plantago coronopus*). Hard-grass (*Parapholis strigosa*) is also present. This zone generally had a track or bare sand along the upper boundary with fixed dune vegetation. Some of this bare sand along the strand-line was being vegetation by Annual Sea-blite, creating some reverse zonation. Saltmarsh Rush is dominant is the more sheltered sections that protrude into the fixed dunes.

The mid-upper marsh zone is quite wide and is dominated by Sea Plantain with frequent Sea Pink and occasionally abundant Sea Milkwort (*Glaux maritima*). Other species include Sea Aster (*Aster tripolium*), Common Saltmarsh-grass and Lax-flowered Sea Lavender, the latter two species becoming more frequent towards the lower side of this zone where it transitions to mid-lower saltmarsh. This zone does not contain very many salt pans. This zone and the lower saltmarsh zone are drained by narrow shallow creeks.

A mid-lower marsh zone is dominated by Lax-flowered Sea Lavender and Common Saltmarsh-grass and also contains Glasswort and Annual Sea-blite. This was the best example of zonation of Lax-flowered Sea Lavender seen during the survey. Some sections of the lower saltmarsh zone contain frequent small scattered clumps or Common Cordgrass plants (1-5% cover). Further west a narrow band dominated by Common Saltmarsh-grass is present at the seaward boundary (1-5 m wide) and Lax-flowered Sea Lavender becomes less frequent. The substrate is quite muddy in the lower zone and this zone transitions to *Spartina* sward. The seaward boundary generally has scattered clumps of Common Cordgrass along it where it transitions to mudflats (mapped as scattered clumps of *Spartina* on mud. Other parts of the seaward boundary transition to a narrow band of *Salicornia* flats. There is a low saltmarsh cliff in places, but along some of the seaward boundary there is an accretion ramp and the vegetation has the appearance of spreading seaward. This indicates that the saltmarsh is growing in places.

There are several areas where saltmarsh enters the sand dunes and is situated on small sheltered low-lying areas surrounded by dunes. Some of these areas have pebble/shingle ridges that partially enclose the saltmarsh. These areas generally have

typical saltmarsh vegetation zonation that follows bands around the edges of these areas. Zonation may be more complicated with zones also present along the back of the pebble/shingle ridges that partially enclose these areas. Each section generally has one main creek that drains the area. There are very few salt pans across the whole of this saltmarsh.

Sea Purslane (*Atriplex portulacoides*) was recorded several times along the spit and is a rare plant at Ballyteige Burrow. The absence of this species is notable as this allows the lower saltmarsh zone to be dominated by Common Saltmarsh-grass and frequent Lax-flowered Sea Lavender. It is likely that the abundance of this species will increase in the future. It is a characteristic feature of the saltmarsh further south at Tramore.

Pebbles are scattered on ASM at western end of the Burrow from the storm beach along the southern side. A shingle ridge along the seaward side of some of these ASM patches and saltmarsh has developed behind the ridge. Sea Beet (*Beta maritima*) and other transition zone species are present on the ridge. There are several breaks in the ridge to allow creeks draining the saltmarsh to connect to the intertidal flats.

3.4.2 ASM along the east of Ballyteige

There are several patches of ASM vegetation east of The Cull Bank. These areas are situated along a deep drain/channel that drains the eastern section of Ballyteige Burrow and the adjacent polderlands. This area has been disturbed significantly by the creation of the polderlands. This saltmarsh has developed in the past 150 years and has developed in a zone that was previously intertidal mudflats along the northern edge of the Burrow.

A small area of saltmarsh is situated in a low-lying area within a flat plain south of the channel and forms a mosaic with the surrounding fixed dune grassland. Upper saltmarsh vegetation is present at this location and is dominated by Saltmarsh Rush. Other saltmarsh species include Sea Aster, Red Fescue, Sea Plantain, Sea Arrowgrass (*Triglochin maritimum*), Long-bracted Sedge and Sea Milkwort. There are several frequent transition species present including Silverweed (*Potentilla anserina*), Sand Sedge (*Carex arenaria*) and Birdsfoot (*Lotus corniculatus*). Common Saltmarsh-

grass is present along the bottom of some of the drains. There are small tussocks within this saltmarsh area that contain Yorkshire Fog (*Holcus lanatus*) and Buttercup sp. (*Ranunculus* sp.). There are several patches of Sea Club-rush (*Bolboschoenus maritimus*). This area has been affected by drainage in the past and is probably connected to the channel via these shallow drains.

A second larger area of saltmarsh is located further east at the end of the deep channel. Some of this saltmarsh is badly poached, particularly on the south side of the fence. This area is dominated by mid-marsh vegetation. This community is dominated by Sea Pink and Sea Plantain. There is also some lower marsh vegetation dominated by Lax-flowered Sea Lavender and Common Saltmarsh-grass. There is a narrow band of upper marsh vegetation around the edge of this zone dominated by Red Fescue and Saltmarsh Rush and containing Long-bracted Sedge. Annual Sea-blite is colonising some of the badly poached bare sand substrate and Glasswort is also present. This saltmarsh also transitions to fixed dune vegetation. Sea Rush (*Juncus maritimus*) and Sea Club-rush is present in an old infilled drain along the boundary between the flat plain and the dune section. Lesser Sea Century (*Centaurium pulchellum*) was recorded on the sandy bank along the fence-line that divides this habitat. This species is very rare and is listed on the Flora Protection Order.

A band of saltmarsh is also present north of the channel. This has developed on lower lying land along the edge of the channel. This area contains several saltmarsh communities and is dominated by upper saltmarsh with Saltmarsh Rush and Red Fescue prominent. The lower saltmarsh zone contains frequent patches of bare substrate. This area is drained by a central channel. Glasswort and Annual Sea-blite are present lower down the sides of the channel. Parts of this area are poached by cattle. There are several fence-lines crossing this area and the various sections have varied grazing intensities. There are several patches of Sea Rush mapped as MSM. The saltmarsh transitions to dry grassland at the landward side and this grassland is improved close to the saltmarsh. There is gravel and sand extraction to the east of this area.

3.4.3 ASM on the north side of the intertidal area

There is a narrow band of eroding saltmarsh present at this location alongside a seawall. Clumps of Common Cordgrass are present on mud further seaward of the ASM. This saltmarsh widens further west and contains several saltmarsh zones similar to those of the south side along Ballyteige Burrow. There is a low zone along the front of this saltmarsh that is vegetated by Twitch (*Elytrigia repens*). Some creeks and salt pans drain this area. This area also contains some MSM.

3.5 Mediterranean salt meadows (H1410)

This habitat is mainly situated behind the Cull Bank. It consists of two different vegetation communities. The more familiar community characterised by dense Sea Rush is present. This habitat forms a band along the back of the embankment and forms large meadow-like areas further east. The habitat is dominated by Sea Rush forming a tall sward (0.5 m high). Other species present include Sea Aster and Common Saltmarsh-grass on the lower lying areas. Saltmarsh Rush and Sea Milkwort become frequent higher up a gentle slope towards the landward edge of this habitat. Further east the habitat becomes brackish and the Sea Rush transitions to patches of Sea Club-rush. Parts of this habitat are grazed and there is an obvious track.

There is also a small area dominated by Borrer's Saltmarsh-grass (*Puccinellia fasciculata*). This species is very rare in Ireland and is listed on the Flora Protection Order. It has only been recorded from seven 10 km^2 squares in Ireland (Preston *et al.* 2002). This low-lying area behind the Cull Bank was known for the presence of this species. This habitat is similar to the lower ASM saltmarsh zone and it surrounds a flooded area of bare mud. Other species present include Sea Aster, Sea Plantain, Glasswort, Lesser Sea-spurrey (*Spergularia marina*) and Sea Arrowgrass. Some *Spartina* sward has also developed along the edge of this bare mud.

3.6 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) (H1420)

This habitat is characterised by the presence of Perennial Glasswort (*Sarcocornia perennis*) (previously known as *Arthrocnemum perenne*). This is a very rare species in Ireland and is listed on the Floral Protection Order. It has only been recorded from

four 10 km^2 squares in Ireland (Preston *et al.* 2002). The habitat (1420) is only known from this site and from Bannow Bay cSAC.

This species is found in the ASM west of the Cull Bank. Perennial Glasswort is generally found rarely within the ASM and does not form an important part of the vegetation. It is generally found amongst lower zone vegetation associated with Common Saltmarsh-grass, Lax-flowered Sea Lavender, Glasswort and Greater Sea-spurrey on muddy substrate. Common Cordgrasss is also present within this habitat (2-5% cover). Further west it is situated with increasing amounts of Annual Sea-blite. It was also recorded amongst the band of Glasswort. Small amounts of bare substrate are generally present in this habitat (5-10%). It is only found frequently at one location along Ballyteige Burrow in a small sheltered area that protrudes into the dunes. Here it is found on sandier substrate. It is found frequently within a mid-lower zone 10 m wide and a mid-upper zone dominated by Sea Pink and Sea Plantain is situated adjacent to this zone. No Common Cordgrass is present in this area.

A study of the ecology of Perennial Glasswort (Wallace 1995) noted that it was found in a narrow zone in bare mud pools. The MPSU conservation plan noted that is habitat was damaged by horse riding and disturbance on the saltmarsh but the MPSU conservation plan notes that its population is recovering.

The habitat is described as perennial vegetation of marine saline mud mainly composed of scrub. Other associated species include Sea Purslane. The habitat corresponds to the UK classification SM7 *Arthrocnemum perenne* stands. This habitat is described as Perennial Glasswort forming an open mosaic with Sea Purslane, Common Saltmarsh-grass and Annual Sea-blite (Rodwell 2000). In Britain it is generally encountered only occasionally and only very locally is it an important part of the vegetation.

4 IMPACTS AND ACTIVITIES

There are several impacts and activities on this site (Table 4.1). The activity codes used on Table 4.1 are given in brackets in the following text. A significant part of the upper and mid-upper ASM zones show signs of low-moderate poaching by cattle. At some locations there is heavy poaching and there is 1-15% bare substrate present (143). The mid-lower saltmarsh zone is generally not affected by poaching or poaching is quite light. The saltmarsh is grazed light-moderately along the ASM adjacent to the Cull Bank. There are signs of cattle grazing along most of the saltmarsh towards the western end of Ballyteige Burrow. Some of the saltmarsh located at the eastern end of Ballyteige is badly damaged by poaching and this area may be used for feeding cattle. Part of the MSM is currently grazed lightly but has been heavily in past and shows signs of disturbance.

Saltmarsh along the western part of Ballyteige Burrow saltmarsh (and fixed dunes) was also grazed heavily by rabbits (146). The grazing intensity is so high that rabbits are eating the Common Cordgrass. Rabbit grazing is much less intense close to the Cull Bank. This variation in grazing intensity may be related to variation in dune topography. The sand dunes adjacent to the saltmarsh close to the Cull Bank are steeper and this may shield the saltmarsh somewhat. The rabbit population may also be lower in this area.

Some of the saltmarsh is damaged by vehicle use (501). There are wheel ruts in the ASM located east of the Cull Bank. These are probably related to recent dredging of the main drainage channel. There are also frequent wheel ruts along the upper section of the saltmarsh west of the Cull Bank. These tracks mainly affect the ASM and have disturbed the surface of the saltmarsh and created bare substrate, which is being re-vegetated by pioneer species. These could be related to amenity use of the site. The MPSU conservation plan noted that there was increased amenity use of Ballyteige Burrow by motorbikes. Tracks also cross the MSM habitat.

The channel that drains the eastern section of Ballyteige Burrow has been recently dredged and this has disturbed the saltmarsh located long the northern side of the channel, although it is recovering.

Saltmarsh at this site was historically more extensive before the land behind the Cull Bank was reclaimed. This old reclamation has had a significant impact on the development of saltmarsh behind the Cull Bank, which has only developed to its current state within the past 150 years. There has been further reclamation between the Cull Bank since the 1920s and the channels have been narrowed and saltmarsh has developed in these old channel areas. Areas of marsh including saltmarsh have been drained and improved. These impacts are not considered during this current period of assessment. However, the saltmarsh behind the Cull Bank may be further disturbed in the future in response to maintenance work related to the Cull Pumphouse and the drainage of the polderlands. This patch of saltmarsh has considerable conservation value due to the presence of Borrer's Saltmarsh-grass. However, the more brackish conditions that this species favours have been created by the development of the Cull Bank and the change in position of the channel in this area.

There are signs that the saltmarsh is increasing in extent along the inner part of the intertidal and estuarine area. An accretional ramp is present along the edge of the saltmarsh and there is a natural transition from ASM to *Salicornia* flat on a gentle slope (910). This is one of the few sites where there is an active pioneer zone with accretion at the seaward edge. Parts of the mid-lower zone have increased bare substrate in places compared to other sites and this may be an indication that it is responding to the changing conditions and is in a dynamic state. The spread of Common Cordgrass may also be affecting sedimentation and the growth of saltmarsh. The inner coastline of the western part of Ballyteige Burrow has not changed significantly in the past 150 years, as several patches of saltmarsh are found in sheltered pockets that were marked on the 1st ed 6 inch map.

Common Cordgrass is an important part of the saltmarsh system at Ballyteige. However, this is an invasive species. It has mainly colonised on intertidal mudflats seaward of the saltmarsh. Nairn (1986) noted its presence at the Cull but indicated that it had not increased since 1960. It is likely that it has spread somewhat on the mudflats since 1986. The impacts of the spread of Common Cordgrass on the intertidal flats are not assessed during this survey (although the intertidal flats are also an Annex I habitat and listed as a qualifying interest for this site). Common Cordgrass has also spread into the mid-lower zone of the ASM and is distributed

along most of the ASM west of the Cull Bank (954). The cover of Common Cordgrass is mainly 1-5% but there occasionally frequent small areas where its cover is greater (20-30%). Some of the ASM is mapped as containing frequent Common Cordgrass (cover 5-40%) and there is one area that is mapped as containing *Spartina* sward (75%) with some ASM. This area was likely to be formerly ASM. It is also present within the *Salicornia* flats (1310) and Mediterranean shrubs (1420) habitats and is sometimes dominating parts of these habitats.

Common Cordgrass is also found in association with two species listed on the Flora Protection Order: Perennial Glasswort and Borrer's Saltmarsh-grass. These two species are both indicators of local distinctiveness and are very rare in Ireland. Common Cordgrass has the potential to lower the abundance of both species by spreading in their habitat and lowering their cover.

Many of the clumps on the saltmarsh are quite small indicating that it has spread quite recently or is currently spreading significantly. Seedlings were recorded on the mudflats in places, indicating that it is likely to increase in extent in the future. An examination of the aerial photos (2000-2005) however does not indicate any significant change in extent of *Spartina* sward in the mudflats during this period.

Spartina swards are an Annex I habitat and are currently listed as a qualifying interest for this site. This leads to a contradiction for management, as while the EU requires *Spartina* swards to be protected at this site, it may be posing a threat to some of the other Annex I habitats and the two species listed on the Flora Protection Order.

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
1310	140	C	0	2.86	Inside
1310	900	C	+1	0.5	Inside
1310	910	C	+1	2.00	Inside
1310	954	C	-1	2.86	Inside
1330	140	C	0	20.00	Inside
1330	143	B	-1	5.00	Inside
1330	146	B	-1	3.00	Inside
1330	501	C	-1	1.50	Inside
1330	910	C	+1	5.00	Inside
1330	954	C	-1	5.00	Inside
1410	140	C	0	all	Inside
1410	501	B	-1	< 0.01	Inside
1410	954	C	-1	1	Inside
1420	954	C	-1	0.23	Inside

[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

Overall, the saltmarsh habitats at this site currently have an *unfavourable* conservation status (Table 5.1). Grazing is the main impact on the site although the intensity of grazing and poaching varies in different sections and on different zones. The saltmarsh has several notable features that add to its overall conservation value. This site contains one of the best examples of saltmarsh plant community zonation seen during the survey. Several very rare species, Perennial Glasswort, Borrer's Saltmarsh-grass and Lesser Sea Century are associated with various parts of the saltmarsh and significantly add to its conservation value.

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

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 - inadequate
Spartina swards (1320)	Extent, Structure and functions, Future prospects,			Favourable
Atlantic salt meadows (1330)	Extent,		Structure and functions Future prospects,	Unfavourable - Bad
Mediterranean salt meadows (1410)	Extent, Structure and functions, Future prospects,	Future prospects,		Unfavourable - inadequate
Mediterranean and thermo-Atlantic halophilous scrubs	Structure and functions,	Future prospects	Extent,	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 accurate information about the previous extent of this habitat. It is mainly present as a narrow band of pioneer saltmarsh vegetation along the seaward boundary of the saltmarsh with the intertidal flats. The habitat does widen in places and forms larger areas. Its overall extent is not high (2.8 ha) but it is spread over a large area. It also forms small patches in sheltered areas where conditions allow sediment to accumulate to a suitable elevation for seedling germination and establishment. Common Cord-grass forms a mosaic with Glasswort in places, so it is possible that this habitat was more extensive in the past, prior to the invasion of this species.

5.2.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. Four monitoring stops were carried out in this habitat and they all passed. It is generally dominated by Glasswort with occasional Annual Sea-blite. Common Cordgrass is also present though generally at low cover (1-5%). It does become more frequent in some areas (5-20%) and also forms a mosaic with *Salicornia* flats in places (20-60% cover). This habitat was notable as it predominantly forms a pioneer saltmarsh community along the seaward edge of the ASM and did not develop as isolated patches further out in the intertidal mudflats of The Cull. It develops on an accretional ramp along the seaward edge of the ASM as well as seaward of *Spartina* swards that have developed along the edge of the ASM. This habitat also includes a second vegetation community dominated by Annual Sea-blite. This generally develops along the seaward edge of ASM where ASM is transitioning to pebble or shingle-dominated sand. These communities develop further westward along Ballyteige Burrow where the ASM breaks in distribution and only forms patches in more sheltered areas.

There are also small patches of upper saltmarsh that are being colonised by Annual Sea-blite and could be classed as this habitat. These areas were not mapped and occur where there has been disturbance of the upper marsh from sand accretion, vehicle use and poaching. Annual Sea-blite is recolonising the bare substrate areas as a pioneer species.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-inadequate*. This assessment assumes that current management activities and impacts continue in the near future. There are few impacts on this habitat and it is likely to continue to thrive along the seaward edge of the ASM in the current accretional conditions along the saltmarsh within the sheltered part of the Cull near the embankment. However, it is assessed as *unfavourable-inadequate* due to the pressure of Common Cordgrass. This species is likely to increase in extent in the future and reduce the extent of Glasswort.

5.3 *Spartina* swards (H1320)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. *Spartina* swards have mainly developed on intertidal mudflats adjacent to the saltmarsh. Common Cordgrass is also found on the saltmarsh as part of the ASM and *Salicornia* flats vegetation, though generally at low cover values. It is sometimes more abundant and some areas have been mapped as mosaics between *Spartina* swards and ASM or *Salicornia* flats. A comparison of the aerial photos (2000-2005) indicates that Common Cordgrass has not spread significantly during this period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. No attributes were assessed for this habitat. However, no negative indicators were noted. No die-back of this habitat was noted. There are some patches close to the seaward edge of the saltmarsh with small amounts of ASM species such as Common Saltmarsh-grass and Lax-flowered Sea Lavender.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that current management activities and impacts continue in the near future. There are no significant impacts or activities on this habitat. Its extent is likely to increase in the future as seedlings of Common Cordgrass are present on one section of mudflats. There are also many small clumps of Common Cordgrass present and these are likely to grow in size in the future. The increase in extent of this habitat is likely to be mainly at the expense of bare mud and sandflats with small increases at the expense of ASM and *Salicornia* flats. The saltmarsh along the inner part of The Cull adjacent to the embankment is accreting at present, so there may be some transition from *Spartina* sward to ASM in the future.

5.4 Atlantic salt meadows (H1330)

5.4.1 Extent

The extent of this habitat is assessed as *favourable* in the absence of accurate information about the previous extent of this habitat. This habitat was likely to be previously more extensive prior to the development of the Cull Bank and the

reclamation of the polderlands, but these historical impacts are not considered. The ASM is predominately distributed to the west of the Cull Bank. There are some indications that the ASM along the inner part of The Cull (east of Duncormick estuary) is spreading seaward and increasing in extent in response to accretion. There is an accretional ramp along the seaward side of the saltmarsh and parts of the lower saltmarsh zone have relatively high amounts of bare substrate, which seems to indicate that the vegetation in this zone is quite dynamic and has formed quite recently.

Common Cordgrass is present at this site and is an important part of the lower marsh ASM vegetation in places. Some areas are classified as a mosaic of ASM and *Spartina* swards indicating that *Spartina* swards have possibly replaced ASM. However, this area is quite small in extent (< 0.5 ha). Most of the *Spartina* swards mapped at the site have developed on previously bare intertidal mudflats.

There are small several patches of ASM located to the east of the Cull Bank. These have recently developed (< 150 years old) and there are relic patches of saltmarsh along the channel draining the polderlands close to Ballyteige Burrow. Saltmarsh is likely to have been more extensive along this channel, but has reduced in extent as more and more land is reclaimed and conditions become less saline.

5.4.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*. Twenty-two monitoring stops were carried out in this habitat and seven failed (32%). Monitoring stops generally failed due to the impacts of heavy cattle poaching or disturbance from wheel ruts, although accretion of sand along the upper saltmarsh boundary may also be significant in places. These activities generally disturb the saltmarsh surface and create significant amounts of unvegetated bare substrate. Some of this bare substrate in small patches along the upper saltmarsh boundary is being colonised by pioneer species, creating reverse zonation in places. The upper and mid-upper zones of the ASM are most affected by these activities. The intensity of grazing in parts of the saltmarsh is also high, with grazing from rabbits significant on ASM in the westward section of Ballyteige Burrow. Much of the ASM in this section has a very low sward of uniform height (1-2 cm high). Rabbits were even grazing Common Cordgrass, which gives some indication of the high grazing pressure.

Most of the other attributes reached their targets and the ASM on this site has several features of significant conservation value. Distinctive zones of upper, mid and lower saltmarsh vegetation have developed in places due to the topography of the shingle/sand spit, which allows saltmarsh to develop on a gentle slope along the back of Ballyteige Burrow in sheltered conditions. There is also a natural transition along the landward boundary to fixed dune vegetation. The species diversity is typical of this habitat and species such as Hard-grass increase the overall diversity. The absence of abundant Sea Purslane in the mid-lower saltmarsh zones is also significant and leads to the development of extensive lower saltmarsh zone vegetation dominated by Lax-flowered Sea Lavender and Common Saltmarsh-grass. The extent of this community and the predominance of Lax-flowered Sea Lavender are notable. The overall sward height is quite diverse as grazing intensity varies in different sections and different zones. Some small areas are not grazed at all.

Saltmarsh topography is not as well-developed on this site compared to other sites, but this is probably related to the ontological development of the saltmarsh. The main part of the ASM has few salt pans and minor creeks. Some of the more sheltered sections in the westward section of Ballyteige Burrow are drained by creeks.

Common Cordgrass is a prominent part of the lower saltmarsh zone of parts of the ASM located along the sheltered part of the Cull. It forms scattered small clumps or isolated plants and stems within the other ASM vegetation. It is more frequent in some sections (up to 20% mapped as ASM with some *Spartina*) and also dominates small sections of saltmarsh with minor amounts of ASM. It is frequently found along the seaward edge of the ASM on the accretional ramp and it may be having some impact on accretion on the saltmarsh in the inner part of The Cull. Common Cordgrass can increase rates of sediment accretion.

There are several patches of ASM located to the east of the Cull Bank. These areas, while not extensive, increase the conservation value of the habitat due to the dominance of upper saltmarsh zone communities and the brackish conditions that have developed in some of the patches, increasing the diversity of the habitat.

Lesser Sea Century, a species listed on the Flora Protection Order, is recorded on saltmarsh and in habitat adjacent to saltmarsh at the east end of Ballyteige Burrow. The presence of this species increases the conservation value of the habitat.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*. This assessment assumes that current management activities and impacts continue in the near future. The ASM is being negatively affected by activities related to vehicle use and to poaching. The intensity of these impacts may actually be relatively low but are having a significant negative impact on parts of the saltmarsh.

Common Cordgrass is also present within this habitat. This is an invasive species and is likely to increase somewhat in extent in the future. While it is unlikely to significantly replace ASM vegetation it may dominate some patches of ASM vegetation in the lower zones. This would increase the extent of *Spartina* swards at this site at the expense of ASM, although it should be remembered that both habitats are Annex I habitats at this site. The substrate at Ballyteige is quite sandy, so this may negate the potential for spread of Common Cordgrass, as this species is less competitive in sandier sediments.

5.5 Mediterranean salt meadows (H1410)

5.5.1 Extent

The extent of this habitat is assessed as *favourable*. There is limited information about the previous extent of this habitat, although patches of Sea Rush were known from behind the Cull Bank embankment. This habitat also includes the saltmarsh community dominated by Borrer's Saltmarsh-grass and this was also known from behind the Cull Bank. There is another small patch of MSM along the northern side of the intertidal flats that was not recorded during pervious surveys.

Information held in the NHA survey files indicates that Borrer's Saltmarsh-grass has been recorded at several other locations behind the Cull Bank. This survey did not record it at these locations, although this species is quite difficult to identify in the field, so it may be more frequent than the records indicate.

5.5.2 Habitat structure and functions

The extent of this habitat is assessed as *favourable*. Five monitoring stops were carried out in this habitat and they all passed. Most of this habitat is dominated by Sea Rush and it has a typical habitat diversity. It has developed relatively recently (past 150 years) in a low-lying area formerly containing inter-tidal flats before the creation of the Cull Bank. After the development of this embankment this low-lying area was formerly part of the drainage channel that drained the newly developed polderlands. There are few salt pans or creeks within this habitat although this can be related to the recent development of the habitat. There is some transition to brackish conditions with patches of Sea Club-rush forming eastward of the habitat. A bare mud channel through the centre of the habitat is likely to become vegetated in the future. Further eastwards clumps of Sea Rush are present on saltmarsh north of the channel.

This habitat has additional conservation value due to the presence of a plant community dominated by Borrer's Saltmarsh-grass. This community is similar to lower saltmarsh zone dominated by Common Saltmarsh-grass. However, it is situated in a brackish area behind the embankment and forms a vegetated zone around a bare mud area, which is frequently flooded.

Common Cordgrass is also present in the area behind the embankment. This species' distribution currently is not extensive and does not affect this habitat significantly. However, this species has the potential to spread into the areas dominated by Borrer's Saltmarsh-grass and reduce its extent. There are few other impacts on this habitat, although some of the MSM is grazed and a track with extensive wheel rutting also crosses the habitat.

5.5.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-inadequate*. This assessment assumes that current management activities and impacts continue in the near future. This area adjacent to the embankment is vulnerable from disturbance to the drainage regime in the area, related to the drainage of the polderlands and recent reclamation of adjacent land. This area has been quite dynamic in the past 150 years and the creation of the Cull Bank has lead to the creation of favourable brackish conditions for this habitat to develop. However, it is unlikely that this area has

stabilised in terms of its drainage and its level of salinity. Therefore, it is probably still adjusting to the realignment of the drainage channel and recent reclamation of adjacent land (in the past 15 years). If the area is becoming more brackish and is drying out it is possible that Sea Rush will spread at the expense of the Borrer's Saltmarsh-grass community. The area where the MSM is located is outside the Nature Reserve, so management is not controlled by NPWS.

Future modifications to the drainage regime may further affect this habitat and specifically the plant community dominated by Borrer's Saltmarsh-grass. The presence of Common Cordgrass also means that this habitat may be vulnerable to invasion. The continuation of saline conditions and high water levels may aid the spread of this species.

5.6 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) (H1410)

5.6.1 Extent

The extent of this habitat is assessed as *unfavourable-bad.* This habitat is characterised by the presence of Perennial Glasswort. This species is present in the ASM (and at one location on the *Salicornia* flats) as part of the ASM vegetation. The habitat extent was taken as small areas of saltmarsh were Perennial Glasswort was recoded (although it may be found only occasionally or rarely). Wallace (1995) studied the distribution and ecology of Perennial Glasswort at Ballyteige. This study was not made available but there is some information from this study in the NHA survey files, the Natura Form explanatory notes and the MPSU conservation plan. The Natura Form explanatory notes estimated the area of this habitat at 10 ha. This estimate is likely to be considerably over-estimated, as the total amount of saltmarsh was estimated at 75 ha. The current mapped habitat area is 0.7 ha. Perennial Glasswort was restricted to relatively narrow bands of marsh in shallow pans and areas subject to water-logging. The main area of habitat was affected by horse riding activities but was thought to be in recovery. A map indicating the former distribution of Perennial Glasswort sussests it had a wider distribution than that indicated from the current survey. This information leads to the assessment of extent as unfavourable-bad. However, its current extent is probably under-estimated and further survey work may increase records of Perennial Glasswort.

5.6.2 Habitat structure and functions

The habitat structure and functions of this habitat is assessed as *favourable*. Two stops were carried out in this habitat and both passed all attributes (for ASM). This species is found generally in the mid-lower saltmarsh zone with Common Saltmarsh-grass and Lax-flowered Sea Lavender predominant. It is also found with frequent Glasswort at another location. It is also found amongst clumps of Common Cordgrass.

Information in the MPSU conservation plan indicates that the habitat was damaged by horse riding activities in the recent past (past 5 years) but was in recovery since then. The MPSU plan noted that Perennial Glasswort was affected by sand accretion related to disturbance on the upper marsh. There were no signs of poaching or vehicle use activity at any of the locations where this species was found, so the intensity of impacts on this habitat may have been reduced.

5.6.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-inadequate*. This assessment assumes that current management activities and impacts on this habitat continue in the near future. The intensity of impacts on this habitat is probably low at present. However, Perennial Glasswort is found in association with Common Cordgrass at one location and may be vulnerable to the further spread of this species. Increases in extent of Common Cordgrass on the ASM may reduce the frequency of Perennial Glasswort.

6 MANAGEMENT RECOMMENDATIONS

Grazing is the most significant activity on the site. The site is grazed during the winter under agreement with NPWS. The upper saltmarsh is heavily poached in places and this is probably related to cattle using the upper saltmarsh as a track to migrate to and from different sections. The saltmarsh is not actually heavily grazed and the mid and lower saltmarsh zones are generally not damaged at all. The intensity of grazing on the site is probably more significant for the fixed dune habitat so while the upper saltmarsh could benefit from less disturbance from grazing, fixed dune habitats require this level of grazing to maintain a species-rich sward. No change in

grazing is required at present as it is an important management tool to maintain the current conservation status of the site.

Common Cordgrass is present at this site and *Spartina* swards are also listed as an Annex I habitat. However, this is an invasive species and is listed as a negative indicator for ASM (1330), *Salicornia* flats (1310) and Mediterranean scrubs (1420). It has the potential to increase somewhat in abundance in the future at the expense of these other habitats. Monitoring of Common Cordgrass is required.

7 REFERENCES

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. Biology and Environment: Proceedings of the Royal Irish Academy 98B, 87-104.

Commission of the European Communities (2003). Interpretation manual of European Union Habitats. (Version EUR 25). European Commission DG XI.

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

Preston, C.D. Pearman, A. & Dines, D. (2002). New atlas of the British and Irish Flora. Oxford University Press.

Rodwell, J.S. (ed.) (2000). British Plant Communities, Volume 5: Maritime communities and vegetation of open habitats. Cambridge University Press, Cambridge.

Wallace, E. (1995). *Aspects of the Ecology of* Arthrocnemum perenne *in Ireland.* Unpublished study, University College Cork.

The Cull
Cull Island
Cull Bank
Pump House
Polderland
Legend
SAC boundary
1310 Monitoring stops
1330 Monitoring stops
1410 Monitoring stops
1420 Monitoring stops
Habitats
1310 Salicornia flats
Spartina swards
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
Spartina clump/mudflat mosaic
Isolated Spartina clumps
Spartina dom, some 1330
1310/Spartina mosaic
1330 dom, some Spartina
1420 Mediterranean scrubs
other

Saltmarsh Monitoring Project

Ballyteige (East)

SMP Code: **SMP0005**

Map produced by: **SMP 2006**

Map Version: **1**

Ballyteige Burrow cSAC (000696)

0 0.2 0.4 0.6 0.8 Kilometers

Scale: **1:10575**

N

Saltmarsh Monitoring Project

Ballyteige

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)

Níl sna teorainneacha ar an léarscáil seo ach nod garshuíomhach ginearálta. Féadfar athbhreithniú a dhéanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordanáis le chead ón Rialtas. (Ceadúnas Uimh. 5953)

Ballyteige Burrow cSAC (000696)

SMP Code: SMP0005

Map produced by: SMP 2006

Map Version: 1

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 Kilometers

Scale: 1:21004

N

Legend

- SAC boundary
- 1310 Monitoring stops
- 1330 Monitoring stops
- 1410 Monitoring stops
- 1420 Monitoring stops

Habitats

- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Spartina clump/mudflat mosaic
- Isolated Spartina clumps
- Spartina dom, some 1330
- 1310/Spartina mosaic
- 1330 dom, some Spartina
- 1420 Mediterranean scrubs
- other

Saltmarsh Monitoring Project

Ballyteige (West)

Ballyteige Burrow cSAC (000696)

SMP Code: **SMP0005**

Map produced by: **SMP 2006**

Map Version: **1**

0 0.2 0.4 0.6 0.8 Kilometers

Scale: **1:11120**

N

Bannow Island

1 SITE DETAILS

SMP site name: **Bannow Island**		SMP site code: **SMP0041**
Dates of site visit : **30/08/2007 & 21/02/2008**		CMP site code: **042**
SM inventory site name: **Bannow Island**		SM inventory site code: **220**
NPWS Site Name: **Bannow Bay**		
NPWS designation	cSAC: **697**	MPSU Plan: **Old Format – Draft 2 Consultation, 2001**
	pNHA: **697**	SPA: **4033**
County: **Wexford**		Discovery Map: **76** Grid Ref: **282500, 107700**
Aerial photos (2000 series): **O 5778-A, B, C, D**		6 inch Map No: **Wx 45**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**
H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
H1410 **Mediterranean salt meadows (Juncetalia maritimi)**
H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Clonmines, Fethard, Gorteens, Grange, Saltmills, Taulaght**
Saltmarsh type: **Sandflats** Substrate type: **Mud/Sand**

2 SITE DESCRIPTION

Bannow Island saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site which empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. Bannow Island is a moderately sized saltmarsh that is located in the south-east corner of the bay, near the mouth of the bay. Bannow Island refers to a small raised area of land that is connected to the rest of the shoreline by a narrow low-lying spit with a small sand dune system. This area was surveyed as part of the Coastal Monitoring Project in 2004 (Ryle *et al*., 2009). Access to the site is via a small local road that leads directly onto Bannow Island itself. The surrounding landscape is low-lying with moderate-gentle slopes to the Bannow Bay shoreline, particularly on the east side. This isolated rural area is largely surrounding by agricultural land, much of it given over to pasture and tillage. There are scattered dwellings along the minor roads through this area.

The saltmarsh has developed in the low-lying sheltered area of Bannow Bay between Bannow Island and the eastern side of the bay. Most of the established saltmarsh is found behind the small sand dune system in the low-lying area between the island and the adjacent mainland. The access road to Bannow Island is built on an embankment across this area and

forms a barrier between this saltmarsh and the adjacent *Spartina* sward on the northern side of the causeway. *Spartina* swards have infilled an extensive area of intertidal mudflats adjacent to this saltmarsh and along the shoreline to the eastern side of the bay.

Bannow Island saltmarsh is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Three Annex I saltmarsh habitats were recorded at this site including *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. This species has been recorded from this saltmarsh in the past (NPWS Rare Plant Survey) where one individual plant was noted in the saltmarsh south of the causeway.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded around the shoreline and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. Saltmarsh extends beyond the upper boundary as indicated by the old OSI 6 inch map in places.

3 SALTMARSH HABITATS

3.1 General description

There are two main areas of saltmarsh at Bannow Island. The first has developed along the back of a disturbed sand dune system and is nestled along the southern side of the road connecting Bannow Island to the mainland. This area is dominated by Atlantic salt meadows (ASM) and contains two shallow lagoons or large pools (Table 3.1). Two individuals of Perennial Glasswort were recorded in this area. There is a landward transition to disturbed

fixed dune grassland. There is a single clump of Sharp Rush (*Juncus acutus*) in this area that is located on the dune grassland above the upper saltmarsh boundary. This marsh is connected to the bay by means of two drainage pipes under the road embankment, which lead out onto the second and more extensive block of saltmarsh.

Much more extensive saltmarsh is found on the northern side of the minor road. The old OSI 2nd edition 6 inch map does not show any saltmarsh development in this area, so this saltmarsh has only developed quite recently. This area is dominated by extensive dense *Spartina* swards. ASM dominates two smaller areas on the northern side of the road. The ASM also forms a narrow band around the shoreline along the landward side of the *Spartina* sward. There is some development of ASM/*Spartina* ward mosaic in the transition zone between these two habitats. Small newly discovered patches of Perennial Glasswort are scattered through this area, particularly in the lower ASM transition zone with *Spartina* sward. These are mapped as Halophilous scrubs (1420). There are some further landward transitions around the shoreline to brackish habitats dominated by stands of Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

There is a small inlet at the east side of the site that contains more extensive brackish marsh. Attempts were made in the past to reclaim this area with a sea wall. This area now contains extensive ASM/*Spartina* sward mosaic and patches of brackish marsh dominated by Common Reed.

There is also a large area located at the west side of the site along the Bannow Island shoreline. A large area has been reclaimed in the past behind a tall embankment that extends from a small mound called Clare Island. A substantial area of former saltmarsh at this site may have been reclaimed. There is still some tidal influence on this area behind the embankment, perhaps due to a valve that has been stuck in an open position. There is a large intertidal pool at the northern end that is fringed by extensive marginal Sea Club-rush prominent. Common Cordgrass is also present in this area. Some Sea Rush (*Juncus maritimus*) is present. Some small patches along drains through this area are typical of ASM and are dominated by Creeping Bent (*Agrostis stolonifera*). However there are also transitional species present like Marsh Ragwort (*Senecio aquaticus*) and Yellow Flag (*Iris pseudacorus*). Some of the vegetation could be classified as Mediterranean salt meadows where Sea Rush is prominent. Several clumps of Sharp Rush (*Juncus acutus*) are also scattered through this area. This area was not surveyed in detail due to the presence of livestock and was mapped in general a brackish marsh (CM2) due to the dominance of Sea Club-rush around the small lagoon.

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

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.002
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1.981
1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0.166
non-Annex	*Spartina* swards	5.789
	Total	**7.938**

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

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

This habitat is not well represented at Bannow Island and there is very little development of *Salicornia* habitat on the intertidal mudflats. The species is occasionally noted in very small patches, but the habitat is only identified from one location along the embankment on mud behind the *Spartina* sward. This patch of habitat was characterised by a scattered individuals of Glasswort (*Salicornia* sp.) in isolation of other saltmarsh species. There is no transition from *Salicornia* flats to ASM along the embankment and the *Salicornia* flats are found in isolation of the other saltmarsh habitats.

3.3 Atlantic salt meadows (H1330)

This habitat is moderately well-developed at this site. The southern, and more sheltered part of the saltmarsh is largely dominated by low-mid and mid ASM vegetation which transitions into transitional grassland/disturbed dune grassland. There are well developed examples of mid marsh sward dominated by Sea Pink (*Armeria maritima*) and Sea Plantain (*Plantago maritima*). Other species present include Lax-flowered Sea Lavender (*Limonium humile*), Sea Aster (*Aster tripolium*), Common Scurvy-grass (*Cochlearia officinalis*) and Greater Sea-spurrey (*Spergularia media*). Sea Purslane is also present but is rare in this area. Lower lying depressions and channels in this area also contain lower marsh vegetation with more frequent Common Saltmarsh-grass (*Puccinellia martima*) and also containing Glasswort.

The saltmarsh structure is moderately developed and there are a series of moderately sized salt pans in this area. Common Cordgrass is present south of the road but is rare and the overall cover is less than 1%. The tidal regime in this area has been created by the construction of the causeway and the narrow drains, which slow the inflow and outflow to this section. This area has a variable sward height depending on the community type and is not grazed.

The mid-upper marsh vegetation is characterised by increased cover of Red Fescue (*Festuca rubra*). Due to the gentle gradients across the saltmarsh there are some subtle transitions

from the mid marsh to mid-upper marsh. This type of vegetation is also found on some low-lying man-made ridges across the marsh where material from drains was deposited. There are some indicators of transitional grassland on these ridges with the appearance of species like Birdsfoot (*Lotus corniculatus*).

ASM on the northern side of the road-bridge is somewhat different in character. This saltmarsh has the appearance of being recently developed and saltmarsh communities have not stabilised yet. A large area is dominated by a rank sward of Common Saltmarsh-grass with a low diversity. Other species present in this low zone include Sea Aster and Sea Plantain. There is some zonation within the ASM to low-mid marsh further east with more frequent Sea Plantain, Sea Aster and Sea Pink. The saltmarsh structure in this area is poorly developed.

Further examples of pure-ASM are found along the upper stretches of the marsh further east. There are occasional clumps of Sea Rush scattered throughout the saltmarsh. It is however very limited in its distribution and is often only defined by the presence of this one species along with ASM species. For this reason, MSM is not recognised from Bannow Island.

Most of the ASM type vegetation in this area grades into mosaic with *Spartina* sward and has been mapped as such.

3.4 Mediterranean and thermo-Atlantic Halophilous scrubs (Sarcocornetea fruticosi) (H1420)

This habitat has been characterised based on the presence of Perennial Glasswort in other saltmarsh vegetation that would mainly be characterised as *Spartina* sward or ASM/*Spartina* sward mosaic in the absence of this species. The species has previously been noted from Bannow Island on the southern part of the saltmarsh in the ASM. Several new records were located in the summer of 2007 in the northern section and the site was revisited in February 2008 with a view to identifying as many records both old and new as possible. Many of these plants are quite stringy and small, indicating that they may be relatively young compared to larger clones of over 1 m in diameter that were found at other sites. This habitat is scattered over a wide area and is probably somewhat under-recorded. More time would be required to survey the marsh in detail fro this species, which can be quite elusive in the *Spartina* sward.

Perennial Glasswort is associated with abundant cover of Common Cordgrass and less frequent Common Saltmarsh-grass, Sea Aster, Lax-flowered Sea Lavender, Greater Sea-spurrey and Annual Sea-blite in the transition zone between the *Spartina* sward and the ASM. It grows around the base of the Common Cordgrass plants.

3.5 *Spartina* swards

By far the largest part of saltmarsh vegetation at Bannow Island is occupied by Common Cordgrass (*Spartina anglica*). It only occurs on the former mudflats and is not recorded from

the smaller section of saltmarsh associated with the small sand-dune system. At the seaward edge of the mudflats, isolated clumps of Common Cordgrass occur some distance out into the bay and are mapped as isolated clumps on mud. There are numerous newly-formed small clumps and seedlings present in this zone indicating that *Spartina* sward is likely to spread further seaward at this site. Much of the mud is unconsolidated and treacherous underfoot.

This *Spartina* sward has developed on very gently sloping intertidal mudflats, so there is well-developed transition between the sward and adjacent ASM along the north side of the road. This zone is characterised by frequent Common Saltmarsh-grass within the *Spartina* sward. There are also smaller amounts of Greater Sea-spurrey and Sea Purslane in this zone.

4 IMPACTS AND ACTIVITIES

There are relatively few damaging impacts and activities at Bannow Island (Table 4.1). The main impact is the presence of Common Cordgrass, an invasive species (954). Grazing (140) is not a significant impact at this site. Most of the saltmarsh is not grazed by livestock but there may be some natural grazing. The level of grazing by wintering wildfowl was not considerable and the sward was quite rank north of the road.

There are several tracks (501) across the marsh adjacent to the dunes where the saltmarsh is used for car-parking. The damage is minimal as is mainly concentrated to vehicle ruts.

There is a significant area of *Spartina* sward at this site and its area is approximately 3 times that of the ASM. Common Cordgrass is an invasive species of saltmarsh (954). The presence of seedlings at the seaward side of the *Spartina* sward would suggest that it is still expanding over the intertidal mudflats. The ASM marsh that is located south of the road contains very little Common Cordgrass. This area is not likely to be vulnerable to the spread of Common Cordgrass, probably because of the one-way culvert that drains the marsh on this side of the road and forms a partial barrier to this species

Nairn (1986) notes that *Spartina* was recorded in Bannow Bay in 1960's, but there is no information to indicate whether it was planted or naturally colonised the site, and for how long it had been present at the site. There is no documented information as to the presence of Common Cordgrass in Bannow Bay, but it is likely to have colonised between 1930 and 1960. There is no information to indicate that the *Spartina* sward has spread significantly at the expense of ASM at this site within the current monitoring period as no ASM was mapped here in the past. The spread of Common Cordgrass may have actually promoted the expansion of ASM due to natural succession (990) and for this reason the impact of invasive species is assessed as neutral. The Perennial Glasswort appears to prefer the transitional zone between *Spartina* sward and the ASM/*Spartina* mosaic, north of the road and co-exists

happily with Common Cordgrass. For this reason the impact of the presence of Common Cordgrass on the Perennial Glasswort is assessed as neutral.

Common Cordgrass may colonise into the ASM north of the road in the future. Much of this ASM is dominated by low marsh sward that is likely to be vulnerable to colonisation by this species. It is unusual to see a sward dominated by Common Saltmarsh-grass adjacent to *Spartina* sward as Common Cordgrass is usually more competitive in both communities. However, there seems to be a distinctive increase in abundance of Common Cordgrass along the gradual seaward gradients on this site so ecological factors may be preventing the spread of this species further landward. This is one indication of the relatively young age and under-development of this saltmarsh.

Erosion (900) is not a significant impact at this site. In fact the upgrading of the track (which was likely inundated at some high tides with a minor embanked road, may have enhanced accretion (910) and the establishment of new saltmarsh in the area north of the road. Much of the current saltmarsh seems to have developed within the past few decades, as a result of changing of infilling mud within this sheltered corner of Bannow Bay. Accretion is assessed as having a positive impact on the ASM north of the road. Continued accretion may lead to further expansion of ASM and *Spartina* sward at this site in the future.

A comparison of the OSI 2nd edition 6 inch map with the year 2000 series aerial ortho-photographs shows that the saltmarsh has expanded considerably in this area during this period and no saltmarsh was mapped in this area on the OSI 2nd edition 6 inch map. It is difficult to determine whether the ASM saltmarsh (north of the road) developed prior to the colonisation of this area by Common Cordgrass. There is likely to have been some development of ASM when the causeway was built and there may have been further expansions after colonisation by Common Cordgrass.

A large area within the intertidal zone adjacent to Bannow Island was reclaimed behind a seawall during the 19th century. This area is likely to have contained some established saltmarsh but has been partially drained and improved. As this reclamation occurred outside the current monitoring period, this impact is not assessed.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	954	C	0	0.002	Inside
1330	501	C	-1	0.005	Inside
1330	910	C	0	1.3	Inside
1330	954	B	0	1.2	Inside
1330	990	C	+1	1.2	Inside
1420	910	C	0	0.166	Inside
1420	954	C	0	0.166	Inside

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

5 CONSERVATION STATUS

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 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. Previous assessments have concentrated on the entire cSAC. As a result of this, there is very little detailed information with which to compare and quantify the findings. There is some more detailed baseline data available from the Rare Plant Survey. It is worth remembering that several separate salt marshes are found within the Bannow Bay cSAC.

Bannow Island saltmarsh has several features of notable conservation interest, particularly the presence of a healthy population of Perennial Glasswort. Much of the saltmarsh is only recently developed in the past 100 years and several Annex I habitats are present. There are no significantly damaging activities affecting the site. Extensive *Spartina* sward has developed at this site, although there are no indications that it has developed as the expense of other saltmarsh habitats. Perennial Glasswort seems to co-exist happily with Common Cordgrass and actually prefers the transition zone between ASM and *Spartina* sward. *Spartina* swards are likely to continue to spread at this site at the expense in intertidal mudflats, another Annex I habitat not assessed by this survey. .

Overall this site has an *unfavourable-inadequate* conservation status (Table 5.1). Most of the saltmarsh is in good condition but the small area of *Salicornia* flats is vulnerable to colonisation by Common Cordgrass in the future. There are few activities impacting on this site at present, other than changing tidal/sedimentation patterns which are considered to be beneficial, as this could lead to the apparent increase in the marsh on consolidated substrate at the back of older *Spartina* sward due to natural succession.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

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 - Inadequate**
Atlantic salt meadows (1330)	Extent Structure and functions Future prospects			**Favourable**
Mediterranean and thermo-Atlantic halophilous scrubs (1420)	Extent Structure and functions, Future prospects			**Favourable**

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

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. Previous information as to the abundance and distribution of this habitat is scant. It could be reasonable to assume that this habitat was more extensive in the past, particularly along the embankment on the west side of the site. However, this was never documented. Although the habitat is not extensive, there are no indications that there has been any loss of habitat due to natural erosion or the spread of Common Cordgrass during the current monitoring period.

5.2.2 Habitat structure and functions

Monitoring stops were not carried out in the *Salicornia* habitat owing to its limited distribution and extent of this habitat. However, a visual assessment of the vegetation suggests that the structure and functions of the habitat are rated as *favourable*. The habitat forms part of the

pioneer zone along the edge of the embankment. Common Cordgrass is not found in this habitat but is found adjacent to it. Smaller patches are also found along the edges of the small creeks and channels in the saltmarsh.

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 such as the spread of Common Cordgrass continue in the near future. This habitat is not being affected by any damaging activities at present but may be vulnerable to further colonisation by Common Cordgrass in the future, particularly as the patches of habitat are quite small.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of ASM at this site during the current monitoring period due to erosion, the spread of Common Cordgrass or land-use changes. Some saltmarsh was reclaimed behind an embankment during the 19th century but this reclamation is not assessed.

Earlier OSI maps give no indication that any saltmarsh existed north of the road, as this area was mapped as mud and sandflats. It would appear that the development of this saltmarsh may in part, be due to the construction of the causeway joining Bannow Island to the mainland. Another factor which may have had some influence but which there is no quantifiable evidence is the changing sediment deposition pattern around the mouth of Bannow Bay itself. There is anecdotal evidence that for many years, locals removed much of the shingle deposits from a number of locations around Bannow Bay for construction purposes. despite natural cyclical changes which might be expected in a mouth of any tidal bay, it has been suggested that the sediment deposition patterns within the bay have been so altered that in places the Bay is infilling. This would appear to be the situation at Bannow Island, where the spread of Common Cordgrass has initiated the consolidation of muddy substrates allowing the continued development of ASM.

5.3.2 Habitat structure and functions

The habitat structure and functions of this habitat are assessed as *favourable*. Eight monitoring stops were carried in this habitat; four on the small sheltered area of established saltmarsh, and another four were taken on the younger marsh which lies north of the road. All stops passed and all attributes for habitat structure and functions reached their targets.

The saltmarsh is generally in good condition. The marsh on the southern side of the road contains typical examples of mid and upper vegetation communities and the saltmarsh structure is well-developed. The marsh is not grazed and there are few other significantly

damaging activities. There have been some modifications in this area to the structure in the past. Common Cordgrass is not found in this area.

The ASM north of the road is also in good condition. This ASM is also found in a large unit with extensive *Spartina* sward and ASM/*Spartina* sward mosaic. The ASM has the appearance of being relatively young and undeveloped. Common Cordgrass is a prominent part of some of the ASM vegetation (the mosaic areas) but there is no indication that it has spread significantly during the current monitoring period. For this reason, the impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as accretion continue in the near future. There are few damaging activities damaging this site. There would appear to be little change in the saltmarsh on the southern side of the road, whilst the marsh to the north of the causeway would appear to be still developing as the substrate becomes consolidated. Continued accretion may lead to continued expansion of ASM at this site where there is natural succession from *Spartina* swards at their upper boundary.

5.4 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) (H1420)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. Although the presence of this habitat has been recognised in the overall cSAC, it has not previously been mapped. The habitat has been mapped based on the occurrence of Perennial Glasswort. Indeed, its presence is more widespread than indicated by the NPWS Rare Plant Survey. And while an estimated 100 plants were recorded, it is likely that is was under-recorded owing to the density of the *Spartina* sward.

5.4.2 Habitat structure and functions

The habitat structure and functions are assessed as *favourable*. The target criteria for this habitat are based upon that used for ASM. Four monitoring stops were carried out in this habitat, all of which passed. The saltmarsh where this species is found is not being affected by any damaging activities.

Perennial Glasswort is thriving in the transition zone between the *Spartina* sward and ASM and over 100 individual plants were recorded. Given the dwarfed nature of the plant, it is likely that further searching would increase this number. Of the plants that were recorded, there was considerable diversity in the size and age of the plants seen. Some plants were greater than 1 metre in diameter, while many of the smaller clumps ranged in diameter from 5

cm to 30 cm. The fact that they are found in the *Spartina* sward, which is only developed in the past 50 years, indicates that it is reproducing. This would indicate healthy population dynamics and thus warrants a *favourable* structure and functions assessment.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as the impact of Common Cordgrass continue in the near future. Perennial Glasswort seems to co-exist happily with Common Cordgrass at this site and at others in Bannow Bay, so this invasive species is not seen as a threat. As the *Spartina* sward extends seaward, there is potential for the spread of Perennial Glasswort onto newly forming transition marsh.

6 MANAGEMENT RECOMMENDATIONS

Given the relative isolated nature of this marsh, no active management of saltmarsh habitats is required at this site. Regular monitoring, however, of the site is recommended in light of the fact that the marsh is seemingly expanding due to the colonisation of the mudflats by Common Cordgrass.

There is potential at this site for managed retreat in the area at the west side of the site that is enclosed by the seawall. This area contains brackish marsh and informed grassland. Managed retreat would create newly developed saltmarsh habitat and would also provide new habitat for possible colonisation by Perennial Glasswort. This could aid the future prospects of this species and the extent and distribution of Halophilous scrubs (1420) in Bannow Bay.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

Ryle, T., Connolly, K., Murray, A. & Swann, M. (2009). *Coastal Monitoring Project. 2004-2006*. Report to the National Parks and Wildlife Service, Dublin.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats	0.002	0.002				
2	Spartina swards	5.116					5.116
3	1330 Atlantic salt meadow	1.379		1.379			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic	1.139		0.569			0.569
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	5.972					
10	*Spartina* clump/mudflat mosaic (50/50)	0.208					0.104
11	Isolated *Spartina* clumps on mud (5%)	0.001					0.00005
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	0.007		0.003			
18	Other SM (CM2)	1.896					
19	1330/rocky shore mosaic	0.058		0.029			
20	1420 Mediterranean scrub	0.166				0.166	
21	1310/1330 mosaic						
	Total	**15.94**	**.002**	**1.98**		**0.166**	**5.79**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- Atlantic/Spartina mosaic
- Spartina clump/mudflat mosaic
- Isolated Spartina clumps
- 1330/dune mosaic
- 1330/rocky shore mosaic
- 1420 Mediterranean scrubs
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1420 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Bannow Island

Bannow Bay SAC (000697)

SMP code: SMP0041

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 50 100 150 200 250 Meters

Date of production: 22/02/2009
Map version: 1

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

N

Castlebridge

1 SITE DETAILS

SMP site name: **Castlebridge**		SMP site code: **SMP0038**
Dates of site visit **10 & 11/09/2007**		CMP site code: **N/A**
SM inventory site name: **Castlebridge**		SM inventory site code: **225**
NPWS Site Name: **Slaney River Valley**		
NPWS designation	cSAC: **781**	MPSU Plan:
	pNHA: **781**	SPA: **4076**
County: **Wexford**		Discovery Map: **77** Grid Ref: **304500, 126000**
Aerial photos (2000 series): **O 5389-B,D; O 5390-A,C**		6 inch Map No: **Wx 032, 037**
Annex I habitats currently listed as qualifying interests for Slaney River Valley cSAC: **None listed**		
Other SMP sites within this SAC/NHA: **Ferricarrig, Rosslare**		
Saltmarsh type: **Estuary**		Substrate type: **Mud/Sand**

2 SITE DESCRIPTION

Castlebridge saltmarsh is located in the northern part of Wexford Harbour in Co. Wexford. Castlebridge Town is situated adjacent to the east of the site. Extensive marsh habitat has developed at the head of a sub-inlet of the inner part of the River Slaney estuary. The survey area covers the main Castlebridge marsh section. The River Sow flows through the marsh and into the estuary dividing the site into two sections. It is one of four SM Inventory sites (Curtis & Sheehy-Skeffington 1998), including The Raven, listed in the River Slaney Estuary and Wexford Harbour and is the most northerly site. Smaller patches of saltmarsh habitat are also found frequently at other locations around the estuary and the outer harbour.

The area around the survey site is still mainly rural and the landscape is dominated by farmland. The estuary is surrounded by low-lying hills. Castlebridge Town is situated to the north-east of the site and the area along the eastern side is increasingly more developed close to the marsh. There are extensive intertidal mudflats and estuarine sub-tidal channels at the seaward side of the marsh. Saltmarsh and brackish habitats are distributed along the shoreline along both sides of the sub-inlet outside the survey area to a lesser extent.

The survey site is part of Slaney River Valley cSAC (781) and The Wexford Slobs and Harbour proposed Natural Heritage Area (pNHA) (712). The site was originally designated as Castlebridge Marsh Area of Scientific Interest (ASI) in the Co. Wexford ASI report (Goodwillie 1979) and was also designated as Castlebridge Marsh pNHA (739) before being subsumed in the larger Slaney River Valley candidate Special Area of Conservation (cSAC) and The Wexford Slobs and Harbour pNHA. Two Annex I habitats are present at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Some small patches of *Spartina* swards are also present on the intertidal mudflats. Nearly all the saltmarsh habitat is located within the cSAC. Adjacent to this site there is extensive estuarine and intertidal mudflat habitat.

One very notable species recorded at this site is Borrer's Saltmarsh-grass (*Puccinellia fasciculata*). This species is listed on the Flora Protection Order and is listed in the Red Data Book. These species is found in more brackish conditions than found in ASM. Borrer's Saltmarsh-grass is generally found in upper saltmarsh and muddy transitional areas particularly along embankments adjacent to coastal areas. It is an indicator of a rarer sub-type of MSM. This species is only found from seven 10 km^2 squares along the Barrow Estuary, Wexford and Dublin Bay since 1960 (Preston *et al.* 2002). There are several records for this species at various sites around Wexford Harbour including Castlebridge, North & South Slobs, Woodtown and Rosslare (NPWS files). There are two separate records for this species at Castlebridge, one on the east side of the marsh near the footbridge used by cattle and one along the tracks on the western side of the marsh.

The site was accessed from both sides as there was no crossing over the River Sow. The eastern side of the marsh was accessed by a right of way used by local hunters. The western side was accessed via privately-owned farmland. Permission was requested to cross this land from the landowner, who also owns this side of the marsh.

3 SALTMARSH HABITATS

3.1 General description

The main marsh area is split into several sections by several channels. The main River Sow channel splits the marsh into two main sections. The eastern section is also further split by the old Castlebridge River channel, which links to the River Sow Channel. This channel now mainly functions as a large creek. This river has been modified and a canalised channel has been dug along the eastern side of the marsh to accommodate this smaller river. Access to the eastern section is over a small bridge.

There is a significant estuarine influence on this site. The development of a relatively large marsh in a low-lying area with a small gradient from the front to the back of the site has allowed the development of wide transition zones from saltmarsh to substantial areas of brackish and other habitats. The saltmarsh habitats are found at the seaward side of the main marsh, while the brackish and other habitats are found further landward. This is a notable site due to the actual extent of brackish habitats and the relatively undisturbed natural transition from saltmarsh to brackish habitats with various saline influences and then to wet grassland.

The saltmarsh habitats at Castlebridge are dominated by Mediterranean salt meadows (Table 3.1). The mapped area of Atlantic salt meadows forms a much smaller portion of the saltmarsh. However, the mapped MSM area does contain small patches of ASM. Much of the MSM area contains mosaic areas that were difficult to classify and were mapped as MSM because this habitat was more dominant. Overall the saltmarsh is comprised of mainly upper saltmarsh vegetation communities. Castlebridge marsh is notable for the absence of significant areas of lower and mid-marsh saltmarsh communities

There are small patches of brackish habitat classified as Other Saltmarsh (CM2) within the area dominated by MSM and ASM habitat. This includes patches of Sea Club-rush (*Bolboschoenus maritimus*), Common Reed (*Phragmites australis*) and Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP

project classification. Stands and clumps of these species are found in pans on the saltmarsh and also in drains. There are several large stands of Common Reed along the main River Sow channel, positioned at bends in the channel. The extent of brackish habitat increases landward towards the head of the marsh.

The main saltmarsh area also contains several tracks that have been built up and are now low embankments in places. These paths may be vegetated by a variety of habitats such as wet grassland, dry grassland and even some scrub in places. Some of the tracks have drains associated with them that are filled with Sea Club-rush or Grey Club-rush creating strips of brackish habitat. There are several mounds present that contain some Willow (*Salix* sp.). The presence of these tracks has introduced some habitat diversity into the marsh and has introduced transitions to brackish and terrestrial habitats within the saltmarsh area. Some of the newer tracks on the western side of the marsh at dominated by Twitch (*Elytrigia repens*) or Common Reed and also contain species like Nettle (*Urtica dioica*). Some of these low embankments may offer some protection from erosion.

A significant part of the marsh at Castlebridge is comprised of brackish habitats including stands of Reed with substantial areas of wet grassland, and also some drier sections. This area, while mapped as one unit is more diverse and also has a diverse topography. These habitats are located at the landward (northern) side of the saltmarsh habitats. There are natural transitions from saltmarsh habitat to these brackish habitats along the northern side of the saltmarsh that are usually marked by subtle changes in the surface topography, creating wide transitional zones.

There is one notable transition from MSM with wet grassland that contains Soft Rush (*Juncus effusus*), Marsh Ragwort (*Senecio aquaticus*), Purple Loosestrife (*Lythrum salicaria*), False Fox Sedge (*Carex otrubae*), Tufted Hair-grass (*Deschampsia caespitosia*), Tall Fescue (*Festuca arundinacea),* Common Sow-thistle (*Sonchus oleraceus*), Sea Rush (*Juncus maritimus*), Marsh Bedstraw (*Galium palustre*) and Creeping Bentgrass (*Agrostis stolonifera*). There is a subtle change from MSM to this habitat that has developed on somewhat more elevated land.

The eastern boundary of the saltmarsh habitats has been modified by the development of the Castlebridge River channel. Common Reed stands generally form the dominant habitat along the southern part of the eastern side of this channel. Much of the northern section has been reclaimed and now contains improved grassland.

Brackish and species-poor drier grassland (dominated by Twitch above the tidal influence - GS2) with some scrub also dominate the shoreline on the western side of the inlet, west and south of the survey site. This area may have been modified in the past and these habitats have developed on old embankments. A drain defines the western boundary of the main saltmarsh section. This drain and associated low embankment separated the site from adjacent improved grassland.

A notable vegetation type was recorded in a low-lying area at the south-western side of the site (mapped as *Juncus maritimus*-dominated GS4). This area is separated from the main saltmarsh by a drainage channel and is situated behind a low ridge that contains dry species poor grassland. This area was dominated by Sea Rush and also contained typical MSM species such as abundant Creeping Bentgrass and frequent Red Fescue (*Festuca rubra*). However, the community is characterised by the presence of brackish and terrestrial species such as Bindweed (*Calystegia sepium*), Twitch, Purple Loosestrife, Fleabane (*Pulicaria*

dysenterica), False Oat-grass (*Arrhenatherum elatius*), Tall Fescue, Smooth Sow-thistle, Yorkshire Fog (*Holcus lanatus*) and Curled Dock (*Rumex crispus*). This area was not classified as MSM due to the presence of these species and the lack of other typical saltmarsh features such as creeks and pans. This area may be transition from saltmarsh to drier habitats and may have developed due to attempted reclamation and the creation of the ridge along the seaward edge of this area. Recent drainage works in this area may have also affected this area.

There is a tall saltmarsh cliff along the southern boundary of the saltmarsh adjacent to soft mudflats. The cliff is quite high (1-1.5 m).

Table 3.1. Area of saltmarsh habitats mapped at Castlebridge.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	2.876
1410	Mediterranean salt meadows (Juncetalia maritimi)	23.391
non-Annex	*Spartina* swards	0.015
	Total*	**26.282**

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

3.2 Atlantic salt meadows (H1330)

This habitat is less dominant compared to MSM at the site, which is much more common. The overall extent of ASM is probably under-estimated somewhat at this site as the mapped areas of MSM contain some MSM/ASM mosaic areas. The ASM is characterised by the presence of grassy upper saltmarsh vegetation communities dominated by either Red Fescue and Creeping Bent-grass, or a mixture of these species. Other species present include Saltmarsh Rush (*Juncus gerardii*), Sea Milkwort (*Glaux maritima*), Sea Aster (*Aster tripolium*), Sea Arrowgrass (*Triglochin maritimum*), Sea Plantain (*Plantago maritima*), Common Scurvygrass (*Cochlearia officinalis*), and Curled Dock. Sea Rush may be present in this habitat and has cover values between 0-10%.

There are few examples of zonation within this habitat and the ASM is quite uniform. This is related to the overall site topography and the relatively high position of the marsh relative to the tidal range. There is some minor development of low-mid zone vegetation along the edges of some creeks with Common Saltmarsh-grass (*Puccinellia maritima*) and Sea Aster more prominent. Lower zone species such as Lax-flowered Sea Lavender (*Limonium humile*) and Glasswort (*Salicornia* sp.) were not recorded. Yorkshire Fog and Twitch were recorded at one location within ASM around a stand of Common Reed in a vegetation community dominated by Creeping Bent-grass. This is another indication of the position of the marsh in the upper part of the tidal range.

There are some examples of the typical saltmarsh topography within the ASM although there are few open salt pans present. Creeks and drainage channels cross through this habitat. The sward height is relatively high and rank in places, especially at the western side of the saltmarsh. The sward surface is damaged in places from long-term cattle grazing and poaching, although the grazing intensity is quite low this year.

3.3 Mediterranean salt meadows (H1410)

The MSM is comprised of one main vegetation community characterised by the presence of Sea Rush, and varies in the cover of some species but is mainly dominated by grasses. Zonation in the MSM is present, although there are no examples of mid marsh to upper marsh zonation. The main example of zonation is where the MSM transitions to more brackish habitat or terrestrial habitat along the tracks and embankments. There is some minor zonation along the creeks linked to the main channel. There are also some examples of zonation between the ASM and MSM (dependant on the cover of Sea Rush), and MSM and transitional habitats, that is related to subtle changes in ground elevation. A second rarer sub-type characterised by Borrer's Saltmarsh-grass is also present.

The main community is characterized by the presence of Sea Rush. The cover of this species may vary within the area mapped as MSM with cover generally between 5-50% and some sections with higher cover values (> 75%). This habitat also contains patches of ASM vegetation where Sea Rush may be absent. Only the largest of these sections were mapped as ASM. Red Fescue and Creeping Bent-grass are both abundant within this vegetation type. Other species include Autumn Hawkbit (*Leontodon autumnalis*), Sea Milkwort, Silverweed (*Potentilla anserina*), Long-bracted Sedge (*Carex extensa*), Parsley Water-dropwort (*Oenanthe lachenalii*), Curled Dock, Sea Arrowgrass, Smooth Sow-thistle, Sea Plantain, Wild Celery (*Apium graveolens*), Spear-leaved Orache (*Atriplex prostrata*), White Clover (*Trifolium repens*), Sea Aster and Saltmarsh Rush. These species vary in cover values and Saltmarsh Rush may occasionally be dominant.

The ASI site description also notes the presence of Strawberry Clover (*Trifolium fragiferum*) and Saltmarsh Flat-rush (*Blysmus rufus*) on the site but these species were not recorded during the current survey. Species such as Hard-grass (*Parapholis strigosa*) and Common Saltmarsh-grass are found along some of the tracks and Common Saltmarsh-grass is also more common around the mouths of the creeks and along some of the drainage channels.

The saltmarsh topography within the MSM is moderately developed. There are some salt pans present, many of which have been vegetated with brackish species, and few of them are left open. The creek topography is also well developed but has been somewhat disturbed by drainage modifications of the years. Some of the channels have been damaged by long-term cattle grazing, which has created eroded margins in places. Some of the sward surface is also quite tussocky and damaged, which is also indicative of long-term cattle grazing. The sward height is more varied in the eastern section, although there is no short-cropped vegetation present. The western section is more uniform in terms of sward height.

A second rarer MSM sub-type characterised by the presence of Borrer's Saltmarsh grass is present at this site. This habitat type is found along a track on the eastern side of the site, adjacent to the access point and bridge onto the marsh. Although it is not frequent, this species is distributed over a wide area along this track, which lies parallel to the Castlebridge river channel,. It was found on the track in ruts and along the sides of the track in poached sections in association with other species such as Common Saltmarsh-grass, Sea Spurrey (*Spergularia media*), Sea Rush and Creeping Bentgrass. The Rare Plant Survey also recorded this species at this location in 1990 and its presence was noted as being very abundant and of being a major population. This species was recorded in very poached sections with no other species present. A comparison of the photos indicates that the track now is totally covered in vegetation compared to 1990 when the track was a bare soil. This track was mown at the time of the survey in 2007.

Borrer's Saltmarsh-grass was recorded by the Rare Plant Survey at several other locations on the west side of the saltmarsh. It was recorded mainly along some of the tracks and drains that divide this section of saltmarsh. This species was not recorded at these locations during this survey. The marsh was not grazed making it difficult to record/locate this species and some of the tracks have also been modified. The lack of grazing and these modifications may have negatively affected the status of this species on this side of the marsh.

Borrer's Saltmarsh-grass was noted at one location on the western side of the marsh. This location was not recorded by the Rare Plant Survey. A small poached area at the access point and bridge onto the marsh contained about 50 small plants. Cattle congregate at this point adjacent to the gate onto the marsh. This small area is on the landward side of the large drain that divides the main saltmarsh from the adjacent farmland. There are brackish influences evident along the drain and this area also contains species such as Creeping Bent, Perennial Ryegrass (*Lolium perenne*), Mouse-ear (*Cerastium fontanum*) and Sea Spurrey.

3.4 *Spartina* swards

There are several large clumps of Common Cordgrass growing on the mudflats adjacent to the western side of the marsh. These clumps were mapped as *Spartina* swards. This habitat seems to be more extensive further south along the shoreline outside the survey area. Common Cordgrass was not recorded on the saltmarsh within the ASM or MSM.

4 IMPACTS AND ACTIVITIES

Several impacts and activities affect this site (Table 4.1). Grazing is the most prevalent activity (140). Cattle have grazed both sides of the marsh during the summer (although the western side was not grazed during 2007 due to bad weather). There are some small patches with poaching damage but overall the site is in good condition. Overall the grazing intensity was low in the east part of the site and there was plenty of foliage left on the marsh at the time of the survey. There are signs that the grazing intensity was higher in the past as parts of the MSM are quite tussocky. The grazing intensity seems to have been reduced during the current monitoring period. A comparison of photographs of a track in 1990 (from the Rare Plant Survey) to its current condition (mowed grassland) indicates that the track was much more poached and stripped of vegetation in 1990. The eastern side of the marsh is grazed as commonage, while the western side is grazed by one landowner.

The Rare Plant Survey notes that grazing and poaching was beneficial to the populations of Borrer's Saltmarsh-grass on the site. The reduction of poaching damage along tracks and the modification of tracks on the western side of the site may negatively affect the population of Borrer's Saltmarsh-grass. Under-grazing (149) could be considered a significant impact affecting the presence of this rare species and the rarer MSM sub-type.

Both sides of the marsh contain several cattle tracks that have been improved with hard core or gravel and form low embankments in places (501). These tracks allow access into various different sections of the marsh. Drains are sometimes associated with these tracks (810). These tracks and drains are likely to have been in existence for some time. There are several footbridges over creeks on the site to allow cattle to access different areas. Some of the tracks on the western side of the marsh have been modified recently, as material has been dug from adjacent drains and placed on these tracks and raising them up to form low embankments. Some of these tracks may offer some protection from erosion (or may be a

pre-curser to land reclamation). The drain along the western boundary has also been canalised in this way.

Some of the tracks on the eastern side have been upgraded recently (501). Upgrading of the tracks may also be related to the use of the site by hunters (230). Several shooting hides are present on the marsh. Hunting probably has a significant disturbance impact to wildlife using the site but these impacts are not considered in this assessment. A track accessing the eastern side of the site was mown recently. This track also contains wheel-ruts indicating that vehicles access the marsh at times. Some of the creeks that cross the main track on the eastern side of the marsh have been recently culverted with concrete pipes. A fenced enclosure for raising wildfowl is also present on the site. A new duck pond was constructed on the western side of the marsh recently. Disturbance from modification of the tracks (501) and drains (810) has affected both habitats but MSM to a greater extent.

Common Cordgrass (*Spartina anglica*) is present at this site but is not extensive. This is an invasive species of saltmarsh and mudflats (954). It is not known when it colonised Wexford Harbour but it has been present since 1960 (Nairn (1986). It has colonised on soft mudflats along the seaward edge of the saltmarsh but is not found on the saltmarsh. The relatively high elevation of the saltmarsh (dominated by upper saltmarsh communities) and the dominance of MSM mean that Common Cordgrass is not likely to colonise significantly on the saltmarsh and replace ASM or MSM habitat with *Spartina* sward. This species prefers to colonise in the lower saltmarsh or on adjacent mudflats.

There are some signs of erosion at this site. There is a tall saltmarsh cliff along the seaward side of the marsh, particularly along the western section, and along the inner river channel that splits the marsh. There are signs of cliff toppling and residual mud mounds along the seaward boundary of the saltmarsh and it is indentated in places. A comparison of OSI 2nd edition 6 inch maps to 2000 aerial photos indicates that some erosion of the saltmarsh during this period. A strip of saltmarsh between 10-20 m wide has been eroded since the 2nd edition 6 inch map was drawn and this accounts for a loss of about 0.4-0.5 ha within about 100 years. There is no measurable erosion when the 2000 and 2005 series of aerial photos are compared. The 1995 aerial photo series are not available for Co. Wexford. While there is no measurable erosion during the current monitoring period, the changes since the 2nd edition 6 inch map are taken as indicative of erosional pressure acting on the site, and erosion is therefore assessed as a negative impact with a low intensity acting on the saltmarsh face. There are also signs of erosion within the main river channels, but this is typical of natural channel movements and accretion banks are present on the opposite sides of eroded or undercut banks.

The ASI site report (Goodwillie 1979) mentioned that the site was used for Reed cutting, but that it was not extensive and was actually beneficial for diversity. This activity does not affect the saltmarsh habitats and may not have been carried out in recent times. The ASI site report also mentioned that the Castletown River was somewhat polluted (701) but that this did not seem to have a significantly negative impact on the marsh. These impacts are not assessed as there is no evidence of their impact within the current monitoring period.

There are frequent signs of older modifications to the structure the marsh. None of the drainage features or tracks that are present on the site are marked on the first edition OSI 6 inch map. Some of the drains are marked on the 2nd edition map, although none of the tracks are marked. Some of the cattle tracks are likely to have been created by the removal of material from adjacent drains. The former channel of the Castlebridge river is now infilling

and the river flows down a canalised channel at the eastern side of the marsh. This channel was canalised prior to the first edition six inch map. There has been relatively little reclamation of former marsh around this site and this is mainly confined to a small zone along the north-eastern side of the Castlebridge river channel. Nearly all of the marsh indicated on the old OSI maps is still present at the site. The ridge along the shoreline to the south-west of the survey site may be man-made, although it does not have a typical embankment structure. These impacts are not assessed as they occurred prior to the current monitoring period.

The main impacts and activities adjacent to the survey site are cultivation (100), fertilization (120) and the grazing of livestock (140) related to farming practises. Other impacts and activities around the site include continuous habitation on the eastern side of the site (Castlebridge Town) (401), dispersed habitation (403) and hunting (230). A new housing development is being constructed adjacent to the eastern side of the site with a new pipeline for grey-water (or sewage?) connected to Castlebridge River. The direct impact of these impacts and activities is difficult to assess accurately. None of these activities may be acting directly on the site but ecological functions such as hydrology, water chemistry and nutrient imputes may be affected to some extent.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	2.876	Inside
1330	230	C	-1	2.876	Inside
1330	501	B	-1	0.25	Inside
1330	810	C	-1	0.25	Inside
1330	900	C	-1	0.02	Inside
1410	140	C	0	22.391	Inside
1410	149	B	-1	1.000	Inside
1410	230	C	-1	23.391	Inside
1410	501	B	-1	2.0	Inside
1410	810	C	-1	2.0	Inside
1410	900	C	-1	0.5	Inside

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

5 CONSERVATION STATUS

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 and 2000 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 in the NPWS Rare Plant Survey.

The overall conservation status of this site is assessed as *unfavourable-inadequate* (Table 5.1). Most of the site is actually in good condition and there are few impacts and activities directly affecting the site. The grazing intensity is low in most places and this is likely to be negatively affecting the status of Borrer's saltmarsh-grass, which is the main reason for the overall assessment as *unfavourable-inadequate*. The site has also been modified by drainage works and track improvement works during the current monitoring period, although the overall impacts of these impacts are relatively minor. There are indications of an erosional trend on the site and a small area of saltmarsh has been eroded in the past 100 years (0.4-0.5 ha). The site may be vulnerable to further erosion in the future if these trends continue.

This is a very notable site due to the presence of a significantly large area of brackish habitats and the relatively natural transition from saltmarsh to these habitats in an estuarine situation. This site contains one of the best examples seen during the survey of this transition in an estuarine situation. At many other sites this area has usually been reclaimed or has been significantly disturbed.

The marsh is an atypical type in that a relatively large and uniform area of the marsh is positioned at a high point of the tidal range in the estuary and there are no suitable gradients for the development of low and mid marsh communities. This means the marsh is dominated by upper zone saltmarsh communities (MSM and ASM), although the diversity of the site is enhanced by the presence of several notable transitions to brackish and terrestrial habitats.

The absence of lower and mid marsh communities could be an indication of landward transition of saltmarsh communities in response to sea-level rise. However, the absence of these trends at other sites in the estuary indicates that local factors related to the reduction of the intertidal area in the estuary (due to the reclamation of North and South Slobs) or other factors may be responsible for this more uncommon saltmarsh zonation.

This site is located within the River Slaney Estuary cSAC so the status of the Annex I habitats and the rare species should not be affected by any land-use changes that have to be licensed by local or national authorities. However, there is no NPWS management plan for this site.

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

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			Favourable
Mediterranean salt meadows (1410)	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 *favourable*. There are no indications of any loss of habitat due to erosion, natural changes and land-use changes during the current monitoring period. The overall site is being affected by erosion, but there was no measurable erosion during the current monitoring period and the MSM is more likely to be affected due to its greater extent and position on the marsh.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Five monitoring stops were carried out in this habitat and they all passed. All of the attributes required for the structure and functions of this habitat reached their targets. There are few impacts and activities acting on this habitat, apart from grazing. The grazing intensity is assessed as low (east side) or absent (west side) and this has actually led to the development of rank vegetation with a uniform structure in places. There is no short-cropped vegetation (also typical of mid marsh zones). The grazing level is likely to vary between years due to the length of the grazing period during the summer (short in 2007 due to bad weather) and may be greater in other years. Drainage and track improvement works may have disturbed some of this habitat, but the extent of any disturbed area is relatively minor. Common Cordgrass was not recorded in this habitat. Hunting is likely to disturb wildlife using this site but the impact of wildlife disturbance is not included in the assessment.

Lower and mid marsh zones are virtually absent and are confined to narrow zones along creeks. The uniformity of the ASM (the vegetation assemblage and the sward structure) is also related to the position of the marsh surface at a relatively high level relative to the tidal range and the relatively flat topography. This means that there is no extensive low or mid zone saltmarsh development due to the lack of required gradients.

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 such as grazing continue in the near future. There are no activities significantly negatively affecting this habitat at present. It should be noted that the long-term absence of grazing in one section of the marsh may not be beneficial to the sward structure. Common Cordgrass is not likely to colonise the ASM on this site to nay great extent, due to the relatively high position of the marsh relative to the tidal range.

Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to erosion, natural changes and land-use changes during the current monitoring period. The overall site is being affected by erosion, but there was no measurable erosion during the current monitoring period. The excavation of a duck pond and track modification works has probably resulted in some very minor loss of habitat (less than 1% of the overall MSM extent), but there have been no measurable losses, so the extent is still *favourable*.

Older drainage works and more recent modifications may affect the extent of this habitat by promoting the development of brackish vegetation types such as the spread of Common Reed along drains or low embankments. These impacts are not assessed as there are no indications of any major habitat change during the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Sixteen monitoring stops were carried out in this habitat (all in the main community dominated by Sea Rush) and they all passed. All of the attributes required for the structure and functions of this habitat (Sea Rush-dominated) reached their targets. There are few impacts and activities acting on this habitat, apart from grazing. The grazing intensity is assessed as low (east side) or absent (west side) and this has actually led to the development of rank vegetation with a uniform structure in places. The vegetation assemblage is typical of this habitat. Zonation within the MSM is not well developed but this is related to overall marsh topography and the lack of suitable gradients to create extensive mid-marsh zones. Zonation to transitional vegetation is much better developed and there are several examples of notable transitional communities that increase the conservation value of the site as a whole.

The lower grazing intensity is not likely to favour the status of Borrer's Saltmarsh-grass and the extent of the rarer MSM sub-type characterised by this species. This species was found in poached areas along tracks that have a reduced brackish compared to the rest of the saltmarsh. A comparison of the condition of the site in 1990 during the Rare Plant Survey to the current condition indicates that the extent of suitable habitat for this species (heavily poached areas) has reduced significantly. The modifications to the tracks on the western side of the site may also have negatively impacted on the status of this species (although it is still present on this side of the marsh). The reduction in the overall population of this species is

the main reason for an assessment of MSM structure and functions as *unfavourable-inadequate*.

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 such as current grazing levels continue in the near future. The grazing intensity is low at present and seems to have reduced during the current monitoring period. A continuation of this reduced grazing intensity is likely to have further negative impacts on the status of Borrer's Saltmarsh-grass. However the status of this species may be somewhat ephemeral and so several years of heavier grazing intensity could increase the extent and distribution of this species to former levels. The presence of this species at the western side of the site shows that it is still able to colonise suitably disturbed areas of habitat.

Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities. It should be noted that one of the sites where Borrer's saltmarsh-grass is located is outside the cSAC boundary.

6 MANAGEMENT RECOMMENDATIONS

Several management recommendations could improve the overall conservation status of this site and the status of the Borrer's Saltmarsh-grass at this site.

The grazing intensity on both sides of the marsh should be increased. While this may have a negative impact one some of the structure and functions of the ASM, it would be beneficial to the status of Borrer's Saltmarsh-grass.

Consultations should be carried out with landowners and managers of the site regarding drainage works and track improvements. Care should be taken to limit the track improvement works and maintain soil substrates on these tracks to promote suitable habitat for Borrer's saltmarsh-grass

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Goodwillie R. (1979). A preliminary report on the areas of scientific interest in Co. Wexford. An Foras Forthbatha.

NHA database (1990). Information from files of pNHAs held by NPWS.

Preston, C.D. Pearman, A. & Dines, D. (2002). *New atlas of the British and Irish Flora*. Oxford University Press.

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards	0.015					0.015
3	1330 Atlantic salt meadow	2.876		2.876			
4	1410 Mediterranean salt meadow	23.391			23.391		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	10.854					
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)	26.343					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**63.479**		**2.876**	**23.391**		**0.015**

Legend

- SAC Boundary
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1410 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Castlebridge

Slaney River Valley SAC (000781)

SMP code: SMP0038

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 70 140 210 280 350 Meters

Date of production: 22/02/2009
Map version: 1

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

N

Clonmines

1 SITE DETAILS

SMP site name: **Clonmines**	SMP site code: **0042**
Dates of site visit: **30 & 31/08/2007**	CMP site code: **N/A**
SM inventory site name: **Clonmines**	SM inventory site code: **219**
NPWS Site Name: **Bannow Bay**	
NPWS designation cSAC: **697**	MPSU Plan: **Old format plan**
pNHA: **697**	SPA: **4033**
County: **Wexford**	Discovery Map: **76** Grid Ref: **284700, 112650**
Aerial photos (2000 series): **O 5638-A,C; O 5708-A**	6 inch Map No: **Wx 040, 045**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Bannow Island, Fethard, Gorteens, Grange, Saltmills, Taulaght**

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

2 SITE DESCRIPTION

Clonmines saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site that empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. Clonmines is located at the northern end of the bay within 1 km of small village of Wellingtonbridge. This part of the bay is narrower where the Owenduff River and Corook River enters the bay. The surrounding landscape on the east side of the channel is low-lying and there are berms along the channel that protect adjacent low-lying land including improved grassland and wet grassland from flooding. There are moderate slopes to the shoreline on the western side and the adjacent land is dominated by farmland. The southern section is quite isolated and there is no simple access to the shoreline apart from crossing adjacent land. The main channel narrows in the northern section and the then splits where the two river channels connect. This area is low-lying and there are berms along both river channels.

The saltmarsh at this site is quite fragmented and there are several large patches scattered along the shoreline in low-lying intertidal areas, mainly on the western side of the channel. The saltmarsh has developed where mud has accreted in the quiet zones of the main

undulating channel flowing through this area. The largest section has developed in a sheltered area behind a shingle ridge. There are extensive intertidal mudflats in the channel adjacent to the saltmarsh that are exposed at low tide. One section forms an 'island' in the middle of the main channel and there is intertidal mud on both sides. Attempts have been made in the past to reclaim some of this saltmarsh. Further north the saltmarsh development is limited to a narrow fringe along the channel and the marginal vegetation along the river channels becomes more brackish and stands of Common Reed appear in places.

Clonmines is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Three Annex I saltmarsh habitats were recorded at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). All three habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. This species is not previously known from this site.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded around the shoreline and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. Saltmarsh extends beyond the upper boundary as indicated by the old OSI 6 inch map in places.

The site can be accessed from a number of locations by crossing adjacent farmland.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh at this site is found in several discrete sections. The main section has developed at the southern end of the site behind a shingle bar, which protects most of the seaward side of the saltmarsh. The majority of this saltmarsh is dominated by ASM with smaller amounts of MSM and also some ASM/*Spartina* sward mosaic. This bar is low-lying and contains some disturbed coastal grassland and patches of scrub. This saltmarsh has been significantly modified by drainage in the past. There is some development of brackish habitats with stands of Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*) along the landward boundary of this saltmarsh. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. There is likely to be some freshwater run off from the adjacent hillside and this zone acts a buffer between the saltmarsh and the adjacent wet grassland or pasture. There are several isolated patches of Sea Club-rush around the saltmarsh also indicating a greater estuarine influence on this site from the adjacent rivers compared to other saltmarshes in Bannow Bay. There are also several patches of *Spartina* sward and scattered clumps of Common Cordgrass (*Spartina anglica*) on bare mud along the seaward side of the shingle bar.

The saltmarsh 'island' situated in the centre of the channel is also dominated by ASM. There are smaller patches of MSM and also stands of Sea Club-rush (mapped as CM2) on this patch of saltmarsh. There are also several low mounds that contain Twitch (*Elytrigia repens*)-dominated grassland. This section has never been modified by drainage or reclamation and is also not grazed by livestock as it is isolated from the mainland. Common Cordgrass is present but is not extensive in cover. There are tall saltmarsh cliffs around the perimeter or seaward boundary of the saltmarsh. The saltmarsh north of Clonmines House is similar in structure. It is dominated by ASM and there are smaller amounts of MSM on this saltmarsh.

The larger semi-circular area of saltmarsh found on the eastern side of the site is dominated by ASM. There is some development of stands of Sea Club-rush on this area and Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*) is present. Other species such as Curled Dock (*Rumex crispus*), Parsley Water-dropwort (*Oenanthe lachenalii*), Creeping bent and Sea Aster are found in the areas dominated by Sea Club-rush. A berm marks the upper boundary of the saltmarsh. There are tall saltmarsh cliffs marking the lower saltmarsh boundary. Common Cordgrass is growing in several clumps around the seaward side of the established marsh. This marsh has been modified in the past and there are some deep channels and pits present where material may have been removed for use on the berms.

The tidal influence as noted on the old OSI 2nd edition 6 inch maps extends a short distance beyond the bridge over the river at Wellingtonbridge. Brackish influences can be seen in the

vegetation at this location but the vegetation is more typical of brackish marsh and is dominated by Common Reed stands (mapped as other non-Annex I saltmarsh or CM2). There is very little salt marsh vegetation lining the channel and it is also difficult to access given the treacherous nature of the muddy channel.

Table 3.1. Area of saltmarsh habitats mapped at Clonmines.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.023
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	15.870
H1410	Mediterranean salt meadows (Juncetalia maritimi)	1.922
non-Annex	*Spartina* swards	1.215
	Total	**19.03**

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

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

This habitat is mainly characterised by the presence of Glasswort (*Salicornia* spp.), mainly on muddy substrates at the seaward edge of the established saltmarsh. The habitat has developed on soft intertidal mud with a moderate slope down to the main channel. It is located at the northern end of the site. Other species which were recorded included Common Saltmarsh-grass (*Puccinellia martima*), Annual Sea-blite (*Suaeda maritima*) and Common Sea-spurrey (*Spergularia media*) but these species only occur quite rarely. There is a distinctive upper boundary to this habitat and no transition between ASM and *Salicornia* flats.

There are other patches of Glasswort vegetation with some other saltmarsh species along the seaward side of the shingle bank. Both *Salicornia europaea* agg. and *S. procumbens* agg. were noted. However, these sparse patches are found on mixed substrate with substantial gravel.

3.3 Atlantic salt meadows (H1330)

This habitat is well developed at this site. It dominates all of the main saltmarsh areas. The main section at the southern end of the site contains well-developed examples of all the major zones including some low-mid marsh vegetation. The structure of this area has been modified by construction of deep drains. Spoil from the drains has been placed along the edge to form a low ridge with differently zoned vegetation. Some Twitch appears on these low ridges in places. Mid upper marsh vegetation can be seen along the edges of the drains with lower zone vegetation found behind these low ridges and this is an example of reverse zonation. There are still some natural drainage creeks still present and there are well-developed salt pans also present. Common Cordgrass is found in some of these pans, particularly in the lower half of the marsh but is still less than 1% cover overall.

The mid marsh zone is dominated by Sea Plantain (*Plantago maritima*) and Red Fescue (*Festuca rubra*) with less frequent Sea Arrowgrass (*Triglochin maritimum*). It also contains small amounts of Sea Pink (*Armeria maritima*), Sea Aster (*Aster tripolium*), Saltmarsh Rush (*Juncus gerardii*), Common Saltmarsh-grass, Common Scurvy-grass (*Cochlearia officinalis*) and Sea Milkwort (*Glaux maritima*). There are subtle changes in the species assemblage in this zone which is related to small changes in the surface topography. Shallow depressions contain more frequent Common Saltmarsh-grass and Lax-flowered Sea Lavender (*Limonium humile*) and can be classified as low-mid marsh.

The mid upper zone is dominated by more frequent Red Fescue. Species such as Common Saltmarsh-grass and Glasswort are absent from this zone and other species such as Saltmarsh Rush are occasionally frequent. The sward height is generally higher in this zone. Along the shingle embankment there is greater abundance of Creeping Bentgrass (*Agrostis stolonifera*) where there is some distinct zonation on a moderate slope to coastal grassland on the bank. Autumn Hawkbit (*Leontodon autumnalis*) and White Clover (*Trifolium repens*) were also present. Wild Celery (*Apium graveolens*) was also noted on some of the low ridges along the drains. There are also sections on the northern half of the main saltmarsh where Creeping Bentgrass is abundant and this is one indication of the estuarine influence on this site. There are occasional clumps of Sea Rush (*Juncus maritimus*) scattered through the ASM in places.

Both the mid marsh and mid-upper marsh zones are also found on some of the other sections of saltmarsh that are not grazed including the 'island'. These areas generally have a taller lusher sward particularly in the mid-upper sward that is dominated by Red Fescue. Long-bracted Sedge (*Carex extensa*), Distant Sedge (*Carex distans*) and Hard Grass (*Parapholis strigosa*) were noted in the upper zone of the large semi-circular saltmarsh at the north-eastern end of the site. There is variable sward height in sections and the mid-marsh zone still has a low sward height. The 'island' has a well-developed saltmarsh topography that has not been modified by any reclamation.

3.4 Mediterranean salt meadows (H1410)

The MSM is moderately developed at this site. The main portion of MSM is located in the southern section. This habitat is found in the upper zone of the marsh and is characterised by tall scattered clumps of Sea Rush at a lower density compared to some other sites (10-25%). Parts of this habitat are still dominated by typical ASM species such as abundant Creeping Bent, and smaller amounts of Saltmarsh Rush, Red Fescue, Common Scurvy-grass, Spear-leaved Orache (*Atriplex prostrata*) and Sea Plantain between the clumps of Sea Rush. Other species present include Sea Arrowgrass and Sea Aster. The abundance of Creeping Bent-grass indicates some freshwater influence, possibly from runoff from the adjacent hillside. Sea Club-rush is spreading into the upper MSM adjacent to the upper boundary of the habitat. Common Saltmarsh-grass and Common Cordgrass are also found in this area along some of

the drainage channels that extend into this habitat. There are some salt pans present within the MSM but the drainage has largely been modified by the creation of the deep drains.

There are also several smaller patches of MSM at various locations around the site on the other patches of saltmarsh. Some of these sections have denser Sea Rush sward compared to the southern section. This MSM generally has a different species assemblage with less frequent Creeping Bent and more frequent Red Fescue. The saltmarsh structure is similar.

There is a narrow band of MSM along the eastern side of the channel lining the berm in places. Some of this MSM is eroded and the Sea Rush is found on isolated hags. This zone contains Sea Plantain, Sea Aster, Common Saltmarsh-grass, Lax-flowered Sea Lavender, Red Fescue and Sea Pink. There are also patches where Sea Rush is spreading back onto the mixed substrate.

3.5 *Spartina* swards

Common Cordgrass has reached its uppermost limits in Bannow Bay just south of Wellingtonbridge. Despite the extensive mudflats, there are few large expanses of *Spartina* sward and most is confined to relatively narrow patches along the seaward side of the marsh. The sward is almost entirely dominated by Common cord-grass and largely confined to muddy substrates. Some narrow sward has developed along the seaward side of the shingle bank at the southern end of the site.

Occasionally, small patches are found along muddy creeks extending into other marsh habitats or on exposed mud over shingle at the southern end of the site. There is also some development of ASM/*Spartina* sward in the southern section, which is already described.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 4.1). Most of the saltmarsh is quite isolated so it is not affected by amenity impacts. The largest section of saltmarsh is grazed by cattle (140) and there is some localised overgrazing (143) in the western section. A large area is not grazed as cattle can not cross the large drain. Another smaller section north of Clonmines House is grazed by sheep and there is also localised poaching. Other sections are not grazed at all by livestock, including the saltmarsh 'island' in the middle of the channel. This section is grazed by wintering wildfowl.

The saltmarsh at this site has been modified by attempted reclamation and drainage in the past. This is most obvious on the southern section where there are deep linear drains cut through the saltmarsh. These old drains pre-date the drawing of the OSI 2nd edition 6 inch map, although they may have been cleaned or deepened since then.

The creation of berms along the upper saltmarsh boundary along much of the channel in the northern section has also modified saltmarsh habitat. Some former saltmarsh in these low-lying areas has been reclaimed behind these berms (870). Some of these dykes are badly maintained in places and the tidal influence is obvious in the maritime element in the grassland habitats. Later modifications have included concrete retaining walls, particularly noticeable on the eastern side of the site towards Wellingtonbridge where erosion has had an obvious impact on the earthen dykes. There is no development of saltmarsh along the front of these concrete structures. The impact of this reclamation is not assessed as it occurred outside the current monitoring period, although these works are still having a residual impact.

Common Cordgrass is present at this site. This is an invasive species of saltmarsh (954). It is not known when Bannow Bay was colonised or was planted by Common Cordgrass, but it has been present since 1960 (Nairn 1986). Small patches of sward have developed mainly along the seaward side of established marsh on former intertidal mudflats. There is also some development of ASM/*Spartina* mosaic in the largest section of saltmarsh where Common Cordgrass has spread into the established saltmarsh and it is having some negative impact on the structure and species composition of this area. The impact of its presence within this mosaic is assessed as moderately negative. There are no indications that there has been significant colonisation by this species during the current monitoring period and it is likely to have mainly become established prior to the current monitoring period. The development of Common Cordgrass along the seaward side of the ASM is not as extensive as other sites within Bannow Bay, possibly owing to the nature of the tidal regime and the location of the site within the upper stretches of the Estuary.

There are some signs of natural erosion (900) at this site, particularly to the island in the centre of the channel and at the northern end of the largest section of saltmarsh. This erosion is mainly due to shifts in position of the main channel and the channel is now undercutting some of the saltmarsh and there are tall saltmarsh cliffs along these sections. The erosion is largely natural but some of the berms near where the two rivers meet have also been damaged by erosion. The creation of berms may be exacerbating the erosional pressure by focusing the river flow into the main channel in periods of flood. There has been a small measurable loss of saltmarsh when the current extent is compared to the extent of saltmarsh marked by the old OSI 2nd edition 6 inch map. About 0.9 ha of saltmarsh has been lost during this period (about 5% over 100 years). However, there has been no measurable loss of saltmarsh during the current monitoring period. The impact of erosion during the current monitoring period is assessed as neutral and having a low intensity.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140). There is also dispersed habitation (403) and some roads (502) in the area. These activities have little or no measurable impact on the saltmarsh habitats other had those already mentioned.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1330	140	C	0	11.5	Inside
H1330	143	B	-1	0.5	Inside
H1330	900	C	0	0.8	Inside
H1330	954	B	-1	0.838	Inside
H1410	140	C	0	1.5	Inside
H1410	143	C	-1	0.4	Inside

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

5 CONSERVATION STATUS

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 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. Previous assessments have concentrated on the entire cSAC.

Clonmines saltmarsh is a moderately sized site with some notable conservation features. These include some sections of fairly intact saltmarsh with typical vegetation zones. Overall, the site has an *unfavourable-inadequate* conservation status (Table 5.1). Most of the site is in good condition. However, there is some localised damage from grazing at the site. The structure of the main marsh has been significantly modified by drainage in the past and these modifications are having a residual impact on the structure of the saltmarsh. The land remains quite boggy, although grazing by livestock is still carried out. The structure of some of the other sections has been modified by the construction of berms along the upper boundary. Common Cordgrass is present at the site but does not form a significant part of the saltmarsh vegetation. There is a small area of ASM/*Spartina* sward mosaic.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	EU Conservation Status Assessment			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent Structure and functions	Future prospects		**Unfavourable - Inadequate**
Atlantic salt meadows (H1330)	Extent	Structure and functions, Future prospects		**Unfavourable-Inadequate**
Mediterranean salt meadows (H1410)	Extent	Structure and functions, Future prospects		**Unfavourable-Inadequate**

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

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. Previous information as to the abundance and distribution of this habitat is scant. Although the habitat is not extensive, there are no indications that there has been any loss of habitat due to natural erosion or spread of Common Cordgrass during the current monitoring period. Indeed it is often recorded as discrete patches, which are some distance removed from the *Spartina* sward.

5.2.2 Habitat structure and functions

Monitoring stops were not carried out in the *Salicornia* habitat owing to its limited distribution and extent of each patch. However, a visual assessment of the vegetation suggests that the structure and functions of the habitat are rated as *favourable*. The habitat forms part of the pioneer zone along the seaward side of the saltmarsh. Although Glasswort is occasionally found among the *Spartina* sward, invariably it is located in small sheltered areas or on shingle. The more exposed examples of the vegetation occur on muddy shingle, which, is not favoured by Common Cordgrass.

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 such as grazing continue in the near future. This habitat is not being affected by any damaging activities at present but may be vulnerable to colonisation by Common Cordgrass in the future, particularly as the patches of habitat are quite small.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. While there is an erosional trend acting on part of this site and there has been measurable loss of saltmarsh habitat over a longer period, there are no indications of any significant loss of habitat due to erosion within the current monitoring period. There have been no land-use changes or significant colonisation by Common Cordgrass at this site during the current monitoring period.

5.3.2 Habitat structure and functions

Sixteen monitoring stops were carried out in this habitat resulting in an *unfavourable-inadequate* structure and functions assessment. Of those, only one failed owing to the level of damage from grazing livestock. Most of the habitat is in good condition but there is localised damage around the site due to heavy grazing levels. The damage is obvious with trampling and poaching commonly noted. The structure of the main saltmarsh has been significantly modified by drainage in the past. Common Cordgrass is present at this site but does not form a substantial part of the vegetation. It has formed an ASM/*Spartina* sward mosaic area in the main section of saltmarsh where clumps of Common Cordgrass are more frequent but this is only about 5% of the overall ASM habitat. However, the impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

There are well-developed examples of several typical ASM zones at this site. There is also some complex zonation in the main saltmarsh. Zonation from ASM to other habitats such as stands of Sea Club-rush and Common Reed are also present, which increase the diversity of the site as a whole.

5.3.3 Future prospects

The future prospects for the Atlantic salt meadows at this site are assessed as *unfavourable-inadequate* for a number of reasons. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. Grazing is having the biggest impact at this site and some sections are suffering from localised poaching damage. Despite earlier attempts at draining parts of the site and the network of relatively deep channels and creeks, much of the land remains relatively wet and boggy underfoot. These same areas are used for livestock grazing which further damages the saltmarsh vegetation to the degree that poaching damage has all but bared the vegetation in places.

Heavy poaching may also promote the spread of Common Cordgrass at this site. Common Cordgrass is not well established at the site and may increase its cover in the future on the

established saltmarsh. Natural erosion due to scouring along the channel is likely to continue in the future. This may have a long-term impact on the extent of ASM.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. There has been no measurable loss of this habitat due to erosion, land-use changes or the spread of Common Cordgrass within the current monitoring period.

5.4.2 Habitat structure and functions

The habitat structure and functions are assessed as *unfavourable-inadequate*. Four monitoring stops were carried out in this habitat and one stop failed. Most attributes reached their targets. However one stop failed due to damage from heavy poaching. Most of the MSM is in good condition but there is some localised damage.

The MSM at this site has a typical species assemblage. It also forms part of the larger saltmarsh system and there are transitions to other vegetation types including stand of Common Reed and Sea Club-rush and stands of ASM. Common Cordgrass is present in this habitat but is not extensive, mainly due to its position in the upper zone of the saltmarsh.

5.4.3 Future prospects

The future prospects of the MSM habitat at Clonmines are rated as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. Grazing is having the most significant impact on this habitat and is likely to continue to cause some localised damage in places.

The MSM is not being negatively affected by other damaging activities. Common Cordgrass is not likely to spread into this habitat as it is uncompetitive in the upper zone. The MSM is not as vulnerable to erosion compared to ASM as it is shielded by this habitat.

6 MANAGEMENT RECOMMENDATIONS

It is likely that flood relief measures will remain in place given the importance and proximity of the saltmarsh to the transit village of Wellingtonbridge. While some of the older dykes are in a state of disrepair, this could lead to unlicensed repair in places and possible damage to the saltmarsh.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats	0.023	0.023				
2	*Spartina* swards	0.726					0.726
3	1330 Atlantic salt meadow	15.163		15.163			
4	1410 Mediterranean salt meadow	1.764			1.764		
5	ASM/MSM mosaic (50/50)	0.316		0.158	0.158		
6	ASM/*Spartina* mosaic	0.838		0.419			0.419
7	1330/other SM (CM2) mosaic	0.252		0.126			
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	4.026					
10	*Spartina* clump/mudflat mosaic (50/50)	0.140					0.070
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*	0.004		0.0038			0.0002
17	1330/sand dune mosaic						
18	Other SM (CM2)	3.929					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**27.18**	**0.023**	**15.870**	**1.922**		**1.215**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Atlantic/Spartina mosaic
- 1330/other SM (CM2) mosaic
- 1330 dom, some Spartina
- Spartina clump/mudflat mosaic
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1410 monitoring stops

Oifreann Oidhreachta agus Rialtais Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Clonmines (Map 1 of 2)

Bannow Bay SAC (000697)

SMP code: SMP0042

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: 22/02/2009
Map version: 1

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

N

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Clonmines (Map 2 of 2)

Bannow Bay SAC (000697)

SMP code: SMP0042

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

N

Date of production: 22/02/2009
Map version: 1

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

Dunbrody Abbey

1 SITE DETAILS

SMP site name: **Dunbrody Abbey**		SMP site code: **0048**	
Dates of site visit **14 & 24/09/2007**		CMP site code: **N/A**	
SM inventory site name: **Dunbrody Abbey**		SM inventory site code: **213**	
NPWS Site Name: **River Barrow and Nore**			
NPWS designation	cSAC: **2168**	MPSU Plan: **N/A**	
	pNHA: **698**	SPA: **N/A**	
County: **Wexford**		Discovery Map: **76**	Grid Ref: **271400, 115400**
Aerial photos (2000 series): **O 5568-D; O 5634-A,B**		6 inch Map No: **Wx 039**	

Annex I habitats currently listed as qualifying interests for River Barrow and Nore cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

Other SMP sites within this SAC/NHA: **Rochestown, Ringville, Kilowen**

Saltmarsh type: **Estuary** Substrate type: **Mud/*Phragmites* peat**

2 SITE DESCRIPTION

Dunbrody Abbey saltmarsh is located in the Campile River estuary 12 .5 km south of New Ross in Co. Wexford. The Campile River is a tributary of the River Barrow Estuary and the saltmarsh site is located near the mouth of the Campile estuary. Dunbrody Abbey is located adjacent to the survey site on the southern side of the river. It is one of four Saltmarsh Inventory sites (Curtis & Sheehy-Skeffington 1998) found in the River Barrow estuary and is also the most southerly of these sites. Saltmarsh habitat is found along both sides of the Campile Estuary. The survey site extended from Saltmills Townland to Dunbrody Bridge. The Campile estuary extends further eastwards but this section mainly contains brackish habitats.

A tall stone embankment has been built along the northern side of the Campile River. A large area of low-lying tidal flats between Greatisland and Kilmannock Townlands was reclaimed in the 19th century behind this embankment. Most of this reclaimed land now contains farmland. There is still some tidal influence on the drainage channels that drain this area behind the tall embankment. Some saltmarsh, brackish and marshland habitat has developed along some of the drains behind this embankment. The Wexford-Waterford Railway was also built in the 19th century and crosses the Campile River north of Dunbrody Abbey. Several other smaller low-lying areas have been reclaimed in the past 100 years along the Campile River estuary. Some have been reclaimed more recently.

Most of the area around the site is quite rural although there is dispersed habitation along minor roads in the area. The landscape in this area is quite variable. The area around both Greatisland and Saltmills contains moderately sloped hillside. The area around Kilmannock is

low-lying and flatter. Both sides are dominated by agricultural grassland with significant amounts of cereal crops. There is also some conifer plantation located to the south of the site within the area enclosed by the embankment.

The site is located within the River Barrow and Nore candidate Special Area of Conservation (cSAC) (002168) and the River Barrow Estuary (698). The site was also listed as part of the River Barrow saltmarshes ASI in the Co. Wexford ASI report (Goodwillie 1979). This site was initially designated as an individual proposed Natural Heritage Area (pNHA) Dunbrody (779) and was then subsumed into the River Barrow Estuary pNHA (698). Two Annex I habitats are present at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both these habitats are listed as qualifying interests for the River Barrow and Nore cSAC.

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.

The brackish and saltmarsh habitats found behind the tall embankment in Kilmannock are quite important as this area is the site of several rare species. One very notable species previously recorded at the site is Divided Sedge (*Carex divisa*). Divided Sedge is one of several species that is an indicator of Mediterranean salt meadows. This species is extremely rare in Ireland and is only known from three sites in the River Barrow estuary. It was listed as possibly extinct in the Red Data Book (Curtis & McGough 1988) but was subsequently re-found and is also listed in the Flora Protection Order. This species is known from brackish or marshy areas along the Barrow Estuary. This species is only found in two 10 km^2 squares along the Barrow Estuary since 1960 and there is also a record in one 10 km^2 square in Co. Antrim near Belfast Lough (Preston *et al.* 2002). This species was not re-found during his survey.

Other very notable species previously recorded at this site include Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum).* Both these species are listed on the Flora Protection Order and are listed in the Red Data Book (Curtis & McGough 1988). Both these species are found in more brackish conditions than found in ASM. Borrer's Saltmarsh-grass is generally found in upper saltmarsh and muddy transitional areas particularly along embankments adjacent to coastal areas. It is an indicator of a rarer sub-type of MSM. This species is only found from seven 10 km^2 squares along the Barrow Estuary, Wexford Harbour and Dublin Bay since 1960 (Preston *et al.* 2002). Meadow Barley is found in brackish situations and in unimproved lowland meadows close to estuaries. Meadow Barley is found in brackish meadows at several locations along the River Barrow Estuary. This species is known from 21 10 km^2 squares in Ireland mainly distributed around the coastline (with some inland sites) since 1960. Both these species were recorded during this survey.

The Natura 2000 explanatory notes for this cSAC assess Atlantic salt meadows and Mediterranean salt meadows together. The notes describe of the percolation of saltwater at the upper edge of the salt meadow where Divided Sedge, Borrer's Saltmarsh-grass and Meadow Barley are present. These conditions are described as indicative of the Mediterranean sub-type of saltmarsh.

The Rare Plant Survey (1990) surveyed this site for each of these species. The species are frequently associated with common terrestrial grassland species such as Tall Fescue (*Festuca arundinacea*), Creeping Thistle (*Cirsium arvense*), Common Birdsfoot (*Lotus corniculatus*) and Cocksfoot (*Dactylis glomerata*) as well as typical species found in brackish and saltmarsh conditions. Meadow Barley is known from drier terrestrial conditions, Divided Sedge is intermediate and Borrer's Saltmarsh-grass is found in the most brackish and wetter conditions.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh at this site is spread over several distinct fragments in different areas and for the purposes of this description can be divided into two sections, saltmarsh in the Campile River estuary and saltmarsh behind the embankment in Kilmannock.

3.1.1 Campile River estuary

Atlantic salt meadows is the more common Annex I habitat present (Table 3.1). This habitat is mainly found in small low-lying patches of consolidated mud that have developed along the Campile River Channel. There is also a significant amount of *Spartina* sward along the Campile River. Clumps and larger areas of Common Cordgrass are spread all along the sides of the river channel. The river channel has been considerably modified with the development of embankments on both sides of the river and the reclamation of intertidal habitats. Some of the areas of saltmarsh further south in the survey site (in Saltmills) are probably found on the original shoreline. ASM saltmarsh has developed in narrow bands along the shoreline at Saltmills and in a larger area behind a spit (or old embankment). This area also contains some MSM dominated by Sea Rush (*Juncus maritimus*). *Spartina* swards are distributed along the estuarine edge of the marsh.

Saltmarsh found higher in the estuary around Dunbrody Abbey has probably developed after the creation of the embankments and railway bridge. Several small 'islands' in the river channel along Dunbrody Abbey contain patches of ASM surrounded by *Spartina* sward. There are also small areas of ASM/*Spartina* sward mosaic.

There are also several low-lying areas behind embankments that contain saltmarsh. These areas are connected to the main estuary via drains and there is still tidal influence on these sections. One of these areas is found to the east of Dunbrody Bridge where a small patch of modified saltmarsh is situated behind a tall Twitch-dominated embankment. This patch of saltmarsh has been modified by drainage and there have probably been attempts to reclaim it in the past. ASM saltmarsh and brackish grassland (CM2) is also found in a small area behind an embankment south of Dunbrody Abbey. This area was not surveyed due to access problems.

Atlantic salt meadows are less prominent between the railway bridge and the Dunbrody road bridge. A relatively large area of saltmarsh has been reclaimed along the southern side in the past 50 years and a new earth embankment has been built close to the river bank. Twitch-dominated grassland is found along the railway embankment and on a newer embankment along the southern river bank. This vegetation has been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. The

northern river bank, which is overhung by tall trees, also contains Twitch-dominated grassland. Common Cordgrass has also colonised along the edge of the Twitch in places and clumps have consolidated into *Spartina* swards.

The Campile estuary continues further east of the Dunbrody road bridge. This section of the estuary mainly contains Twitch-dominated grassland along earth embankments. Further east towards Campile, there are several patches of brackish habitat dominated by Sea Club-rush (*Bolboschoenus maritimus*) and Common Reed (*Phragmites australis*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. This area was not surveyed.

3.1.2 Kilmannock

Saltmarsh is also located behind the tall stone embankment in Kilmannock. A hedge and some scrub have developed on top of the embankment. A large pasture is situated adjacent to the embankment a large drainage channel that drains this section of reclaimed land is situated along the north side of the pasture and separates the pasture from cereal crops in adjacent fields. This area is occasionally flooded via this drain, which enters the main estuary channel further west near Greatisland Power Station. Flow through the drain may be controlled by a one-way culvert that sometimes jams open, allowing tidal influence into the drainage channel. The landowner indicates that the pasture may be flooded for relatively long periods depending on the prevailing wind and spring tides. This means that the pasture can be covered by brackish water at infrequent times but for relatively long periods. The NHA notes and other sources also mention that there may be seepage of salt water under the embankment and this may be the source of the brackish conditions.

A narrow band of brackish habitat (CM2) dominated by Sea Club-rush is present along lower-lying land adjacent to the southern side of the main drainage channel in the pasture. There is only a small strip of brackish habitat on the northern side of the channel. Clumps of Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*) are also present in this zone and further east this species becomes occasionally frequent. This zone also contains occasionally frequent saltmarsh species such as Sea Plantain, Sea Milkwort, Saltmarsh Rush (*Juncus gerardii*), Greater Sea-spurrey (*Spergularia media*), Sea Arrowgrass, Red Fescue, and Creeping Bent. There are also patches of ASM type vegetation within this zone. This zone widens towards the western end and forms a large patch dominated by Sea Club-rush. The brackish strip transitions to a strip of wet grassland (GS4) dominated by Hard Rush (*Juncus inflexus*) in a slightly higher zone and then to improved grassland that forms the main part of the pasture.

The main areas of brackish MSM are located at either end of this pasture. The eastern end of the pasture contains some brackish saltmarsh (MSM and ASM) mapped as a mosaic. The western low-lying end of the pasture contains the largest area of saltmarsh behind the embankment. A narrow strip of ASM has developed along the edge of the area dominated by Sea Club-rush. This area also contains a very narrow strip mapped as MSM located along the foot of the embankment that contains Borrer's saltmarsh-grass. This brackish vegetation is associated with a secondary drain that is situated along the foot of the embankment.

The large drain continues west along the embankment west of the pasture. This area has been planted with broad-leaves and conifers in the past 20 years and a narrow band of rank grassland has been left unplanted between the embankment and the conifer plantation. The NHA survey noted that some of the broad-leaves had died and this was due to saline

seepage from under the embankment. There are some patches of brackish grassland along this drainage channel. Sea Club-rush has also colonised sections of the drainage channel.

The large drain also continues east along the embankment, east of the pasture. The drain is infilled with Sea Club-rush. There is a narrow strip of semi-natural grassland still remaining between the embankment and the large drain. Land adjacent to the north side of the drain contains cereal crops. There are several small patches along the eastern section the embankment that contain colonies of Borrer's Saltmarsh-grass.

Table 3.1. Area of saltmarsh habitats mapped at Dunbrody Abbey.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1.713
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.129
non-Annex	*Spartina* swards	1.208
	Total*	**3.050**

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

3.2 Atlantic salt meadows (H1330)

The best example of this habitat is found at Saltmills. The marsh is dominated by a low-mid marsh community. This community is dominated by a mixture of Sea Arrowgrass, Common Saltmarsh-grass, Sea Pink and Sea Plantain. Sea Aster is also present. Common Cordgrass is present in the ASM but is rare. Some tussocks with Red Fescue and Autumn Hawkbit are present. Attempts may have been made to reclaim this area in the past as an embankment is present along the estuarine edge of the eastern section. An old wall was built across the saltmarsh in the past and split it in half. This saltmarsh is grazed with a low-moderate intensity. Poaching damage is minor and was localised around the path onto the marsh. Zonation of saltmarsh vegetation is evident along the embankment with transition from low-mid vegetation to mid-upper vegetation dominated by Red Fescue and then a band of Creeping Bentgrass. This vegetation also contains Parsley Water-dropwort (*Oenanthe lachenalii*) and White Clover (*Trifolium repens*). The saltmarsh vegetation along the embankment transitions to Twitch-dominated vegetation higher up on the embankment.

There are also several patches of ASM on 'islands' or on patches along the embankments in the estuary channel. This ASM is mainly dominated by Common Saltmarsh-grass with occasional Sea Aster and clumps of common Cordgrass.

A small area of ASM is located at the eastern end of the pasture in Kilmannock. This area is dominated by Saltmarsh Rush and Sea Milkwort and also contains Sea Aster, Sea Plantain, Sea Arrowgrass, Creeping bent, Autumn Hawkbit, Curled Dock and Autumn Hawkbit. This area is surrounded by Sea Club-rush and this species seems to be spreading into the ASM zone. This area of ASM is moderately poached.

Further west on the narrow grassy strip adjacent to the conifer plantation there are several small unmapped patches along the drainage channel dominated by Saltmarsh Rush. This area is not grazed.

3.3 Mediterranean salt meadows (H1410)

There is a small area of classic MSM dominated by tussocks of Sea Rush at Saltmills. This area also contains frequent Sea Pink, Sea Arrowgrass and Fed Fescue, and smaller amounts of Creeping Bent, Autumn Hawkbit, Sea Aster and Sea Plantain.

Mediterranean salt meadows characterised by the presence of Borrer's Saltmarsh-grass is present at the western and eastern end of the pasture. Brackish vegetation is situated along the secondary drain along the foot of the embankment. This habitat is only several metres wide and is located between the large areas dominated by Sea Club-rush and the drier edge of the embankment.

This vegetation is dominated by grasses and contains a mixture of brackish species and species more typical of freshwater marsh and wet grassland. Species include Creeping Bent, Kneed Fox-tail (*Alopecurus geniculatus*), Curled Dock (*Rumex crispus*), Saltmarsh Rush, Celery-leaved Buttercup (*Ranunculus sceleratus*), Greater Sea-spurrey, Sea Club-rush, False Fox-sedge (*Carex otrubae*), Spear-leaved Orache, Marsh Arrowgrass (*Triglochin palustris*), Hard Rush, Perennial Rye-grass (*Lolium perenne*), White Clover, Birdsfoot (*Lotus corniculatus*), Sea Aster, Sea Milkwort, Sea Arrowgrass, Silverweed (*Potentilla anserina*), Common Saltmarsh-grass and Toad Rush (*Juncus bufonius*). This area is grazed and is moderately poached. Brackish species like Borrer's Saltmarsh-grass can be found in small hollows while Hard Rush grows on tussocks. Borrer's Saltmarsh-grass is only found at low cover values (2-5%). Some poaching seems to be beneficial to Borrer's Saltmarsh-grass, while too much poaching will destroy the vegetation and create bare patches of substrate. Between 50-100 Borrer's Saltmarsh-grass plants were estimated to be present. The brackish influence does not extend very far into the pasture and the disappearance of species such as Sea Arrowgrass, Sea Plantain and Common Saltmarsh-grass and the greater frequency of Hard Rush and Perennial Rye-grass indicates the development of wet grassland or drier pasture.

Similar habitat is found at the western end of the pasture. There are several poached areas with Borrer's Saltmarsh-grass along the cattle track and along the edges of the secondary drain in this area. Sea Club-rush is found in the secondary drain at the foot of the embankment and the brackish influence extends fro 1-2 m either side of the drain and into small hollows along this drain.

Borrer's Saltmarsh-grass was also noted along a cattle track that is situated at the foot of the embankment at the eastern end of the site. Small poached patches that may be only 1-2 m in diameter with wetter substrate contain these species. These patches are somewhat elevated and seem to be beyond the influence of brackish water from the adjacent drainage channel and may be the result of seepage through the embankment. The NHA survey notes also note that seepage may be occurring under the embankment to create the brackish areas. Other species associated with Borrer's Saltmarsh-grass in these poached areas include Red Fescue, Creeping Bent, Perennial Rye-grass, Toad Rush, Curled Dock, Spear-leaved Orache and White Clover. Most of these patches are not mapped as habitat as they were so small, but the presence of Borrer's Saltmarsh grass was recorded in the Notable Species shapefile.

3.4 *Spartina* swards

This habitat is found in the Campile River Estuary. Common Cordgrass is not found behind the embankment in Kilmannock and is rare eastwards of the Dunbrody road bridge. However, it is frequently found in the estuary west of the Dunbrody road bridge. Common

Cordgrass has mainly colonised on soft mudflats in the estuary and these clumps have coalesced to form *Spartina* swards. These patches of *Spartina* sward have mainly developed along the edges of the estuary channel. *Spartina* sward has also developed around the small low-lying 'islands' of ASM located near to Dunbrody Abbey. In some instances it has formed small patches of ASM/*Spartina* mosaic. Common Cordgrass is not a significant feature in the larger fragments of ASM saltmarsh found at Saltmills.

4 IMPACTS AND ACTIVITIES

Several impacts and activities act on the saltmarsh habitats at this site (Table 4.1). The main impact is grazing (140). Cattle graze the pasture behind Kilmannock embankment. The saltmarsh situated along the Campile River estuary is generally not grazed as most of it is inaccessible to livestock. The small area located behind an embankment at Saltmills is grazed. The grazing intensity was moderate at the time of the survey in the pasture at Kilmannock. The brackish and saltmarsh areas are moderately-heavily poached as they are wetter compared to the drier pasture (143). However the sward height is variable (5-10 cm) and is not overgrazed. This poaching damage creates bare substrate and may actually suit Borrer's Saltmarsh-grass, which seems to prefer wet brackish poached habitat. The grazing intensity may have increased somewhat within the pasture during the current monitoring period. Pictures taken during the NPWS Rare Plant Survey in 1990 indicate that the overall sward height was much higher at that time compared to the current survey.

The pictures taken during the rare plant survey also indicate that the pasture may have been improved somewhat (103) since the Rare Plant Survey. Curtis and Fitzgerald (1994) noted that the pasture in Kilmannock was the subject of some drainage works in 1992. This drainage was likely to have had a significant impact on the condition of the pasture and have reduced the area of suitable habitat. This may also involve the spreading of some fertiliser rather than reseeding of the pasture. More detailed fieldwork is required to determine the level of improvement. While the drainage works occurred outside the current monitoring period, they are considered in this assessment, due to their significance on the condition of the MSM habitat and the status of the rare species found at this site.

The narrow strip of grassland west of the pasture is not grazed. The NPWS Rare Plant Survey noted that this area was grazed at this time and that both sides of the fence were badly poached. The area west of the fence at the western end of the pasture has changed significantly as the drier parts of the filed have been planted with conifers. The development of forestry is not likely to have replaced saltmarsh or brackish habitat, although the lack of grazing or under-grazing may have affected it (149). The poaching intensity on the eastern side of the fence was been reduced, so there may not be any significant change in grazing intensity.

Common Cordgrass is present at this site and is frequently found along the Campile River estuary. This is an invasive species of saltmarsh (954). It is not known when Common Cordgrass colonised the Barrow River Estuary and if it was planted, but it was known to be present in Waterford Harbour since 1960 (Nairn 1986). This species is known in the River Barrow estuary as far as Kilowen saltmarsh.

Common Cordgrass forms mosaics in places around some of the small 'islands' in the main river channel. This species is rare in the estuary above the Dunbrody river bridge. There is a

low potential for this species to expand on the ASM, mainly due to the relatively small area of ASM present in the estuary. Common Cordgrass is already present around the fringes of the ASM islands, which is its preferred niche. The impact of its presence is assessed as a low negative impact in these areas. There may be some further potential for the spread of Common Cordgrass on intertidal mudflats along the estuary. It was not recorded in the area behind the embankment. A comparison of the OSI 2000 and 2005 series aerial photographs does not indicate any significant expansion or change in the cover of *Spartina* swards in the estuary. The 1995 photographs were not available.

Erosion of saltmarsh at this site is not significant (900). A moderate saltmarsh cliff is present along the edge of the some of the larger areas of saltmarsh present in the estuary channel, with the best example at Saltmills. Common Cordgrass is frequently present along the edge of these cliffs. 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. The impact of erosion is assessed as having a neutral impact with a low intensity.

Table 4.1. Intensity of various activities on saltmarsh habitats at Dunbrody Abbey.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	103	B	-1	0.260	Inside
1330	143	B	-1	0.260	Inside
1330	802	A	-2	0.75	Inside
1330	900	C	0	0.015	Inside
1330	954	C	-1	0.2	Inside
1410	103	A	-2	0.129	Inside
1410	143	B	+1	0.129	Inside
1410	149	C	-1	0.001	Inside

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

The Campile River estuary has been considerably modified by reclamation in the past 200 years. The largest section was reclaimed in the 19th century and created the brackish and saltmarsh habitat in Kilmannock. There have also been attempts to reclaim smaller areas, mainly along the southern side of the Campile River estuary (802). A comparison of the OSI 2nd edition 6 inch map to the OSI 2000 series aerial photos indicates that saltmarsh was more extensive in the past. Some of the attempts at reclamation have only been partially successful and saltmarsh and brackish habitat is still present behind some of the embankments. There are no indications that any of these reclamation works occurred during the current monitoring period.

The most recent reclamation occurred in the pasture located north of the railway bridge on the east side of the estuary at Dunbrody Abbey (802). The NHA survey notes indicated that a new embankment had been constructed and some saltmarsh habitat was still present behind the embankment (winter 1995). This reclamation (estimated to be 0.75 ha of ASM) can be

included within the assessment of impacts and activities. This area now contains improved grassland.

The main impacts and activities adjacent to the site are cultivation (100), fertilization (120) and the grazing of livestock (140) related to farming practises. Other impacts and activities include dispersed habitation (403), the Waterford-Wexford railway (503), forestry (160) and amenity use of Dunbrody Abbey (620). Wexford County Council have advertised for tenders to repair parts of the stone embankment at Kilmannock in the past few years.

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 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 is some additional information available from the NPWS Rare Plant Survey.

The overall conservation status of this site is assessed as *unfavourable-bad* (Table 5.1). Dunbrody Abbey saltmarsh is a very notable site in a national context, as three rare species have been recorded from this site. The largest population of one of these species, Divided Sedge (found only at two other sites along the River Barrow estuary) was recorded from this site in the past. However the status of this species is uncertain, as it was not recorded during the 2007 survey, despite considerable searching.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Dunbrody Abbey.

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
Mediterranean salt meadows (1410)			Extent Structure and functions, Future prospects	Unfavourable - bad

Some saltmarsh has been reclaimed along the Campile estuary during the current monitoring period. The remaining ASM in the Campile River estuary is in generally good condition. The brackish marsh and MSM found in the pasture in Kilmannock has also been affected by drainage and land improvement works, prior to the current monitoring period. The 1995 OSI aerial photos are not available for Wexford so no comparison can be made between 1995 and

2000. Common Cordgrass is also present within the Campile River estuary, but is not thought to have had a significant impact on the extent of ASM found in the estuary.

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

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of this habitat is assessed as *unfavourable-bad*. There are no indications of any measurable loss of habitat due to erosion and natural habitat change within the current monitoring period. However, this habitat is mainly found in small discontinuous fragments along the Campile estuary, with small patches also found in Kilmannock behind the embankment. Common Cordgrass is present on the ASM and is frequently associated with it along the Campile Estuary. There are no indications of any significant loss of ASM habitat due to its colonisation on this site during the current monitoring period.

There has been some loss of saltmarsh due to reclamation along the Campile estuary over the past 100 years. The most recent reclamation is present north of the railway embankment on the east side of the river at Dunbrody Abbey. It is estimated that about 0.75 ha of saltmarsh was reclaimed. The NHA survey notes mention that a new embankment had been constructed in 1995 but saltmarsh was still present. This area now contains improved grassland.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Six monitoring stops were carried out in this habitat and five passed. Most of the attributes required for the structure and functions of this habitat reached their targets. One stop failed due to damage caused by heavy grazing and poaching by cattle. The ASM habitat found in the Campile estuary is not particularly well developed and is not as extensive compared to other sites in the River Barrow estuary. Most of the habitat is not subject to any significant grazing pressure as it is found in small fragments along the estuary, which are inaccessible. Common Cordgrass is found associated with many of these small fragments and sometimes forms mosaics with ASM on the low-lying islands within the Campile River estuary. However, the impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

Some habitat is associated with the brackish habitats found at Kilmannock, behind the embankment. This area is part of a pasture and is being grazed. The grazing intensity has caused some poaching damage. The grazing intensity has probably not varied significantly within the current monitoring period. The habitat structure is not particularly well-developed in this area and the habitat only covers a small zone along the edge of more brackish habitat. However, the ASM forms part of a more complex brackish area containing rare species that is influenced by seepage of seawater through or under the embankment and tidal influence along the large drainage channel.

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. Much of the habitat at this site within the Camplie Estuary is currently in good condition. No significant erosion was noted along the saltmarsh in this estuary.

Common Cordgrass is present in this estuary. This is an invasive species although it is not likely to spread significantly in the future and reduce the extent of ASM. This is mainly due to the relatively small extent of ASM already present within the estuary and the fact that some of the habitat is situated at tidal levels too high for significant colonisation. The small ASM 'islands' present within the estuary may be somewhat more vulnerable to the spread of Common Cordgrass. Common Cordgrass may also spread and increase its extent in the future at the expense of intertidal mudflats in the estuary.

Most of the saltmarsh habitats are within a cSAC, so the habitat should not be affected by other land-use changes.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

Typical MSM vegetation is not well developed at Dunbrody Abbey site. The habitat is classified as the areas associated with Borrer's Saltmarsh-grass, Divided Sedge and Meadow Barley, which are characteristic of a MSM habitat subtype and are located behind the Kilmannock embankment. The Rare Plant Survey recorded these species as being distributed over a significant area of pasture. The extent of this habitat is assessed as *unfavourable-bad*. This habitat is now confined to two small areas at each end of the large pasture in Kilmannock, behind the embankment.

The extent of Borrer's Saltmarsh-grass has reduced significantly when compared to the previous extent outlined in the Rare Plant Survey (1990-1992). Several hundreds of plants were recorded during the Rare Plant Survey in 1990, whereas less than 50 plants were present in 2007. Borrer's Saltmarsh-grass is not found at the western side of the fence at the western side of the pasture, as this area is not grazed at present. The frequency of this species has reduced significantly. However, its distribution at the site may have increased slightly, as no plants were noted along the eastern side of the embankment by the earlier Rare Plant Survey.

Divided Sedge was not recorded during the 2007 survey so its status remains uncertain. This species was previously abundant in places and was spread over a significant area of the pasture, as indicated by the Rare Plant Survey. Meadow Barley was also recorded from this area and was quite frequent in the pasture and was associated with the Divided Sedge, but again this species was also not recorded in the pasture in 2007. It was only recorded on the adjacent embankment.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*. Three monitoring stops were carried out in this habitat and two passed. One stop failed due to excessive poaching damage.

Two different sub-types of this habitat are present. A very small patch of the more typical sub-type, dominated by Sea Rush, is present in the small area of saltmarsh located at Saltmills in the Campile River Estuary. The rarer sub-type with Divided Sedge, Borrer's Saltmarsh-grass and Meadow Barley was formerly present in the pasture at Kilmannock and was distributed over a relatively large area. The Rare Plant Survey reports (1990-1992) indicate that the distribution of these species overlaps in places. Since Divided Sedge and Meadow Barley was not re-recorded in the pasture at this site in 2007, the structure and functions are assessed as *unfavourable-bad*. The absence of Divided Sedge may be due to the timing of the fieldwork late in the season or heavy grazing levels in this site. Reclamation of this area may also have had a significant impact.

Curtis and Fitzgerald (1994) described surveys of Divided Sedge Habitat in this area in 1990-1992. They noted that unless the flower heads are visible, Divided Sedge can be extremely hard to find and that heavy grazing may mean they are unnoticed for several years. Curtis and Fitzgerald (1994) also noted that this site was the subject of extensive drainage in 1992 and the range of the species (in the pasture) has reduced significantly.

Curtis and Fitzgerald (1994) noted that occasional salt influx, regular cycles of grazing and trampling and winter inundation create a vegetation pattern favourable to these specialist species. The site at Kilmannock is still being affected by salt influx via seepage and tidal influence along the drainage channel. The pasture (but not the narrow strip of grassland located further west along the woodland) is still grazed. The grazing levels are probably favourable to the status of Borrer's Saltmarsh-grass. Any reduction in extent of this habitat could be related to reclamation and land improvement in the years prior to the current monitoring period (1990-1995). Common Cordgrass is not present and does not affect this habitat.

5.3.3 Future prospects

The future prospects of this site are assessed as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts continue in the near future. The status of Divided Sedge at the site in Kilmannock is uncertain. The extent of Borrer's Saltmarsh-grass has retracted in the current monitoring period and this is likely to be linked to drainage works during the 1990's. Drainage of the site may have created unfavourable conditions for this species (and for Divided Sedge and Meadow Barley) and it may be difficult to reverse this trend and recreate more favourable conditions.

The saltmarsh habitats are within a cSAC, so the habitat should not be affected by land-use changes. (However, nature conservation designation was not able to protect the site at Kilmannock from reclamation and drainage works in the 90s).

6 MANAGEMENT RECOMMENDATIONS

This site is very important in a national context, as it was the site of three rare species in Kilmannock. The largest populations of Divided Sedge, an extremely rare species, were found at this site. The current status of Divided Sedge is uncertain as it was not recorded during the current survey in 2007.

This site is still under the influence of a notable set of ecological conditions, including infrequent salt influx, which has created these brackish conditions. Further survey work is required to confirm the status of each of the three rare species previously found at this site.

The NHA survey notes mention that several areas including the large area of immature woodland to the west of the pasture in Kilmannock could revert to saltmarsh if the embankment was breached and this was the reason why they were left in the pNHA/cSAC. The NHA survey notes mentioned that some of the trees along the large drainage channel had died due to saline influence.

Some consideration should be given to actively manage the site with nature conservation as the primary objective. Perhaps some or all of the relevant land influence by brackish conditions behind the embankment could be bought by NPWS and then grazed to create a suitable regime (or regimes) for the rare species. The narrow strip of grassland that extends along the embankment to the west of the pasture should also be considered. This area should be grazed anyway to create suitable habitat for Borrer's Saltmarsh grass.

A bigger scale project could involve breaching the current embankment and re-flooding some of the land behind the embankment to re-create saltmarsh and brackish conditions (Managed retreat). All of the former intertidal area does not need to be re-flooded. Some farmland could be protected by a series of secondary embankments.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Curtis, T.G.F. & Fitzgerald, R.J. (1994). The re-discovery of *Carex divisa* Hudson, divided sedge, in Ireland. *Irish Naturalists Journal*, **24**, 496-498.

Goodwillie R. (1979). A preliminary report on the areas of scientific interest in Co. Wexford. An Foras Forthbatha.

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

NHA database (1990). Information from files of pNHAs held by NPWS.

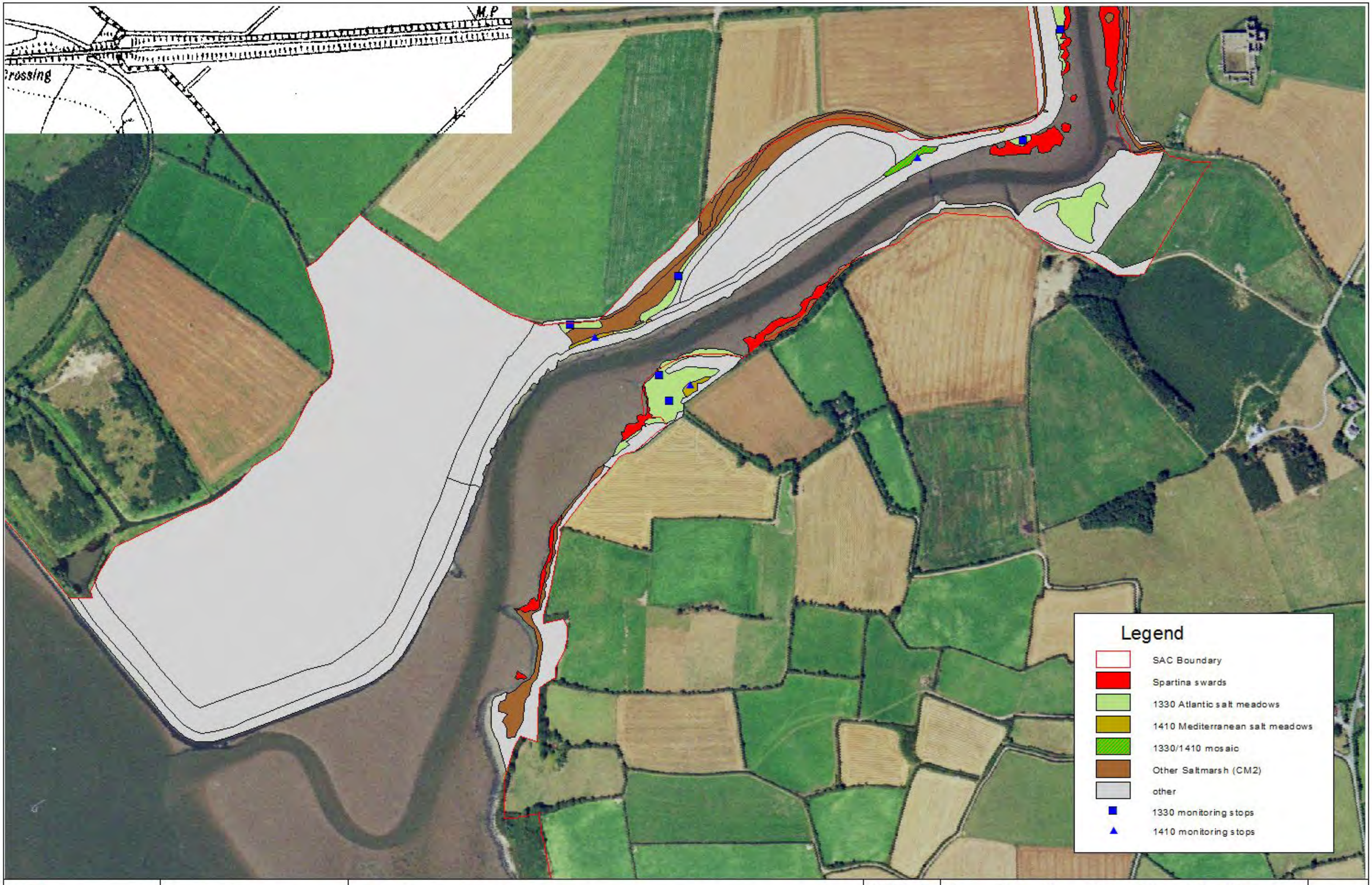
Preston, C.D. Pearman, A. & Dines, D. (2002). *New atlas of the British and Irish Flora*. Oxford University Press.

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards	1.208					1.208
3	1330 Atlantic salt meadow	1.674		1.674			
4	1410 Mediterranean salt meadow	0.080			0.080		
5	ASM/MSM mosaic (50/50)	0.079		0.039	0.039		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	34.496					
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)	3.928					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**41.465**		**1.713**	**0.129**		**1.208**



Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Dunbrody (Map 1 of 2)

River Barrow and River Nore SAC (002162)

SMP code: SMP0048

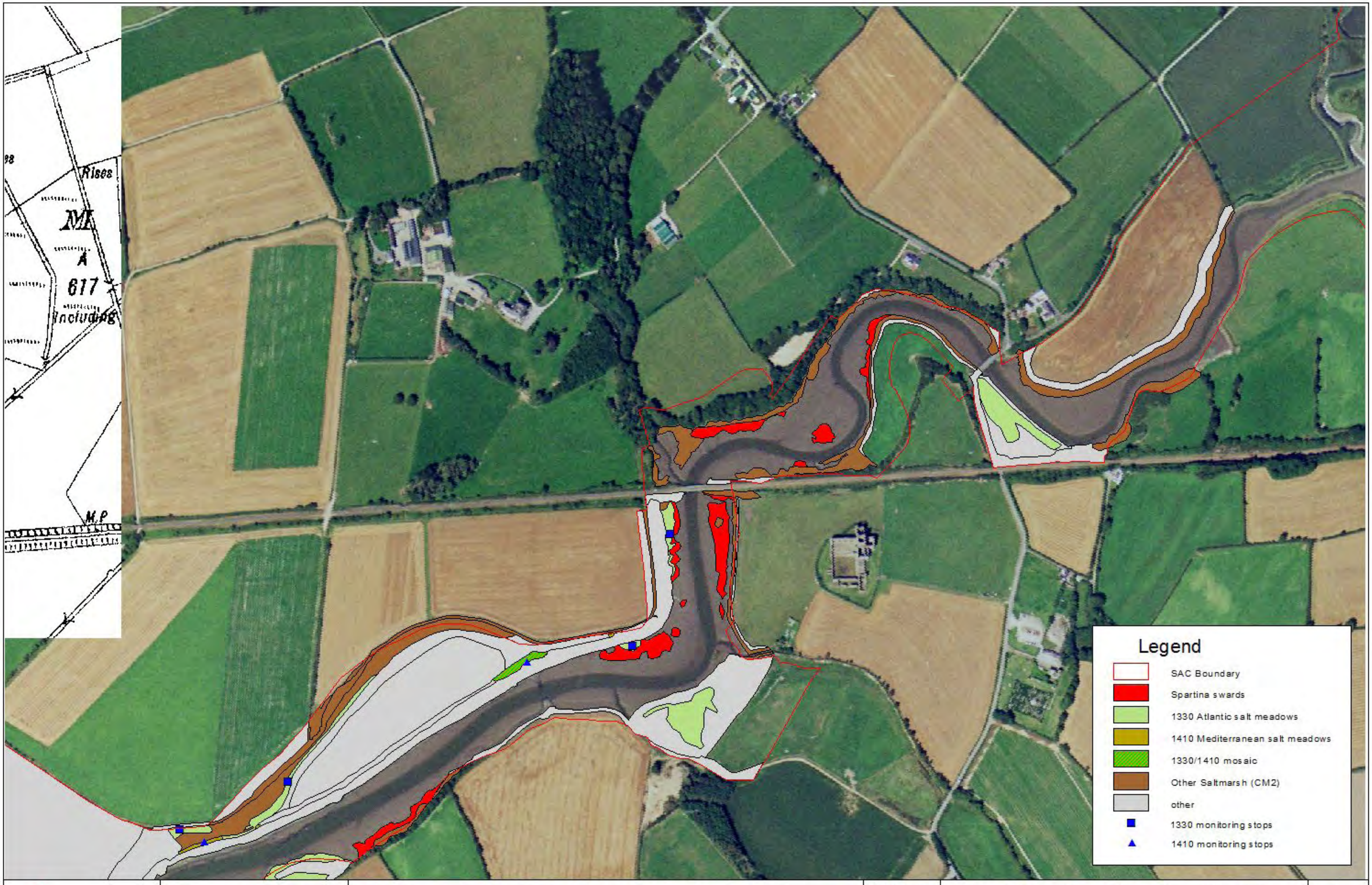
This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are subject to revision. Produced from Ordnance Survey material by permission of the Government (Permit number 5953)

0 70 140 210 280 350 Meters

Date of production: 22/02/2009
Map version: 1

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

N



Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Dunbrody (Map 2 of 2)

River Barrow and River Nore SAC (002162)

SMP code: SMP0048

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 70 140 210 280 350 Meters

N

Date of production: 22/02/2009
Map version: 1

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

Duncormick

1 SITE DETAILS

SMP site name: **Duncormick**		SMP site code: **SMP0006**
Site name (Curtis list): **Duncormick**		CMP site code: **Not surveyed**
		Site No: (Curtis list): **231**
NPWS Site Name: **Ballyteige Burrow**		Dates of site visit: **8+9/06/2006**
NPWS designation	cSAC: **696**	MPSU Plan: **new format plan available**
	pNHA: **696**	
	SPA: **Ballyteige Burrow SPA 4020**	
	Nature reserve: **Ballyteige Burrow (S.I. no 279 of 1987 and 8 of 1990)**	
County: **Wexford**		Discovery Map: **77** Grid Ref: **291793, 107820**
1st ed 6 inch Map No: **Wx46**		Aerial photos (1995 series): **not available**
2nd ed 6 inch Map No: **Wx46**		Aerial photos (2000 series): **5780-b, 5781-a**
		Aerial photos (2000 series): **0692606, 0692608, 0690606, 0690608**

Annex I habitats currently designated for Ballyteige Burrow *c*SAC:

***Salicornia* and other annuals colonizing 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)

Other SMP sites within this cSAC/pNHA: **Ballyteige**

Saltmarsh type: **Sandflats** Substrate type: **Mud/sand with iron**

2 SITE DESCRIPTION

Duncormick saltmarsh is located along the southern Wexford coast, 2 km south of Duncormick village, which is 8 km north-west of Kilmore Quay. The site is part of Ballyteige Burrow Nature Reserve and is owned by NPWS. Duncormick saltmarsh is located along the northern side of the intertidal and subtidal area enclosed by Ballyteige Burrow. Saltmarsh also lines the landward side of Ballyteige Burrow, which is a separate site (SMP0005). The site can be accessed by a small lane leading to the coast from minor roads to the south-west of Duncormick Village. The site is then accessed by following the seawall east at low tide to the saltmarsh. The site is shaped like a finger extending from the northern shore into a spit. A ridge runs along the seaward side with the main saltmarsh area located behind the ridge. The saltmarsh has developed behind this ridge and behind a second artificial embankment

along the eastern side. A small intertidal 'bay' containing mudflats occurs on the eastern side behind the second embankment.

The ridge is comprised of pebbles, shingle and embryonic dune in places and the summit is vegetated by Twitch (*Elytrigia repens*), Marram grass (*Ammophila arenaria*) and other coastal and dune species. Further east the ridge grows wider and fixed dune grassland and some Gorse (*Ulex europaea*) scrub has developed. The western and highest part of the saltmarsh contains some transitional areas with brackish and dry grassland developing. Some saltmarsh extends along the coastline to the north.

The intertidal area is fed by two main watercourses, a stream/artificial channel at the Cull (managed by a sluice) and the Duncormick River. The Cull is a long, narrow sea inlet and estuary of the Duncormick River. The eastern portion of this inter-tidal system was reclaimed in the last century by construction of the Cull Bank and is now polder land. The drains and pumping station of the polder are maintained by the Drainage Dept. of the OPW.

Two Annex I habitats, Atlantic salt meadows (1330) (ASM) and Mediterranean salt meadows (1410) (MSM) are found at this site. Both habitats are listed as qualifying interests for the Ballyteige Burrow cSAC. Clumps of Common Cordgrass (*Spartina anglica*) are present on the site but are scattered over the site and do not form swards. Nearly all the saltmarsh habitat is included within the cSAC boundary. There is a small area of ASM and MSM located along the Duncormick Estuary excluded from the cSAC. This area was excluded because the edge of the shoreline was used to draw the cSAC boundary and not the high water boundary.

3 HABITATS

3.1 General description

The main block of saltmarsh at Duncormick is located behind the stony coastal barrier. The saltmarsh floods and drains from the eastern side through the small 'bay'. The eastern side contains the most lower-marsh vegetation with upper saltmarsh vegetation developing on more elevated ground towards the ridge and the fence-line along the northern boundary. The main area is dominated by ASM. There

are several small clumps of Sea Rush (*Juncus maritimus*) scattered over the area that are mapped as MSM. However, these areas were too small to carry out a conservation assessment of this habitat. A mosaic of Sea Rush-Saltmarsh Rush dominated vegetation occurs as a narrow band along the coastline to the north. This was mapped as a mosaic of ASM and MSM (1330/1410). There are several small blocks of saltmarsh further north along the coastline bordering the Duncormick Estuary. A seawall borders the coastline west of Duncormick saltmarsh towards Lackan.

Information held in the NHA survey files indicates that Perennial Glasswort (*Sarcocornia perennis*) (previously known as *Arthrocnemum perenne*) was recorded at this site. This is an indicator species for the Annex I saltmarsh habitat Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) (1420). However, this species was not recorded at this site during the survey. No *Salicornia* flats (1310) were recorded at this site.

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

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	5.31 [1]
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.13 [2]
	Total	**5.44**

[1] this total includes 50% of the 1330/1410 mosaic and 50% of the 1330/other SM mosaic.
[2] this total includes 50% of the 1330/1410 mosaic.

3.2 Atlantic salt meadows (H1330)

The western part of the saltmarsh is dominated by a mosaic of ASM and transition grassland or upper saltmarsh vegetation. This area is mapped as a mosaic. This occurs over an uneven topography with low mounds and shallow hollows. Some vegetated channels are present. Some low mounds are dominated by Twitch and Red Fescue (*Festuca rubra*), with frequent White Clover (*Trifolium repens*), Silverweed (*Potentilla anserina*), Creeping Bentgrass (*Agrostis stolonifera*), Long-leaved Plantain (*Plantago lanceolata*) and contain occasional Perennial Rye-grass (*Lolium perenne*), Creeping Thistle (*Cirsium arvense*) and Birdsfoot (*Lotus corniculatus*). The ASM in this area occurs in the hollows (or old channels) and is dominated by upper saltmarsh species such as Red Fescue and Saltmarsh Rush (*Juncus gerardii*). Some of these hollows in the mosaic area contain mid-marsh vegetation dominated by

Sea Pink (*Armeria maritima*) and Sea Plantain (*Plantago maritima*) with frequent Sea Arrow-grass (*Triglochin maritima*), Sea Milkwort (*Glaux maritima*), Saltmarsh Rush and Common Saltmarsh-grass (*Puccinellia martima*). Other species found in the lower saltmarsh include Greater Sea-spurrey (*Spergularia media*).

More typical saltmarsh develops towards the east with low-lying saltmarsh vegetation developing. This part of the saltmarsh has been drained in the past (visible from the aerial photo) and this has damaged the structure of the saltmarsh. There are few natural pans on the saltmarsh. More typical natural pans occur most frequently close to the seaward boundary. The old drains act as creeks although there are remnants of old creeks in the upper saltmarsh zones. The drains in the central area have infilled with Common Saltmarsh-grass and also contain Glasswort (*Salicornia* spp.*) and* Annual Sea-blite (*Suaeda maritima*). These drains divide upper or mid-upper saltmarsh dominated by Red Fescue and Saltmarsh Rush. Further east, there are channels 1-2 m apart with mid-saltmarsh vegetation dominated by Sea Pink and Sea Plantain between them. Some of these channels have not re-vegetated and still contain bare mud. Some of the channels have partly vegetated and now have characteristics of pans. Upper saltmarsh vegetation along the ridge is dominated by Red Fescue and Saltmarsh Rush with Sea Milkwort, Sea Plantain and Sea Pink. Other species recorded in the upper saltmarsh include Orache sp. (*Atriplex* sp.), Long-bracted Sedge (*Carex extensa*) and Buck's-horn Plantain (*Plantago coronopus*).

There is a small area of saltmarsh on the eastern side of the site divided from the main section by an embankment. The lower part of this saltmarsh shows some signs of erosion.

There is little cover of lower or pioneer saltmarsh vegetation dominated by Glasswort and Annual Sea-blite. This only occurs in small patches in some of the channels. These species usually occur in conjunction with Common Saltmarsh-grass-dominated areas. No Glasswort occurred on the intertidal mudflats.

This site is notable for the absence of Sea Purslane (*Atriplex portulacoides*).

3.3 Common Cordgrass on the saltmarsh

Common Cordgrass is present at the site. However, it occurs only occasionally and does a not form dense sward seen on the other side of the Cull along Ballyteige Burrow. Several clumps occur within the ASM and are confined to pans or are located in creeks or artificial drainage channels. Some clumps are also present on the intertidal mudflats found in the small 'bay' around the edge of the saltmarsh. Some of the clumps have seedlings around them.

3.4 Mediterranean salt meadows (H1410)

There are occasional clumps of Sea Rush scattered over the saltmarsh, forming some small clumps in places. These clumps are associated with other saltmarsh species such as Saltmarsh Rush, Sea Plantain and Red Fescue.

A narrow band of Sea Rush and Saltmarsh Rush dominated vegetation occurs along the shoreline to the north and leads to several small areas of saltmarsh. This is mapped as a mosaic of ASM and MSM. Other saltmarsh species along this band include Sea Pink, Sea Plantain, Common Saltmarsh-grass, Glasswort and Annual Sea-blite. The mosaic of ASM and MSM vegetation located at the north of the site is characterised by scattered clumps of Sea Rush amongst other upper and mid zone saltmarsh species.

4 IMPACTS

There are several impacts on this saltmarsh (Table 4.1) but the most significant impacts probably related to historical reclamation. The saltmarsh has been significantly modified in the past by drainage in the central and eastern portions (810). This drainage is likely to have been related to land reclamation (802). The drains are at least 150 years old as they were marked on the 1st ed 6 inch map (1860's). The embankment across the eastern side of the saltmarsh is likely to have been built to enclose the saltmarsh between the ridge and the embankment for land reclamation. The 2nd edition 6 inch map shows this embankment enclosing most of the saltmarsh with a small opening at the northern side. The embankment has been breached at some stage after the 6 inch map was drawn and this would have stopped the reclamation. The embankment now extends from both sides of the 'bay' with a small

breach in the centre. The presence of the embankment may have actually helped saltmarsh development on its landward side.

The 2nd edition 6 inch map shows some drains pre-date the drawing of this map although most of the drainage post-dates the mapping. Larger drains were dug in a grid pattern and many of these are still active. The eastern side also contains regular shallow channels 1-2 m wide and 1-2 m apart giving a striped affect to the saltmarsh. This drainage work may have occurred over an extended period as some of the channels seem to have recovered to a greater extent compared to others that still contain bare mud. This drainage works has negatively impacted the structure of the saltmarsh. There are fewer salt pans than would be expected and there is less natural creek formation draining the saltmarsh. The drains act as creeks. However, there are signs of some recovery as the channels are infilling and re-vegetating with Common Saltmarsh-grass. These impacts are not assessed as they occurred prior to the current period of assessment.

Some light poaching (140) was noted at several points on the saltmarsh. However, there are no signs of recent grazing so these impacts could be related to escaped cattle onto the site from nearby farmland. The most recent conservation plan for this site (MIPSU plan) makes reference to overgrazing by sheep (143) and supplementary feeding in this area. The site has now recovered from this overgrazing. A small track (501) is located at the western side of the site allowing access to vehicles visiting the site from along the shoreline.

There are some signs of natural erosion (900) along the edge of the saltmarsh in the small bay. A saltmarsh cliff is present. However, analysis of aerial photos and the 6 inch map indicates that the saltmarsh has actually grown somewhat since the map was drawn. Saltmarsh has grown by 5-15 m around the edge of the small bay. The small section of saltmarsh along the spit at the eastern end is likely to be younger as the 6 inch map indicates the spit has changed position since the map was drawn and this area was formerly a pebble/shingle bank similar to the habitat present along the seaward side of the ridge.

Clumps of Common Cordgrass are currently quite rare on the Atlantic saltmarsh although they do occur on the intertidal mudflats along the edge of the saltmarsh in

the small 'bay'. Common Cordgrass is not likely to spread significantly on the ASM in the near future (954). However there is potential for further Common Cordgrass spread and the formation of swards on the intertidal flats adjacent to the saltmarsh in the small 'bay'. Seedlings were noted around some of the clumps indicating further spread in the future is likely. Nairn (1986) noted the presence of Common Cordgrass in The Cull and it is likely to be present since at least 1960.

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

EU Habitat Code[1]	Activity code[2]	Intensity[3]	Impact[4]	Area affected (ha)	Location of activity[5]
13s	140	C	0	5.44	Inside
13s	501	C	-1	< 0.01	Inside
13s	900	C	0	N/A	Inside
13s	954	C	-1	< 0.01	Inside

[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

Overall this site has a favourable conservation status (Table 5.1). There are few impacts or activities on this site at present. The MPSU conservation plan noted that this site was heavily grazed by sheep but the site has now recovered from this disturbance. The site was not grazed during the survey. The site is now owned by NPWS.

The medium-term future prospects of natural landward saltmarsh migration in response to sea level rise are low-moderate. The upper saltmarsh and transition area at the western side of the saltmarsh will allow some migration of saltmarsh habitats.

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

Habitat	EU Conservation Status Assessment			
	Favourable	Unfavourable - inadequate	Unfavourable - Bad	Overall EU conservation status assessment
Atlantic salt meadows (1330)	Extent, Future prospects, Structure and functions			Favourable
Mediterranean salt meadows (1410)	Extent, Future prospects, Structure and functions			Favourable

5.1 Atlantic salt meadows (H1330)

5.1.1 Extent

The extent of this habitat is assessed as *favourable*. There are no signs of erosion of the saltmarsh and the spit that the saltmarsh developed behind has remained stable. This area was marked on the 1st edition 6 inch map and has remained fairly stable since then.

5.1.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Four monitoring stops were carried out in this habitat and all four passed. All the attributes

reached their targets. This saltmarsh has been disturbed by reclamation works in the past. Drainage has affected the creek and salt pan structure and this is still having a residual impact. However, these impacts are not assessed as they occurred prior to the assessment period. The saltmarsh is recovering from these impacts and the drains are slowly being revegetated. Some of the drains have partially infilled creating an artificial salt pan structure that is becoming more naturalised.

The vegetation has not been affected by the disturbance and a typical species diversity is present. Several different plant communities are present and the ASM is dominated by mid marsh vegetation. There is also an upper saltmarsh zone at the western side that forms a transition habitat or mosaic with hummocks dominated by Twitch (non-Annex I vegetation). This area has a variable topography. The presence of this transition habitat to terrestrial vegetation enhances the conservation value of the site. There are also transition habitats to fixed dune type vegetation along the back of the spit.

5.1.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current intensity of management and impacts continue in the near future. There are no major impacts on this habitat at this site and its extent and structure and functions are likely to remain stable in the near future. Common Cordgrass is present on the saltmarsh but is generally found in the creeks and old drainage channels where it has colonised bare mud. This species is more likely to further colonise on the mudflats within the embankment. The site is now owned by NPWS.

5.2 Mediterranean salt meadows (H1410)

5.2.1 Extent

The extent of MSM is assessed as *favourable* in the absence of any accurate information on the previous extent of this habitat. This habitat is present at this site but is not very extensive. Several large clumps are situated on the main section of the marsh but it is more extensive along the western edge of Duncormick Estuary.

5.2.2 Habitat structure and functions

No monitoring stops were carried out in this habitat due to its limited extent. It forms mosaics along the shoreline of the Duncormick estuary with ASM vegetation that are similar to the vegetation found east of the embankment at Ballyteige. There are no major impacts on this habitat.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current intensity of management and impacts continue in the near future. There are no major impacts on this habitat at this site and its extent and structure and functions are likely to remain stable. The site is now owned by NPWS.

6 MANAGEMENT RECOMMENDATIONS

No management is required for this site.

7 REFERENCES

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

Saltmarsh Monitoring Project

Duncormick

Ballyteige Burrow cSAC (000696)

SMP Code: SMP0006

Map produced by: SMP 2006

Map Version: 1

0 40 80 120 160 200 240 Meters

Scale: 1:3670

N

Ferrycarrig

1 SITE DETAILS

SMP site name: **Ferrycarrig**		SMP site code: **SMP0039**	
Dates of site visit **10/09/2007**		CMP site code: **N/A**	
SM inventory site name: **Ferrycarrig**		SM inventory site code: **224**	
NPWS Site Name: **Slaney River Valley**			
NPWS designation	cSAC: **781**	MPSU Plan: **N/A**	
	pNHA: **712/781**	SPA: **4076**	
County: **Wexford**		Discovery Map: **77**	Grid Ref: **301500, 123200**
Aerial photos (2000 series): **O 5449-B; O 5450-A,B**		6 inch Map No: **Wx 037**	

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

None listed

Other SMP sites within this SAC/NHA: **Castlebridge, Rosslare (partial)**

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

2 SITE DESCRIPTION

Ferrycarrig marsh is located near the head of River Slaney Estuary in Co. Wexford. The site is located 0.4 km east of the Ferrycarrig N11 road bridge on the south side of the River Estuary. It is one of four SM Inventory sites (Curtis & Sheehy-Skeffington 1998) listed in the River Slaney Estuary and Wexford Harbour and is the most westerly site. Smaller patches of saltmarsh habitat are also found frequently at other locations around the estuary and the outer harbour.

The survey site covers a small marsh in a low-lying area between Ballyboggan and Newtown Townlands that is developed in a small valley. The Wexford-Waterford railway is located to the north of the survey site on an embankment close to the shoreline and enters a tunnel to the west of the survey site. A regional road (R730) is also situated along this embankment. The main part of the marsh is located on the landward side of the railway embankment. The embankment and a second minor road spit the survey site into three sections. The marsh is dominated by brackish and freshwater-influenced Reed stands and the extent of actual saltmarsh habitat is very small.

The grid reference recorded in the SM inventory for Ferrycarrig positions the site to the west of the bridge along the southern side of the estuary. However, there is no significant saltmarsh development in this area (opposite the heritage centre). Only a tiny patch (several metres wide) contains Saltmarsh Rush (*Juncus gerardii*), Sea Aster (*Aster tripolium*) and clumps of Common Cordgrass (*Spartina anglica*). Further west there is a large area of brackish habitat dominated by Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*).

Brackish Reed stands also cover a large area on the adjacent northern side of the estuary west of the road-bridge. The NHA survey notes indicate there is some saltmarsh

development at this location and describe the presence of a thin strip of saltmarsh vegetation along the estuary shoreline extending quite far west along the estuary shoreline. There is also some development of *Spartina* swards in places along the estuary shoreline and seaward of the brackish Reed stands.

An examination of the aerial photos during the initial stages of the survey identified the current site as the area around Ferrycarrig as the site most likely to contain Annex I habitats.

The area around the survey site is still mainly rural and the landscape is dominated by farmland. There is increasing development of dispersed habitation along minor roads in the area. The shoreline at this site is used for mooring several boats. A steep hill with farmland is positioned at the western side of the site (through which the tunnel passes). The marsh transitions into woodland and scrub further south in the low-lying area. There is some housing development on the eastern side of the site.

The survey site is part of Slaney River Valley cSAC (781) and The Wexford Slobs and Harbour pNHA (712). Two Annex I habitats are present at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). The entire saltmarsh habitat is located within the cSAC. Adjacent to this site there is extensive estuarine and intertidal mudflat habitat.

The site is accessed via the shoreline and via the roads that cross the site.

3 SALTMARSH HABITATS

3.1 General description

Most of the marsh located at this site is dominated by freshwater and brackish-influenced habitats and the development of Annex I saltmarsh at this site is actually quite minor (Table 3.1). The survey site is divided into three sections by the railway embankment and two roads that cross the site.

The northern section is dominated by Common Reed stands and is the smallest section. This area is cut off from the rest of the site by the railway embankment. There is some scrub and wet grassland along the embankment and encroaching into the sides of this area. There is some very minor ASM development along the shoreline covering an area only up to 10 m wide and 30 m long. Common Reed fringes most of the seaward edge of the marsh on a saltmarsh cliff adjacent to intertidal mudflats. These intertidal flats slope moderately down into a central estuarine channel. The edge of the intertidal flats is lined with a zone dominated by brown algae. Several ASM species such as Sea Aster, Sea Arrowgrass (*Triglochin maritima*), Saltmarsh Rush, Sea Milkwort (*Glaux maritima*), and Common Saltmarsh-grass *(Puccinellia maritima*) can be found along the edge of the Common Reed stand. Twitch is also present. The dominance of Common Reed in this area may be an indication of the estuarine influence on this part of the estuary.

The central section is positioned between the railway embankment and a minor road that crosses the site. This area is also dominated by a stand of Common Reed. This area contains several small pool features that may have formerly been saltmarsh features that are visible from the aerial photos but not in the field. There are several mounds in this area where scrub has developed. The north-east section is dominated by a mosaic of scrub and

drier grassland with Alder (*Alnus glutinosa*), Gorse (*Ulex europaeus*) and Hawthorn (*Crataegus monogyna*) present. A small area at the south-east corner adjacent to the minor road has been infilled in the past and has now developed scrub. A drain/stream channel is situated at the eastern side of this area and is linked to the estuary by a culvert under the embankment. There is some tidal influence from stream/drain at high tide. Brackish vegetation grows along this channel and there is a patch of Sea Club-rush with Twitch (*Elytrigia repens*) on the lower lying area adjacent to scrub developing higher along the channel. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

The southern section is positioned south of the minor road that crosses this site. There are drains on both sides of this road. The area to the south of the road is also dominated by a stand of Common Reed. There is a small patch of MSM located on the north-east corner of this area surrounded by Common Reed. This patch of saltmarsh is located adjacent to the small stream/drain that is linked to the estuary. A small stream/drain flows through the marsh and links to this channel. The brackish influence on this marsh disappears quite close to this area and the stand of Common Reed seems to be mainly influenced by freshwater further south. The freshwater marsh transitions to woodland, scrub and wet grassland around its fringes.

Table 3.1. Area of saltmarsh habitats mapped at Ferrycarrig.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.026
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.060
	Total*	**0.086**

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

3.2 Atlantic salt meadows (H1330)

A small patch of ASM habitat is located at the north-west corner of the survey site, adjacent to the intertidal flats. It has developed on stonier substrate and the vegetation transitions to bare cobble along the shoreline to the west. There is a low saltmarsh cliff that develops towards the east. This narrow ASM zone is dominated by Creeping Bent (*Agrostis stolonifera*) and also contains Saltmarsh Rush, Sea Pink (*Armeria maritima*) and Sea Aster. There is no saltmarsh zonation or development of saltmarsh topography. This band of vegetation is disturbed by its use to moor a boat and associated equipment is also present. The ASM transitions to dense Common Reed stands along the landward side.

3.3 Mediterranean salt meadows (H1410)

A small patch of this habitat is located in the southern section adjacent to the drainage channel that links this area to the estuary. This area is dominated by Sea Rush and is surrounded by dense Common Reed stands. Other species present include Red Fescue, Creeping Bentgrass, Sea Aster, Sea Milkwort, Parsley-leaved Dropwort (*Oenanthe lachenalii*) and Curled Dock (*Rumex crispus*). Common Reed is spreading into this area creating a transition zone with Sea Rush (*Juncus maritimus*), Red Fescue (*Festuca rubra*) and Common Reed. Purple Loosestrife (*Lythrum salicaria*), Soft Rush (*Juncus effusus*), Common Sow-thistle (*Sonchus oleraceus*) is present in this transition zone. The MSM sward height is quite tall and tussocky. This area is not grazed. There is no pan or creek development in this area.

Saltmarsh Rush and Sea Club-rush are present in a small drain along the road side that is liked to the main channel.

4 IMPACTS AND ACTIVITIES

There are few impact or activities acting on this site (Table 4.1), which is not surprising as it is so small and the area of Annex I saltmarsh habitat is so small. However the site has been significantly modified by impacts and activities that occurred prior to the current monitoring period. None of the sections of marsh are grazed (140). There is a moderate saltmarsh cliff along the seaward edge of the marsh mainly along the stand of Common Reed. However, there are no indications of any significant erosion or retreat of saltmarsh at this site (900). The impact of erosion is assessed as neutral with a low intensity along the marsh face.

Common Cordgrass is present in the River Slaney estuary but is not present adjacent to this site (954). Common Reed may have spread in the recent past at the expense of saltmarsh habitats. There are no direct impacts on the MSM habitat. The small ASM patch is used to moor a boat and there is also fishing equipment and boat equipment also present (220).

There are indications of older impacts on this marsh with signs of drainage in the past (810). The marsh has also been impacted by the creation of the railway embankment and the minor road that crosses the site and splits the site into three sections. However these impacts are quite old and the embankment was built in the 19th century. The minor road is present on the 1st edition 6 inch map so was built prior to the mid 1800s. The creation of the embankment and the reduction of saline influence on the marsh probably reduced the extent of saltmarsh habitats and promoted the development of brackish and freshwater marsh and Reed stands. Further infilling during the 20th century is also likely to have reduced the extent of any saltmarsh habitat. A large area to the south-east of the railway embankment has been infilled during this period and is now covered by scrub and wet grassland. This infilling also filled an old drain that connected to several pools. These impacts are not assessed as they occurred prior to the current monitoring period.

The main impacts and activities adjacent to the southern side of the survey site are fertilization (120) and the grazing of livestock (140) related to farming practises. A minor road (502) and a railway embankment cross the site (503). Other impacts and activities around the site include dispersed habitation (403), and leisure fishing (220) in the Slaney River estuary.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	220	C	-1	0.026	Inside
1330	900	C	0	0.001	Inside
1410	140	C	0	0.060	Inside

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

5 CONSERVATION STATUS

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 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.

Ferrycarrig saltmarsh is a very small site with few features of significant conservation interest. The overall conservation status of this site is assessed as *favourable*. In reality the extent of saltmarsh habitats is so small that a conservation assessment is not relevant. While the structure and functions of the ASM are assessed as *unfavourable-bad*, the extent is very small anyway so the assessment is not applicable. The marsh is dominated by brackish and freshwater influenced stands of Common Reed. There are few impacts or activities directly acting on this site. Common Cordgrass is present in the estuary but is not present around this site. The marsh has been significantly modified by impacts and activities in the past, such as the construction of the railway embankment and the minor road, and more recently by infilling. These impacts occurred prior to the current monitoring period.

This site is located within the River Slaney Estuary cSAC so the status of the Annex I habitats should not be affected by any land-use changes that have to be licensed by local or national authorities. However, there is no NPWS management plan for this site.

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

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
Mediterranean salt meadows (1410)	Extent Structure and functions, Future prospects			Favourable

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of ASM is assessed as *favourable*. There are no indications of any loss of habitat due to erosion, to land-use changes or natural habitat change during the current monitoring period. Only a very small patch of this habitat is present.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*. No monitoring stops were carried out in this habitat as the extent was so small. However, a visual assessment indicates the habitat is impacted negatively by the presence of a boat and associated activities.

5.2.3 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. The habitat is impacted negatively by the presence of a boat and associated activities and these are likely to continue in the future.

The site is located in a cSAC so it should not be affected by land-use changes that have to be licensed by local or national authorities in the future.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

The extent of MSM is assessed as *favourable*. There are no indications of any loss of habitat due to erosion, to land-use changes or natural habitat change during the current monitoring period. Only a very small patch of this habitat is present.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable.* One monitoring stop was carried out in this habitat and it passed. Most of the attributes required for the structure and functions of this habitat reached their targets. This area is not grazed and there are no other impacts affecting the habitat. The habitat structure is poorly developed as the extent is very small. Natural transitions to brackish habitats are present.

5.3.3 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 activities acting directly on this site.

The site is located in a cSAC so it should not be affected by land-use changes that have to be licensed by local or national authorities in the future.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

7 REFERENCES

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.026		0.026			
4	1410 Mediterranean salt meadow	0.060			0.060		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	1.865					
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)	5.047					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**6.998**		**0.026**	**0.060**		

Legend

- SAC Boundary
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- Other Saltmarsh (CM2)
- other
- 1410 monitoring stop

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Ferrycarrig

Slaney River Valley SAC (000781)

SMP code: SMP0039

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 30 60 90 120 150 Meters

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2250

N

Fethard

1 SITE DETAILS

SMP site name: **Fethard**		SMP site code: **0047**
Dates of site visit: **29/08/2007 & 22/02/2008**		CMP site code: **N/A**
SM inventory site name: **Fethard**		SM inventory site code: **214**
NPWS Site Name: **Bannow Bay**		
NPWS designation	cSAC: **697**	MPSU Plan: **Old Format – Draft 2 Consultation, 2001**
	pNHA: **697**	SPA: **N/A**
County: **Wexford**		Discovery Map: **76** Grid Ref: **280000, 105000**
Aerial photos (2000 series): **O 5849-B,D; O 5850-A,C**		6 inch Map No: **Wx 050**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia* and other annuals colonizing mud and sand**
H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
H1410 **Mediterranean salt meadows (Juncetalia maritimi)**
H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Taulaght, Saltmills, Grange, Bannow Island, Gorteens, Clonmines**

Saltmarsh type: **Estuary** Substrate type: **Mud/Sand/Pebbles**

2 SITE DESCRIPTION

Fethard saltmarsh is located along the southern coast of Co. Wexford which lies on the promontory approach to Hook Head. The site is located south of Bannow Bay in a small sheltered inlet south of Fethard Village. This inlet is sheltered at the seaward end by a small sand spit with minor development of sand dunes. The surrounding area is dominated by fertile farmland with improved grassland, tillage and arable crops all found in the area. The inlet is found in a small basin and there are moderate slopes from higher ground. Further west the inlet develops into a small valley through which a river flows into the inlet. This inlet is divided by a road bridge accessing Hook Head. Further west of the road bridge there is extensive development of brackish and freshwater wetland habitats in the basin of the valley. The urban part of the village extends to the edge of one part of the inlet. There are also scattered houses along the minor road along the southern side of the inlet.

Much of the inlet between the road bridge and the sand spit now contains saltmarsh habitats. It is spilt into two sections by an undulating river channel that flows through the site. Much of the inlet contained intertidal mudflats but these have been largely infilled by *Spartina* swards. One notable feature of this site is that the majority of the saltmarsh has developed in the past

100 years and the old OSI 2nd edition 6 inch map does not show any saltmarsh habitat within the inlet, which is marked as containing intertidal mud and sandflats. Saltmarsh was found west of the road bridge at this stage.

Fethard saltmarsh is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Three Annex I saltmarsh habitats were recorded at this site including *Salicornia* flats and Atlantic salt meadows (ASM). Both habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is known from Fethard saltmarsh (Ferguson, 1962, 1964) and its persistence has been confirmed by a number of surveys (NPWS Rare Plant Survey 1990, Dubsky 2006). The 1990 survey indicated that the colony consisted of approximately 50 separate patches measuring 1 metre by 1 metre and mainly occurred in sand/mud pans.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded around the shoreline and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. Saltmarsh extends beyond the upper boundary as indicated by the old OSI 6 inch map in places.

The majority of the salt marsh is located on the northern side of the sheltered river inlet and the site is readily accessed from the slipway to Fethard beach and then walking in a southerly direction over the narrow sand ridge. Alternatively, the site may be accessed from the road bridge that crosses the River to the south of Fethard, although this can only be done at low tides and involves crossing mud. Accessing the second part of the saltmarsh, on the opposite bank of the river inlet, is through crossing the mud and sandflats at low tide or alternatively, from a small slipway which runs from a local road.

3 SALTMARSH HABITATS

3.1 General description

Fethard saltmarsh now occupies most of the inlet between the road bridge and the sand spit towards the seaward side of the site. This saltmarsh is now dominated by *Spartina* swards that have nearly infilled former intertidal mudflats that were previously found in the inlet around more established saltmarsh. Most of the marsh is on the northern side of the river, with only one significant area on the opposite shore as well as some fringing marsh. There are still some bare intertidal mudflats located at the south-west corner and along the main river channel through the marsh.

Much of the older saltmarsh is dominated by Atlantic salt meadows (ASM) and is situated along the northern side of the inlet. Common Cordgrass (*Spartina anglica*) has also spread across this saltmarsh and has created significant areas of ASM/*Spartina* sward or *Spartina* sward with small amounts of ASM vegetation. There has been some secondary succession and ASM has developed along the edge of the *Spartina* swards adjacent to the river channel. The saltmarsh structure is particularly well-developed with an intricate network of creeks in places, mainly because most of the marsh is quite flat and at a similar elevation. This is also one of the few sites visited during the SMP where a moderately sized saltmarsh has not been modified by drainage works or attempted reclamation, perhaps because it is quite young.

Small patches of Halophilous scrubs (1420) are distributed through the ASM, the *Spartina* sward and associated mosaics. There are several patches of *Salicornia* flats, mainly distributed in the main channel and some of the minor creeks on sand and mud banks along the edge of the more established saltmarsh where there is some accretion. Further east there is a low sandy mound along the edge of the saltmarsh with some coastal grassland.

There is some transition along the northern boundary of the saltmarsh habitat to a narrow zone containing brackish vegetation dominated by Sea Club-rush (*Bolboschoenus maritimus*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. There is also some development of a band of transitional Twitch (*Elymus repens*)-dominated vegetation, particularly in the north-east corner and adjacent to the sand spit (also mapped as CM2). This zone is situated around the shoreline and is adjacent to hedgerows at a higher level that marks the field boundaries. There is also some natural transition to fixed dune vegetation along the sand hills.

Table 3.1. Area of saltmarsh habitats mapped at Fethard.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	0.100
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	4.276
H1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0.121
Non-Annex	*Spartina* swards	5.658
	Total	**10.155**

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

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

A large proportion of mudflats have been colonised by *Spartina* swards, with the effect that there is minor development by *Salicornia* flats vegetation on the intertidal mudflats. Indeed very little *Salicornia* flats vegetation was recorded adjacent to the *Spartina* sward. Several discrete patches of this habitat have been recorded, most of which are associated with larger creeks or the lower edges of ASM-dominated vegetation. These patches of habitat have developed on sand-banks within the main channel or in small accreting patches within the bends of the main creeks in the marsh.

In addition to Glasswort (*Salicornia* spp.) other species that are recorded in this habitat include Annual Sea-blite (*Suaeda maritima*), Greater Sea-spurrey (*Spergularia media*) and occasionally Sea Purslane (*Atriplex portulacoides*). Not surprisingly as the habitat is found on mudflats, Common Cordgrass can account for a small percentage of the habitat. Some patches of this habitat are dominated by dense rank cover of Annual Sea-blite whose development may be related to nutrient enrichment on the site.

3.3 Atlantic salt meadows (H1330)

A number of typical ASM vegetation communities are found within the salt marsh at Fethard and represent typical zonation within the marsh from low-mid to upper marsh. Much of the marsh is dominated by a mosaic of low-mid marsh and mid marsh communities with distinct zonation related to small changes in the surface topography of the marsh, mainly around salt pans, creeks and central platforms.

The low-mid zone of the ASM habitat are dominated by patches of Sea Purslane and Common Cordgrass with less frequent Common Saltmarsh-grass (*Puccinellia martima*) and with small amounts of Lax-flowered Sea Lavender (*Limonium humile*), Sea Pink (*Armeria maritima*), Greater Sea-spurrey and Sea Aster (*Aster tripolium*). This community is found around the edges of some of the pans and depressions on the marsh. Common Cordgrass forms a significant but variable part of this vegetation type and there are subtle transitions into

pans dominated by this species. This zone forms a complicated mosaic with the mid-marsh zone and with the various mosaics depending on the cover of Common Cordgrass.

There are small sections along some of the creeks where Common Saltmarsh-grass is dominant and has not been colonised by Common Cordgrass. This lower sward is quite rank, especially as it is not grazed and there is some nutrient enrichment from the sewage outflow.

The transition from *Spartina* sward to pure ASM is represented by a complicated mosaic with admixtures of a variety of ASM species already listed but in particular, Sea Purslane, Common Saltmarsh-grass, and Greater Sea-spurrey. Several discrete patches of this ASM/*Spartina* sward mosaic were recorded and they were commonly found on firmer substrates adjacent to the larger creeks that occur in the site.

Much of the more established ASM in the north-east corner is dominated by a mid-marsh community where Sea Pink and Sea Plantain (*Plantago maritima*) are more prominent. Red Fescue (*Festuca rubra*) also appears in this zone along with Saltmarsh Rush (*Juncus gerardii*). The saltmarsh structure is well-developed in this zone and there are frequent large salt pans present.

The mid-upper marsh is easily recognised as, although the site is not grazed by livestock, the vegetation is a low growing homogenous sward unlike the rest of the salt marsh with tall vegetation characterised by Common Cordgrass. This community is also best-developed in the north-east corner. It is dominated by a small number of species such as Red Fescue (*Festuca rubra*), Sea Pink, Sea Plantain and Lax-flowered Sea Lavender. Other species present include Long-bracted Sedge (*Carex extensa*). Several clumps of Sea Rush (*Juncus maritimus*) are also present in this zone near the upper boundary but they do not occupy a large enough area to be mapped as Mediterranean salt meadows. Minor amounts of Glasswort are also present although they are usually confined to pans in the upper marsh.

3.4 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) (H1420)

Although Perennial Glasswort is known from this site, the Annex I habitat has not previously been mapped at any of the sites in Bannow Bay cSAC. The presence of Perennial Glasswort as identified in the NPWS Rare Plant Database and recent Coastwatch survey was re-confirmed in the 2007 and the 2008 site visit. The number of plants recorded by this survey has increased the distribution of this species at this site compared to the distribution as mapped by the NPWS Rare Plant Database. The population seems to have increased in abundance and distribution during this period, although there are less large clumps of this species greater than 1 m present. This plant is probably under-recorded by this SMP survey and a longer period of time would be required to survey the whole of the marsh in detail for this plant.

Generally plants are less than 50 cm in diameter, but some larger clumps (> 1 m diameter) were recorded. The larger (and older) plants were generally woodier forms of the plant and are more readily identified on the marsh. It is generally confined to the lower marsh area, in a zone between mid-marsh and *Spartina* sward that has developed in pans to form ASM/*Spartina* sward mosaics. Species commonly associated with and recorded around the Perennial Glasswort plants include Sea Pink, Common Saltmarsh-grass, Sea Purslane, Lax-flowered Sea Lavender and Sea Plantain.

3.5 *Spartina* swards

The intertidal zone of the marsh is dominated by *Spartina* sward. Pure sward accounts for 4.605ha of the total area mapped. The remainder comprises mostly vegetation transitions with Atlantic salt meadow – *Spartina* with some ASM and ASM/*Spartina* (50/50%) mosaic. This dominance is quite dramatic in light of the fact that Common Cordgrass has extensively spread in the past 40 years (B. Hickey, pers comm.).

While Common Cordgrass is typically the only species in the pure sward, transitions to firmer substrates are marked by the occurrence of other salt marsh species. Indeed, the transition from intertidal mud onto a more consolidated substrate is characterised by the presence of Perennial Glasswort (*Sarcocornia perennis*) and is mapped as Halophilous scrubs. Elsewhere the species are more typical of ASM habitats which results in a complicated habitat mosaic. Species commonly found include Common Saltmarsh-grass, Sea Purslane, Sea Aster and Lax-flowered Sea Lavender. Common Cordgrass may have spread into more established saltmarsh that developed prior to the colonisation of this site by this species. However, there is frequent evidence that secondary succession of *Spartina* swards into ASM is occurring at this site.

On the southern side of the river estuary, a large area of the saltmarsh is dominated by Common Cordgrass, but is no longer on soft mud. This is mapped as *Spartina* with some ASM and may represent the initial stages of more established ASM development.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 3.1). The main impacts are the presence of Common Cordgrass and eutrophication from the sewage outflow from Fethard Village. The site is not grazed and there are few other damaging activities. However, there are indications of natural grazing by wintering wildfowl but this is not considered to have any serious impact on the marsh. In earlier times, the marsh was a natural playground for children. It is still used as a shortcut to the beach and for recreational walkers. Some remnant tracks (501) can still be recognised, particularly towards the back of the marsh where the agricultural fields end. There is little obvious damage from walkers at this site.

There is a significant area of Common Cordgrass at this site that is now greater than the total area of the other established saltmarsh. This is an invasive species of saltmarsh and mudflats (954). First documented in Bannow Bay in the 1960's, (Nairn 1986) it is not known if *Spartina* was transplanted or arrived of its own accord. As the first record for *Spartina* in Ireland relates to the transplanted specimens in Cork Harbour in 1925, it is reasonable to suggest that it arrived in Bannow Bay after that time. It has since thrived within Bannow Bay and is widespread in its distribution. All the evidence (anecdotal and documented) indicates that this species was not widespread at Fethard prior to the 1960's. The ASM saltmarsh is likely to have been established prior to the colonisation of the site by Common Cordgrass.

The *Spartina* sward has mainly developed on the lower intertidal mudflats adjacent to the more established saltmarsh fringe. There is significant development of ASM/*Spartina* mosaic in places. It is difficult to quantify whether there has been any loss of ASM saltmarsh due to the colonisation of this intertidal zone by Common Cordgrass. All the evidence (anecdotal and documented) indicates that this species was not widespread prior to the 1960's, but that does not clarify the true extent of the ASM prior to the spread of *Spartina sward*. It is likely that this species has spread into the established ASM to form areas of ASM/*Spartina* sward mosaic. For this reason, the impact of its presence is assessed as a moderate negative impact. There is also evidence of secondary succession where *Spartina* sward has developed more frequent cover of typical low zone ASM species such as Sea Purslane and Common Saltmarsh-grass. This natural succession can be assessed as a positive natural change (990).

Perennial Glasswort seems to co-exist happily with Common Cordgrass and is found growing through the sward in association with other species. Common Cordgrass has probably spread into some of the larger clumps recorded by the NPWS Rare Plant Survey and has probably disrupted them to some extent. However, the spread of Common Cordgrass and the subsequent succession of *Spartina* sward to ASM may actually be creating new suitable habitat for Perennial Glasswort. The increased distribution of this species is an indication it must be reproducing and spreading to new areas within the site.

The older established mid-upper ASM is less vulnerable to colonisation by this species as it is found on moderate slopes at elevations where Common Cordgrass is uncompetitive. Whatever the case, the presence of Common Cordgrass seedlings at the seaward side of the *Spartina* sward indicates that the sward is still expanding over the intertidal mudflats. This is occurring towards the road-bridge at the north-east corner of the site. A comparison of the OSI 2000 and 2005 series aerial photos shows that the *Spartina* sward has measurably expanded on the intertidal mud in this area during this period.

Unlike the saltmarsh at Grange which is less than 3 kilometres away, Erosion (900) is not a significant impact at Fethard, as it is situated behind the relative shelter of a growing sand bar. There are no indications of erosion at this site. Accretion (910) within the inlet within the

past 100 years has promoted the development of this saltmarsh during this period. The restriction of tidal flow through the road bridge by the construction of one-way valves also is likely to have had a significant influence on the development of this saltmarsh. This is a young and dynamic site and is likely to be still accreting. However, there has been no measurable growth of saltmarsh during the current monitoring period. Accretion is also more likely to promote the expansion of *Spartina* sward at the expense of the mudflats. This also promotes the succession of ASM saltmarsh from *Spartina* sward. Changes in the position of the main river channel through the marsh between the OSI 2000 and 2005 series aerial photos is one indication that this site is still quite dynamic and likely to continue to change in the future.

Another significant impact is the discharge of Fethard's sewage onto the marsh (701). The small primary treatment facility has not kept apace with the towns' growth. This discharge is also likely to have promoted the spread of Common Cordgrass. There are clear signs of nutrient enrichment through much of the marsh and some of the vegetation is quite rank. This may be affecting the diversity of some sections, particularly close to the outflow pipe. There are plans to relocate and upgrade the sewerage treatment plant, so that it does not discharge onto the salt marsh.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140) and Fethard Town (401). There is also dispersed habitation (403) along the minor road (502) along the southern side of the inlet. These activities have little or no measurable impact on the saltmarsh habitats other had those already mentioned.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	954	C	-1	0.044	Inside
1330	501	C	0	0.005	Inside
1330	910	C	0	0.2	Inside
1330	954	B	-1	1.1	Inside
1330	990	C	+1	0.4	Inside
1420	954	C	0	0.121	Inside
1310	701	C	-1	0.005	Outside
1330	701	B	-1	1.0	Outside
1420	701	C	0	0.121	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.

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 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. Previous assessments have concentrated on the entire cSAC. As a result of this, there is very little detailed information with which to compare and quantify the findings. There is some more detailed baseline data available from the NPWS Rare Plant Survey carried out on the distribution of Perennial Glasswort. It is worth remembering that several separate salt marshes are found within the Bannow Bay cSAC.

Fethard saltmarsh has several features of notable conservation interest, particularly the presence of a healthy population of Perennial Glasswort. This is also a relatively new marsh, has only developed in the past 100 years and several Annex I habitats are present. The spread of Common Cordgrass has had a significant impact on the site and has infilled a large part of the intertidal flats in the inlet. The *Salicornia* flats vegetation does not appear to have been greatly impacted by the spread of Common Cordgrass in the intertidal zone. The site is also affected by eutrophication caused by untreated sewage piped from Fethard into the site. The overall conservation status of the site is assessed as unfavourable-inadequate due to this impact. However, the impacts are not severe and the saltmarsh is generally in good condition.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	**EU Conservation Status Assessment**			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent Structure and functions	Future prospects		**Unfavourable-Inadequate**
Atlantic salt meadows (H1330)	Extent Future prospects	Structure and functions		**Unfavourable-Inadequate**
Mediterranean and thermo-Atlantic halophilous scrubs (H1420)	Extent Structure and functions Future prospects			**Favourable**

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

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. Although *Salicornia* flats were recorded at this site, there is no accurate information as to its previous extent or condition and there are no indications it was more extensive in the past. Although large areas of the intertidal zone are dominated by Common Cordgrass, it does not seem to impact on the occurrence of *Salicornia* flats which is concentrated on small sandy bars in creeks. These patches of habitat are likely to be quite dynamic and subject to sudden change in extent and distribution due to changing accretion patterns from year to year.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Three monitoring stops were carried out and all satisfied the target criteria for the habitat. The habitat is in relatively good condition. It is mainly found on sandbanks along the edge or within the main creeks. Common Cordgrass is not a significant feature of this vegetation in these areas, particularly as they are quite dynamic. Some of the vegetation is affected by the nutrient enrichment and there are some stands of rank Annual Sea-blite at the site. However, this does not seem to impact on the overall structure and functions of this habitat.

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 such as the spread of Common Cordgrass continue in the near future. It would appear that Common Cordgrass does not, or has not, become established in the areas where the *Salicornia* flats has developed and whilst the habitat is ephemeral and subject to changing sediment deposition patterns within the creeks, the annual species are likely to regenerate. However, some of this habitat is vulnerable to colonisation by this invasive species.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any measurable loss of habitat due to erosion or land-use changes within the current monitoring period. Anecdotal evidence suggests that ASM was once more extensive at Fethard, but that the spread of *Spartina* swards within the intertidal zone and onto firmer substrates. This has resulted in the development of extensive *Spartina*/ASM mosaic, which has ultimately reduced the area of pure ASM. However this has largely occurred prior to the current monitoring period and there are no indications that the extent of ASM has been reduced during the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Eight monitoring stops were carried out in ASM and the ASM/*Spartina* sward mosaic. The ASM is generally in good condition. There is extensive Common Cordgrass scattered over the ASM and it dominates in patches within the ASM/*Spartina* sward. It is not known if it has spread by more than 10% during the current monitoring period due to the lack of accurate baseline data. However there are indications that it has spread somewhat when the condition of the site is compared to the descriptions form the NPWS Rare Plant Survey (1990).

Eutrophication has affected the sward structure and created patches of rank sward in places and possibly has affected the species diversity of these areas. This is the main reason for the revised assessment of structure and functions as *unfavourable-inadequate*. The nutrient enrichment from sewage piped into the site has also probably promoted the spread of Common Cordgrass at this site.

The ASM is well-developed in some sections and there are good examples of several typical ASM communities. Zonation between these communities is related to the natural topography of the saltmarsh surface. The saltmarsh topography is also well-developed and there is an intricate creek network and large salt pans present at this site.

5.3.3 Future prospects

The future prospects are rated as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts such as eutrophication continue in the near future. Most of the ASM is in adequate condition but there are currently some damaging impacts from nutrient enrichment. These are likely to continue while untreated sewage continues to flow into the site. The planned removal or upgrading of the sewage treatment plant (Anon 2006) in the future would probably have a positive impact. This is also a dynamic site and the habitat mosaic may change in the future with potentially more ASM developing from *Spartina* swards due to natural succession. This would be a positive indicator.

5.4 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any measurable loss of habitat due to erosion or land-use changes within the current monitoring period. This habitat has not previously been defined from this site, although Perennial Glasswort was known to occur here. Indeed, its presence is more widespread than indicated by the NPWS Rare Plant Survey. And while in excess of 100 plants were recorded, it is likely that is was under-recorded owing to the density of the *Spartina* sward. The area of habitat at this site is based on the interpretation of the occurrence of Perennial Glasswort found at this site in summer 2007 and early 2008. Additional detailed surveys would likely increase the

number of plants that could be found and thus further refine the habitat boundary. For these reasons, habitat extent is assessed as *favourable*.

5.4.2 Habitat structure and functions

The habitat structure and functions are assessed as *favourable*. The target criteria for this habitat is based upon that used for ASM. Two monitoring stops were made in this habitat, both of which passed on target criteria set out for ASM habitats. The earlier records indicate that the clumps were generally <1metre diameter. Most of the newly recorded plants are small or occur in tight clumps (5-30cm in diameter), suggesting that the Perennial Glasswort is healthy and reproducing despite the abundance of Common Cordgrass. The impact of Common Cordgrass on this habitat is assessed as neutral.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as eutrophication or spread of Common Cordgrass continue in the near future. Perennial Glasswort seems to co-exist happily with Common Cordgrass at this site and at others in Bannow Bay, so this invasive species is not seen as a threat. Eutrophication does not seem to be affecting the extent or distribution of this species. It should be noted that Fethard Saltmarsh is a relatively new saltmarsh and has only developed in the past 100 years, so it has been colonised by Perennial Glasswort during this time.

6 MANAGEMENT RECOMMENDATIONS

No active management of the salt marsh habitat is recommended for this site. However, the planned removal of the sewerage plant at Fethard (Anon. 2006) to another location elsewhere in Fethard may have as yet unrealised impacts on the salt marsh through the development of the additional homes above the saltmarsh.

7 REFERENCES

Anon. (2006). *Strategic Environmental Assessment – Environmental Report 2007-2???.* Wexford County Council, Wexford.

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

Ferguson, K. (1962 & 1964). *S. perennis* in Wexford. *Irish Naturalists Journal* **14,** 18-19 & 215.

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	Spartina swards
1	1310 *Salicornia* flats	0.100	0.100				
2	*Spartina* swards	4.065					4.065
3	1330 Atlantic salt meadow	3.645		3.645			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic	1.186		0.593			0.593
7	1330/other SM (CM2) mosaic						
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	1.572					
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	1.038		0.038			1.000
15	1310/*Spartina* mosaic						
16	ASM dominated with some *Spartina*						
17	1330/sand dune mosaic						
18	Other SM (CM2)	0.593					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub	0.121					
21	1310/1330 mosaic						
	Total	**12.32**	**0.100**	**4.28**			**5.66**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- Atlantic/Spartina mosaic
- Spartina dom, some 1330
- 1420 Mediterranean scrubs
- Other Saltmarsh (CM2)
- other
- 1310 monitoring stops
- 1330 monitoring stops
- 1420 monitoring stops

Oifigeach, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Fethard

Bannow Bay SAC (000697)

SMP code: SMP0047

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: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2750

Gorteens

1 SITE DETAILS

SMP site name: **Gorteens**		SMP site code: **0045**
Dates of site visit : **28/08/2007**		CMP site code: **N/A**
SM inventory site name: **Gorteens**		SM inventory site code: **216**
NPWS Site Name: **Bannow Bay**		
NPWS designation	cSAC: **697**	MPSU Plan: **Old Format – Draft 2 Consulatation, 2001**
	pNHA: **697**	SPA: **4033**
County: **Wexford**		Discovery Map: **76** Grid Ref: **279600, 107200**
Aerial photos (2000 series): **O 5777-B, D; O 5778-A, C**		6 inch Map No: **Wx 045, 050**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**
H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
H1410 **Mediterranean salt meadows (Juncetalia maritimi)**
H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Bannow Island, Clonmines, Fethard, Grange, Saltmills, Taulaght**

Saltmarsh type: **Estuary** Substrate type: **Mud/Stones**

2 SITE DESCRIPTION

Gorteens saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site which empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. The site is located in the south-west corner of Bannow Bay in a small inlet that extends southwards towards the church at Pollfur Bridge and extends to Oyster Point. This area is 1.5 km north of Fethard. Gorteens saltmarsh is located a short distance around the coast from Grange (SMP0044), from where it was accessed. A small river enters the bay and the head of the inlet and there are also several small streams flowing into the bay around the shoreline. The adjacent area is dominated by fertile farmland with improved grassland, tillage and arable crops all found in the area. The surrounding area is low-lying and there are moderate slopes from higher ground along a seaward gradient to the shoreline. This part of Co. Wexford is quite rural and there is scattered habitation along minor roads in the area.

The saltmarsh is poorly developed along both sides of this inlet and is mainly represented as a narrow band of continuous habitat stretched along the shoreline, usually 5-20 m wide. This

saltmarsh has developed adjacent to soft intertidal mudflats. There are some larger sections where saltmarsh has developed in small more sheltered indentations associated with streams running off the adjacent land and where *Spartina* swards have developed.

Gorteens is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Four Annex I saltmarsh habitats were recorded at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). All these habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. This species was known from Grange saltmarsh to the east of this site but was not recorded from this area until the Coastwatch Survey in 2006. This SMP survey has increased the distribution and number of records at this site along the southern shoreline.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded around the shoreline and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. Saltmarsh extends beyond the upper boundary as indicated by the old OSI 6 inch map in places.

The southern side of the site is accessed by continuing on foot from Grange (SMP site number 0044) and walking in a westerly direction around Oyster Point. The southern shoreline is quite inaccessible while the northern shoreline was accessed from several lanes from private farms. While it may seem possible to cross the Sandflats from one side of the inlet to the other at low tides, it is not advisable owing to the fact that there is always water in the channel and the nature of the sediment.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh is poorly developed compared to other sites in Bannow Bay. Most of the habitat is a thin band along the shoreline that is generally less than 10 m wide although some sections are wider. This saltmarsh has developed on a moderately sloped shoreline so the intertidal zone is narrower. The main saltmarsh is mainly a mosaic of Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM) (Table 3.1). *Spartina* swards have also developed along the seaward side of this more established saltmarsh, mainly on the mudflats. This band of habitat is also quite narrow in places because of the moderate slopes along the intertidal zone but some sections are more extensive.

Saltmarsh is best developed in a small indentation along the southern shoreline where a shingle bank has developed and this is partially vegetated by some ASM. Small patches of Halophilous scrubs (1420) are found on this shingle bank and along the seaward edge of the established saltmarsh. Small patches were also noted in the upper zone of the *Spartina* sward. Further east and north the saltmarsh development ends and the shoreline is dominated by a narrow band of shingle or cobble. There are signs of erosion of this shoreline particularly along the north-western section.

Table 3.1. Area of saltmarsh habitats mapped at Gorteens.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	0.008
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.997
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.785
H1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0.059
non-Annex	*Spartina* swards	2.906
	Total	**4.755**

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

There is also some typical zonation of vegetation along the upper boundary of the established saltmarsh. This zone is dominated by Twitch (*Elytrigia repens*). Smaller patches of vegetation that are not classified as Annex I salt marsh were recorded, often where small streams entered the site or from where there was seepage of fresh water adjacent fields. This vegetation included Common Reed (*Phragmites australis*) most of which were located in a small channel on the northern side of the site. Elsewhere, stands of Sea Club-rush (*Bolboschoenus maritimus*) and Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*) appears along the upper saltmarsh boundary in places. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. There is generally some further transition along the

landward boundary to a band of Brambles (*Rubus fruticosus*), scrub or a hedge that marks the boundary of the adjacent farmland. Further west in the inlet where it gets narrower some of the saltmarsh is shaded and overhung by tall trees.

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

This habitat does not form an extensive zone on the mudflats, which are dominated by *Spartina* sward which appears to be more successful at trapping sediment. Several small patches of this habitat are found associated with the small shingle bank in the inlet at the eastern end of the site. It is also found in some tiny patches within small salt pans at the seaward side of this section.

This habitat is characterised largely by the presence of Glasswort (*Salicornia* spp.). It is rarely dense in cover and accounts for 20-40%. Occasionally, Annual Sea-blite (*Suaeda maritima*) is found in this habitat and was co-dominant with Glasswort in one patch of the annual habitat on the seaward side of the large shingle bar. Another species that is noted as an occasional in the habitat is Common Saltmarsh-grass (*Puccinellia maritima*). This is an indication that this habitat is part of the pioneer zone of the saltmarsh and there is some gradual transition from the *Salicornia* flats to ASM along a landward gradient.

Elsewhere, smaller isolated clumps of the Glasswort are found, but rarely is enough to justify mapping it as a separate habitat. It is worth noting that it was sometimes difficult to delineate the habitat as species from other ASM zones such as Common Saltmarsh-grass and Sea Pink (*Armeria maritima*) increase in abundance in the pioneer zone. When these species appear the habitat is generally classified as pioneer ASM.

3.3 Atlantic salt meadows (H1330)

The ASM is generally poorly developed at this site. Much of the ASM vegetation is confined to a relatively narrow band which is found around much of the sheltered estuary at Gorteens. Zonation within this band of ASM is poorly developed and a mixture of species is present, dominated by mid-upper species. Red Fescue (*Festuca rubra*), Saltmarsh Rush (*Juncus gerardii*), Sea Pink, Sea Plantain (*Plantago maritima*) are prominent in these narrow bands and other species like Lax-flowered Sea Lavender (*Limonium humile*), Sea Purslane (*Atriplex portulacoides*), Long-bracted Sedge (*Carex extensa*), Sea Aster (*Aster tripolium*), Greater Sea-spurrey (*Spergularia media*), Sea Milkwort (*Glaux maritima*) and Common Cordgrass (*Spartina anglica*) are all present.

There are some sections were the ASM saltmarsh is somewhat better developed. One of the largest sections is found near the shingle bank at the eastern end of the site. This patch of saltmarsh contains several zones including a low zone and mid-upper zone and the ASM has developed on a low mound. The lower zone is dominated by Common Saltmarsh-grass and

is characterised by frequent Annual Sea-blite. Other species present include small amounts of Sea Pink, Sea Aster, Sea Plantain and Lax-flowered Sea Lavender. There is very little Common Cordgrass in this vegetation although it does dominate more extensive vegetation adjacent to this area. The mid zone is characterised by greater cover of Sea Plantain with smaller amounts of Common Saltmarsh-grass.

Another more extensive patch of ASM has developed further west of this area. There is some typical zonation from ASM to ASM/*Spartina* sward mosaic and onto *Spartina* sward along a seaward gradient. A band of vegetation dominated by Saltmarsh Rush is present along the landward boundary. Further seaward there is a change in vegetation cover and there is increased Common Saltmarsh-grass, Sea Plantain, Sea Pink, Common Cordgrass and Lax-flowered Sea Lavender.

3.4 Mediterranean salt meadows (H1410)

The MSM is poorly developed at this site. It is mainly found as a generally narrow fringe of habitat along the shoreline. Some of this habitat is less than 5 m wide. The habitat is distinguished by the presence of Sea Rush (*Juncus maritimus*). This species dominates some dense patches of the saltmarsh vegetation. The tall rush is quite distinct from the low-growing ASM sward, though it may not actually dominate the cover in places and the sward is dominated by Red Fescue. Other species frequently associated with the Sea Rush include Common Scurvy-grass (*Cochlearia officinalis*), Saltmarsh Rush, Creeping Bent (*Agrostis stolonifera*), Lax-flowered Sea Lavender, Red Fescue, Spear-leaved Orache (*Atriplex prostrata*) and Sea Milkwort. Some sections have an understorey dominated by Sea Plantain and Sea Pink. Zonation is poorly developed in this habitat, although some zonation of some species was noted where species like Common Saltmarsh-grass are found along the seaward boundary.

The saltmarsh structure is poorly developed, but this is typical of a relatively small extent of habitat spread over a large area. A low saltmarsh cliff marks the lower MSM boundary in places but there has been some saltmarsh development along the seaward side of this old cliff. Some clumps of Sea Rush are spreading lower on the shoreline and into the *Spartina* sward in places. Perennial Glasswort is occasionally found within tussocks of Sea Rush in this habitat and these patches are mapped as Halophilous scrubs.

Several patches of the habitat are mapped, and most occur in an intricate pattern with ASM and ASM/*Spartina* mosaics. Some of the MSM forms a narrow band of saltmarsh habitat at the landward side of the *Spartina* sward. Further north there are distinctive signs of erosion within this habitat and hags containing Sea Rush are found along the shoreline.

Towards the edge of the habitat boundary, the clumps of Sea Rush become less frequent and there is often a transition to ASM vegetation. It should be noted that in a small number of

cases (1/2) occasional clumps of Sea Rush may be present within the ASM, but do not form any appreciable area of MSM habitat.

3.5 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) (H1420)

This habitat is widely distributed along the southern side of the inlet, although it covers a relatively small area. It was characterised by the presence of Perennial Glasswort, so small patches of saltmarsh where this species appeared was classified as this habitat The Coastwatch survey first recorded this species on the shingle bank at the east end of the site. This SMP survey reconfirmed these records and increased the number of and distribution of records westwards into the inlet. During the summer, it is often difficult to identify the thin leggy shoots of this prostrate perennial amongst the dense *Spartina*. For this reason it was considered to be under-recorded and a second visit to the site in February 2008 greatly increased the distribution mapping of the species and consequently the Annex I habitat. More extensive surveying may increase the number and distribution of records at this site.

Perennial Glasswort was found in a broad range of habitats or saltmarsh zones at this site. Several large old and woody plants are growing on the shingle bank. This habitat would not normally be considered saltmarsh habitat but these plants are growing low on the bank adjacent to other saltmarsh vegetation including Sea Plantain, Annual Sea-blite, Lax-flowered Sea Lavender and Common Cordgrass.

Perennial Glasswort was also found in the lower zone saltmarsh mapped as ASM or ASM/*Spartina* sward mosaic depending on the density of Common Cordgrass. Smaller and possibly younger plants were growing amongst a sward with Common Saltmarsh-grass, Glasswort, Annual Sea-blite, Lax-flowered Sea Lavender and Greater Sea Spurrey. Plants were also found in denser cover of Common Cordgrass that is classified as *Spartina* sward, mainly along the transition area between the *Spartina* ward and the adjacent ASM. The presence of younger plants growing in the *Spartina* sward suggests that these plants colonised this saltmarsh after Common Cordgrass colonised this area and the presence of Common Cordgrass does not seem to threaten the status of this plant.

Some plants were also found along the seaward boundary of narrow patches of MSM. These plants are found higher up on the saltmarsh and are growing on a low saltmarsh cliff amongst clumps of Sea Rush. Saltmarsh vegetation indicating *Spartina* sward has developed along the base of this low saltmarsh cliff.

3.6 *Spartina* swards

This habitat covers a considerable area of former intertidal mudflats at the site and seems well-established, particularly further west where the inlet is more sheltered. Most of this sward occupies a narrow zone between 10-20 m wide but there are some larger sections that

extend seaward for 60 m. There are several areas further north where isolated clumps were noted, suggesting steady growth rather than significant expansion.

There is some natural succession along the landward side of the *Spartina* sward habitat where Common Saltmarsh-grass, Sea Purslane, Sea Aster, Greater Sea-spurrey and Lax-flowered Sea Lavender all appear within the upper zone. Some of these areas are mapped as ASM/*Spartina* sward where these species are frequent. It is difficult to ascertain from the maps if this represents original ASM vegetation that Common Cordgrass has colonised. This is likely to have happened but there are also small areas where there has been a measurable expansion of ASM due to natural succession after the development of *Spartina* sward.

4 IMPACTS AND ACTIVITIES

Although the site is surrounded by a largely agricultural setting, there are few threatening impacts on this saltmarsh as it is quite isolated (Table 4.1). There is no grazing and poaching and other associated threats by livestock are not an issue at present as the adjacent land is given over to tillage. The southern side of the site is not used for amenity activities and sections are not vulnerable to other damaging activities like dumping as it is isolated. There are some access tracks (501) along the northern side of the site. These tracks are positioned along the landward side of the saltmarsh and are used by farmers to access other fields along the shoreline.

There is a significant area of Common Cordgrass at this site that is now greater than the total area of the other established saltmarsh. This is an invasive species of saltmarsh and mudflats (954). First documented in Bannow Bay in the 1960's, (Nairn 1986) it is not known if *Spartina* was transplanted or arrived of its own accord. As the first record for *Spartina* in Ireland relates to the transplanted specimens in Cork Harbour in 1925, it is reasonable to suggest that it arrived in Bannow Bay after that time. It has since thrived within Bannow Bay and is widespread in its distribution. The *Spartina* sward has mainly developed on the intertidal mudflats adjacent to the saltmarsh fringe. There is some development of ASM/*Spartina* mosaic in places but there are indications that ASM species are spreading into the *Spartina* sward and not vice-versa. For this reason the impact of its presence is assessed as neutral. The relatively narrow band of established ASM and MSM is less vulnerable to colonisation by this species as it is found on moderate slope at elevations where Common Cordgrass is unfavourable. The natural succession of *Spartina* sward to ASM can be assessed as a positive natural change (990).

Natural erosion (900) was noted at this site, particularly along the northern section. The saltmarsh zone is much narrower and is quite fragmented and patchy. The indented terracing visible along the front of these exposed areas of ASM and MSM show signs of natural erosion with isolated mud mounds and hags with patches of vegetation present. There is no *Spartina*

sward along this shoreline and the sandier sediment indicates there are increased tidal currents compared to the narrow sheltered inlet. There are also some signs of erosion along the edge of the saltmarsh that has developed on the shingle bank. There are fewer signs of erosion along the southern side of the inlet. An old saltmarsh cliff is present on the saltmarsh but there has been some subsequent expansion of saltmarsh along the seaward side of this old cliff. Overall, there are signs of both erosion and accretion at this site (although no measurable erosion or retreat within the current monitoring period) so the impact of erosion is assessed as neutral.

A comparison of the old OSI 2nd edition 6 inch map to the current extent of saltmarsh and the profile of the shoreline shows that there has not been any measurable erosion or retreat of shoreline during this period. Indeed, the spread of Common Cordgrass within the inlet may be an indication of accretion (910) in this area and there is some development of ASM in areas where there was previously no development of established saltmarsh. This indicates that natural succession from *Spartina* sward to ASM is occurring (990). However, this is not likely to have occurred in the current monitoring period but over a longer period of time.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1310	954	C	-1	0.008	Inside
H1330	501	C	-1	0.01	Inside
H1330	900	C	0	0.02	Inside
H1330	954	C	0	0.06	Inside
H1330	990	C	+1	0.02	Inside
H1410	501	C	-1	0.02	Inside
H1410	900	C	0	0.02	Inside
H1420	954	C	0	0.059	Inside

out

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

5 CONSERVATION STATUS

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 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. Previous assessments have concentrated on the entire cSAC. There is no other data available from other surveys in Bannow Bay.

Gorteens saltmarsh is a notable site of particular conservation interest, mainly for the presence of Perennial Glasswort. This rare and protected species was not recorded from this site until 2005 (Coastwatch 2006). The SMP survey has increased the number of records and their known distribution at this site. The saltmarsh is relatively poorly developed at the site and there are only several minor areas of typical ASM development. *Spartina* swards are well-established at this site and there is some evidence that natural succession is occurring and *Spartina* swards has transitioned to ASM or ASM/*Spartina* mosaic.

The overall conservation status of this site is *unfavourable-inadequate* (Table 5.1). The saltmarsh is in generally good condition and there are no significant negative impacts affecting this site. Gorteens is situated in an isolated section of Bannow Bay and is not grazed. However, the *Salicornia* flats found at this site are vulnerable to colonisation by Common Cordgrass in the future, particularly as their extent is so small.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	**EU Conservation Status Assessment**			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent Structure and functions Future prospects	Future prospects		**Unfavourable-inadequate**
Atlantic salt meadows (H1330)	Extent Structure and functions Future prospects			**Favourable**
Mediterranean salt meadows (H1410)	Extent Structure and functions Future prospects			**Favourable**
Mediterranean and thermo-Atlantic halophilous scrubs (H1420)	Extent Structure and functions Future prospects			**Favourable**

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

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. Although *Salicornia* flats were recorded at this site, there is no accurate information as to its previous extent or condition. It is not extensive. There are no indications that there has been a reduction in the area of *Salicornia* flats vegetation through competition from Common Cordgrass, merely that it is not extensive at this site.

5.2.2 Habitat structure and functions

Given the scarcity of the vegetation, monitoring stops were not carried out in this habitat. A visual assessment of the vegetation indicates that Glasswort (and associated species) were growing healthily. This habitat is found on the side of the shingle bank on mud and on mixed substrate and Common Cordgrass is rare. For this reason, its structure and functions are rated as *favourable*.

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 such as the spread of Common Cordgrass continue in the near future. This habitat is not being affected by any damaging activities at present but some of the patches on mud may be vulnerable to colonisation by Common Cordgrass in the future, particularly as the patches of habitat are quite small. However, the habitat is generally recorded in sheltered areas or on the muddy edges of shingle deposits where Common Cordgrass does not occur or at least is not abundant. The patches that have developed on mixed substrate are less vulnerable to colonisation by this species.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. While there is an erosional trend acting on part of this site along the northern shoreline, there are no indications of any measurable loss of habitat due to erosion within the current monitoring period. There have been no land-use changes or significant colonisation by Common Cordgrass at this site during the current monitoring period. There are indications that natural succession from *Spartina* sward to ASM is occurring at one location in the inlet. Accretion may be occurring in these sheltered conditions and the spread of Common Cordgrass may have enhanced this accretion.

5.3.2 Habitat structure and functions

This attribute is assessed as *favourable*. Two monitoring stops were carried out, both of which achieved the target criteria for habitat structure and functions. The saltmarsh is in good condition and there are no damaging activities. The site is not grazed so the sward structure is quite variable. The overall saltmarsh structure is poorly developed but this is typical of a relatively small saltmarsh spread over a long shoreline. In general, there was little variation in the overall floristic composition of the marsh, and zonation is poorly developed. There is some succession from *Spartina* sward to ASM and there are several patches of mosaic. For this reason, the impact of its spread on species composition is assessed as neutral.

5.3.3 Future prospects

The future prospects for the Atlantic salt meadows at this site are assessed as *favourable* for a number of reasons. This assessment assumes that the current management activities and level of impacts such as erosion continue in the near future. There are no apparent damaging activities at this site. Common Cordgrass is present at this site and is well-established on the mudflats. However it is not likely to spread into the existing ASM vegetation as most of this habitat is positioned at a level where Common Cordgrass is uncompetitive. Some of the saltmarsh is exposed to natural erosion but this is likely to be occurring at a very slow rate. In contrast there seems to be some succession of *Spartina* sward to ASM in places so the extent of ASM may also increase in the future.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is rated as *favourable*. Although not as extensive as the ASM (Table 3.1), the habitat characterised by the presence of Sea Rush, is patchily distributed throughout the site. Most of the Mediterranean salt meadow habitat is found in mosaic with ASM though it is also found at the eroded edge of the marsh. While there is an erosional trend acting on part of this site along the northern shoreline, there are no indications of any measurable loss of habitat due to erosion within the current monitoring period.

5.4.2 Habitat structure and functions

The habitat structure and functions are assessed as *favourable*. No monitoring stops were carried out in this habitat so this assessment is based on a visual assessment. The MSM is in good condition and there are no damaging activities. The MSM at this site has a typical species assemblage. It also forms part of the larger saltmarsh system and there are transitions to other vegetation types including stands of Sea Club-rush and mosaics with ASM. Common Cordgrass is present in this habitat but is not extensive, mainly due to its position in the upper zone of the saltmarsh.

5.4.3 Future prospects

The future prospects for MSM are assessed as *favourable* for a number of reasons. This assessment assumes that the current management activities and level of impacts such as erosion continue in the near future. There are no apparent damaging activities at this site. Common Cordgrass is present at this site and is well-established on the mudflats. However it is not likely to spread into the existing ASM vegetation as most of this habitat is positioned at a level where Common Cordgrass is uncompetitive. Some of this habitat along the northern shoreline is vulnerable to natural erosion, although this is probably occurring at a slow rate.

5.5 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi) (H1420)

5.5.1 Extent

The extent of this habitat is assessed as *favourable*. There is no information on the former status of perennial Glasswort at this site as this is a new location for this species. Records from 2005 were relocated and the distribution and number of Perennial Glasswort plants has been greatly increased as part of this survey. There are no indications of any measurable loss of habitat due to erosion land-use changes or significant colonisation by Common Cordgrass at this site during the current monitoring period. This habitat is mainly shielded from erosion by the other habitats.

5.5.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Four monitoring stops were carried out in this habitat and they all passed. The saltmarsh habitat is in relatively good condition and there are no damaging activities. Perennial Glasswort is found in a variety of situations including on shingle, on mud within *Spartina* sward, amongst clumps of Sea Rush and in habitat that would otherwise be mapped as ASM/*Spartina* sward. The diversity of these ecotypes is a positive indicator. The fact that plants are found within the *Spartina* sward that has only developed in the past 50 years indicates that this species has obviously reproduced and these are not relic plants that are being 'overwhelmed' by Common Cordgrass. Perennial Glasswort seems to co-exist happily with Common Cordgrass and this is also seen at Bannow Island and Fethard. The impact of Common Cordgrass on this habitat is assessed as neutral.

5.5.3 Future prospects

The future prospects of this habitat are assessed as *favourable* for a number of reasons. This assessment assumes that the current management activities and level of impacts such as erosion continue in the near future. There are no apparent damaging activities at this site. Perennial Glasswort is not threatened by Common Cordgrass or by natural erosion that is occurring at the site. In fact, further succession of *Spartina* sward to ASM due to continued accretion may provide more suitable habitat for this species.

6 MANAGEMENT RECOMMENDATIONS

No management is required of this isolated site, other than a regular monitoring regime so that the status of Perennial Glasswort can be maintained. It is likely that this species still remains under-recorded at this site, particularly along the interface between the *Spartina* sward and the ASM/*Spartina* mosaic.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

Fitzgerald R. (1990). Inventory of *A. perenne in Ireland. NPWS Rare Plant Survey,* Unpublished report to National Parks and Wildlife Service, Dublin.

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

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats	0.008	0.008				
2	*Spartina* swards	2.820					2.820
3	1330 Atlantic salt meadow	0.868		0.868			
4	1410 Mediterranean salt meadow	0.726			0.726		
5	Spartina/MSM mosaic (50/50)	0.118			0.059		0.059
6	ASM/*Spartina* mosaic	0.054		0.027			0.027
7	1330/other SM (CM2) mosaic	0.203		0.102			
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	1.326					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)	0.005					0.00025
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)	0.672					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub	0.059				0.059	
21	1310/1330 mosaic						
	Total	**6.86**	**0.008**	**1.00**	**0.79**	**0.059**	**2.91**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Atlantic/Spartina mosaic
- 1330/other SM (CM2) mosaic
- Isolated Spartina clumps
- 1420 Mediterranean scrubs
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1420 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Gorteens (Map 1 of 2)

Bannow Bay SAC (000697)

SMP code: SMP0045

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

N

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:4250

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Atlantic/Spartina mosaic
- 1330/other SM (CM2) mosaic
- Isolated Spartina clumps
- 1420 Mediterranean scrubs
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1420 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Gorteens (Map 2 of 2)

Bannow Bay SAC (000697)

SMP code: SMP0045

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: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:4250

N

Grange

1 SITE DETAILS

SMP site name: **Grange**		SMP site code: **0046**
Dates of site visit : **28/08/2007**		CMP site code: **043**
SM inventory site name: **Grange**		SM inventory site code: **215**
NPWS Site Name: **Bannow Bay**		
NPWS designation	cSAC: **697**	MPSU Plan: **Old Format – Draft 2 Consultation, 2001**
	pNHA: **697**	SPA: **4033**
County: **Wexford**		Discovery Map: **76** Grid Ref: **281400, 107500**
Aerial photos (2000 series): **O 5778-A, C**		6 inch Map No: **Wx 045, 050**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**
H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
H1410 **Mediterranean salt meadows (Juncetalia maritimi)**
H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Bannow Island, Clonmines, Fethard, Gorteens, Saltmills, Taulaght**

Saltmarsh type: **Sandflats** Substrate type: **Sand/Mud**

2 SITE DESCRIPTION

Grange saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site which empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. Grange or the Big Burrow as it is often referred to, is located to 2.5 km north-east of Fethard Village at Oyster Point. It is situated directly opposite Bannow Island at the mouth of Bannow Bay. The adjacent area is dominated by fertile farmland with improved grassland, tillage and arable crops all found in the area. The surrounding area is low-lying and there are gentle-moderate slopes along a seaward gradient to the shoreline. This part of Co. Wexford is quite rural and there is scattered habitation along minor roads in the area.

Over the past number of years, however, this coastal site has all but been eroded, a fact which was noted in the sand dune survey carried out in 2004 (Ryle *et al*. 2009). Anecdotal evidence has suggested that historically, the sand-flats around Grange and the back of Bannow Island were overlain with a thick band of shingle and cobble, much of which was removed over a number of decades for the purposes of building houses etc. This has resulted in an “unquantified” acceleration of the erosion along much of the low cliffs and

coastal habitats around Grange and further south to Fethard. These changes have also had a very significant impact of the coastal habitats found at this site and the site is currently quite dynamic.

It is unlikely that Grange was ever a substantial sand dune system. The development of the fore dunes was confined to a narrow strip. Much of the ground behind the dune ridge was highly disturbed and was at one time grazed by livestock (Wallace 1995). The water table was close to the surface of the low-lying ground which resulted in the development of dune slack vegetation. Although listed in the saltmarsh inventory, the salt marsh at Grange was not extensive and was confined to low-lying areas around the water body at the north of the derelict sand hills.

Grange is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Two Annex I saltmarsh habitats were recorded at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both habitats are listed as qualifying interests for this site.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. The presence of this rare and legally protected species was first noted in 1990 (Fitzgerald and Wallace 1990) who noted that it was locally abundant (in excess of 150 plants) in pans of the low-mid marsh communities. Wallace confirmed its presence a number of years later when carrying out research into its distribution as part of a M.Sc. dissertation (Wallace 1995).

The saltmarsh at this site is notable for the presence of Sharp Rush (*Juncus acutus*). This species is much more rarely found on saltmarshes compared to Sea Rush (*Juncus maritimus*). Stands of saltmarsh vegetation dominated by either Sea Rush or Sharp Rush can be classified as MSM. There are few saltmarshes in Ireland with the rarer MSM sub-type dominated by Sharp Rush present. Sharp Rush is generally found along the upper boundary of the saltmarsh/fixed dune interface, although it was previously more abundant as indicated by the eroded hags of its root system.

Despite its proximity to Fethard, Bannow Island and Gorteens (all of which support populations of Perennial Glasswort) which lies around the headland from Grange, the Perennial Glasswort was not located. Indeed, by the time of an earlier survey of the sand dune system in 2004 (Ryle *et al*. 2009), the extent of the salt marsh had been greatly reduced, a fact which was also documented in a memo to NPWS (Dubsky 2006) who described that the site had been totally obliterated through erosion.

The entire saltmarsh habitat at this site is found within the digital cSAC boundary. The site was accessed via a small carpark that allows access to the shoreline.

3 SALTMARSH HABITATS

3.1 General description

The current saltmarsh is associated with a small sand dune system and brackish water-body that is found at the northern tip of Grange, towards Oyster Point. The original marsh had developed on a sheltered area behind the sand dune spit and the mainland. There was development of ASM at the northern end of this area and further south there were transitions to brackish habitats, dune slack and onto wet grassland. However this spit has been eroded significantly and the saltmarsh has also been significantly reduced in extent due to erosion.

Much of the remaining saltmarsh that was investigated during the course of this survey is considered to be derelict remnants of the original saltmarsh or possible secondary saltmarsh development. Indeed, much of this area had previously been characterised as largely consisting of dune slacks in 2004 (Ryle *et al*. 2009). It is mostly confined to peripheral locations around a brackish water-body that has developed at the northern tip of the site.

Sediment has accreted along the seaward side of the former saltmarsh with the development of a significant area of embryonic and mobile dunes on a large ridge in the northern section. Seaward of this ridge there is extensive sand flats. This ridge was beginning to grow in the 2004 survey but it has now cut off regular tidal inundation into saltmarsh and created a pool with standing water for long periods of time. This has caused the remaining marsh to develop brackish vegetation. There is a channel along the western side that connects to the marsh. This site is quite dynamic and there are frequent indicators that it is still changing. Much of the vegetation seems transitional in appearance and there are frequent open patches of bare substrate where some of the vegetation has died.

The brackish vegetation is dominated by extensive stands of Sea Club-rush (*Bolboschoenus maritimus*) and Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*) towards the landward side and there are also patches of open brackish water in the pool. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. The Sea Club-rush is found in standing

water. There is a zone dominated by a swampy area of Creeping Bent-grass around the landward (southern) side of the Sea Club-rush. The brackish influence seems to have increased in the former dune slack area and there is lots of dead vegetation with newly colonising Sea Aster (*Aster tripolium*), Saltmarsh Rush (*Juncus gerardii*), False-fox Sedge (*Carex otrubae*), Silverweed (*Potentilla anserina*), Spear-leaved Orache (*Atriplex prostrata*), Celery-leaved Buttercup (*Ranunculus sceleratus*) and Sea Plantain (*Plantago maritima*). Further south there is a transition from brackish vegetation to diverse dune slack or wet grassland, where there is increased freshwater influence with species such as Purple Loosestrife (*Lythrum salicaria*), Marsh Arrowgrass (*Triglochin palustre*), Curled Dock (*Rumex crispus*), Twitch (*Elymus repens*), Lesser Spearwort (*Ranunculus flammula*), Soft Rush (*Juncus effusus*), Spike-rush (*Eleocharis* sp.), Common sedge (*Carex nigra*), Mint (*Mentha aquatica*), Anglica (*Angelica sylvestris*) and Yellow Flag (*Iris pseudacorus*) appearing. The occurrence of Atlantic salt meadow (ASM) vegetation is negligible in extent and the greatest area of saltmarsh vegetation is dominated by Sea Rush (*Juncus maritimus*). Clumps of Sharp Rush are mostly found on the edge of the dune-slack vegetation and the landward edge of the brackish vegetation.

Although a single clump of Common Cordgrass was recorded in this brackish pool, there are no mudflats at Grange. There is no development of *Salicornia* flats or indeed *Spartina* sward during the time of this survey.

Table 3.1. Area of saltmarsh habitats mapped at Grange.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	0
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.014
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.040
H1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0
	Total	**0.054**

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

3.2 Atlantic salt meadows (H1330)

Any semblance of Atlantic salt meadow (ASM) vegetation at this site has all but been decimated at this site due to the ongoing erosion and redistribution of the sediment. Notwithstanding this, a very small (Table 3.1) and highly disturbed patch of ASM vegetation was recorded at the northern side of the semi-permanent pool adjacent to the back of the embryonic dunes. The vegetation is quite open and there is frequent bare substrate.

The fragmentary vegetation largely consists of Creeping Bent (*Agrostis stolonifera*), Sea Milkwort (*Glaux maritima*), Sea Aster (*Aster tripolium*), Glasswort (*Salicornia* sp.), Sea Plantain, Saltmarsh Rush and Sea Arrowgrass (*Triglochin maritimum*). Other minor species

included Long-bracted Sedge (*Carex extensa*), Orache spp. (*Atriplex* spp.), Hard-grass (*Parapholis strigosa*), clumps of Sea Rush and several clumps of Sharp Rush.

3.3 Mediterranean salt meadows (H1410)

The largest area of saltmarsh vegetation remaining at this site is composed of a narrow band of Sea Rush-dominated vegetation at the landward side of the brackish pool. Floristically poor, this linear patch of MSM vegetation was homogenous in appearance and as extensive (Table 3.1) as previously recorded in 2004 (Ryle *et al*. 2009). This MSM may be related to secondary development of saltmarsh along the edge of the semi-permanent pool. The sward height is quite tall (0.5-1 m high) and dense in places. There are some clumps of Sharp Rush present in this habitat. Other species present include Sea Aster, Spear-leaved Orache and Creeping Bent-grass. This habitat seems to be in a state of flux and there are patches within the habitat with bare substrate. There is no development of typical stable habitat with typical saltmarsh structure.

Sharp Rush is also found at this site. However, most clumps are scattered over the dune slack area. There are also some clumps scattered amongst the Sea Rush-dominated vegetation and along the upper limit of the brackish stands of Sea Club-rush mainly at its upper limit. The Sharp Rush is not found in a distinctive saltmarsh community. These clumps have colonised sandy substrate. Clumps are also scattered around the brackish pool and there are indications that the number of clumps has increased recently.

4 IMPACTS AND ACTIVITIES

The site at Grange is affected by several impacts and activities (Table 4.1) with by far the most significant impact being erosion (900). The sand spit with its associated habitats and saltmarsh has significantly eroded in the past 100 years when comparing the extent of the spit on the old 2nd edition 6 inch map to the current extent. Significant changes can also be seen between the 2001 and 2005 series OSI aerial photos in the profile and extent of the sand spit and associated habitat. Anecdotally the level of erosion has hastened over the past 20 years since the large deposits of cobble and shingle have been removed from the beach for construction purposes.

More recently, there has been a significant redistribution of the sediment from the seaward side of Grange, which has been redeposited at the northern tip of the site at Oyster Point extending into the inner parts of Bannow Bay. A large part of the original saltmarsh has been eroded and the remaining habitat is subject to dynamic natural changes caused by the re-deposited sediment that is currently creating brackish conditions around a semi-permanent pool. The structure of this area has also changed significantly since the 2004 survey (Ryle *et al.* 2009) and the semi-permanent pool has developed since then.

The impact of erosion is rated as A (high intensity with a irreparable negative influence). Habitat maps based on earlier surveys during this monitoring period indicates that about 2 ha of saltmarsh (ASM, MSM and Halophilous scrubs) were present at the site. Nearly all of this original saltmarsh has been destroyed. There is no possibility for the retreat of the saltmarsh further west as it is confined by moderately slopes terrestrial farmland adjacent to the coastal system. Some saltmarsh may develop in the future if the site stabilises and the there is no further erosion.

There are no other significant negative impacts affected this site. The site is not grazed, although it probably was in the past. There are some old tracks across the site but these do not cross the saltmarsh. Recreational use at Grange consists mostly of pedestrian traffic which has little impact or no on the remaining salt marsh (622). A number of tracks (501) are visible the year 2000 series aerial photographs. Many of these have been eroded, although there is a trail alongside the MSM vegetation. As a result of the erosion and often waterlogged dune slacks, the majority of walkers walk along the beach. These activities have little or no impact on the site. Common Cordgrass was recorded from this site. This is an invasive species of saltmarsh and mudflats (954). However, very few clumps were recorded and this species has very little impact.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140). There is also dispersed habitation (403) along the minor road (502) on the shoreline. These activities have little or no measurable impact on the saltmarsh habitats.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1330	900	A	-2	0.014	Inside
H1330	954	C	0	0.014	Inside
H1410	501	C	0	0.001	Inside
H1410	622	C	0	0.001	Inside
H1410	900	A	-2	0.040	Inside

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

5 CONSERVATION STATUS

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 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 is some more detailed baseline data available from the Rare Plant Survey (Fitzgerald 1990) and from a M.Sc. thesis (Wallace 1995) carried out on the ecology of Perennial Glasswort.

The site has changed radically when compared to these older descriptions of the saltmarsh at this site. The changes seen at this site represent the greatest changes recorded at any site during the Saltmarsh Monitoring Project. The small dune system along much of the front of this saltmarsh has been obliterated due to erosion probably enhanced by sediment removal in the past. There has been significant loss of sand dune and saltmarsh habitat compared to its original extent and the remaining area has changed significantly in structure and composition. Brackish marsh dominated by *Bolboschoenus maritimus*) is now much more prominent. This habitat has increased in extent since the 2004 survey of the sand dune habitats (Ryle *et al*. 2009). The current marsh may not be functioning as a saltmarsh with regular tidal inundation due to the position of a sandy ridge along the front of the former marsh, which has created a semi-permanent brackish pool. A small patch of *Salicornia* flats recorded by Ryle *et al.* (2009) has now disappeared as this area has been infilled by the sandy ridge. Perennial Glasswort was not re-found and is likely to be extinct.

The overall conservation status of the small area of saltmarsh is considered to be *unfavourable-bad*. This site is still highly dynamic and likely to continue to change and evolve in the future. In the long-term there may be some development of stable saltmarsh habitat if the sand dune system and changes in sediment distribution stabilises.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	EU Conservation Status Assessment			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)			Extent, Structure and functions Future prospects	**Unfavourable-Bad**
Atlantic salt meadows (H1330)			Extent, Structure and functions Future prospects	**Unfavourable-Bad**
Mediterranean salt meadows (H1410)			Extent Structure and functions Future prospects	**Unfavourable-Bad**
Mediterranean and thermo-Atlantic halophilous scrubs (H1420)			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 *unfavourable-bad*. This habitat was not recorded at this site. The CMP survey recorded some *Salicornia* flats at this site in 2004 so erosion and sediment re-distribution during this period has had a significant negative impact.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this small patch of highly disturbed ASM is rated as *unfavourable-bad*. The extent of the original saltmarsh habitat has been reduced significantly and there has also been significant loss during the current monitoring period. There was no indication of ASM vegetation during the 2004 sand dune survey (Ryle *et al*. 2009). The saltmarsh was estimated to be 2.5 ha in 1990 (NPWS Rare Plant Survey) and was reduced to about 0.5-0.75 ha in 2001.

5.3.2 Habitat structure and functions

The structure and functions of the ASM are assessed as *unfavourable-bad*. One monitoring stop was carried out in this habitat and it passed. All the attributes reached their targets for favourable status during the field survey. However, the small patch of ASM vegetation was highly disturbed and did not exhibit features that would be seen in more stable habitat, such as salt pans. The ASM habitat is likely to be secondary development of habitat with few features of the original habitat left. The saltmarsh vegetation is quite dynamic and there were no typical saltmarsh communities present at the site that indicate stable conditions. Therefore, the assessment is *unfavourable-bad*.

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 such as erosion continue in the near future. Erosion is likely to continue at this site in the near future and the ASM habitat is likely to be affected by the current natural dynamic changes that are affecting this site and are related to re-distribution of sediment.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this MSM is rated as *unfavourable-bad*. It is not known what proportion of the original saltmarsh was MSM. However, the extent of the original saltmarsh habitat has been reduced significantly and there has also been significant loss during the current monitoring period so this is also likely to have reduced the extent of MSM. Comparison of the MSM distribution in the 2004 habitat map (Ryle *et al*. 2009) with the current survey reveals a considerable reduction in habitat extent. For this reason, habitat extent is assessed as *unfavourable-bad*.

5.4.2 Habitat structure and functions

The structure and functions of this habitat were visually assessed as *unfavourable-bad*. Monitoring stops were not carried out in this habitat during the field survey due to its position adjacent to a large brackish patch of habitat and a brackish semi-permanent pool that is not likely to be performing as a saltmarsh. The MSM was structurally homogeneous and had a species-poor flora. Sharp Rush is present at this site but does not form a distinctive saltmarsh community and clumps are scattered over brackish and dune slack vegetation.

5.4.3 Future prospects

The future prospects of the MSM habitat are rated as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts such as erosion continue in the near future. Unless the site experiences a severe erosion phase, it is unlikely that there will be a significant change in the extent of the remaining MSM vegetation at Grange, as a considerable sand bar has developed to the northern tip of the site, since 2004, which appears to limit the damage from tidal erosion from the northern approach to the habitat.

However, erosion is likely to continue at this site in the near future and the MSM habitat is likely to be affected by the current natural dynamic changes that are affecting this site and are related to re-distribution of sediment. The current marsh is not functioning as a typical saltmarsh as tidal inundation is restricted and a semi-permanent brackish pool has developed due to the development of a sand ridge along the front of the original marsh. It is not known how this site will develop in the future.

5.5 Mediterranean and thermo-Atlantic halophilous scrubs (H1420)

5.5.1 Extent

The extent of this habitat is assessed as *unfavourable-bad*. Perennial Glasswort was not refound at this site. Considering the significant changes that have occurred at this site it is likely to be extinct as its habitat (ASM vegetation) has been destroyed.

5.5.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*.

5.5.3 Future prospects

The future prospects of this habitat are assessed as *unfavourable-bad*.

6 Management Recommendations

This site has over the past number of years being decimated, to the extent that the saltmarsh habitats at Grange are of limited conservation value. Much of the frontline has been eroded with a loss of much of the sand-dune habitats that were recently recorded (Ryle *et al*. 2009). Given the redistribution of the sand to the northern end of the site, it is recommended that the site be revisited in the near future to monitor any further change to both the Annex I salt marsh and sand dune habitats.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

Ryle, T., Connolly, K., Murray, A. & Swann, M. (2009). *Coastal Monitoring Project. 2004-2006*. Report to the National Parks and Wildlife Service, Dublin.

Wallace, E.F. (1995). *Aspects of the ecology of Arthrocnemum perenne in Ireland*. Unpublished M.Sc. thesis.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats						
2	*Spartina* swards						
3	1330 Atlantic salt meadow	0.01429		0.014			
4	1410 Mediterranean salt meadow	0.040			0.040		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	5.265					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)	0.00029					0.00001
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)	1.780					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**7.10**		**0.014**	**0.040**		**0.00001**

Oifreann, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Grange

Bannow Bay SAC (000697)

SMP code: SMP0046

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 40 80 120 160 200 Meters

N

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2500

Killowen

1 SITE DETAILS

SMP site name: **Killowen**		SMP site code: **0049**
Dates of site visit **12/09/2007**		CMP site code: **N/A**
SM inventory site name: **Killowen**		SM inventory site code: **212**
NPWS Site Name: **River Barrow and Nore**		
NPWS designation	cSAC: **2168**	MPSU Plan: **N/A**
	pNHA: **698**	SPA: **N/A**
County: **Wexford**		Discovery Map: **76** Grid Ref: **268690, 120245**
Aerial photos (2000 series): **O 5503-A**		6 inch Map No: **Wx 034**

Annex I habitats currently listed as qualifying interests for River Barrow and Nore cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

Other SMP sites within this SAC/NHA: **Rochestown, Ringville, Dunbrody Abbey**

Saltmarsh type: **Estuary** Substrate type: **Mud/*Phragmites* peat**

2 SITE DESCRIPTION

Kilowen saltmarsh is located in the River Barrow Estuary, 7.3 km south of New Ross, in Co. Wexford. It is one of four Saltmarsh Inventory sites (Curtis & Sheehy-Skeffington 1998) found in the River Barrow estuary and the most northerly of these sites (although saltmarsh vegetation has also been recorded further north along Carrickcloney and Dungenstown Townlands). This small saltmarsh has developed in a low-lying narrow sheltered valley that is a mouth of a small stream flowing into the River Barrow. Rochestown saltmarsh is located close by around the bend to the south of the site on the Co. Kilkenny side of the river.

Most of the area around the site is quite rural although there is dispersed habitation along minor roads in the area. Both sides of the Barrow River valley slope quite steeply in places from the river channel, although there are several low-lying areas, particularly along some of the secondary inlets and where tributaries meet the main river channel. Both sides are dominated by agricultural grassland with significant amounts of cereal crops. There is a significant amount of low-lying grassland and shoreline that is being reclaimed or has been reclaimed in the past along both sides of the River Barrow in this area. Some recently reclaimed land is situated to the south of this site.

The site is located within the River Barrow and Nore cSAC (002168) and the River Barrow Estuary pNHA (698). The site was also listed as part of the River Barrow saltmarshes ASI in the Co. Wexford ASI report (Goodwillie 1979). One Annex I habitat is present at this site, Atlantic salt meadows (ASM). This habitat is listed as a qualifying interest for the River Barrow and Nore cSAC. The entire saltmarsh habitat mapped at this site is located within the cSAC boundary.

Several rare species listed on the Flora Protection Order including Divided Sedge (*Carex divisa*), Borrer's Saltmarsh-grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum)* have been recorded from saltmarshes or brackish areas within the River Barrow Estuary pNHA. Divided Sedge is extremely rare and is only known from three sites in the River Barrow. It was listed as possibly extinct in the Red Data Book (Curtis & McGough 1988) but has been re-found (Curtis & Fitzgerald 1994). This species is only found in two 10 km^2 squares along the Barrow Estuary since 1960 and there is also a record in one 10 km^2 square in Co. Antrim near Belfast Lough (Preston *et al.* 2002). The NPWS Rare Plant Database notes an old record for Divided Sedge at marshes near Kilowen House in Dunganstown. This could indicate this saltmarsh or marshes further north in the next Townland (Dunganstown). The last record at this site was in 1921.

The site was accessed from adjacent farmland close to Kilowen House. Permission was sought to cross this land on to the saltmarsh from the farm near the end of the lane accessing this area.

3 SALTMARSH HABITATS

3.1 General description

The only Annex I saltmarsh found at this site is Atlantic salt meadows (ASM) (Table 3.1). There is also a significant amount of habitat classified as Other Saltmarsh (CM2) (Appendix I) dominated by stands of Sea Club-rush (*Bolboschoenus maritimus*) and Common Reed (*Phragmites australis*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. This is quite typical of an estuarine site with significant freshwater influence. The saltmarsh has developed in a small low-lying inlet along the main River Barrow estuary. The saltmarsh is widest nearest the river channel and then narrows further east towards the landward side up the valley. The marsh is generally fairly flat, although there is some internal topography with mounds and channels and a slight slope to higher land along the northern and eastern sides. There is a moderately sloped hillside adjacent to the northern boundary and the area to the south is low-lying and has been reclaimed.

There are extensive stands of Sea Club-rush along the seaward or river channel side of the saltmarsh. Intertidal mudflats shelve steeply away from the saltmarsh into the main estuarine channel. Brackish vegetation is also located along the northern boundary and towards the eastern terrestrial side of the site. A tall hedge on a ditch marks the northern boundary of the site and the division between the marsh and the adjacent pasture on moderately sloped land. A drain marks the southern side of the site and separates the site from a steep embankment that encloses recently reclaimed land.

There is some transition to wet grassland with freshwater marsh influence along these boundaries and particularly at the eastern side, where there is some Scrub dominated by Willow and freshwater stands of Common Reed. This transitional area along the northern boundary is quite tussocky and damaged somewhat by poaching and contains a mixture of brackish and freshwater species. This area contains Creeping Bent (*Agrostis stolonifera*), Glaucous Club-rush (*Schoenoplectus tabernaemontani*), Marsh Arrow-grass (*Triglochin palustris),* Hard Rush (*Juncus inflexus*), Yellow Flag (*Iris pseudacorus*), Brookweed (*Samolus*

valerandi), Wild Celery (*Apium graveolens*), False Fox-sedge (*Carex otrubae*) and Marsh Marigold (*Caltha palustris*).

A small stream flows down the valley and along the southern side of the site before crossing the saltmarsh and entering the Barrow channel about midway along the saltmarsh. This main stream or creek divides the largest area of brackish habitat from the main area of saltmarsh.

Table 3.1. Area of saltmarsh habitats mapped at Killowen.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	2.697
	Total	**2.697**

3.2 Atlantic salt meadows (H1330)

The ASM at this site contains typical estuarine vegetation communities. The freshwater influence on the site is notable with the presence of Creeping Bent in association with Common Saltmarsh-grass (*Puccinellia martima*). There are several different typical saltmarsh communities present and zonation of these communities is present. A low-lying ridge along the seaward edge contains a mid-marsh community dominated by Common Saltmarsh-grass and Sea Milkwort (*Glaux maritima*). Other species present include Sea Aster (*Aster tripolium*), Creeping Bent, Sea Plantain (*Plantago maritima*) and Sea Arrowgrass (*Triglochin maritimum*). This community also appears along some more low-lying marsh, particularly along the main creek that divides the saltmarsh. Common Cordgrass (*Spartina anglica*) is present on the site but is rare.

The saltmarsh is dominated by a grassy mid-high vegetation community dominated by Red Fescue (*Festuca rubra*) with smaller amounts of Creeping Bent and Saltmarsh Rush (*Juncus gerardii*). Other species present include Long-bracted Sedge (*Carex extensa*), Sea Aster, Parsley Water-dropwort (*Oenanthe lachenalii*), Autumn Hawkbit (*Leontodon autumnalis*), Common Scurvygrass (*Cochlearia officinalis*), Sea Milkwort and Sea Plantain

There are small patches and strips of Sea Club-rush, Common Reed and Glaucous Sea-rush within the area mapped as ASM. These brackish species occur in some of the shallow vegetated channels that criss-cross the marsh and probably have a greater freshwater influence due to seepage from adjacent land.

The saltmarsh has some creek and salt pan development, although its development is quite minor, which is typical of a small site like Kilowen. The internal saltmarsh topography also affects zonation. Tidal debris with patches of old Reed stems is present in places on the saltmarsh. The sward height was still quite high (near the end of the summer) and the site was only lightly grazed, (although there are signs of heavy poaching along the marshy freshwater/transitional zone along the saltmarsh boundary).

4 IMPACTS AND ACTIVITIES

There are few impacts and activities affecting this site (Table 4.1). The main impact is grazing (140). The site was being grazed by cattle at the time of the survey but the grazing intensity was quite low and the ASM does not show any signs of poaching damage. Cattle

have easy access from adjacent pasture, but only seem to access the site infrequently. Some of the transitional zones (CM2) are quite tussocky and damaged by poaching. These transitional areas around the northern boundary are quite soft and marshy and this may discourage cattle from accessing this area. Common Cordgrass (954) is present on the site but is rare and has very little impact.

Erosion of the site is not significant (900). There is a tall saltmarsh cliff along the seaward edge of the saltmarsh, although much of the seaward edge is vegetated by Sea Club-rush. A comparison of the OSI 1995, 2000 and 2005 series aerial photos indicates that there is some adjustment of the stands of Sea Club-rush and Common Reed that are situated along the seaward edge of the saltmarsh. A comparison of the OSI 2nd edition 6 inch map to the OSI 2000 series aerial photos indicates that there has been no significant loss of habitat at this site in the intervening period. The impact of erosion is assessed as neutral with a low intensity on the marsh face.

Impacts and activities adjacent to the site include dispersed habitation (403), amenity use of the Barrow River estuary (620), use of the Barrow for navigation and access to New Ross Port (509), fishing (200) and fertilization (120), the grazing of livestock (140) and tillage (100) related to farming practises. These activities have no measurable impact on the saltmarsh habitats.

There have been dredging works in the past few years along the Barrow River channel (820). A large area to the south of the site has been used to dump sediment dredged from the River Barrow navigation channel and is protected from the estuary by a high embankment. This area now contains tillage crops. These low-lying fields were reclaimed prior to the drawing of the 2nd edition 6 inch map and the embankment was also built at this stage.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	2.697	Inside
1330	900	C	0	0.1	Inside
1330	954	C	0	2.697	Inside

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

5 CONSERVATION STATUS

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.

The overall conservation status of this site is assessed as *favourable* (Table 5.1). Kilowen saltmarsh is a small site with several features of particular interest. The saltmarsh is in relatively good condition and there are few impacts and activities acting on the site in a negative way. The grazing intensity is low. The presence of brackish and freshwater marsh vegetation along the northern boundary of the saltmarsh increases the diversity of the site. There is considerable freshwater influence on this estuarine site and this has significantly influenced the vegetation of the site when compared to other types of saltmarsh. Retaining variability in the different types of saltmarsh is important for the conservation of the overall habitat.

This site is located within the River Barrow and Nore cSAC. A NPWS conservation plan is not available for this cSAC. The entire saltmarsh habitat is situated within the cSAC boundary.

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

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			Favourable

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any measurable loss of habitat due to erosion or to land-use changes within the current monitoring period. Common Cordgrass is present on the ASM but is rare and no *Spartina* swards were mapped on this site.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Four monitoring stops were carried out in this habitat and they all passed. All of the attributes required for the

structure and functions of this habitat reached their targets. The ASM habitat at this site shows typical development of various saltmarsh communities related to zonation on the saltmarsh. There is significant freshwater influence on this site and this is indicated by the presence of Creeping Bentgrass in the lower saltmarsh communities. The pioneer saltmarsh community is not represented. The saltmarsh topography is moderately-developed and is quite natural. Common Cordgrass is present on the saltmarsh but is rare.

There are natural transitions to brackish and freshwater marsh habitats along the northern and eastern boundaries of the saltmarsh. This brackish and freshwater marsh vegetation adds to the diversity of the site. The Rare Plant Survey (1990) noted that this area should be searched for Divided Sedge, as it is a suitable site for this species. The southern margin of the site has been modified by the development of a tall embankment along the edge of the stream bed.

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. Much of the habitat at this site is currently in good condition. There are no indications that this site will be affected by significant erosion in the future.

Common Cordgrass is present on the site but is rare and is unlikely to spread significantly in the future. The position of Kilowen in the Barrow Estuary means there is considerable freshwater influence on the site and this lowers the competitively of Common Cordgrass relative to the other saltmarsh species. Common Cordgrass may spread into pans on the site, although this site has relatively few pans) but it is not likely to replace significant amounts of ASM habitat.

The saltmarsh habitats are within a cSAC, so the habitat should not be affected by other land-use changes.

6 MANAGEMENT RECOMMENDATIONS

No specific recommendations.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Curtis, T.G.F. & Fitzgerald, R.J. (1994). The re-discovery of *Carex divisa* Hudson, divided sedge, in Ireland. *Irish Naturalists Journal*, **24**, 496-498.

Goodwillie R. (1979). A preliminary report on the areas of scientific interest in Co. Wexford. An Foras Forthbatha.

NHA database (1990). Information from files of pNHAs held by NPWS.

Preston, C.D. Pearman, A. & Dines, D. (2002). *New atlas of the British and Irish Flora*. Oxford University Press.

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	2.697		2.697			
4	1410 Mediterranean salt meadow						
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	0.216					
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)	3.836					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**6.749**		**2.697**			

Legend

SAC Boundary

1330 Atlantic salt meadows

Other Saltmarsh (CM2)

other

1330 monitoring stops

Department of the Environment, Heritage and Local Government

National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Killowen

SMP code: SMP0049

River Barrow and River Nore SAC (002162)

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 20 40 60 80 100 Meters

Date of production: 22/02/2009

Map version: 1

Original Drawing Size: 297 x 420 (A3)

Scale 1:1750

N

Rosslare

1 SITE DETAILS

SMP site name: **Rosslare**		SMP site code: **0040**
Dates of site visit **11&12/09/2007**		CMP site code: **36**
SM inventory site name: **Rosslare**		SM inventory site code: **223**
NPWS Site Name: Slaney River Estuary/Wexford Slobs and Harbour		
NPWS designation	cSAC: **781**	MPSU Plan: **N/A**
	pNHA: **712**	SPA: **4076**
County: **Wexford**		Discovery Map: **77** Grid Ref: **309100, 116400**
Aerial photos (2000 series): **O 5513-C,D; O 5577-B,C; O 5578-A,C**		6 inch Map No: **Wx 038, 043**
Annex I habitats currently listed as qualifying interests for Slaney River Estuary cSAC: **none listed**		
Other SMP sites within this SAC/NHA: **Ferricarrig and Castlebridge**		
Saltmarsh type: **Estuary**		Substrate type: **Mud/Sand**

2 SITE DESCRIPTION

Rosslare saltmarsh is situated in the south-east part of the Wexford Harbour in County Wexford. Rosslare Town is situated 1 km south of the survey site. It is one of four SM Inventory sites (Curtis & Sheehy-Skeffington 1998), including The Raven, listed in the River Slaney Estuary and Wexford Harbour. The Raven is further north. Smaller patches of saltmarsh habitat are also found frequently at other locations around the estuary and the outer harbour. The site is positioned behind and to the west of Rosslare Burrow, which shelters estuarine and intertidal mud and sand flat habitat from the Irish Sea. Rosslare Burrow is a large sand spit, which is now quite developed, although there is still some dune habitat present towards Rosslare Point. Saltmarsh habitat is found around the shoreline of this sheltered intertidal area.

The area around the site is very low-lying and has a flat landscape dominated by farmland. A large area of intertidal flats known as the South Slobs to the west of the site (Rosslare and Drinagh intake) was reclaimed in the 19th century (South Slobs). A large embankment was built to enclose this area and prevent tidal inundation, and pumping has kept this area from flooding. Part of the survey site (Hopeland) was actually reclaimed prior to the reclamation of the South Slobs and was enclosed by an embankment, but this was breached in the 20th century and the former harbour has reverted to intertidal and coastal habitats. The 2nd edition OSI 6 inch map indicates that this area was criss-crossed with drains and some enclosures. However the only signs of the former reclamation of this area are the remains of the old embankment and several old posts in the intertidal area. The drains have been totally obliterated.

The survey site is part of Slaney River Valley cSAC (781) and The Wexford Slobs and Harbour proposed Natural Heritage Area (pNHA) (712). The candidate Special Area of Conservation (cSAC) designation only covers the northern part of the survey site including the

intact dunes and saltmarsh at Rosslare Point. The cSAC boundary follows the old embankment that formerly enclosed the Hopeland intertidal area. The intertidal area south of this old embankment is included within the pNHA designation. The site was originally designated as part of the Wexford Slobs ASI in the Co. Wexford ASI report (Goodwillie 1979). Three Annex I habitats are present at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). *Spartina* swards are also present.

Most all the saltmarsh habitat is located within the cSAC but there is a considerable portion of mapped saltmarsh situated outside both the cSAC and pNHA boundaries. Some are unintentional exclusions, as the 6 inch map was used to draw the SAC 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. Saltmarsh has encroached landwards behind some former field boundaries that used to designate the boundary between pasture and saltmarsh.

One very notable species recorded at this site is Borrer's Saltmarsh-grass (*Puccinellia fasciculata*). This species is listed on the Flora Protection Order and is listed in the Red Data Book. This species is found in more brackish conditions than found in ASM. Borrer's Saltmarsh-grass is generally found in upper saltmarsh and muddy transitional areas particularly along embankments adjacent to coastal areas. It is an indicator species of a rarer sub-type of MSM. This species is only found from seven 10 km^2 squares along the Barrow Estuary, as well as Wexford and Dublin shorelines since 1960 (Preston *et al.* 2002). There are several records for this species at various sites around Wexford Harbour including Castlebridge, North & South Slobs, Woodtown and Rosslare. This survey site includes two of the sites recorded by the Rare Plant Survey at Woodstown and Rosslare.

The site was accessed from several points around the shoreline. Permission was requested to cross private land in Woodstown. The mudflats of the inner Hopeland area are quite treacherous and soft.

3 SALTMARSH HABITATS

3.1 General description

The most common Annex I habitat at this site is Atlantic salt meadows (Table 3.1). However the area of *Spartina* swards is actually greater than the total area of Annex I saltmarsh habitat. The survey site covers a relatively long length of shoreline (5 km) and the saltmarsh development along the shoreline varies. The survey site can be spilt into 3 main sections for ease of description: Burrow, Woodtown and Lake Little, and Island.

3.1.1 Burrow

This section is located in the north-east part of the survey site and covers the shoreline from north of the old embankment that enclosed Hopeland to the end of the saltmarsh at Rosslare Point. A narrow band of saltmarsh has developed along this shoreline, becoming somewhat wider and more extensive towards Rosslare Point. A minor road is situated close to the shoreline in this area, leaving only a narrow band of coastal habitats between the road and the intertidal flats. The saltmarsh is only 5-20 m wide at the southern end of this section. This contains a band of *Spartina* sward along the edge of adjacent mudflats, which then transitions to a band of ASM. The width and dominance of these bands of vegetation may

vary and *Spartina* sward is dominant in places and disappears from other sections. The ASM occasionally has patches of other saltmarsh along the landward side, dominated by patches of Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. Some of these brackish habitats have developed at outflows from adjacent residences. The saltmarsh transitions at the landward side to a grassy or scrubby embankment along the road.

The intertidal flats become sandier towards Rosslare Point. The northern section contains better developed saltmarsh with wider ASM and *Spartina* sward zones that are up to 45 m wide at the northern end. There is a very low saltmarsh cliff along the lower seaward boundary or the saltmarsh cliff is absent. The dominance of *Spartina* swards increases towards the northern end. A track divides the saltmarsh from adjacent golf course links that have been developed on the sand dunes of the Burrow.

3.1.2 Woodtown and Lake Little

This is the largest section of saltmarsh and contains all of the shoreline around the Hopeland intertidal area, south of the old embankment. The largest area of saltmarsh development on the site is located in the south-east corner of this area. Narrower bands of saltmarsh fringe the rest of the shoreline, around to Island at the north-west corner of the survey site.

A narrow band of saltmarsh (about 20 m wide) is situated along the eastern shoreline, south of the old embankment. This band increases in width towards the south-east corner (to about 40 m in width). This section is structured with a dominant band of Common Reed with some Sea Club-rush (mapped as CM2) along the landward side and a narrow fringe of ASM along the seaward side, adjacent to soft mudflats. Common Cordgrass (*Spartina anglica*) is present on the ASM in the northern part of this section and becomes more dominant towards the south-east corner. A band of *Spartina* swards develops along the seaward side of the ASM. There is a natural transition along a shallow slope from *Spartina* sward to ASM. There are several clumps of Sharp Rush (*Juncus acutus*) along the landward side of the ASM in this section. Sharp Rush is a notable species and an indicator of a rarer MSM sub-type, but its extent was too small to map as distinct MSM habitat.

An extensive *Spartina* sward has developed in the south-east corner of this area. There are several small patches of *Salicornia* flats at the seaward edge of this sward on the intertidal flats. The *Spartina* swards transition along a natural gradient to ASM. The ASM zone is about 40 m wide. There is some development of MSM dominated by Sea Rush (*Juncus maritimus*) in this area, situated at the landward side of the ASM in typical zonation. The saltmarsh transitions to pasture at the landward side. The former upper boundary is marked on the ground by an old eroding earth-bank but saltmarsh has encroaches landward behind this boundary into the pasture. Some Gorse (*Ulex europaeus*) bushes are present on this earth-bank. There is a natural transition between the saltmarsh and the pasture in places. Saltmarsh encroaches along some of the drainage channels landward into the pasture. Some of these brackish drains and edges of earth banks provide habitat for Borrer's Saltmarsh-grass.

The saltmarsh thins to a very narrow band of habitat that fringes the south-west and western shorelines. This saltmarsh band is similar in structure and contains a zonation from a band of ASM to *Spartina* swards to intertidal mud along most of the shoreline. The south-west shoreline is natural (Woodtown) but the western shoreline is part of the first embankment that

enclosed the Hopeland area. An old channel is situated adjacent to the embankment and saltmarsh forms on a narrow strip adjacent to this channel. There is an outflow into the intertidal area between the embankment and the natural shoreline. This area also contains a small patch of the rarer MSM sub-type containing Borrer's Saltmarsh-grass.

3.1.3 Island

This section is situated at the north-west corner of the survey site. This area was formerly a small isolated grassy island with some sand dune development before the construction of a seawall between Woodstown and this area to enclose Hopeland. This area now contains complex mosaic of saltmarsh habitats around its shoreline. The development of this area has been considerably affected by the construction of the embankment and there are several internal hollows that contain saltmarsh vegetation around small pools and several internal embankments between these pools. Similar zonation has developed with a generally narrow band of ASM fronted by a band of *Spartina* swards along most of the shoreline. There is some development of *Salicornia* flats on internal mudflat areas that are situated between the Island and the embankment. This area contains some reverse zonation that has developed between some low remnant banks and the island. There are some landward transitions between the saltmarsh and dry coastal grassland along grassy banks on the island and along the embankment.

Table 3.1. Area of saltmarsh habitats mapped at Rosslare.

EU Code	Habitat	Area (ha)
1310	*Salicornia* and other annuals colonizing mud and sand (1310)	0.172
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	7.535
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.426
non-Annex	*Spartina* swards	9.237
	Total*	**17.370**

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

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

There are small patches of this habitat at two locations at this site. The first patch is situated along the seaward side of the *Spartina* swards in the south-east corner of the site on very soft mud. This zone is only several metres wide but extends to 10 m wide at one point. These patches are dominated by Glasswort (*Salicornia europaea*) and also contain green algal mats. It contains Common Cordgrass seedlings and some small clumps. This narrow zone acts a pioneer saltmarsh zone. There is no transition between the *Salicornia* flats and the adjacent *Spartina* swards and a definite boundary is present.

The habitat is also found at the Island in the north-west corner of the site. *Salicornia* flats have developed in several areas where there are bare mudflats that are partially enclosed by *Spartina* swards, ASM and by low embankments. This area has been significantly modified by the polderisation of the South Slobs area in the past. This area is still changing and these patches may transition to *Spartina* swards or ASM in the future.

3.3 Atlantic salt meadows (H1330)

This habitat is the most common Annex I habitat found on the site. It is best developed at Burrow (north-east corner), in the south-eastern corner of the site (Lake Little) and at island

(north-west corner of the site). The remaining habitat consists of a generally narrow strip of ASM that fringes the remaining shoreline. This fringe usually has (but not always) a zone of *Spartina* sward at the seaward edge and there is a narrow transitional zone present between these two zones in places. Other sections have an abrupt boundary between these two habitats. The fringe is dominated by lower zone ASM containing Common Saltmarsh-grass (*Puccinellia maritima*), Lax-flowered Sea Lavender (*Limonium humile*) and less frequent Sea Pink (*Armeria maritima*), Glasswort and Sea Aster (*Aster tripolium*). Clumps of Common Cordgrass are also present in the ASM zone. Some of this fringe is mapped as a mosaic of *Spartina* sward and ASM. This mosaic is co-dominated by Common Saltmarsh-grass and Common Cordgrass.

This fringe of ASM along the eastern side of the Hopeland section is in poor condition and contains frequent eroded hollows revealing bare substrate. The vegetation seems to be dying back and is less vigorous in places. Zonation of saltmarsh vegetation is also unusual in some sections of this shoreline. The saltmarsh topography is poorly developed along these strips. A strip of *Spartina* swards transitions to ASM, which then transitions back to *Spartina* sward or a mosaic of *Spartina* sward and ASM further landward. The presence of Common Cordgrass higher up on the saltmarsh may be related to different stages of colonisation or related to stress on the site caused by water pollution that allowed the colonisation of Common Cordgrass in this area.

Much of the landward boundary of the ASM in the Hopeland section is quite distinct and is marked by stands of Common Reed or Sea Club-rush. However, the eastern section of the saltmarsh contains a gradual transition from ASM to Common Reed stands at the landward boundary of the ASM in places. This transition contains Common Reed growing amongst other saltmarsh vegetation and may be an indication that Common Reed is spreading (as a result of the pollution?). There is a low cliff along the ASM fringe along the south-west section of the site. Some of the ASM is overhung by a hedge and some of the coastal strip is open and there is a low cliff up to 1 m high in places separating the coastal strip from adjacent pasture. This cliff shows signs of erosion in places but this may in fact be induced by cattle poaching.

The ASM found in the south-east corner of the site is dominated by low zone and low-mid zone communities. Zonation of vegetation is well developed as the saltmarsh has developed on a shallow slope from the seaward to landward sides. The zonation from *Spartina* sward to ASM is particularly well developed. This area is heavily grazed and this has affected the species assemblage as Sea Purslane (*Atriplex portulacoides*) is not found in this area. The sward height is also quite low and uniform. The saltmarsh topography is poorly developed and there are few pans present. This area is drained by several main creeks.

The transitional zone between the ASM and *Spartina* sward displays the worst damage from cattle poaching and the sward surface is badly damaged and tussocky. This zone contains typical pioneer vegetation dominated by Common Saltmarsh-grass, Glasswort and Lax-flowered Sea Lavender. The heavy poaching has affected the species assemblage of the ASM in places as this has promoted the frequency of Glasswort in the disturbed ASM and in the adjacent *Spartina* sward.

A mid–upper zone is also present in this area. This zone is dominated by Red Fescue and also contains Sea Plantain (*Plantago maritima*), Common Saltmarsh-grass, Sea Aster, Sea Spurrey (*Spergularia media*) and Sea Arrowgrass (*Triglochin maritimum*).

A good example of ASM saltmarsh zonation has developed at the northern end of the Woodstown area adjacent to an outflow draining part of the South Slobs. The lower zone is typical and is dominated by Common Saltmarsh-grass. A narrow mid marsh ASM zone has developed that is dominated by Sea Plantain, Sea Arrowgrass, Common Saltmarsh-grass and Sea Pink. The grazing intensity is low-moderate in this area and this has helped create a typical low close cropped sward due to the presence of the mid marsh zone. The lower zone is somewhat poached. This vegetation transitions to an upper zone community dominated by Creeping Bentgrass (*Agrostis stolonifera*) and also containing Autumn Hawkbit (*Leontodon autumnalis*), White Clover (*Trifolium repens*), Toad Rush (*Juncus bufonius*), Red Fescue (*Festuca rubra*), Perennial Rye-grass (*Lolium perenne*), Saltmarsh Rush (*Juncus gerardii*) and Hard grass (*Parapholis strigosa*). The saltmarsh topography is poorly developing in this area.

The ASM at Burrow at the northern end is somewhat different in structure as it is not grazed. This saltmarsh is also likely to be much older as it has not been directly affected by the attempted reclamation of Hopeland. There is some zonation in ASM with the upper zone dominated by Sea Purslane adjacent to a sandy track. The Sea Purslane is more prominent due to the lack of grazing. A lower zone is dominated by Common Saltmarsh-grass and Lax-flowered Sea Lavender. There is also pioneer type vegetation with Annual Sea-blite (*Suaeda maritima*) and Glasswort also present (*Salicornia europaea* and *Salicornia procumbens* types both present). Common Cordgrass is also present in this section and becomes more prominent towards the northern end, forming *Spartina* swards. There is some erosion along the seaward edge and some of the sediment is being re-worked and is accreting in places. The saltmarsh topography of this section is also not particularly well-developed with no salt pans or creeks present.

3.4 Mediterranean salt meadows (H1410)

There are two MSM sub-types present at this site. The main area is characterised by the presence of Sea Rush. This is located at the south-east section of the site. There is some zonation present within this habitat that can be seen in the distribution of other saltmarsh species. Sea Rush is associated in saltmarsh dominated by low-mid zone saltmarsh species, which is uncommon. The vegetation is dominated by Common Saltmarsh-grass in places. Other species such as Red Fescue, Saltmarsh Rush, Common Scurvygrass (*Cochlearia officinalis*), Sea Aster, Sea Arrowgrass, Sea Pink and Sea Plantain are present. Red Fescue, Sea Plantain and Saltmarsh Rush become more prominent towards the landward side. This area is grazed by cattle but it is not damaged by poaching. The sward height is variable due to the presence of clumps of Sea Rush (ungrazed) and patches of other saltmarsh vegetation (grazed).

A second rarer sub-type characterised by the presence of Borrer's Saltmarsh-grass is present at two locations at the site. This is not a distinct vegetation type but rather an upper saltmarsh community with Borrer's Saltmarsh-grass. Both of these locations were already identified by the Rare Plant Survey (1990). The first location is situated in a brackish area at the top of a drainage ditch at the upper saltmarsh boundary. The area in the drainage channel is quite poached and the substrate is disturbed. Borrer's Saltmarsh-grass is associated with Common Saltmarsh-grass, Sea Spurrey, Toad Rush, Creeping Bent, Red Fescue, Saltmarsh Rush, Sea Arrowgrass and Celery-leaved Buttercup (*Ranunculus sceleratus*). Clumps of Common Cordgrass are also found close by in the drainage channel.

The second location is a somewhat similar habitat (northern end of Woodstown). Saltmarsh has developed close to an old ditch lined with a hedge and some mature trees. Borrer's Saltmarsh-grass is found on old poached hags in a poached zone along the landward edge of the saltmarsh, and is overhung by Bramble (*Rubus fruticosus*). A narrow zone of mainly ASM is found along the landward boundary adjacent to more extensive *Spartina* swards at this location. About 10 plants were noted at this location in association with common Saltmarsh-grass and Creeping Bentgrass. Borrer's Saltmarsh-grass is also found close by on a poached zone with bare mud where a track crosses over a ditch. Three plants were noted here.

Several clumps of Sharp Rush were noted along the eastern ASM saltmarsh in the Hopeland area. This species is an indicator of a rarer sub-type of MSM. However, it was not frequent enough to classify any area as MSM.

3.5 *Spartina* swards

This is the most common saltmarsh habitat present at this site. Common Cordgrass has colonised soft mudflats along the seaward side of the more established saltmarsh to form generally narrow strips of habitat on the eastern and western sides of the site. Clumps of Common Cordgrass have coalesced to form these strips of *Spartina* swards. There are sections where the clumps have not coalesced yet and Common Cordgrass forms small mosaics with ASM or with bare mudflats. The *Spartina* sward and isolated clumps of Common Cordgrass shows similar stress and die back of vegetation in places that is also seen in the ASM and may be caused by water pollution. Some of the seaward boundary of the sward shows signs of erosion.

Common Cordgrass has colonised on sandier sediment adjacent to ASM at the northern end of the site. The sward develops along the seaward side of the ASM and becomes more prominent towards the northern end of this area. The substrate is quite sandy at this end and clumps of common Cordgrass are trapping sand and becoming smothered. There are no signs that Common Cordgrass spreading on the mud and sand flats in this area.

The largest area of sward has developed in the south-east corner of the site. *Spartina* swards are up to 150 m wide in places and form a dense monoculture in places. There is some Glasswort amongst the Common Cordgrass at the seaward side of the sward. Common Cordgrass seedlings appear on the seaward side of the sward and indicate that the sward may still be spreading on the mudflats.

The sward has developed in an area with a gentle slope from the seaward to the landward edge of the marsh. This has allowed the development of a naturally wide transition zone between the *Spartina* sward and the ASM. The transition zone contains frequent Common Saltmarsh-grass and occasional Sea Aster, Glasswort, Sea Spurrey and Lax-flowered Sea Lavender. There is also some zonation to an ASM strip along the main creeks that drain this section of saltmarsh and these are dominated by Sea Purslane.

4 IMPACTS AND ACTIVITIES

This site is affected by several different impacts and activities (Table 4.1). The grazing intensity varies over the site. The Burrow, Island sections and narrow strips of saltmarsh along the eastern and western shorelines are not grazed. The saltmarsh along the southern

shoreline of Woodstown and Lake Little are grazed heavily by cattle (143). This area also shows some variation in grazing intensity that can be seen along a fence line dividing the eastern and western sections. The transitional zone between the *Spartina* swards and the ASM is particularly heavily poached and the damage decreases further seaward as the mud becomes softer and the Common Cordgrass becomes denser. (Cattle will not graze this vegetation unless there is no alternative). The MSM is not damaged significantly by the grazing level and *Salicornia* flats are not grazed at all as this area is not accessible to cattle. The saltmarsh (ASM and *Spartina* swards) along Woodstown is particularly damaged by poaching (some of the heaviest poaching seen during the survey). The grazing intensity has actually affected saltmarsh zonation as the *Spartina* swards are situated further seaward on the more heavily grazed section compared to the other side of the fence. The very heavy grazing and poaching has actually promoted the development of Common Saltmarsh-grass and glasswort further seaward compared to the other side of the fence, which is less grazed. The *Spartina* swards have been grazed to some extent in this area. The variation in grazing intensity over the whole site means that there is also significant overall variation in sward height.

While the grazing intensity is high in the southern section and negatively impacts the ASM, this is beneficial to the status of Borrer's Saltmarsh-grass. This species prefers poached ground in brackish situations at the landward side of the ASM, particularly where the ASM extends along drainage channels. A comparison of pictures taken during the Rare Plant Survey (1990) to the current condition of the site indicates that overall grazing intensity may have actually reduced at this site.

A track used to access Rosslare Point marks the upper boundary of saltmarsh at Burrow (501). This track is used by vehicles and has destroyed any natural transition between saltmarsh and adjacent sand dunes. There are also deep wheel ruts on the saltmarsh at this location, caused by vehicles parking on the saltmarsh.

Water pollution (701) from sewage outflows is visible along the eastern side of the survey site and is quite malodorous. Many houses in Burrow have outflows from septic tanks that directly flow into the intertidal zone (424). Parts of this shoreline have dense Common Reed development at some of these outflows. The saltmarsh along this area is in poor condition with die back of vegetation and more frequent bare substrate visible. The saltmarsh has the appearance of being grazed or being less vigorous, but is not actually grazed. There may also be some erosion along the seaward boundary of the ASM. The saltmarsh seems to be stressed in this area and this may be caused by the pollution and leading to dieback of vegetation. There are frequent eroded hollows in this part of the ASM. The EPA map site (www.epa.ie) rates the intertidal and estuarine zones of Wexford Harbour and this area as being unpolluted with the last assessment in 2004-2005.

There are some signs of erosion at this site along the eastern shoreline (900). There is a low saltmarsh cliff (20-30 cm high) at the seaward boundary of the ASM and *Spartina* sward and the adjacent mudflats or sandflats. In some cases there is no cliff at all and there is a natural gradient or accretion ramp between the saltmarsh and the adjacent intertidal flats. There are some visible signs of erosion along the seaward boundary in places and the saltmarsh vegetation is dying back, particularly along the eastern side of the site. This can also be attributed to stress from water pollution, but can also be seem in the northern section adjacent to the golf course where there is no direct sewage outflow. There is some measurable erosion indicated from a comparison of the 2000 and 2005 series of OSI aerial photos and GPS points recorded along the current seaward boundary in 2007. The saltmarsh has

retreated by about 5 m wide in places since 2000 due to erosion. The area lost due to erosion is likely to be quite minor and estimated to be of the order of about 0.05 ha. There are moderate prospects for landward retreat of saltmarsh at this site. Erosion has a fairly low impact on both the *Salicornia* flats and the MSM vegetation.

There have been some recent repairs to the roadside embankment along the road accessing Rosslare Point. These repairs have not had any significant impacts on the adjacent strip of saltmarsh. The saltmarsh around the old embankment on the eastern side of the site is used for mooring several small fishing and amenity boats (210). There is some disturbance to this area from these activities but it is relatively minor.

Common Cordgrass is present at this site and has formed extensive swards around the shoreline. This is an invasive species of saltmarsh (954). It is not known when this species was planted or naturally colonised Wexford Harbour. However, it is known to be present since 1960 (Nairn 1986), so it is likely to have colonised or been planted in this area between 1930-1960. It is known from Ireland since 1925.

There are some signs that this species is still spreading on the mudflats, particularly along the south-eastern shoreline, as new seedlings have appeared on the mudflats. However, there are no indications that this species has spread significantly on mudflats in this area between 2000-2005, from a comparison of the OSI aerial photos. There are some signs of the spread of *Spartina* sward seaward over a 5-10 m wide zone at the northern end of the site along the Burrow.

There are natural transitions from *Spartina* swards and ASM that are related to the development of saltmarsh on a gentle gradient. This may be some indication that the overall saltmarsh has developed relatively recently with the spread of Common Cordgrass. Usually *Spartina* swards develop on mudflats adjacent to the former ASM and there is a distinct boundary between the two habitats that is related to the old ASM seaward boundary and may take the form of a saltmarsh cliff. However this type of transition is not present at this site indicating the spread of Common Cordgrass occurred in conjunction with the lower saltmarsh.

Common Cordgrass may have replaced lower zone and pioneer ASM habitat in these transitional areas. For this reason the impact of Common Cordgrass is assessed as moderately negative within the transitional areas. However, there is no evidence that this species has spread into ASM during the current monitoring period. The impact of this species on extent and structure and functions of the ASM is assessed as neutral due to the lack of accurate baseline data on the former status of Common Cordgrass. This species is also likely to have replaced *Salicornia* flats in the south-eastern corner of the site but again there is no accurate baseline information to definitely state that this has occurred within the current monitoring period.

There has been some dumping or infilling in the Hopeland intertidal area during the current monitoring period. This has affected saltmarsh in the south-eastern corner of the site. Some saltmarsh (about 0.5 ha) has been infilled (802) and a new fence line has been built along the new boundary.

This site has been considerably modified by historical reclamation of intertidal land in the past. The area known as Hopeland was enclosed by a seawall in the past (801) but the seawall has since been breached and the area has reverted back to intertidal and coastal habitats. Former earth banks marking the former boundary between the saltmarsh and

adjacent pasture in the south-east section have also been breached. This area is a good example of 'accidental' retreat in Ireland and shows that reasonably natural saltmarsh can develop quite quickly (50-100 years). This impact is not assessed as it occurred prior to the current monitoring period.

The main impacts and activities adjacent to the survey site are cultivation (100), fertilization (120) and the grazing of livestock (140) related to farming practises. Other impacts and activities around the site include discontinuous habitation (402) at the south-eastern corner of the site and dispersed habitation (403) along the southern side. A caravan park (608) and golf course (601) are some of the developments related to the amenity use of the area that are located in Burrow at the east of the site. The northern section adjacent to Rosslare Point is used by walkers (622). The outer Wexford Harbour is used for fishing (200). The direct impact of these impacts and activities is difficult to assess accurately. Ecological functions such as hydrology, water chemistry and nutrient inputs may be affected to some extent by these developments, but the site does seem to be directly affected by water pollution related to sewage outflow from some of these developments.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1310	900	C	0	0.172	Inside
1310	954	C	-1	0.172	Inside
1330	143	B	-1	2.500	Inside
1330	210	C	-1	0.010	Inside
1330	501	C	-1	0.850	Inside
1330	701	B	-1	9.237	Inside
1330	802	A	-2	0.500	Inside
1330	900	C	-1	0.5	Inside
1330	954	B	-1	1.0	Inside
1410	140	C	0	0.426	Inside
1410	143	B	+1	0.001	Inside
1410	210	C	-1	0.426	Inside
1410	701	C	0	0.426	Inside
1410	900	C	0	0.426	Inside
1310	424	B	-1	0.172	Outside
1330	424	B	-1	9.237	Outside
1410	424	B	-1	0.426	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.

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 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 is some additional information available from the NPWS Rare Plant Survey.

The overall status of this site is assessed as *unfavourable-bad* (Table 5.1). This is mainly due to the grazing damage on the ASM and the visible signs of stress on the eastern side of the site, possibly from water pollution. However, it should be noted that while the grazing level has negatively affected the ASM, it is actually beneficial to the status of Borrer's Saltmarsh-grass and the rarer sub-type of MSM. The site has also been affected by infilling and a small portion of ASM has been destroyed. Common Cordgrass is a prominent feature at this site and has formed extensive sward areas, mainly in the lower and pioneer zones of the saltmarsh.

Nationally, this is an important site due to the presence of Borrer's Saltmarsh-grass, a rare species found on saltmarsh. It is found at two locations at this site. This site is also notable due to its history and the fact that the most substantial area of saltmarsh has developed in Hopeland that was formerly reclaimed at the start of the 20th Century. This is a good example of 'unmanaged retreat' (or accidental retreat) of saltmarsh in Ireland and how saltmarsh can redevelop within the intertidal area relatively quickly.

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

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 - inadequate
Atlantic salt meadows (1330)		Extent	Structure and functions Future prospects	Unfavourable-bad
Mediterranean salt meadows (1410)	Extent Structure and functions, Future prospects			Favourable

The medium-term future prospects of natural landward saltmarsh migration in response to sea level rise are moderate-high. Some of the saltmarsh has landward transitions to pasture in the south-east section and therefore provides some scope for natural landward transition. The saltmarsh along Rosslare Point may be vulnerable to erosion if the sand spit is eroded. However, these are very general predictions.

This site is located within the River Slaney Estuary cSAC so the status of the Annex I habitats and the rare species should not be affected by any land-use changes that have to be licensed by local or national authorities. However, there is no NPWS management plan for this site.

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

5.2.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to erosion, natural changes and land-use changes during the current monitoring period. This habitat is found in typical pioneer areas on mudflats. This habitat is found adjacent to *Spartina* swards but there is no indication that *Salicornia* flats were more extensive in the past.

5.2.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. Three monitoring stops were carried out in this habitat and they all passed. All of the attributes required for the structure and functions of this habitat reached their targets. Two Glasswort species were recorded in this habitat. There are few impacts and activities acting on this habitat, apart from the presence of Common Cordgrass, an invasive species. The pollution does not seem to be visually affecting this vegetation type and there are no signs of erosion. There are some indications that Common Cordgrass is spreading at present on the mudflats as seedlings are present. This may be at the expense of *Salicornia* flats but the absence of accurate and detailed baseline data means this impact is not considered. There is no information about the previous extent of *Salicornia* flats or the frequency of Common Cordgrass in this habitat.

5.2.3 Future prospects

The future prospects of the habitat are assessed as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. Common Cordgrass is present and there are signs that it is spreading. This species has the potential to continue to spread in the future at the expense of *Salicornia* flats. There are few other impacts or activities that can negatively affect this habitat.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *unfavourable-inadequate*. About 0.5 ha of saltmarsh (most likely to be ASM) has been infilled during the current monitoring period and this represents a 7% loss of habitat. There are also signs of some minor erosion along the eastern edge of the site. A zone of about 5 m wide has been eroded in places, but the erosion is discontinuous and is not present along the whole of the shoreline. This erosion represents a much smaller loss of habitat (about 0.1 ha) along the whole of the shoreline. There is no evidence of any loss of ASM due to the spread of *Spartina* swards during the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-bad*. Nineteen monitoring stops were carried out in this habitat and seven failed (36%). Monitoring stops usually failed due to the level of poaching damage from grazing, or to stress on the saltmarsh habitat from possible water pollution. The grazing intensity varies over the site and some sections are not grazed at all while other sections are heavily grazed and contain some of the worst poaching damage seen during the survey. The heavy grazing has also altered the species assemblage of the ASM, as Sea Purslane is noticeably absent in the grazed sections and the frequency of Glasswort is increased in the heavily poached areas.

Several ASM saltmarsh communities are present at this site including pioneer zones. There are some good examples of zonation present. There are also natural transitions to other saltmarsh and coastal habitats present. However the saltmarsh topography is relatively poorly developed compared to other sites. This may be an indication of the relatively young age of the saltmarsh. The sward height varies overall and this is related to grazing intensity.

Common Cordgrass is a prominent feature of this saltmarsh and forms extensive swards to the landward side of the ASM. There is also a significant transitional zone present between these two habitats. There is no evidence that Common Cordgrass has spread into the ASM during the current monitoring period, although this may have occurred prior to the monitoring period. The impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

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 such as grazing continue in the near future. Currently the grazing pressure is high on a significant portion of the site and this is damaging the ASM. Continuing pollution from sewage outflows also has the potential to further stress the saltmarsh. Common Cordgrass is already quite extensive in the lower saltmarsh zone so there is less potential for it to spread in the future at the expense of ASM.

Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to erosion, natural changes and land-use changes during the current monitoring period. The overall site is being affected by erosion, but there was no measurable erosion affecting the MSM. The infilling probably only affected ASM and there was no indications that it also infilled MSM. The spread of common Cordgrass has not affected the extent of MSM, due to the position of MSM in the upper saltmarsh zone.

5.4.2 Habitat structure and functions

The structure and functions of this habitat is assessed as *favourable*. Four monitoring stops were carried out in this habitat (Two in the main community dominated by Sea Rush and two in the rarer MSM sub-type characterised by the presence of Borrer's Saltmarsh-grass) and

they all passed. All of the attributes required for the structure and functions of this habitat reached their targets. There are few other impacts and activities directly acting on this habitat, apart from grazing. The signs of stress possibly related to water pollution are not seem in the MSM, probably due to its position and some distance from the sewage outflows.

The sub-type dominated by Sea Rush is not damaged by poaching, although the drainage intensity is moderate-high. The vegetation assemblage of this area is not typical of this habitat as Sea Rush is found in a section of low-mid marsh and not upper marsh, which is more typical. The saltmarsh topography is not developed in this habitat due to its relatively small size.

Poaching favours the rarer sub-type dominated by Borrer's Saltmarsh-grass. There are indications that the grazing intensity has actually decreased during the current monitoring period when the vegetation cover of the Borrer's Saltmarsh-grass sites at the time of the Rare Plant Survey (1990) is compared to the current condition of these sites. Pictures taken during the Rare Plant Survey indicate that the vegetation cover was much lower at these sites. The extent of this sub-type is actually quite small and covers a zone only several metres wide at a particular position along the saltmarsh gradient (at the landward boundary).

Sharp Rush was recorded at this site but only a few large clumps are present. There are no indications that this species was more frequent at this site in the past.

5.4.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. High levels of grazing in the future are required to maintain the status of Borrer's Saltmarsh-grass at the site so the current grazing levels could be maintained.

Most of the habitat is located within the cSAC boundary so the habitat should not be affected by any land-use changes that have to be licensed by local or national authorities. It should be noted that both of the sites where Borrer's Saltmarsh-grass is located are outside the cSAC boundary.

6 MANAGEMENT RECOMMENDATIONS

Grazing is the main activity directly acting on this site. While the grazing intensity is negatively affecting the ASM in places it is beneficial to the status of Borrer's Saltmarsh-grass, which requires disturbed areas in brackish situations. The grazing regime while overall being damaging to the ASM should continue for the benefit of Borrer's Saltmarsh-grass.

Action should be taken about the water pollution from the sewage outflows along the eastern side of the site.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

Curtis, T.G.F.C. and Sheehy-Skeffington, M.J. (1998). The Salt Marshes of Ireland: An Inventory and Account of their Geographical Variation. *Biology and Environment: Proceedings of the Royal Irish Academy* **98B**, 87-104.

Goodwillie R. (1979). A preliminary report on the areas of scientific interest in Co. Wexford. An Foras Forthbatha.

NHA database (1990). Information from files of pNHAs held by NPWS.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

Preston, C.D. Pearman, A. & Dines, D. (2002). *New atlas of the British and Irish Flora*. Oxford University Press.

www.epa.ie/Internetmapviewer. *Environmental Protection Agency maps indicating water quality and potential status of water bodies and ground water as related to the Water Framework Directive.*

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats	0.172	0.172				
2	Spartina swards	9.237					9.237
3	1330 Atlantic salt meadow	7.357		7.357			
4	1410 Mediterranean salt meadow	0.248			0.248		
5	ASM/MSM mosaic (50/50)	0.356		0.178	0.178		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	6.990					
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)	2.214					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**26.574**	**0.172**	**7.535**	**0.426**		**9.237**

Legend

- NHA Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Other Saltmarsh (CM2)
- other
- 1310 monitoring stops
- 1330 monitoring stops
- 1410 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Rosslare (Map 1 of 2)

Wexford Slobs and Harbour NHA (000712)

SMP code: SMP0040

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 70 140 210 280 350 Meters

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:5250

N

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Rosslare (Map 2 of 2)

Wexford Slobs and Harbour NHA (000712)

SMP code: SMP0040

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 70 140 210 280 350 Meters

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:5250

N

Saltmills

1 SITE DETAILS

SMP site name: **Saltmills**		SMP site code: **0044**
Dates of site visit: **27 & 28/08/2007**		CMP site code: **N/A**
SM inventory site name: **Saltmills**		SM inventory site code: **217**
NPWS Site Name: **Bannow Bay**		
NPWS designation	cSAC: **697**	MPSU Plan: **Old Format- Draft 2 Consultation 2001**
	pNHA: **697**	SPA: **4033**
County: **Wexford**		Discovery Map: **76** Grid Ref: **280700, 109100**
Aerial photos (2000 series): **O 5707-C**		6 inch Map No: **Wx 045**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**
H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**
H1410 **Mediterranean salt meadows (Juncetalia maritimi)**
H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Bannow Island, Clonmines, Fethard, Gorteens, Grange, Taulaght**

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

2 SITE DESCRIPTION

Saltmills saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site which empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. Saltmills is located along the western side of the bay 1.2 km south-east of Tintern Abbey. This marsh is also known as St Kieran's Marsh and an old church with this name is located nearby. The adjacent area is dominated by fertile farmland with improved grassland, tillage and arable crops all found in the area. The surrounding area is low-lying and there are gentle-moderate slopes along a seaward gradient to the shoreline. This part of Co. Wexford is quite rural and there is scattered habitation along minor roads in the area and along the shoreline.

The saltmarsh has developed in a small partially enclosed area by a shingle ridge. It was probably reclaimed to some extent in the past but has been left derelict for a considerable time. It consists of a small low-lying plain behind a glacial mound, which contains some improved grassland, transitional coastal grassland and scrub. The site is bounded on its seaward side by a shingle ridge and on its upper side by a local road. There are some modified drainage channels through the marsh.

Saltmills is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Three Annex I saltmarsh habitats were recorded at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). All three habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. There was no information from the NPWS site files or the NPWS Rare Plant Survey to suggest that this species was previously recorded at this site. However, one individual plant was located by a recent Coastwatch survey (2006). It was not relocated during this survey.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. The lower part of the road or upper shoreline as mapped by the 2nd edition 6 inch map was taken as the cSAC boundary but the saltmarsh habitat extends beyond this boundary in places.

Access to the site is from a roadside gate which leads directly onto the foreshore.

3 SALTMARSH HABITATS

3.1 General description

The marsh at Saltmills is a remnant saltings or grazed marsh which may have been associated with the local Abbey at Tintern. It is a small low-lying marsh that is sheltered from all but the most severe tidal inundations by the shingle barrier. This barrier is vegetated by Twitch (*Elymus repens*)-dominated vegetation with other species such as Sow-thistle (Sonchus sp.) and Curled Dock also present. The history of the site as a saltings is clear and many of the linear creeks are obviously man-made. They all connect into a single, relatively deep channel which drains to the west of the site into the bay. A Hawthorn-dominated

hedgerow marks the boundary between the saltmarsh and the mound at the western side. The majority of the main saltmarsh is dominated by Atlantic salt meadows (ASM) with small patches of Mediterranean salt meadows also scattered through this main area. The marsh is roughly divided into two with the MSM mainly found on the western side of the site and the ASM confined to the eastern end of the site.

The landward boundary is marked by a band of Common Reed (*Phragmites australis*) along a deep drain that probably marks some freshwater influence from the adjacent land. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

There is also some patchy saltmarsh development along the road further west of the main section. This saltmarsh is dominated by MSM with some patches of Common Cordgrass mapped as *Spartina* sward on the seaward side. There are several small patches of *Salicornia* flats in this area.

Table 3.1. Area of saltmarsh habitats mapped at Saltmills.

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	0.015
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	1.127
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.843
non-Annex	*Spartina* swards	0.002
	Total	**1.987**

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

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

This habitat is characterised by the presence of Glasswort (*Salicornia* spp.), that have colonised mixed substrate (muddy shingle) towards the western side of the site. Annual Sea-blite (*Suaeda maritima*) is also present. It is found outside the main section of marsh and close to the stands of Sea Rush (*Juncus maritimus*) along the roadside. There is a distinctive boundary between the adjacent MSM and the *Salicornia* flats and no accretion ramp is present. While there are clumps of Common Cordgrass in proximity to these small patches of habitat there are none within the patches. There are indications of erosion in this area and Glasswort may be colonising muddy shingle that formerly contained more established saltmarsh in the past.

3.3 Atlantic salt meadows (H1330)

There are well-developed examples of mid marsh and mid-upper marsh vegetation at this site. The Atlantic salt meadow habitat is confined to the eastern end of this small marsh, lying behind the elevated shingle ridge. For the most part the vegetation consists of a low sward, distinctive of mid marsh with the vegetation cover about 10 cm high. There are no signs of

grazing. There is very little development of a low marsh sward but this habitat can be found along the main drainage channels and some of the smaller creeks and channels on the site. This community is dominated by a sward of Common Saltmarsh-grass.

The mid-marsh vegetation is dominated by a typical sward of Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*). There are generally smaller but variable amounts of Lax-flowered Sea Lavender (*Limonium humile*), Sea Milkwort (*Glaux maritima*), Common Scurvy-grass (*Cochlearia officinalis*), Red Fescue (*Festuca rubra*), Sea Arrow-grass (*Triglochin maritimum*) and Common Saltmarsh-grass (*Puccinellia martima*). Some zonation is evident and the cover of Lax-flowered Sea Lavender, Sea Aster, Glasswort and Common Saltmarsh-grass increases in some shallow hollows in this zone. There are scattered clumps of Common Cordgrass in this zone but these species do not form a significant part of the vegetation (5-10% overall). This zone has a well-developed salt pan network.

The mid-upper zone is characterised by the greater dominance of Red Fescue and the absence of species like Common Saltmarsh-grass and Lax-flowered Sea Lavender. This zone and contain low mounds with Saltmarsh Rush (*Juncus gerardii*) present. This sward has a higher sward height (10-20 cm). There are also some scattered clumps of Sea Rush (*Juncus maritimus*) in places. Some pans are present in this zone.

The saltmarsh structure has been modified in the past by drainage with one main channel draining the site and smaller drains criss-crossing the rest of the saltmarsh. Ridges dominated by Red Fescue run alongside the drains and this affects zonation across the marsh. However these artificial drainage channels act in the same way as natural channels and are partially infilling in places to create pan like structure in places. Some well-developed natural large salt pans are also present. The presence of these drains has allowed the colonisation of some clumps of Common Cordgrass in places, but this species does not form a significant part of the vegetation. There are also some clumps found within the natural salt pans present in this habitat.

3.4 Mediterranean salt meadows (H1410)

This habitat was characterised by frequent cover of Sea Rush (*Juncus maritimus*) clumps interspersed with mid-upper ASM marsh dominated by Red Fescue. There is some typical zonation of this habitat where it is positioned along the landward side of the ASM, mainly around the back of the glacial mound.

The sward height is generally much higher compared to the ASM (0.5 m). Some sections are denser with almost complete cover of Sea Rush cover. Other species present includes small amounts of Creeping Bent (*Agrostis stolonifera*), Sea Plantain, Sea Arrowgrass, Sea Milkwort (*Glaux maritima*), Greater Sea-spurrey (*Spergularia media*) and Parsley Water-dropwort (*Oenanthe lachenalii*). There are some salt pans in this habitat. Some clumps of Common

Cordgrass are found within the MSM mainly along some of the artificial drains within this habitat.

There is some zonation evident in this habitat where Sea Rush tussocks are also present in the mid marsh zone, which is dominated by Sea Pink and Sea Plantain. The Sea Rush cover is lower in this zone. Lower zone species such as Common Saltmarsh-grass and Lax-flowered Sea Lavender are also present in this zone which is an unusual occurrence.. There was generally a discrete boundary between the Atlantic and Mediterranean salt meadow which is striking.

A second area of Sea Rush-dominated vegetation is present on the muddy shingle of Bannow Bay to the west of the main marsh. This section seems to have eroded significantly in the past. Sea Rush is found on mixed substrate and there are some signs that it is re-colonising along the lower seaward boundary. This could be classified as a pioneer habitat. There are fewer other species in this section and there is frequent cover of bare substrate.

3.5 *Spartina* swards

Unlike many other saltmarsh sites in Bannow Bay, Common Cordgrass is not commonly recorded at Saltmills. Five separate patches, totalling 0.002ha were patchily distributed on the seaward side of the shingle ridge and there was little distribution of Common Cordgrass within the main section.

4 IMPACTS AND ACTIVITIES

This is a small saltmarsh and is not greatly impacted by many threatening activities (Table 4.1). It is not easily accessible from the road side as there is a deep drain between the road and the marsh. The saltmarsh is not grazed extensively (140) and the sward height was quite high at the time of the survey. The adjacent small mound with dry coastal grassland has been enclosed in the past and is not grazed at present. The field is not well fenced and cattle could easily access the marsh.

Some round bales of straw have been placed in the adjacent shingle along the outflow at the western side of the saltmarsh. These bales may be acting as sea defence (871) to protect the eroding marsh and shoreline or to prevent the flow of water into the main drainage channel. Some grading of the shingle has also been carried out into a secondary barrier behind the straw bales.

There are few direct signs of erosion (900) in the main section of saltmarsh as it is enclosed and protected by a shingle barrier. Except during storm tides etc which can overtop the shingle ridge, the marsh is open to the sea on its western side only. However, a comparison of the old 2nd edition 6 inch map to the current extent of the saltmarsh as shown from the

2005 aerial photos indicates that it has got smaller during this period. The shingle ridge seems to have retreated somewhat around the seaward side of the site during this period. The retreat of the marsh is by 15 m on the west side adjacent to the glacial mound and up to 50 m towards the south-east corner where it is more low-lying. Old hardened layers of mud that may have formed part of the saltmarsh in the past are visible on the seaward side of the shingle ridge.

There are also some signs of erosion to the clumps of Common Cordgrass and Sea Rush that have colonised the more exposed area to the west of the main saltmarsh. The old 2nd edition 6 inch map marks a small map of saltmarsh along the shoreline adjacent to the road to the west of the main saltmarsh but this has largely eroded away. This is an indication of an erosional trend acting on the site. However there was no measurable loss of saltmarsh due to erosion during the current monitoring period when the 1995, 2000 and 2005 series aerial photos are compared. Therefore, the rate of erosion is likely to be quite slow but still continuing. There are no prospects for natural landward retreat of saltmarsh at this site as it is confined by a road at the upper boundary. Therefore erosion is assessed as having a moderate negative impact that is affecting all of the saltmarsh. This erosional trend is also present at other sites in Bannow Bay including Grange and Taulaght.

Common Cordgrass is present at this site. This is an invasive species of saltmarsh (954). Although the first record for Common Cordgrass in Ireland is from 1925 in Cork Harbour, it wasn't recorded in Bannow Bay until 1960 (Nairn 1986). There is no documented information as to the presence of Common Cordgrass in Bannow Bay, but it is likely to have colonised between 1930 and 1960. It is not known if it was planted or colonised Bannow Bay naturally. Common Cordgrass is not a prominent part of the saltmarsh vegetation at this site. Saltmills is not considered to be overly threatened by the spread of Common Cordgrass. Its presence at Saltmills is localised at best and of more concern elsewhere in Bannow Bay. Indeed most of the Common Cordgrass that is mapped was recorded on the muddy gravel as groups of clumps or single individuals on the seaward side of the shingle barrier that surrounds this site. For this reason, the impact of the presence of Common Cordgrass is assessed as neutral.

The site has also been affected by drainage in the past. As these works were carried out prior to the current monitoring period these impact are not assessed. However, they are still having a significant residual impact on this site.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140). There is also dispersed habitation (403) along the minor road (502) on the shoreline. Bannow Bay is also used for aquaculture (200), mainly growing oysters. However, there are no cultivation areas close to this site. These activities have little or no measurable impact on the saltmarsh habitats.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1310	954	C	0	0.015	Inside
H1330	140	C	0	1.127	Inside
H1330	871	C	-1	0.01	Inside
H1330	900	B	-2	1.127	Inside
H1330	954	C	0	1.127	Inside
H1410	140	C	0	0.843	Inside
H1410	900	B	-2	0.843	Inside
H1410	954	C	0	0.843	Inside

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

5 CONSERVATION STATUS

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 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. The limited descriptions of this site in the NHA files indicate that the vegetation of this site has not significantly changed since this survey.

The overall conservation assessment for this site is *unfavourable-bad* (Table 5.1). Saltmills is relatively small and sheltered marsh that still bears a passing resemblance to its earlier heritage as a saltings. The current saltmarsh is in good condition and is not been affected by any significant negative impacts like grazing. The vegetation is well-developed and there are some typical examples of saltmarsh communities present. Drainage in the past is still having a residual impact on the saltmarsh. However, there is a long-tern erosional trend at this site and the saltmarsh has retreated significantly when the current extent is compared to the extent indicated by the old OSI 2nd edition 6 inch map. There are no prospects for retreat of saltmarsh habitat at this site as the upper boundary is constrained by the minor road and the adjacent site topography is a gentle-moderate gradient.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	EU Conservation Status Assessment			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable – Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent Structure and functions	Future prospects		**Unfavourable - Inadequate**
Atlantic salt meadows (H1330)	Extent Structure and functions		Future prospects	**Unfavourable - Bad**
Mediterranean salt meadows (H1410)	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*. Only a very small patch of this habitat was present at this site. There are no indications that this habitat was more extensive in the past. There are no indications of any loss of habitat due to land-use changes or erosion within the current monitoring period.

5.2.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. No monitoring stops were carried out in this habitat due to the small habitat extent. However, a visual assessment indicated that this habitat was in a favourable condition. This habitat is not affected by any negative impacts or activities. Common Cordgrass is not present in these small fragments of habitat.

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 such as grazing continue in the near future. This habitat is not being affected by any damaging activities at present but may be vulnerable to colonisation by Common Cordgrass in the future. However, this species prefers softer substrate than the muddy shingle present at this location so it may not spread as significantly as it has at Bannow Island.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. While there is an erosional trend acting at this site and there has been measurable loss of saltmarsh habitat over a longer period,

there are no indications of any significant loss of habitat due to erosion within the current monitoring period. There have been no land-use changes at this site during the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Four monitoring stops were carried out in this habitat and they all passed. The saltmarsh is currently in good condition. There is no grazing at present and there are no other activities significantly affecting the structure and functions of the habitat. Drainage at the site in the past has modified the structure of the saltmarsh and this drainage is still having a residual impact.

There are well-developed examples of mid-marsh and mid-upper saltmarsh zones at this site. Zonation is present and is related to small differences in the surface topography of the saltmarsh, sometimes creating a mosaic of zones. There is some zonation to a low-mid zone with increased cover of Lax-flowered Sea Lavender and common Saltmarsh-grass. Common Cordgrass is present but is not a significant feature of the saltmarsh vegetation and is mainly found along the drains, channels and salt pans in the ASM. The impact of its spread on species composition is assessed as neutral.

There is also some natural zonation along the upper boundary to other habitats such as Common Reed beds, MSM and coastal grassland on a shingle ridge that increase the diversity of the site as a whole. There are some natural saltmarsh features like well-developed salt pans.

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 such as grazing continue in the near future. There are few impacts which are significantly negatively affecting this habitat. However, there is an erosional trend at this site and there has been some measurable loss of saltmarsh habitat in the past 100 years. This erosion is likely to continue in the future and the extent of saltmarsh is likely to be reduced in the long-term. There are no prospects for retreat of saltmarsh at this site as the upper boundary is marked by a minor road.

This habitat is not being significantly affected by any other damaging activities at present. Further modifications and possible coastal protection works along the front of the saltmarsh may affect its structure and composition. The habitat is not likely to be vulnerable to significant further colonisation by Common Cordgrass in the future as the site is dominated by mid-marsh and mid-upper marsh communities where Common Cordgrass does not have a significant competitive advantage.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of this habitat is assessed as *favourable*. While there is an erosional trend acting at this site and there has been measurable loss of saltmarsh habitat over a longer period, there are no indications of any significant loss of habitat due to erosion within the current monitoring period. There have been no land-use changes at this site during the current monitoring period.

5.4.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Three monitoring stops were carried out in this habitat and they all passed. All of the attributes required for favourable conservation status reached their targets. The saltmarsh is currently in good condition. There is no grazing at present and there are no other activities significantly affecting the structure and functions of the habitat. Drainage at the site in the past has modified the structure of the saltmarsh and this drainage is still having a residual impact.

The sward structure of MSM is in good condition. The species assemblage at this site is typical of this habitat and there are some examples of zonation within the MSM. There is also unmodified zonation of coastal grassland along the shingle ridge. Common Cordgrass is present within the habitat but is only found along the drains.

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 such as current grazing levels continue in the near future. There are few impacts which are significantly negatively affecting this habitat. However, there is an erosional trend at this site and there has been some measurable loss of saltmarsh habitat in the past 100 years. This erosion is likely to continue in the future and the extent of saltmarsh is likely to be reduced in the long-term. There are no prospects for retreat of saltmarsh at this site as the upper boundary is marked by a minor road.

This habitat is not being affected by any other damaging activities at present. The habitat is not likely to be vulnerable to significant further colonisation by Common Cordgrass in the future as the site is dominated by mid-marsh and mid-upper marsh communities where Common Cordgrass does not have a significant competitive advantage.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats	0.015	0.015				
2	*Spartina* swards	0.015					0.015
3	1330 Atlantic salt meadow	1.087		1.087			
4	1410 Mediterranean salt meadow	0.819			0.819		
5	ASM/MSM mosaic (50/50)	0.049		0.024	0.024		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic	0.032		0.016			
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	1.819					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)	0.005					0.005
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)	0.584					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**4.43**	**0.015**	**1.13**	**0.84**		**0.02**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- 1330/other SM (CM2) mosaic
- Isolated Spartina clumps
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1410 monitoring stops

Oifreann, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Saltmills

Bannow Bay SAC (000697)

SMP code: SMP0044

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 20 40 60 80 100 Meters

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:1500

N

Taulaght

1 SITE DETAILS

SMP site name: **Taulaght** SMP site code: **0043**

Dates of site visit : **27/08/2007 & 21/02/2008** CMP site code: **N/A**

SM inventory site name: **Taulaght** SM inventory site code: **218**

NPWS Site Name: **Bannow Bay**

NPWS designation cSAC: **697** MPSU Plan: **Old format – Draft 2 Consultation**

pNHA: **697** SPA: **4033**

County: **Wexford** Discovery Map: **76** Grid Ref: **282500, 110900**

Aerial photos (2000 series): **O 5707-A,B,D** 6 inch Map No: **Wx 045**

Annex I habitats currently listed as qualifying interests for Bannow Bay cSAC:

H1310 ***Salicornia*** **and other annuals colonizing mud and sand**

H1330 **Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**

H1410 **Mediterranean salt meadows (Juncetalia maritimi)**

H1420 **Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)**

Other SMP sites within this SAC/NHA: **Bannow Island, Clonmines, Fethard, Gorteens, Grange, Saltmills**

Saltmarsh type: **Estuary** Substrate type: **Mud/*Phragmites* Peat**

2 SITE DESCRIPTION

Taulaght saltmarsh is located along the southern coast of Co. Wexford in Bannow Bay. This bay is a fairly large estuarine site which empties at low tide to expose extensive intertidal flats. The bay is sheltered somewhat by a narrow connection to the sea. Saltmarsh has developed around the bay at several locations where conditions allow. Taulaght is a small isolated saltmarsh situated within a sheltered inlet mid-way along the west side of Bannow Bay and 4.5 km south-west of Wellingtonbridge. The surrounding landscape is low-lying with moderate-gentle slopes to the Bannow Bay shoreline. This isolated rural area is largely surrounding by agricultural land, much of it given over to pasture. There are scattered dwellings along the minor roads through this area. There are also quite a number of well established shellfish operations on mudflats in Bannow Bay that are accessed by the tracks adjacent to this site.

Taulaght saltmarsh is located in a small inlet along the Bannow Bay shoreline. The main saltmarsh has developed in a sheltered area behind a shingle spit. A small stream flows into this inlet from the adjacent land. The bay drains at low-tide to expose extensive mudflats adjacent to the shingle spit.

Taulaght is one of 7 separate salt marshes that are included within the Bannow Bay candidate Special Area of Conservation (cSAC 696). The cSAC takes in all of Bannow Bay and some land on the shoreline and extends down the coastline to Fethard. The main habitats within the cSAC are the extensive intertidal mudflats, which also support notable populations of wintering waders and wildfowl. Other notable coastal habitats found within the cSAC include the sand dune complexes at Bannow Island and Big Burrow on either side of the entrance to the bay. Three Annex I saltmarsh habitats were recorded at this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). All three habitats are listed as qualifying interests for this site. *Spartina* swards are also found within the saltmarsh at this site, although this habitat is not now considered to qualify as an Annex I habitat.

Bannow Bay is one of two coastal sites where Perennial Glasswort (*Sarcocornia perennis*) has been recorded in Ireland (the other being Ballyteige Burrow further east along the shoreline in Co. Wexford). Mediterranean and thermo-Atlantic Halophilous scrubs (1420) (from here known as Halophilous scrubs) are the rarest of the four Annex I saltmarsh habitats found in Ireland. This habitat is characterized in Ireland by the presence of Perennial Glasswort on saltmarsh. This species is very rare in Ireland and is listed as a Red Data Book species (Curtis and McGough 1988) and is also listed on the Flora Protection Order. A NPWS Rare Plant Survey (1990) recorded Perennial Glasswort at this site. It was also recorded by a recent Coastwatch survey (2006). It was not located during the 2007 survey, although it was relocated at most of the previously known stations at Taulaght and a number of new records were added in February 2008.

The majority of the saltmarsh habitat is found within the digital cSAC boundary. A minor area of saltmarsh habitat is excluded around the shoreline and this is related to small differences between the old OSI 2nd edition 6 inch map and the current 2005 aerial photo series. Anything lying outside the boundary is generally a narrow fringe of Atlantic salt meadow (ASM) vegetation, which grades into transitional Twitch-rich grassland. One large patch of upper ASM is found outside the northern boundary of the site in a field excluded from the cSAC.

The site is accessed by a small local road which ends at a dirt track. This track is used by the local aquaculture industry. There is an old ford across the inlet onto the main saltmarsh.

3 SALTMARSH HABITATS

3.1 General description

The main part of the saltmarsh that has developed behind the shingle bank on the southern side of the inlet is dominated by ASM (Table 3.1). A significant part of the established

saltmarsh has been invaded by Common Cordgrass so a significant area is mapped as ASM/*Spartina* sward mosaic. There is also some development of *Spartina* swards along the seaward boundary of this section. The seaward boundary is marked by a saltmarsh cliff and there are soft mixed sediments in the intertidal channel in the centre of the inlet. Towards the southern end where the spit is connected to the mainland there is some typical transition from ASM to MSM. There is further transition from saltmarsh to wet grassland at the southern boundary.

The main section of saltmarsh has been modified in the past and is spilt into two sections by an embankment running north-south that formed part of an old track that ran along the shoreline. There is some development of coastal grassland dominated by Twitch on the shingle bank and along this embankment, as well as some Gorse scrub.

Further west in the inlet there is a mosaic of saltmarsh habitats. There are several relic patches of ASM and MSM that are now surrounded by dense *Spartina* sward and some ASM/*Spartina* mosaic. The northern shoreline is marked by the development of a fringe of dense *Spartina* sward. There is minor ASM development along the landward side of this *Spartina* sward and the upper boundary is marked by a track along the shoreline. There is an additional patch of ASM in a field landward of this track where tidal inundation encroaches along an adjacent drain.

There are several small patches of *Salicornia* flats along the seaward boundary of the main saltmarsh and isolated from the rest of the site on the seaward side of the shingle ridge. Perennial Glasswort was recorded at several locations around the site, including several large plants on the tip of the shingle bank that extends from the main saltmarsh. Small patches of saltmarsh around these plants were mapped as Halophilous scrubs (1420).

Table 3.1. **Area of saltmarsh habitats mapped at Taulaght.**

EU Code	Habitat	Area (ha)
H1310	*Salicornia* and other annuals colonizing mud and sand	0.006
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	2.547
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.491
H1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)	0.012
non-Annex	*Spartina* swards	2.133
	Total	**5.189**

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

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

Three small patches of this habitat are found along the muddy front of the saltmarsh on exposed semi-solid mud ridges at the front of Atlantic/*Spartina* sward mosaic. The habitat is defined by the presence of Glasswort (*Salicornia* sp.) that has colonised intertidal mud

seaward of the established saltmarsh. There are no other saltmarsh species in this habitat. Despite the extent of soft mudflats in the intertidal zone at Taulaght, the occurrence of Glasswort is not widespread. In total, it is estimated that the area of *Salicornia* flats vegetation is approximately 0.006ha (Table 3.1). The habitat is rarely species-rich, a feature of this annual vegetation and the conditions in which it is usually found. Although Common Cordgrass dominates large areas of the intertidal zone, it would not appear to be threatening the current extent of the *Salicornia* flats. However this habitat may have been more extensive in the past before the spread of Common Cordgrass.

The fourth and final patch of *Salicornia* flats vegetation occurs towards the seaward side of the salt marsh and is located on sandy shingle. It co-exists with Annual Sea-blite (*Suaeda maritima*), which is another species typical of the habitat.

3.3 Atlantic salt meadows (H1330)

The ASM at this site is well-developed. It dominates the main saltmarsh and smaller patches are also scattered around the inlet. The main section is dominated by a mid marsh and mid-upper marsh zone. The mid marsh zone is dominated by a low sward of Sea Plantain (*Plantago maritima*) and Sea Pink (*Armeria maritima*) and generally flat platforms. This zone also contains Sea Aster (*Aster tripolium*), Sea Purslane (*Atriplex portulacoides*), Common Scurvygrass (*Cochlearia officinalis*), Sea Milkwort (*Glaux maritima*), Greater Sea-spurrey (*Spergularia media*), Sea Arrow-grass (*Triglochin maritimum*) and Lax-flowered Sea Lavender (*Limonium humile*). This zone has a well-developed saltmarsh structure and contains medium-sized salt pans with clumps of Common Cordgrass. There may be patches of this species in this zone, particularly near the ASM/*Spartina* mosaic. The saltmarsh creek structure is also well-developed and there are some wide channels where the established saltmarsh has been cut off and forms small 'islands' that may be surrounded by *Spartina* sward.

The lower zone is poorly represented at this site as much of this zone has been colonised by Common Cordgrass to create *Spartina* sward and ASM/*Spartina* mosaic. There is some zonation on the mid marsh from the mid marsh zone to a low-mid zone along lower channels and depressions in the marsh where Sea Purslane and Common Saltmarsh-grass become more frequent. Common Cordgrass also increases in abundance.

In upper part of the ASM zone, the vegetation is often dominated by lush taller sward dominated by Red Fescue. This zone also contains small amounts of Saltmarsh Rush (*Juncus gerardii*), Sea Aster, Sea Milkwort, Common Scurvy-grass, Sea Plantain, Sea Purslane, Spear-leaved Orache (*Atriplex prostrata*) and Creeping Bent-grass (*Agrostis stolonifera*). There may also be some clumps of Sea Rush present. The ASM found in the field at the north of the site is also dominated by mid-upper zone vegetation with some mid marsh and lower-mid zone marsh development along the channel.

A large part of the main saltmarsh and the smaller patches to the west is characterised by abundant cover of Common Cordgrass, which can account for up to 50% of ground cover, although it can be patchy at the outer edges. This area is mapped as ASM/*Spartina* sward mosaic. There is also frequent Common Saltmarsh-grass and Sea Purslane in this zone within the *Spartina* sward. There are also patches of more typical low-mid and mid-marsh ASM vegetation with sparser cover of Common Cordgrass. This mosaic has developed in established saltmarsh and also in some of the newly formed *Spartina* sward, which indicates that some vegetation succession is occurring.

3.4 Mediterranean salt meadows (H1410)

This habitat is generally confined to the landward side of the main salt marsh and it is uncommon for large expanses of the MSM to be in direct contact with tidal waters. The largest area of MSM is on the main island along the creek, where it occurs between the ASM/*Spartina* mosaic and the pure ASM vegetation. There are several smaller, scattered, smaller patches throughout the salt marsh, although most are located on the western side or uppermost reaches of the salt marsh where it is found in the mosaic with ASM vegetation. A MSM/*Spartina* mosaic is not common and is recorded in one patch only (~0.004ha).

The habitat is readily distinguished by the presence of a tall sward of Sea Rush (0.5-1m high), which forms large clumps and sometimes these can be extensive. There is also abundant Red Fescue cover in places where the clumps of Sea Rush are less extensive. These patches are more typical of mid-upper marsh ASM. Other species frequently present in low cover include Common Scurvy-grass, Lax-flowered Sea Lavender, Sea Plantain, Sea Aster and Sea Milkwort. Common Cordgrass is present within this habitat but is confined to the creeks that are present in the MSM and its overall cover is quite low. This habitat also contains a well-developed saltmarsh structure in places with creeks and small salt pans present.

3.5 Mediterranean and thermo-Atlantic Halophilous scrubs (Sarcocornetea fruticosi) (H1420)

The presence of Mediterranean halophilous Scrub (H1420) is not shown on any NPWS map, although it is listed as a qualifying interest for Bannow Bay owing to the presence of Perennial Glasswort.

Perennial Glasswort found in ASM-dominated areas differs from the ecotypes described for Fethard or Bannow Island. Several plants were found in the mid marsh zone on the main saltmarsh in association with Sea Pink, Common Saltmarsh-grass, Lax-flowered Sea Lavender, Sea Plantain and Glasswort. This type of vegetation is found along the edges of channels or salt pans and is adjacent to lower zone ASM with Common Saltmarsh-grass and Common Cordgrass. Several other large plants were noted along the seaward boundary of

the ASM found on the northern side of the channel in association with Common Saltmarsh-grass and Greater Sea-spurrey.

Several large clumps of Perennial Glasswort were also distributed along a linear band on the sheltered side of the shingle ridge. This was a new location for this species. These plants were quite woody and seemed older compared to the plants on the saltmarsh. The Perennial Glasswort was found in association with clumps of Sea Purslane, Sea Beet, Sea Milkwort and green algae amongst bare shingle. This type of habitat is similar to that described from Gorteens, also in Bannow Bay. This ecotype on shingle has also been recorded at other sites in Britain (Rodwell 2000).

3.6 *Spartina* swards

The site is largely dominated by extensive *Spartina* swards, although there is a vegetation transition from pure sward to ASM or rarely to MSM. A large part of the intertidal zone is characterised by the presence of a dense sward comprising monodominant stands of Common Cordgrass. There are few other saltmarsh species in this sward and the sward height is about 0.3-0.5 m high. This sward has mainly developed on former intertidal mudflats along the northern side of the inlet and along the landward side of the shingle bank. One section situated further east along the northern shore has a low closely-cropped sward and may have been cut. *Spartina* sward has also developed around the relic patches of saltmarsh situated further west into the inlet.

A significant amount of ASM/*Spartina* sward mosaic has also developed where Common Cordgrass has spread into the seaward side of the former established saltmarsh. This zone contains a mixed assemblage of low marsh species with the sward also containing frequent Sea Purslane, Common Saltmarsh-grass and occasional Sea Aster and Greater Sea-spurrey. There is a general decrease in cover of Common Cordgrass along a landward gradient and the ASM adjacent to the ASM/*Spartina* sward mosaic contains scattered clumps of Common Cordgrass.

A small number of clumps are confined to sheltered areas towards the upper reaches of the marsh along a narrow stream that feeds into the Bay. One patch was recorded on the open, seaward side of the salt marsh, along the front of the shingle ridge.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 4.1). Given the isolated nature of this site, there would appear to be few recreational activities along this part of the bay. However, horses are ridden out along the shoreline and sometimes let graze the saltmarsh as indicated by hoof prints (622). Livestock may also occasionally escape onto the marsh, but this is not considered a damaging activity and there was no indication that livestock actively

graze the main section at present (140). This section is likely to have been grazed in the past. The shoreline along the northern side of the inlet is occasionally grazed and there is some poaching damage in places. The field at the northern end of the site was also grazed by horses with some localised poaching damage.

The shellfish industry is an important economic feature of Bannow Bay. In developing the shellfish farms on mudflats adjacent to Taulaght (200), a number of access points and tracks along the shoreline are used by the tractors to approach the shellfish trestles. In an attempt to protect the access points, rubble has been dumped on the seaward side of these tracks to prevent excessive flooding and to prevent further erosion and loss of land (803). Some of this dumping is on a narrow fringe of ASM and also on *Spartina* sward. This dumping does not affect the main section of saltmarsh. Most of this dumping is centred on a track 200 m to the east of the salt marsh, at the western end of the site. There has also been some dumping of rubble along the narrow dirt track that leads around to separate fields. The amount of dumping was such that an unidentified person erected a small sign next to the piles of spoil notifying people as to the presence of a very rare plant (Perennial Glasswort) in the area. Elsewhere, discarded oyster shells are dumped at the end of the waterlogged path at the ford across the inlet (422).

While erosion (900) is not having a significant impact on the salt marsh, recent storms has resulted in the erosion of parts of the unprotected coastline and the loss of agricultural land to the sea to the north of the inlet. A comparison of the old 2nd edition 6 inch map to the current extent of the saltmarsh shows that the shingle spit has grown northwards during this period and this has increased the shelter to the inlet. There has been no loss of saltmarsh but there are signs of erosion and loss of habitat on the seaward side of the shingle spit. Saltmarsh cliffs are present around some of the internal margins of the site. There has been no measurable loss of saltmarsh during the current monitoring period. The impact of erosion is assessed as neutral with a low impact on the seaward edge of the saltmarsh, which is mainly saltmarsh sward.

There is a significant area of Common Cordgrass at this site. This is an invasive species of saltmarsh and mudflats (954). First documented in Bannow Bay in the 1960's, (Nairn 1986) it is not known if *Spartina* was transplanted or arrived of its own accord. As the first record for *Spartina* in Ireland relates to the transplanted specimens in Cork Harbour in 1925, it is reasonable to suggest that it arrived in Bannow Bay after that time. It has since thrived within Bannow Bay and is widespread in its distribution. At Taulaght, it occupies an area a little under the total ASM and has formed established close-knit swards (Table 3.1). It is notable that, although *Spartina* swards from an extensive shoreline fringe, that its seedlings were scarce on the mudflats, indicating that it is not spreading seawards at present. Common Cordgrass has already spread into the established ASM (and also some MSM) to create about 1.4 ha of ASM/*Spartina* sward mosaic. For this reason the impact of the presence of

Common Cordgrass is assessed as moderately negative within these mosaic areas. The ASM sward is not considered to be under any further significant threat from the spread of Common Cordgrass except around creeks, where it is already present as it is already well-established.

One interesting feature that was observed during the site survey was some damage to a discrete area of Common Cordgrass. It appeared that the Common Cordgrass had been mown as evidenced by the torn leaves and even nature of the sward. This is likely to be an unofficial attempt at controlling Common Cordgrass. When the site was revisited in February 2008, the *Spartina* was showing signs of regrowth although many of the newer shoots were still purple-black.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140) and aquaculture (200). There is also dispersed habitation (403) along the minor road (502) on the shoreline. These activities have little or no measurable impact on the saltmarsh habitats other had those already mentioned.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1310	954	C	-1	0.006	Inside
H1330	140	C	0	0.3	Inside
H1330	422	A	-2	0.001	Inside
H1330	501	C	-2	0.005	Inside
H1330	803	A	-2	0.02	Inside
H1330	900	C	0	0.02	Inside
H1330	954	B	-1	1.4	Inside
H1410	954	C	-1	0.1	Inside
H1420	803	B	0	0.001	Inside
H1420	900	C	0	0.01	Inside
H1420	954	C	0	0.012	Inside
H1330	200	C	-1	0.5	Outside
H1420	200	C	-1	0.012	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.

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 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. Previous assessments have concentrated on the entire cSAC. As a result of this, there is very little detailed information with which to compare and quantify the findings. There is some more detailed baseline data available from the NPWS Rare Plant Survey. It is worth remembering that several separate saltmarshes are found within the Bannow Bay cSAC.

Overall, the site has an *unfavourable-inadequate* conservation status (Table 5.1). Most of the site is in good condition. However, there has been some dumping at this site that was probably associated with maintaining tracks along the shoreline. This dumping has destroyed a small patch of ASM. Further dumping may threaten future distribution of Perennial Glasswort at this site.

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

Habitat	**EU Conservation Status Assessment**			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Salicornia flats (H1310)	Extent Structure and functions	Future prospects		**Unfavourable - Inadequate**
Atlantic salt meadows (H1330)	Extent Structure and functions	Future prospects		**Unfavourable - Inadequate**
Mediterranean salt meadows (H1410)	Extent Structure and functions Future prospects			**Favourable**
Mediterranean and thermo-Atlantic halophilous scrubs (H1420)	Extent Structure and functions	Future prospects		**Unfavourable - Inadequate**

Common Cordgrass is well-established at this site hand has formed extensive area of sward on former mudflats and has also spread into established saltmarsh to create a significant area of ASM/*Spartina* sward mosaic. Where Common Cordgrass is found in a mosaic with ASM, it is typically around areas where there are creeks. This invasive species is not likely to spread further at this site as it is already well-established.

In addition, Taulaght is one of a handful of sites where Perennial Glasswort is found. Evidence from other sites has shown that this Mediterranean species is often found in transitional zones between *Spartina* sward and other salt marsh types such as ASM and MSM. Thus Common Cordgrass is not considered to be a significant threat.

This site is located within the Bannow Bay cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

5.2.1 Extent

The extent of the habitat is assessed as *favourable*. Previous information as to the abundance and distribution of this habitat is scant. Although the habitat is not extensive, there are no indications that there has been any loss of habitat due to natural erosion owing to its relatively sheltered position in the marsh.

5.2.2 Habitat structure and functions

Monitoring stops were not carried out in the *Salicornia* habitat owing to its limited distribution and extent of each patch. However, a visual assessment of the vegetation suggests that the structure and functions of the habitat are rated as *favourable*. The habitat forms part of the pioneer zone along the seaward side of the saltmarsh. Common Cordgrass is not found in this habitat but is found adjacent to it.

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 such as grazing continue in the near future. This habitat is not being affected by any damaging activities at present but may be vulnerable to further colonisation by Common Cordgrass in the future, particularly as the patches of habitat are quite small. However, Common Cordgrass seems to be well established at this site and may not spread seaward significantly in the future, and therefore may not threaten these very small patches of pioneer saltmarsh habitat.

5.3 Atlantic salt meadows (H1330)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. It is the most extensive of the saltmarsh habitats at this site closely followed by *Spartina* sward. Its distribution is widespread and it occurs as a number of large, discrete patches throughout the site. There are no indications that there has been any loss of habitat due to natural erosion owing to its relatively sheltered

position in the marsh. A small patch of ASM has been destroyed by dumping but this only represents < 1% of the total ASM habitat.

The spread of Common Cordgrass at this site has led to the development of extensive ASM/*Spartina* sward where there is high cover of Common Cordgrass (20-60%) on previously established ASM. However, the Common Cordgrass is well established so much of this colonisation occurred prior to the current monitoring period. Therefore it is not assessed as a negative impact on extent.

5.3.2 Habitat structure and functions

Habitat structures and functions for the ASM at Taulaght are assessed as *favourable*. This assessment is based upon the results of eight monitoring stops that were carried out in this habitat. All eight passed, as all of the attributes reached their targets. The saltmarsh is generally in good condition. There is some minor damage from dumping around the site. Most of the ASM is not grazed although there is some localised poaching in places along the northern side of the inlet and in the field at the northern end of the site.

There is considerable variation within the ASM in terms of species assemblage and zonation is well-developed in places. The saltmarsh structure is also well developed with salt pans and creeks forming an important part of the saltmarsh structure. The structure of the main saltmarsh has been modified in the past by the construction of an old track on an embankment across the site.

Common Cordgrass is a prominent part of the saltmarsh vegetation and forms a significant area of ASM/*Spartina* sward mosaic at the seaward side of the main marsh. This is an invasive species that is well-established at this site and the lower zone ASM is poorly represented due to the presence of this species. However as it has largely established prior to the current monitoring period the spread of this species is not assessed. The impact of its spread on species composition is assessed as neutral, mainly due to the lack of accurate baseline data.

5.3.3 Future prospects

The future prospects are rated as *unfavourable-inadequate*. This assessment assumes that the current management activities and level of impacts such as grazing and dumping continue in the near future. Most of the ASM is in good condition but there is currently some damage along the northern side of the inlet from dumping along the track. This practise may continue in the future.

While Common Cordgrass occupies a considerable area and may at some point exceed the area currently occupied by the ASM, it is mainly thriving on the intertidal mud. It is well-established at this site and has already spread significantly into the lower zone of the main

section to form a large area of ASM/*Spartina* mosaic. As it is already established, it is not likely to spread significantly in the future as the remaining ASM is mainly mid marsh and mid-upper marsh where Common Cordgrass is generally uncompetitive.

5.4 Mediterranean salt meadows (H1410)

5.4.1 Extent

The extent of the habitat is rated as *favourable*. While much of the MSM habitat is fragmented, there is one large patch of the vegetation on the main "island", there are no indications, on the ground, that there has been any great loss of extent over the course of the assessment period. There are no indications that there has been any loss of habitat due to the spread of Common Cordgrass, which has mainly spread into the ASM. Dumping has mainly affected the ASM and not this habitat.

5.4.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Two monitoring stops were carried out in the MSM, both of which passed. All attributes reached their targets for favourable conservation status. The MSM is in good condition. The habitat has a typical species diversity that would be expected for MSM. Although not extensive there is some zonation within the MSM particularly towards the periphery of the habitat, where the occurrence of Sea Rush is more scattered. There are also natural transitions from this habitat to wet grassland at its upper boundary.

5.4.3 Future prospects

The future prospects of the MSM habitat at Taulaght are rated as *favourable*. This assessment assumes that it is unlikely that there will be any significant change in the management or use of the site. The MSM is not being negatively affected by damaging activities. Common Cordgrass is not likely to spread into this habitat as it is uncompetitive. Given the fragmented nature of the habitat in places, a certain degree of natural erosion may have an impact, but it could be expected to be a slow process.

5.5 Mediterranean and thermo-Atlantic halophilous scrubs (H1420)

5.5.1 Extent

The extent of this habitat is assessed as *favourable*. Although the presence of this habitat has been recognised in the overall cSAC, it has not previously been mapped. The habitat has been mapped based on the occurrence of Perennial Glasswort. The majority of earlier records for this species at this site were relocated (NPWS Rare Plant Survey) and additional finds on the shingle bank suggest that the colony is established and that it was probably under-recorded at Taulaght. The presence of this species on the main saltmarsh may be

somewhat under-recorded. There has been some dumping close to one of the locations of several plants on the northern side of the inlet but it is not known if any plants were destroyed.

5.5.2 Habitat structure and functions

Habitat structure and functions are assessed as *favourable*, owing to the distribution of and indeed variety of the ecotypes that were recorded at Taulaght. A visual assessment of the areas in which Perennial Glasswort was found reveals a good deal of variety in the age and structure of the plants which would suggest a healthy population.

5.5.3 Future prospects

The future prospects are assessed as *unfavourable-inadequate.* Most of the habitat would not appear to be under any direct threat. However, the populations are relatively small with some groups only consisting of 2-3 plants and are therefore quite vulnerable to changes. Common Cordgrass is found in association with some of the plants but is not likely to be a threat. Evidence from other sites in Bannow Bay shows that Perennial Glasswort persists quite happily along the edges of *Spartina* sward in association with dense Common Cordgrass

One area of the marsh is under threat from continued dumping of rubble, possibly to maintain the track used by the aquaculture industry along the shoreline. Some of the dumping has occurred adjacent to a number of plants and person(s) unknown have erected a small sign indicating the significance of the area. This habitat is vulnerable to further dumping along the track and this is the main reason for the assessment as *unfavourable-inadequate*.

6 MANAGEMENT RECOMMENDATIONS

No change in the management regime is required for this site as it is relatively isolated. A sign has been put up by person(s) unknown indicating the presence of a legally protected and rare species and asking that rubble not be dumped along a stretch of track. Elsewhere, rubble has been dumped along access tracks and on the shoreline at the front of eroded field boundaries in an effort to curtail erosion. This is in contravention of a number of pieces of legislation including waste management legislation, foreshore licensing and the wildlife acts 1976 (&2000) in terms of damaging operations in a SAC. Further dumping is a threat to the ASM and the distribution of Perennial Glasswort at this site.

A small area of Common Cordgrass was also controlled at the site. Owing to these damaging activities at the site, particularly in light of the presence of Perennial Glasswort, it is recommended that the site is regularly visited to curtail these practices which could have an impact (however, well intentioned) on the persistence of this legally protected species.

7 REFERENCES

Curtis, T.G.F. & McGough, H.N. (1988). *The Irish Red Data Book*. Stationary Office, Dublin.

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

Dubsky, K. (2006). *Unpublished correspondence concerning the distribution of Sarcocornia perennis*. National Parks and Wildlife Service, Dublin.

MPSU (2001). *Draft 2 Conservation Plan and aquaculture zoning for Bannow Bay cSAC 697 and SPA 33*. National Parks and Wildlife Service, Dublin.

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

Rare Plant Survey (1990). Series of NPWS surveys 1990-1994 of rare plant sites. Information held by NPWS.

Rodwell, J.S. (2000). *British Plant Communities Volume 5. Maritime communities and vegetation of open habitats*. Cambridge University Press, Cambridge.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats	0.006	0.006				
2	*Spartina* swards	1.379					1.379
3	1330 Atlantic salt meadow	1.830		1.830			
4	1410 Mediterranean salt meadow	0.489			0.489		
5	ASM/MSM mosaic (50/50)	0.004		0.002	0.002		
6	ASM/*Spartina* mosaic	1.430		0.715			0.715
7	1330/other SM (CM2) mosaic						
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	1.224					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)	0.039					0.039
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)	0.004					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub	0.012				0.012	
21	1310/1330 mosaic						
	Total	**6.42**	**0.006**	**2.55**	**0.49**	**0.012**	**2.13**

Legend

- SAC Boundary
- 1310 Salicornia flats
- Spartina swards
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/1410 mosaic
- Atlantic/Spartina mosaic
- Isolated Spartina clumps
- 1420 Mediterranean scrubs
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops
- 1410 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Taulaght

Bannow Bay SAC (000697)

SMP code: SMP0043

0 40 80 120 160 200 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: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2500

Buckroney

1 SITE DETAILS

SMP site name: **Buckroney**		SMP site code: **0037**
Dates of site visit: **07/09/2007**		CMP site code: **018**
SM inventory site name: **N/A**		SM inventory site code: **N/A**
NPWS Site Name: Buckroney Fen and Brittas Dunes		
NPWS designation	cSAC: **729**	MPSU Plan: **New Format – Draft 2: 2004-2009**
	pNHA: **729**	SPA: **N/A**
County: **Wicklow**		Discovery Map: **62** Grid Ref: **329442, 179600**
Aerial photos (2000 series): **O 4313-A,C; O 4197-D**		6 inch Map No: **Wi 036, 041**
Annex I habitats currently listed as qualifying interests for: Buckroney Fen and Brittas Dunes cSAC: **H1410 Mediterranean salt meadows (Juncetalia maritimi)**		
Other SMP sites within this SAC/NHA: **Potters Bar, North end of Brittas Bay**		
Saltmarsh type: **N/A**		Substrate type: **N/A**

2 SITE DESCRIPTION

This site is located in Co. Wicklow near Brittas Bay and 6 km east of the Village of Redcross. Located along the coastline between Wicklow town and Arklow, the area around Brittas Bay is easily accessible and very popular, seeing as it is within easy reach of a large population. A long sand dune system has developed in this bay and was surveyed by the Coastal Monitoring Project in 2004. Sand-hills are also found south of Mizen Head. This area is a popular tourist amenity and Brittas Bay is a popular beach during the summer. There are also caravan parks situated in this area near the coastline. This area is quite rural and the adjoining landscape is low-lying and dominated by farmland.

This site is unique as it is not listed on the saltmarsh inventory published by Curtis and Sheehy-Skeffington (1998). However, one of the qualifying interests for Buckroney Fen and Brittas Dunes candidate Special Area of Conservation (cSAC) is the Annex I saltmarsh habitat, Mediterranean salt meadows (MSM). A small area dominated by Sharp Rush (*Juncus acutus*) has developed in low-lying ground behind sand hills. Saltmarsh dominated by Sharp Rush is considered to qualify as this type of Annex I habitat. This species is more rarely found on saltmarshes compared to Sea Rush (*Juncus maritimus*). Stands of saltmarsh vegetation dominated by either Sea Rush or Sharp Rush can be classified as MSM. There are few saltmarshes in Ireland with the rarer MSM sub-type dominated by Sharp Rush present. Sharp Rush is generally found along the upper boundary of the saltmarsh/fixed dune interface and can also be found in fixed dunes and in dune slacks.

This site has also been proposed for designation as it is a relatively large coastal complex that supports 10 Annex I habitats including two priority habitat types - Fixed coastal dunes with herbaceous vegetation (Grey dunes) and delcalcified fixed dunes. The former accounts for approximately 44% of the total site area. The latter is a habitat of limited distribution in Ireland (Ryle *et al*. 2009). Also included is the wetland complex which includes fen vegetation towards the rear of Buckroney. Only a small area of MSM is known to occur at Buckroney, although the recent NPWS management plan suggest that other patches of MSM vegetation may occur within the site.

Two sub-sites were surveyed. The main sub-site (called Buckroney) is situated to the south of Brittas Bay in Sandymount Townland. It is separated from Brittas Bay by the promontory headland at Mizen Head and is part of Buckroney Nature Reserve. The other smaller sub-site is situated around the mouth of Potter's Bar River. This area is located at the northern end of Brittas Bay.

Brief mention of a second area of salt marsh vegetation is made in the NHA notes at Potter's Bar River. Situated at the northern end of Brittas Bay Beach along the river inlet, much of the vegetation is described as non saltmarsh and is characterised by alternating stands of Common Reed (*Phragmites australis*), Sea Club-rush (*Bolboschoenus maritimus*) and wet grasslands. Several individual clumps of Sharp Rush were noted on both sides of the river, although the vegetation was typically that of wet, poached grassland. A very small area of ASM saltmarsh was recorded at the mouth of the river.

Access to the smaller sub-site of saltmarsh was by means of foot along the beach from the Brittas Bay Northern Car Park. It is possible to cross the river at low tide.

3 SALTMARSH HABITATS

3.1 General description

The recent NPWS Management plan for the cSAC indicates that a small but significant area of vegetation dominated by Sharp Rush occurs at Buckroney, with the possibility of smaller outliers occurring elsewhere within the site. This area was surveyed as recently as 2004 (Mizen Head) as part of the Coastal Monitoring Project (Ryle *et al*. 2009). At that time, none of the vegetation was characterised as salt marsh.

The Buckroney sub-site is situated behind the tall dunes that extend southwards towards Pennycomequick. The only point of access for seawater into the marsh is via the small stream that runs alongside the boundary of the adjacent golf course. This had been blocked at its mouth for a number of years, although it has recently been unblocked. Apart from changes in the ground water levels due to precipitation, there had been no appreciable regular inundation of tidal waters at the site. The NPWS Management plan also stated that this area was only

flooded infrequently by the tide. Therefore the vegetation dominated by Sharp Rush should not be classified as normal functioning saltmarsh.

Most of the low-lying ground with Sharp Rush at Buckroney was damp and brackish in nature. This is a distinctive area characterised by dense clumps of tall Sharp Rush. There are other sections with scattered clumps of Sharp Rush. While some saltmarsh species were recorded, there was no development of any typical saltmarsh habitat. The low-lying vegetation, although dominated by Sharp Rush, also has features typical of dune slack vegetation. This vegetation has developed on sandy substrate. The vegetation was transitional between wetland and dune slack. It was mapped during this survey as other vegetation and not saltmarsh. The influence of tidal inundation in the past is likely to have been variable in this area. Some of the dense patches of Sharp Rush may have been flooded more frequently in the past compared to the typical dune slack type vegetation with scattered clumps of Sharp Rush.

The vegetation map produced by the coastal survey (Ryle *et al*. 2009) shows that there has been a change in the extent of some of the habitat boundaries since the 2004. The small river that drains Buckroney Fen and runs alongside the golf course has had its channel opened since 2004 and there has been a significant increase in the extent of the Reeds and smaller graminoid species which are found in the low-lying ground adjacent to the river. In addition, there has also been considerable increase in the extent of the Sharp Rush, which might be explained by the erection of a fence since the 2004 survey.

Table 3.1. Area of saltmarsh habitats mapped at Buckroney (and Potter's Bar).

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.085
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.084
	Total	**0.169**

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

3.2 Atlantic salt meadows (H1330)

Atlantic salt meadow vegetation was not recorded at Buckroney. A small area, however, was noted along rocks on the northern shore of the Potters River to the north of the Brittas Bay dune system. In total, it occupied an area less than 0.085ha (Table 3.1).

The vegetation occurs in a tiny cove where river mud accumulates over rock. Indeed the vegetation is fragmented by outcropping rock. Several species, typical of ASM were noted including Sea Pink (*Armeria maritima*), Sea Plantain (*Plantago maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Common Scurvy-grass (*Cochlearia officinalis*) and Red Fescue (*Festuca rubra*).

3.3 Mediterranean salt meadows (H1410)

A small area of more typical MSM vegetation does occur at Buckroney and accounts for 0.0844ha of the total area shown for MSM. This area is dominated by Sea Rush and is situated adjacent to dense stands of Reeds. Typically species poor, two monitoring stops which were taken adjacent to each other, but displayed differences. One stop was dominated by Saltmarsh Rush (*Juncus gerardii*) and Creeping Bent (*Agrostis stolonifera*), whilst the second stop supported Sea Rush and Sea Club-rush. Species common to both stops included Orache spp. (*Atriplex* spp.), Curled Dock (*Rumex crispus*) and Silverweed (*Potentilla anserina*). Indeed much of the low-lying ground was dominated by a low sward of Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*), which often graded into the Sharp Rush zone. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

4 IMPACTS AND ACTIVITIES

Brittas Bay is one of the largest and most popular recreational beaches along the eastern seaboard. The neighbouring beach at Buckroney is not frequented by many people, possibly as a result of its isolated nature and owing to the coarse nature of the sand. A large part of the site is in the ownership of the National Parks and Wildlife Service and is managed as Nature Reserve. Table 4.1 lists the impacts and activities that apply to the low-lying marsh plain at Buckroney.

One of the main impacts that have been reported for Buckroney includes some of the management practices of the golf course (601) and water abstraction for the greens (NPWS management plan). The river has in the past been blocked at its mouth with shingle preventing tidal waters from accessing the river (Ryle *et al*. 2009). At the time of the survey, a sizable amount of shingle and cobble had been removed from the channel (850). This has had the result that tidal waters occasionally inundate the small river, particularly during winter floods. There has been some change in both the composition and extent of the vegetation that were mapped at Buckroney between 2004 and 2007. A local landowner indicated that the duration and extent of standing water that occurred at the marsh was noticeably different and would explain the change in the vegetation patterns (990).

Possibly the greatest threat to the overall site is the maturing of the dune system and the subsequent drying of the substrate which has favoured the spread of Bracken. As part of the management programme of the nature reserve, a small herd of horses are permitted to graze the sand dunes (140). Several areas have been fenced off including a number of exclusion experimentation plots. Much of the Sharp Rush habitat is found within one of these exclusions and is not grazed.

Table 4.1. Intensity of various activities on saltmarsh habitats at Buckroney and Potters Bar.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	622	C	0	0.085	Inside
1330	900	C	0	0.085	Inside
1410	990	B	0	0.084	Inside
1410	850	C	-1	0.1	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.

At the other end of the site, at Potter's Bar, the fragmentary patch of ASM occurs in a small cove at the base of outcropping rocks. It is not regularly accessed, although there is some evidence of people accessing the main beach (622) from nearby holiday homes (403). The impact is largely negligible. Natural erosion (900) is a natural feature, particularly at the mouth of the river, but its impact is not thought to be significant.

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 NPWS management plan, 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 this area during the survey at this site.

Buckroney is a notable site as it not included in the original saltmarsh inventory (Curtis & Sheehy-Skeffington 1998). Some of the dense Sharp Rush displays some features typical of saltmarsh but also has other features typical of other habitats. It has not been functioning as a saltmarsh in the recent past and there has been infrequent tidal inundation. However, this has allowed a suite of ecological conditions to develop that has created a transitional type of brackish habitat in a dune slack situation.

This survey did not classify this Sharp Rush dominated vegetation as saltmarsh as it had not been functioning as saltmarsh and there were frequent terrestrial dune species found in association with the Sharp Rush. However the site is quite dynamic and recent changes in the hydrological regime may affect the development of this habitat in the future where it may have increased saline influences. The overall assessment of this site is *favourable* due to the limited extent of more typical saltmarsh habitat present at the site.

This site is located within the Buckroney Fen and Brittas Dunes SAC. A NPWS management plan is available for this SAC.

Table 5.1. Conservation status of Annex I saltmarsh habitats at Buckroney and Potters Bar.

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**
Mediterranean salt meadows (1410)	Extent Structure and functions, Future prospects			**Favourable**

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of the habitat is rated as *favourable*. This habitat has not previously been recorded within the cSAC. This may be due to the small area of habitat and the fact that its relatively inaccessible position may have resulted in it been overlooked. There are no indications that it was more extensive at this site in the past.

5.2.2 Habitat structure and functions

The habitat structure and functions are assessed as *favourable*. Monitoring stops were not carried out due to the limited extent of habitat at Potter's Bar. Based on a visual assessment, however, of this the fragmentary patch of ASM, the floristic diversity is typical of for the habitat and that it has persisted at this site for some time.

5.2.3 Future prospects

The future prospects are rated as *unfavourable-inadequate*. It is the intention of Wicklow County Council to further facilitate access to the northern end of Brittas Strand, so as to relieve pressure elsewhere on the heavily utilised beach. If this planned access improvement proceeds, then it is likely that there will be a change in the quality and possibly extent of the habitats in and around Potter's Bar.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

In assessing the MSM habitat at Buckroney, there is an inherent difficulty in defining its extent let alone character. Much of the Sharp Rush occurs on sandy substrates, most of which is rarely flooded by tidal waters. Thus it would appear that the Sharp Rush vegetation is more analogous to the dune slack, which was suggested in the updated NATURA 2000 explanatory notes and also by the coastal survey (Ryle *et al*. 2009). This vegetation is not considered as MSM for the purposes of this assessment.

Some more typical MSM vegetation dominated by Sea Rush was recorded at Buckroney. Although not identified in the coastal survey of 2004 (Ryle *et al*. 2009), there has been a change in the water levels at the site due to the reopening of the river channel, which has resulted in brackish water. The increased influence of seawater may be responsible for this limited presence of MSM vegetation. Thus the extent of the MSM habitat is assessed as *favourable*

5.3.2 Habitat structure and functions

Two monitoring stops were carried out in the most typical patch of Mediterranean salt meadow vegetation, both of which reached the target criteria. For this reason, habitat structure and functions are assessed as *favourable*. The saltmarsh is in generally good condition. There are no significant negative impacts or activities affecting this site.

This assessment relates to the small area of Sea Rush-dominated vegetation and assumes that the Sharp Rush-dominated areas are more properly characterised as part of the dune slack habitat, as much of the substrate on which it is found is sandy in nature and not as rich in organic content as that which is seen towards the small river and the Reed-bed.

5.3.3 Future prospects

The future prospects of the MSM habitat at Buckroney are rated as *favourable*. This assessment is based on the fact that the site, as a nature reserve, is managed for conservation purposes. Changes to this part of the site in the past few years shows that it is quite dynamic. The river channel was blocked for a relatively long period and tidal inundation was restricted. The channel has now been reopened and this may have some impact on the extent of various vegetation communities found at the site.

6 MANAGEMENT RECOMMENDATIONS

Buckroney dunes are largely managed as a nature reserve. The site is actively managed, with the assistance of local landowners and has horses in a limited grazing programme. In terms of the marsh, it is suggested that this practice should not be altered as it does not

impact the marsh. Much of the site has recently been fenced off and a number of exclusion plots installed to examine the effects of grazing on the maturing dune system.

However, the status and characterisation of Sharp Rush and which is the most appropriate habitat in which it is placed need to be finalised. It has been suggested in a letter contained in MPSU files (Duffy 1999) that the habitat could be included as part of the overall humid dune slack vegetation. Indeed, the coastal survey (Ryle *et al*. 2009) did not consider the site warrant the MSM designation, which may have been due to the fact the river dividing the nature reserve from the European golf course was blocked and that it had been a number of years since the site had been inundated by the sea. Perhaps this area should not be listed as a qualifying interest for this site as it is not functioning as a typical saltmarsh.

7 REFERENCES

Anon. (1976). *Areas of Scientific Interest in Co. Wicklow*. An Foras Forbartha, Dublin.

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

Duffy, P. (1999). *Unpublished Internal letter to MPSU*. National Parks and Wildlife Service, Dublin.

Casey, S., Keleman, J. & Stockdale, C. (1995). *Management Plan for Buckroney Dunes Co. Wicklow*. Unpublished report to National Parks and Wildlife Service, Dublin.

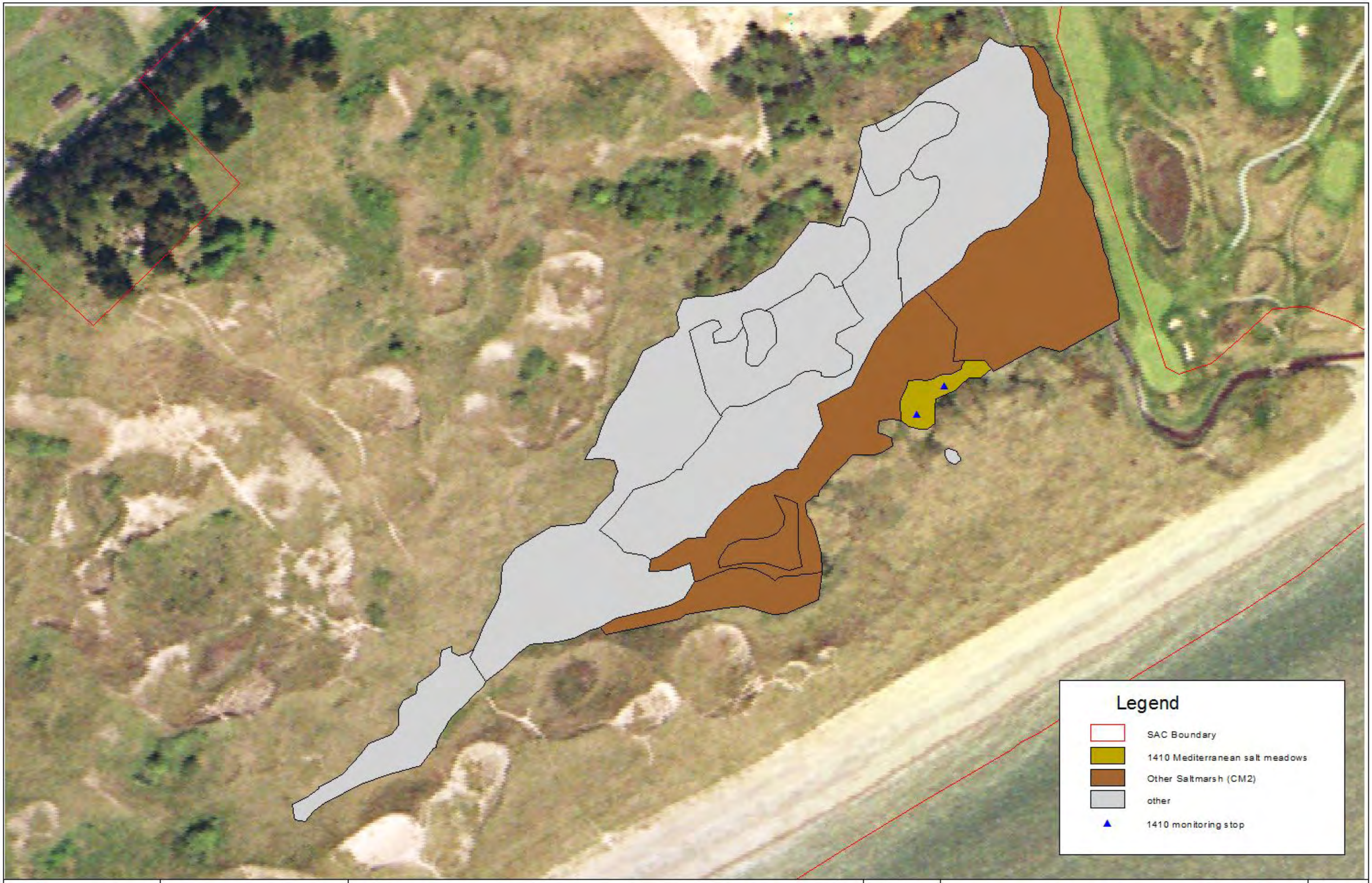
MPSU (2004). *Conservation Plan for Buckroney/Brittas Dunes and Fen 2004-2009: New format, Consultation.* National Parks and Wildlife Service, Dublin.

Ryle, T., Connolly, K., Murray, A. & Swann, M. (2009). *Coastal Monitoring Project. 2004-2006*. Report to the National Parks and Wildlife Service, Dublin.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.073		0.073			
4	1410 Mediterranean salt meadow	0.084			0.084		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	3.171					
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)	2.387					
19	1330/rocky shore mosaic	0.023		0.0115			
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**5.74**		**0.08**	**0.084**		



Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Buckroney (Map 1 of 2)

Buckroney-Brittas Dunes and Fens SAC (000729)

SMP code: SMP0037

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 30 60 90 120 150 Meters

Date of production: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2000

N

Legend

- SAC Boundary
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- 1330/rocky shore mosaic
- Other Saltmarsh (CM2)
- other

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Buckroney - Potters Bar (Map 2 of 2)

SMP code: SMP0037

0 30 60 90 120 150 Meters

N

Buckroney-Brittas Dunes and Fen SAC (000729)

This habitat map was created with a compination of fieldwork, GPS and interpreation 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: 22/02/2009
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:2000

Kilcoole

1 SITE DETAILS

SMP site name: **Kilcoole**		SMP site code: **0036**
Dates of site visit: **21/09/2007**		CMP site code: **013**
SM inventory site name: **Kilcoole**		SM inventory site code: **228**
NPWS Site Name: **The Murrough Wetlands**		
NPWS designation	cSAC: **2249**	MPSU Plan: **Old Format Draft2 Consultation, 2000**
	pNHA: **730**	SPA: **4186**
County: **Wicklow**		Discovery Map: **56** Grid Ref: **331400, 207000**
Aerial photos (2000 series): **O 3732-B,D; O 3790-B,D; O 3848-B,D; O 3906-B,D; O 3963-B,D; O 4020-B**		6 inch Map No: **Wi 013, 019, 025**

Annex I habitats currently listed as qualifying interests for The Murrough Wetlands 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: **Lagoon** Substrate type: **Mud**

2 SITE DESCRIPTION

Kilcoole marsh is located in Co. Wicklow between Greystones and Wicklow town. This large wetland complex is landlocked by the Dublin–Rosslare railway embankment and various coastal protection works that have been installed over the years on a shingle barrier that forms the shoreline. While there are a number of one-way gates that are used to control the water levels of the marsh, one area known as The Breaches is constantly open to the tides, although owing to the volume of shingle along this coastline, incoming waters must are generally associated with higher tides. The adjacent land forms a low-lying plain that is dominated by farmland. There has also been extensive and ongoing reclamation in this area.

Kilcoole is not a typical saltmarsh; rather it is largely an extensive low-lying wetland area that is situated behind the railway embankment. Part of this area is flooded by the tide flowing from The Breaches. The tide flows into a network of wide shallow intertidal channels. These channels extend into a mosaic of wetland habitats. Much of the wetland complex was altered through drainage in the 1980's and early 1990's (NPWS management plan). Extensive berms have been created along the edges of these channels to enclose a significant amount of wetland, some of which has also been drained and improved to develop agricultural grassland. There are also substantial amounts of brackish Reedbeds dominated by stands of Common Reed (*Phragmites australis*) or Sea Club-rush (*Bolboschoenus maritimus*). These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in

accordance with the SMP project classification. Wet grassland that forms a mosaic with smaller amounts of scrub is also present. The NPWS management plan notes that there is still some seepage of saline water into the enclosed area and this has created patches of brackish wetland and pockets of saltmarsh. There is still some more typical saltmarsh developed along the landward side of the shingle embankment near The Breaches and in the northern section of the site (Cooldross Middle and Lower) where the tide has not been excluded.

There are still deep natural drainage channels found behind these berms that are permanently filled and classified as brackish lakes. Oliver (2005) classified the intertidal channels located behind the embankments as artificial lagoons. These three lagoons have a wide salinity range.

The saltmarsh was classified as a 'Lagoon' type marsh by Curtis and Sheehy-Skeffington (1998). This is mainly due to the fact that The Breaches outflow regularly becomes blocked by naturally shifting cobble and shingle. This creates a lagoon in the intertidal channel behind this area and some of the adjoining saltmarsh may be flooded for long periods of time. This outflow is regularly cleared of these blockages to help drainage in this area.

Kilcoole marsh is part of The Murrough Wetlands candidate Special Area of Conservation as well as a Special Protection Area. It contains a number of Annex I habitats such as Alkaline fens, Perennial vegetation of stony banks, and Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae. This coastal wetland complex also has been designated as a Special Protection Area (4186) as it supports nationally important numbers of certain Annex I birds as defined by the Birds Directive. In addition, parts of the site are being developed as bird sanctuaries by Birdwatch Ireland owing to the numbers of migratory birds that have been found there. Three Annex I saltmarsh habitats are listed as qualifying interests for this site, *Salicornia* flats, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Only the latter two habitats were recorded at the site by this survey.

A large part of this wetland complex has been excluded from the cSAC. This includes most of the Annex I saltmarsh habitat mapped at this site in Colldross Middle and Lower. This area has been excluded from the cSAC in the past due to land reclamation in this area. The current cSAC boundary follows the landward side of the shingle bar in this area.

Accessing the site is complicated by the fact that this long linear area is dissected by many man-made drainage dykes and impenetrable field boundaries. Birdwatch Ireland has the leasehold on a number of plots and are actively developing a wetland marsh in a plot adjacent to Kilcoole Railway. This work was on-going at the time of survey. Access to the bird sanctuary at Kilcoole and information on crossing private land was facilitated by Birdwatch Ireland. The large area behind the berm was not directly surveyed due to time constraints on

the survey and the fact that this area was dominated by other wetland habitats and the potential for saltmarsh development was limited.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh at surveyed Kilcoole is found in two main sections. There is minor development of saltmarsh vegetation along the edge of the intertidal channels that flow along the landward side of the shingle bank. This saltmarsh is dominated by ASM. Saltmarsh vegetation is found on both sides of The Breaches.

The largest area of saltmarsh development to the north of the site is in Cooldross Middle and Lower. This saltmarsh is found in low-lying meadows that have been partially improved and reseeded in the recent past. The main intertidal channel containing soft mud extends through this area and there is saltmarsh development on both sides of the channel and along smaller branches of the channel that connect to drainage ditches. The intertidal channel is bridged by an embankment to allow livestock access to the east side. The saltmarsh is generally found in the low-lying ground on both sides of the channel but in places the topography is variable and some low mounds within the saltmarsh area contain terrestrial grassland that does not get inundated by the brackish water. These mounds contain species like Curled Dock (*Rumex crispus*), Yorkshire Fog (*Holcus lanatus*), Crested Dogstail (*Cynosuros cristatus*) and Perennial Rye-grass (*Lolium perenne*). This area is divided into several fields by ditches and hedges. There are transitions to wet grassland and improved grassland along the upper landward boundary of this saltmarsh. This saltmarsh is dominated by ASM (Table 3.1) with a small amount of MSM development at one location.

Table 3.1. Area of saltmarsh habitats mapped at Kilcoole.

EU Code	Habitat	Area (ha)
H1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	13.058
H1410	Mediterranean salt meadows (Juncetalia maritimi)	0.216
	Total	**13.274**

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

3.2 Atlantic salt meadows (H1330)

The ASM at this site is mainly found in two sections. The saltmarsh near The Breaches is more typical of marine situations and is obviously inundated by the tide more frequently. Saltmarsh has developed on a narrow band of low-lying land along the landward side of the shingle embankment and adjacent to the wide intertidal channels. There are moderate to steep slopes along this embankment which has created some distinctive zones within the

saltmarsh vegetation. There are also a small saltmarsh 'island' that is isolated within the intertidal channel that is dominated by low marsh vegetation. The lower zone is dominated by a band of dense Sea Purslane (*Atriplex portulacoides*) with small amounts of Common Saltmarsh-grass (*Puccinellia martima*), Common Scurry-grass (*Cochlearia officinalis*), Sea Plantain (*Plantago maritima*) and Sea Milkwort (*Glaux maritima*). There is some development of a mid-upper marsh zone dominated by Red Fescue (*Festuca rubra*) and also containing more frequent Sea Plantain, and small amounts of Sea Purslane, Sea Aster (*Aster tripolium*), Sea Pink (*Armeria maritima*) and Creeping Bent-grass (*Agrostis stolonifera*). The saltmarsh structure is poorly developed as it is quite small and it has also been modified by arterial drainage works in the past. There is a gradual landward transition to coastal grassland also dominated by Red Fescue in places but containing species such as Birdsfoot (*Lotus corniculatus*), Curled Dock and Sea Beet (*Beta maritima*). Creeping Bent also forms a narrow band of saltmarsh vegetation along the upper boundary in places. There are also some landward transitions to Twitch (*Elymus repens*)-dominated grassland along the back of this embankment.

The largest area of ASM occurs in the low-lying area on either side of the brackish lagoon at the northern end of the site. Much of the land is heavily poached and in places bared of vegetation. This area contains several ASM vegetation communities including some communities not recorded at any other sites during the SMP survey. Some zonation is present and is related to the variable micro topography over the surface of the saltmarsh area. Low-lying shallow depressions and zones along the channels contain low marsh vegetation. Much of this vegetation is dominated by Lesser Sea-spurrey (*Spergularia marina*) and contains patches dominated by Reflexed Saltmarsh-grass (*Puccinellia distans*). Common Saltmarsh-grass is also present and there are small amounts of other species like Glasswort, Greater Sea-spurrey, Sea Plantain, Creeping Bent, Frosted Orache (*Atriplex lacinata*), Saltmarsh Rush (*Juncus gerardii*), and Sea Milkwort. Some areas contain frequent amount of Kneed Foxtail (*Alopecurus geniculatus*), indicating the brackish influence and prolonged flooding on this site, rather than regular tidal inundation. Much of this vegetation seems quite disturbed, possibly from prolonged flooding, and is more typical of pioneer saltmarsh with bare substrate dominant and containing frequent Glasswort (*Salicornia* sp.).

Adjacent low mounds contain differently-zoned vegetation with more frequent Red Fescue or Creeping Bent in places. Some of these mounds contain terrestrial grassland. There are small amounts of Sea Club-rush scattered in hollows over the site and along the margins of the intertidal channel/lagoon.

An unusual vegetation community has developed at the northern end of the site in and area that was reseeded recently. This area is dominated by Lesser Sea-spurrey (*Spergularia marina*) and also contains Creeping Bent, Common Saltmarsh-grass, Reflexed Saltmarsh-

grass, Sea Milkwort, Sea Plantain, Spear-leaved Orache (*Atriplex prostrata*) and Kneed Foxtail. There is also frequent bare substrate cover. This community is in transition.

There is a transition from the upper saltmarsh vegetation to agricultural grassland at the upper boundary.

3.3 Mediterranean salt meadows (H1410)

Mediterranean salt meadows habitat is poorly developed at this site. Two small patches were mapped in the northern section that represents less than 1% of the total saltmarsh area. The largest patch is found along the edges of one of the smaller channels that connect to the main intertidal channel. Both areas are characterised by the presence of Sea Rush (*Juncus maritimus*). This habitat is distinctive as it is much taller than the surrounding vegetation. Other species found in association with the Sea Rush clumps include Greater Sea-spurrey, Common Saltmarsh-grass, Red Fescue and Saltmarsh Rush. The habitat is badly poached in places and is in poor condition with frequent bare substrate cover.

4 IMPACTS AND ACTIVITIES

This site is affected by several impacts and activities (Table 4.1). The majority of the salt marsh is in private ownership and not readily accessible. The main impact on the remaining saltmarsh is grazing. Poaching and associated impacts are noticeable at this Kilcoole with large area of the ASM heavily poached (143), indeed bare of vegetation in places. There are also tracks across that marsh (501) created by livestock. However, this may also be related to excessive flooding and is typical in a lagoon with variable water levels. Some of this saltmarsh has actually been improved in the recent past and was re-seeded but has since reverted back to saltmarsh vegetation due to tidal inundation and brackish flooding (802). This is clearly seen on the OSI 2005 series aerial photographs where part of the current saltmarsh was cut for silage and was improved grassland. The saltmarsh located closer to The Breaches is not grazed.

This site is also likely to be quite dynamic (990). The development of saltmarsh is usually dependent on regular tidal inundation. However, inundation at this site is not regular so periods with prolonged phases of brackish flooding when The Breaches is blocked is likely to increase saline influence over a wider area. In contrast, periods when The Breaches is kept open may restrict saltmarsh development to areas with tidal inundation during spring tides. Prolonged flooding promotes grazing and poaching damage.

The greatest impacts affecting the overall site are all associated with human management of the site and include the construction of coastal protection works, management of the drainage pattern of the low-lying marshland and reclamation of flooded ground for agricultural purposes. More recently the development, in parts of the marsh of a bird sanctuary includes

the construction of large ponds for the purposes of waterfowl and nesting birds. These activities have affected land at Leabeg Lower and Leamore Lower. This area was likely to have contained saltmarsh habitat in the past but this area has been significantly modified. While it was not surveyed, the area behind the berms is not likely to contain any extensive saltmarsh and is most likely to be a mosaic of brackish habitats and other wetland habitats. Therefore extensive saltmarsh habitat has been destroyed. This reclamation has largely occurred prior to the start of the current monitoring period (1995) although there have been ongoing works after this period.

The NPWS management plan states that some of this land may revert back to saltmarsh due to saline seepage and infrequent tidal inundation and flooding. This is likely to happen at this site as it is quite dynamic.

Natural erosion (900) is not a significant impact as this area is quite sheltered by the shingle barrier.

Impacts and activities adjacent to the site are mainly related to farming (100, 102, 120, 140). Wicklow County Council also undertake coastal protection works on the seaward side of the shingle embankment. These activities have little or no measurable impact on the saltmarsh habitats other than those already assessed.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
H1330	143	A	-1	12.5	Inside
H1330	501	C	-1	0.5	Inside
H1330	802	A	-1	1.2	Inside
H1330	990	B	-1	12.5	Inside
H1410	143	C	-1	0.216	Inside
H1410	990	C	0	0.216	Inside

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

5 CONSERVATION STATUS

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 NPWS management plan, 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 this area during the survey at this site. There are more detailed descriptions of the saltmarsh habitat within the NPWS management plan.

Kilcoole is not a typical saltmarsh and has several notable features. The development of the site has created unusual lagoon-like conditions where the saltmarsh is influenced by prolonged flooding when the tidal connection to the sea is blocked. This has influenced the vegetation of the site with species like Reflexed Saltmarsh-grass and Sea-spurrey dominated significant parts of the vegetation, which is unusual.

A large part of this wetland complex has been modified by reclamation works and former saltmarsh habitat has been enclosed by berms. Some of this land has been reclaimed and some still is dominated by wetland habitats. This reclamation is not considered by this assessment as it largely occurred outside the current monitoring period.

The overall conservation status of the remaining saltmarsh at Kilcoole is *unfavourable-bad* (Table 5.1). The saltmarsh is in poor condition due to a combination of heavy grazing levels and prolonged flooding. Large sections are damaged by excessive poaching and are bared of vegetation. The conservation status of the lagoons at this site has also been assessed as part of an overall assessment of conservation status of lagoons in Ireland (NPWS 2007). The status of the lagoons has been assessed as *unfavourable-inadequate* mainly due to eutrophication, modification of drainage and poaching by cattle.

This site is located within The Murrough Wetlands cSAC. An old format NPWS management plan is available for this cSAC but is now out of date.

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

Habitat	**EU Conservation Status Assessment**			
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**
Atlantic salt meadows (H1330)	Extent		Structure and functions Future prospects	**Unfavourable-bad**
Mediterranean salt meadows (H1410)	Extent		Structure and functions Future prospects	**Unfavourable - Bad**

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of the ASM is assessed as *favourable*. A large portion of the marsh occurs on the low-lying ground surrounding the lagoon. The remaining marsh occurs as a narrow fringe along creeks and drainage channels. Part of this saltmarsh was improved and reseeded during the current monitoring period but this area has since reverted back to ASM vegetation.

This assessment does not consider reclamation to enclose a large area of former saltmarsh habitat in the southern part of the site. This area was largely reclaimed prior to the current monitoring period.

5.2.2 Habitat structure and functions

The structure and functions for ASM are assessed as *unfavourable-bad*. Ten monitoring stops were carried out throughout the ASM habitat, four of which failed to reach the target criteria. While all stops passed on the presence of typical species, the level of poaching/ damage resulted in a homogenously low vegetation height and areas of that have been badly damaged. The saltmarsh is in poor condition at present and seems to be in a state of transition. Prolonged flooding is having a significant impact on the vegetation at this site. However, this has also created a suite of conditions that has resulted in the development of more unusual ASM communities. Vegetation with frequent Reflexed Saltmarsh-grass was not encountered at any other site during the SMP survey. The saltmarsh structure has also been significantly modified in the past with modifications to the drainage of this area.

5.2.3 Future prospects

The future prospects of the habitat are rated as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. High grazing levels have damaged the sward surface at this site in association with prolonged flooding and these impacts are likely to continue in the future. There are few prospects for grazing management in this area as it is excluded from the cSAC.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

Although not widespread in its distribution or extent, the extent of the Mediterranean salt meadows at Kilcoole is assessed as *favourable*. There are no indications that this habitat was more extensive in the past. There are no indications of any loss of habitat due to land-use changes or erosion within the current monitoring period.

5.3.2 Habitat structure and functions

Given the limited extent of the MSM, monitoring stops were not carried out. Hence the assessment of the structure and functions of the habitat are based solely on a visual assessment and is assessed as *unfavourable-bad*. This vegetation is also damaged by heavy grazing levels and there is excessive poaching in places.

5.3.3 Future prospects

The future prospects of the habitat are rated as *unfavourable-bad*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. High grazing levels have damaged the MSM at this site in association with prolonged flooding and these impacts are likely to continue in the future.

6 MANAGEMENT RECOMMENDATIONS

A considerable portion of the saltmarsh has been damaged through agricultural management, which would benefit from a reduction in livestock pressure. However, as the saltmarsh largely occurs outside the cSAC designation, this recommendation may not be easily introduced. Periods of prolonged flooding at the site should be considered as part of the overall natural environmental process that affects the site. This is a dynamic site and natural transition due to prolonged flooding should be allowed to continue.

7 REFERENCES

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

Goodwillie, R. (1976). *County Report for Co. Wicklow*. An Foras Forbartha, Dublin.

MPSU, (2000). *Conservation plan for the Murrough Wetlands, Draft 2- Consultation*. National Parks and Wildlife Service, Dublin.

NPWS (2007). Conservation Assessment of Coastal lagoons in Ireland. NPWS. www.npws.ie.

Oliver, G. A. (2005). Seasonal changes and biological classification of Irish coastal lagoons. Ph. D Thesis. University College Dublin. www.irishlagoons.ie

Wolfe-Murphy, S.A. (1996). *A preliminary botanical description and appraisal of the IWC property at Kilcoole Marshes Co. Wicklow, with comments on potential management.* Unpublished report to the Irish Wildlife Conservancy, Dublin.

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			H1310	H1330	H1410	H1420	*Spartina* swards
1	1310 *Salicornia* flats						
2	*Spartina* swards						
3	1330 Atlantic salt meadow	13.058		13.058			
4	1410 Mediterranean salt meadow	0.216			0.216		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grassland mosaic						
9	Other (non saltmarsh)	74.719					
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)	15.091					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**103.08**		**13.058**	**0.216**		

Legend

- SAC Boundary
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops

Comhshaol, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Kilcoole (Map 1 of 3)

The Murrough SAC (002249)

SMP code: SMP0036

0 80 160 240 320 400 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: 22/02/2009
Map version: 1

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

Oifigeach, Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Kilcoole (Map 2 of 3)

The Murrough SAC (002249)

SMP code: SMP0036

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 Ordinance Survey material by permission of the Government (Permit number 5953)

0 70 140 210 280 350 Meters

N

Date of production: 22/02/2009
Map version: 1

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

Legend

- SAC Boundary
- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows
- Other Saltmarsh (CM2)
- other
- 1330 monitoring stops

Oidhreacht agus Rialtas Áitiúil
Environment, Heritage and Local Government
National Parks and Wildlife Service

Saltmarsh Monitoring Project 2007-2008

Kilcoole (Map 3 of 3)

The Murrough SAC (002249)

SMP code: SMP0036

0 70 140 210 280 350 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: 22/02/2009
Map version: 1

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