

**Tramore Dunes and Backstrand SAC (site code 671)
Conservation objectives supporting document
-coastal habitats**

NPWS

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

Please note that this document should be read in conjunction with the following report: NPWS (2013). Conservation Objectives: Tramore Dunes and Backstrand SAC 000671. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

1 Introduction

Achieving Favourable Conservation Status (FCS) is the overall objective to be reached for all Annex I habitat types and Annex II species of European Community interest listed in the Habitats Directive 92/43/EEC (Commission of the European Communities, 2007). It is defined in positive terms, such that a habitat type or species must be prospering and have good prospects of continuing to do so.

Tramore Dunes and Backstrand is a composite coastal site that lies at the head of Tramore Bay, east of the town of Tramore, County Waterford. The site comprises a shallow intertidal area known as the Backstrand, enclosed by a substantial spit known as Tramore Burrow. Tramore dunes (Burrow) are the result of a classic inshore process, i.e. the growth of a spit of shingle and sand across a shallow bay. Behind the spit lies the Backstrand which dries out at low tide and is connected to the open sea by narrows at Rinneshark. The extreme inner part of the intertidal area is particularly well sheltered as it is bounded by an embankment with a narrow gap. Here saltmarsh vegetation, *Spartina* swards and communities of *Salicornia* and other annuals thrive. The spit is dominated by a substantial dune system and on the seaward side there is a fine sandy beach with a shingle element. The land to the north and east of the site is fairly intensive agricultural land while to the west the town encroaches, with a local authority landfill adjacent to the site.

Tramore Dunes and Backstrand SAC is an important coastal site of high conservation significance. It supports a range of habitats, including several listed on Annex I of the E.U. Habitats Directive, as well as several rare species. It is also an important area for birds and part of the SAC overlaps with Tramore Backstrand SPA (site 4027).

Saltmarsh is well developed and fairly extensive in the sheltered inner part of the site. It is the lagoon type of saltmarsh, which is the rarest type in Ireland.

The dunes at Tramore are well-developed and are a fine example of a sand spit developed on a shingle ridge. They represent one of the few dune systems on the south coast of Ireland. They consist of high ridges and valleys, old stabilised surfaces and new foredunes (embryonic dunes) at shore level. The fixed dunes are substantial in area though species diversity is low due to the absence of grazing. The fixed dunes are complemented by small, though good examples of shifting marram dunes and embryonic dunes.

The main threat to the stability of the dune habitats at Tramore is from recreational pressures, with heavy usage of the site due to its proximity to Tramore. Drift line and shingle vegetation is also under pressure from heavy usage of the beach area. The intertidal and saltmarsh habitats are not under significant threats, although seepage from the landfill site is a potential threat.

Tramore dunes and Backstrand SAC (site code: 671) is designated for a range of coastal habitats including vegetated shingle, saltmarsh and sand dunes. The known distribution of saltmarsh habitats is presented in Appendix I and of sand dune habitats in Appendix II.

The following eight coastal habitats are included in the qualifying interests for the site (* denotes a priority habitat):

- Perennial vegetation of stony banks (1220)
- Salicornia and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) (ASM) (1330)
- Mediterranean salt meadows (*Juncetalia maritimi*) (MSM) (1410)
- Annual vegetation of drift lines (1210)
- Embryonic shifting dunes (2110)
- Shifting dunes along the shoreline with *Ammophila arenaria* (2120)
- Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)*

The first habitat represents vegetated shingle, the next three are saltmarsh habitats and the last four are associated with sand dune systems, although all eight of these habitats are found in close association with each other (Moore & Wilson, 1999; McCorry, 2007; Ryle *et al.*, 2009).

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

The targets set for the **vegetated shingle** are based in part on the findings of the National Shingle Beach Survey (NSBS), which was carried out in 1999 on behalf of the National Parks and Wildlife Service (NPWS) (Moore & Wilson, 1999) and partly on the Coastal Monitoring Project (Ryle *et al.*, 2009), who recorded a small area of vegetated shingle at Tramore.

The NSBS visited the following sub-site within Tramore Dunes and Backstrand SAC:

1. Tramore.

During the NSBS profiles and transects were recorded from each shingle beach and each site was assigned a crude High/Medium/Low interest ranking. A 'high interest' ranking denotes a site that is of high conservation value. The site may be of interest botanically or geomorphologically. A 'medium interest' ranking implies the site may be extensive but not of particular interest either botanically or geomorphologically. A 'low interest' ranking is reserved for small sites, highly damaged sites or sites

that are of a very common classification. Tramore is rated a site of 'medium interest' as the site has the potential to be of high interest were it not for the high level of pedestrian traffic.

The vegetated shingle habitat was not mapped at this sub-site, but the vegetation was recorded, as were the human impacts and alterations at the site, which are useful tools for assessing the Structure and Functions of the site.

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

The SMP surveyed, mapped and assessed the following sub-site within Tramore Dunes and Backstrand SAC (McCorry, 2007):

1. Tramore

As part of the SMP, a detailed report and habitat maps were produced for this sub-site and are included in Appendix III. The conservation objectives for the saltmarsh habitats in Tramore Dunes and Backstrand are based on a combination of the findings of the individual reports for the sub-site. There may be some additional small areas of saltmarsh present within the site, however, it is estimated that the sub-site as surveyed by the SMP represents approximately 98% of the total area of saltmarsh within Tramore Dunes and Backstrand SAC.

The targets set for the **sand dune habitats** are based primarily on the results of the Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009) and this document should be read in conjunction with that report. As part of the Coastal Monitoring Project (CMP) a detailed individual report and habitat maps was produced for one sub-site (Tramore) and this is included as an Appendix to this document (Appendix IV). The Tramore sub-site also includes an area of dune habitats directly to the east of the spit, which is referred to throughout the report as Bass Point.

The conservation objectives for the sand dune habitats in Tramore Dunes and Backstrand are based on the findings of the individual report for this site, combined with the results of Gaynor (2008). It is thought that the sub-site as surveyed by the CMP represents the total area of sand dunes within Tramore Dunes and Backstrand SAC.

2 Conservation Objectives

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

3 Perennial vegetation of stony banks

Perennial vegetation of stony banks is vegetation that is found at or above the mean high water spring tide mark on shingle beaches (i.e., beaches composed of cobbles and pebbles). It is dominated by perennial species (i.e. plants that continue to grow from year to year). The first species to colonise are annuals or short-lived perennials that are tolerant of periodic displacement or overtopping by high tides and storms. Level, or gently-sloping, high-level, mobile beaches, with limited human disturbance, support the best examples of this vegetation. More permanent ridges are formed by storm waves. Several of these storm beaches may be piled against each other to form extensive structures. However, little is known about the distribution and nature of this habitat at this site.

3.1 Overall Objective

The overall objective for 'perennial vegetation of stony banks' in Tramore Dunes and Backstrand SAC is to 'maintain the favourable conservation condition'. This objective is based on an assessment of the recorded condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Range, (b) Area and (c) Structure and Functions.

3.2 Area

3.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target for favourable condition is '*no decrease in extent from the established baseline*'. Bearing in mind that coastal systems are naturally dynamic and subject to change even within a season, this target is assessed subject to natural processes, including erosion and succession.

The exact current extent of this habitat in Tramore Dunes and Backstrand is unknown. The National Shingle Beach Survey (Moore & Wilson, 1999) visited this site but did not map extent. A shingle ridge (0.211ha) was recorded by the CMP at the western end of the beach at Tramore outside the SAC boundary, where its location in an area of greatest pedestrian traffic and interference reduces its interest as a habitat (Ryle *et al.*, 2009).

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

3.3 Range

3.3.1 Habitat distribution

Tramore is a vegetated shingle ridge that is predominantly associated with the dune system at Tramore Burrow, with a small area on the east side of the channel at Bass Point (Moore & Wilson, 1999). Some shingle also occurs behind the main strandline above the saltmarsh. The habitat is not as well developed as perhaps it could be, as a result of the high levels of disturbance caused by pedestrian traffic.

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

3.4 Structure and Functions

A fundamental aim of shingle conservation is to facilitate natural mobility. Shingle beaches are naturally dynamic systems, making them of geomorphological interest as well as ecological interest. They are constantly changing and shingle features are rarely stable in the long term.

3.4.1 Functionality and sediment supply

The health and on-going development of this habitat relies on a continuing supply of shingle sediment. This may occur sporadically as a response to storm events rather than continuously. Interference with the natural coastal processes, through offshore (or onshore) extraction or coastal defence structures in particular, can interrupt the supply of sediment and lead to beach starvation.

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

3.4.2 Vegetation structure: zonation

Ecological variation in this habitat type depends on stability; the amount of fine material accumulating between the pebbles; climatic conditions; width of the foreshore and past management of the site. The ridges and lows also influence the vegetation patterns, resulting in characteristic zonations of vegetated and bare shingle. In the frontal less stable areas of shingle, the vegetation tends to be dominated by annuals and short-lived salt-tolerant perennials. Where the shingle is more stable the vegetation becomes more perennial in nature and may include grassland, heathland and scrub, depending on the exact nature of the site. The presence of lichens indicates long term stability of the shingle structure. Transitions to inter-tidal, saltmarsh and sand dune habitats occur at this site.

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

3.4.3 Vegetation composition: typical species & sub-communities

The degree of exposure, as well as the coarseness and stability of the substrate determines species diversity. The shingle at Tramore Dunes and Backstrand support a typical flora for this habitat. Typical species would include sea sandwort (*Honckenya peploides*), sea beet (*Beta vulgaris* ssp. *maritima*), rock samphire (*Crithmum maritimum*), sea mayweed (*Tripleurospermum maritimum*) and sea campion (*Silene uniflora*). Other species recorded include sea pink (*Armeria maritima*), thistle (*Cirsium* species), yarrow (*Achillea millefolium*), marram (*Ammophila arenaria*), kidney vetch (*Anthyllis vulneraria*) and Babbington's orache (*Atriplex glabriscula*).

A number of rare species that are considered characteristic of this habitat have been recorded in the past, including the Red Data Book species sea-kale (*Crambe maritima*) and sea knotgrass (*Polygonum maritimum*) (Ferguson & Ferguson, 1974a & b). Cottonweed (*Otanthus maritimus*), a protected species in Ireland, was also previously recorded at this site. While the current status of the first two species at this site is unknown, cottonweed is considered to be extinct.

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

3.4.4 Vegetation composition: negative indicator species

Where shingle becomes more stabilised negative indicator species can become an issue. Negative indicator species can include non-native species (e.g. *Centranthus ruber*, *Lupinus arboreus*); species indicative of changes in nutrient status (e.g. *Urtica dioica*) and species not considered to be typical of the habitat (e.g. *Pteridium aquilinum*).

The target for this attribute is that negative indicator species (including non-native species) should make up less than 5% of the vegetation cover.

4 Saltmarsh habitats

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

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

The first three habitats (In bold) are listed as Qualifying Interests for Tramore Dunes and Backstrand. The last habitat is restricted in its distribution to a small number of sites in the southeast of the country.

The distribution of saltmarsh habitats within Tramore Dunes and Backstrand SAC is presented in Appendix I. A total area of 32.83ha of saltmarsh habitats was mapped within the SAC, all of which is of qualifying interest.

Within Tramore Dunes and Backstrand SAC there are several patches of saltmarsh around the shoreline of the Backstrand with the main section situated along the back of the sand/shingle spit within the area enclosed by the embankment (The Cush). There are two smaller patches of saltmarsh along the northern side of the Backstrand, one of which is connected to the embankment (Tramore Intake) while the other (Lisselan Intake) is further east along the Backstrand. There also is a very small patch of saltmarsh within the sand dune system near the end of the Burrow.

Spartina swards are present at several locations around the Backstrand. The largest area is within the partially enclosed Malcolmson embankment to the west of the Backstrand, south of the landfill. *Spartina* swards and clumps are also present along the saltmarsh at Lisselan, as well as on the south-east side of the Malcolmson embankment. There is a large area of *Spartina* sward north of the landfill. Recently developed swards (since 1993) are also present on mudflats on the small inlet/channel at the north-west corner of the Backstrand (McCorry, 2007).

The Backstrand 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 landfill. A tall embankment (called the Malcolmson embankment after the family who built it) was built across the western side of the Backstrand and was completed in 1863 (McGrath, 2001) The embankment was

breached in 1911 (McCorry, 2007) resulting in a small opening near the centre that allows the tide to flood the intertidal flats and around the landfill to the west of the Malcolmson embankment.

The Annex I habitats, *Salicornia* flats, Atlantic Salt Meadows (ASM) and Mediterranean salt meadows (MSM) are all found at the Tramore sub-site. Detailed descriptions of each habitat in the sub-site recorded by McCorry (2007) in Tramore Dunes and Backstrand can be found in Appendix III.

4.1 Overall Objectives

The overall objective for '*Salicornia* and other annuals colonising mud and sand' in Tramore Dunes and Backstrand SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Atlantic salt meadows' in Tramore Dunes and Backstrand SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Mediterranean salt meadows' in Tramore Dunes and Backstrand SAC is to '*maintain the favourable conservation condition*'.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

4.2 Area

4.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. The target is no decrease in extent from the baseline which was established by McCorry (2007). Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion and succession.

A baseline habitat map was produced for the saltmarsh in Tramore Dunes and Backstrand during the SMP. This map is included with the individual site report for Tramore in the Appendices at the end of this document.

The largest patches of *Salicornia* habitat are situated on mudflats within the area partially enclosed by the Malcolmson embankment at The Cush.

The extent of the ASM habitat at Tramore has been in the past been affected by reclamation, infilling and drainage around the Backstrand. Comparison of 1920's and 2000 aerial photos indicates erosion has reduced the area of Lisselan saltmarsh, however there are no indications that erosion is a current impact in this area from examination of aerial photos from 1995 to 2005.

MSM habitat occurs on Lisselan and Tramore Intake saltmarshes. The former extent of MSM is likely to have been affected by reclamation around the Backstrand in the past (McCorry, 2007).

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

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

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

Sub-site	Total area (ha) of <i>Salicornia</i> mudflats (excluding mosaics) from SMP	Total area (ha) of <i>Salicornia</i> mudflats within SAC boundary (including mosaics)
Tramore	0.99	0.99
Total	0.99	0.99

Sub-site	Total area (ha) of ASM (excluding mosaics) from SMP	Total area (ha) of ASM within SAC boundary (including mosaics)
Tramore	29.55	30.29
Total	29.55	30.29

Sub-site	Total area (ha) of MSM (excluding mosaics) from SMP	Total area (ha) of MSM within SAC boundary (including mosaics)
Tramore	1.76	1.54
Total	1.76	1.54

In view of the fact that the SMP rated all three habitats as Favourable in terms of extent, the target for each habitat is that the area should be stable or increasing, subject to natural processes, including erosion and succession.

4.3 Range

4.3.1 Habitat distribution

Saltmarsh is currently known to display a wide distribution throughout the site. The largest area of saltmarsh is located 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 (McCorry, 2007)

Two small patches of saltmarsh are situated along the northern side of the Backstrand. The western section is located in the Tramore Intake and is a complex mosaic of several habitats. The second area of saltmarsh along the northern boundary of the Backstrand is located towards the eastern side in the townland of Lisselan (McCorry, 2007).

Salicornia mudflats are found at two locations within the Tramore sub-site: on mudflats partially enclosed by the Malcolmson embankment in the south-west section of the Backstrand and along the edge of the saltmarsh at Lisselan in the north-east section (McCorry, 2007).

The largest area of Atlantic salt meadows (ASM) occurs at The Cush, which has developed along the back of the shingle/sand spit that forms Tramore Burrow. The main area is enclosed by the Malcolmson embankment. ASM also dominate the saltmarsh at Lisselan. A small patch of saltmarsh is located at the north side of the Malcolmson embankment at Tramore Intake (McCorry, 2007).

Mediterranean salt meadows (MSM), occurs within the main saltmarsh areas along the northern side of the Backstrand at Tramore Intake and Lisselan (McCorry, 2007).

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

4.4 Structure and Functions

The location, character and dynamic behaviour of saltmarshes are governed by sediment supply, tidal regime, wind-wave climate and sea level change. The slope of the saltmarsh allows the development of several ecological gradients such as tidal submergence and salinity, and this influences the development of distinctive zones of halophytic and salt tolerant plant communities. Maintaining the favourable conservation condition of the saltmarsh habitats in Tramore Dunes and

Backstrand in terms of its structure and functions depends on a range of attributes for which targets have been set as outlined below.

4.4.1 Physical structure: sediment supply

Accretion and erosion are natural elements of saltmarsh systems. Maintaining the sediment supply is vital for the continued development and natural functioning of a saltmarsh system. Interruption to the sediment circulation through physical structures can starve the system and lead to accelerated erosion rates. The development of the large Malcolmson embankment to partially enclose a large area of mudflats to the west of the Backstrand probably affected sedimentation in the area (McCorry, 2007).

Reclamation and drainage works have occurred in the past at Lisselan and Tramore Intake (McCorry, 2007). There are signs of erosion along the seaward edge of the saltmarsh at Lisselan. This erosion may be in response to changes in the shoreline geomorphology on both sides of this saltmarsh, with large intertidal areas enclosed by embankments built in the last 150 years. There are no indications of any recent (1995-2005) loss in extent of saltmarsh from examinations of aerial photos (McCorry, 2007).

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

4.4.2 Physical structure: creeks and pans

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

The ASM along the west side of the saltmarsh at The Cush 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). The seaward boundary of the ASM has also been disturbed by drainage carried out in the past. Deep creek-like drains were dug on the mudflat (McCorry, 2007).

The saltmarsh topography at Lisselan saltmarsh is quite well developed with a complex creek structure and a series of large salt pans both present (McCorry, 2007).

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

4.4.3 Physical structure: flooding regime

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

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

4.4.4 Vegetation structure: zonation

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

Saltmarsh zonation is particularly well developed along The Cush as mid and upper saltmarsh zones are particularly well-developed. Also at the Cush there are natural transitions to fixed dune grassland towards the eastern end close to the Malcolmson embankment. Most of the northern saltmarsh is situated adjacent to embankments or natural boundaries with farmland, so the extent of transition habitats is low (McCorry, 2007).

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

4.4.5 Vegetation structure: vegetation height

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

species and destruction of the vegetation cover, while undergrazing can lead to a loss of plant diversity due to competitive exclusion.

Grazing by stock was absent from the site at the time of the SMP survey, though there has been some grazing by cattle within the saltmarsh at Lisselan in the past. There is also some natural grazing by wildfowl throughout the site (McCorry, 2007).

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

4.4.6 Vegetation structure: vegetation cover

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

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

4.4.7 Vegetation composition: typical species & sub-communities

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

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

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

Species of local distinctiveness were recorded at a number of locations throughout the SAC. Golden-samphire (*Inula crithmoides*) was recorded within the ASM at Tramore, while sharp rush (*Juncus acutus*) is present in the MSM (McCorry, 2007).

4.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species recorded on saltmarshes during the SMP was common cordgrass (*Spartina anglica*). This species was recorded frequently in Tramore Dunes and Backstrand SAC by the SMP and it forms a significant part of the saltmarsh and intertidal flats around the Backstrand. This species has been present at the site since the 1960s and Nairn (1986) noted that it had increased significantly in extent during this period (McCorry, 2007).

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

5 Sand dune habitats

Sand dunes are hills of wind blown sand that have become progressively more stabilised by a cover of vegetation. In general, most sites display a progression through strandline, foredunes, mobile dunes and fixed dunes. Where the sandy substrate is decalcified, fixed dunes may give way to dune heath. Wet hollows, or dune slacks, occur where the dunes have been eroded down to the level of the water-table. Machair is a specialised form of dune system that is only found on the northwest coasts of Ireland and Scotland. Transitional communities can occur between dune habitats and they may also form mosaics with each other. Dune systems are in a constant state of change and

maintaining this natural dynamism is essential to ensure that all of the habitats present at a site achieve favourable conservation condition.

In Ireland, there are 9 sand dune habitats (including annual vegetation of drift lines) listed under Annex I of the EU Habitats Directive (92/43/EEC) (* denotes a priority habitat):

- **Annual vegetation of drift lines (1210)**
- **Embryonic shifting dunes (2110)**
- **Shifting dunes along the shoreline with *Ammophila arenaria* (2120)**
- **Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130) ***
- Decalcified dunes with *Empetrum nigrum* (2140) *
- Decalcified dune heath (2150) *
- Dunes with *Salix repens* (2170)
- Humid dune slacks (2190)
- Machair (21AO) *

Four dune habitats were recorded by Ryle *et al.* (2009) and are indicated in bold above as Qualifying Interests for Tramore Dunes and Backstrand SAC. These habitats include mobile areas at the front, as well as more stabilised parts of dune systems. Dune slacks were also recorded and mapped at the SAC site at Bass Point, however there is doubt as to whether the habitat is representative of true dune slack as it is more closely aligned with freshwater marsh (Ryle *et al.*, 2009).

Annual vegetation of drift lines is found on beaches along the high tide mark, where tidal litter accumulates. It is dominated by a small number of annual species (i.e. plants that complete their life-cycle within a single season). Tidal litter contains the remains of marine algal and faunal material, as well as a quantity of seeds. Decaying detritus in the tidal litter releases nutrients into what would otherwise be a nutrient-poor environment. The habitat is often represented as patchy, fragmented stands of vegetation that are short-lived and subject to frequent re-working of the sediment. The vegetation is limited to a small number of highly specialised species that are capable of coping with salinity, wind exposure, an unstable substrate and lack of soil moisture. Typical species include spear-leaved orache (*Atriplex prostrata*), frosted orache (*A. laciniata*), sea rocket (*Cakile maritima*), sea sandwort (*Honckenya peploides*) and prickly saltwort (*Salsola kali*).

Embryonic dunes are low accumulations of sand that form above the strandline. They are sometimes referred to as foredunes, pioneer dunes or embryo dunes, as they can represent the primary stage of dune formation. They are characterised by the presence of the salt-tolerant dune grasses sand couch (*Elytrigia juncea*) and lyme grass (*Leymus arenarius*), which act as an impediment to airborne sand. Strandline species can remain a persistent element of the vegetation.

Where sand accumulation is more rapid, marram grass (*Ammophila arenaria*) invades, initiating the transition to mobile dunes (Shifting dunes along the shoreline with *Ammophila arenaria*). Marram

growth is actively stimulated by sand accumulation. These unstable and mobile areas are sometimes referred to as 'yellow dunes' (or white dunes in some European countries), owing to the areas of bare sand visible between the tussocks of marram.

Fixed dunes refers to the more stabilised area of dune systems, generally located in the shelter of the mobile dune ridges, where the wind speed is reduced and the vegetation is removed from the influence of tidal inundation and salt spray. This leads to the development of a more or less closed or 'fixed' carpet of vegetation dominated by a range of sand-binding species (Gaynor, 2008).

All the dune habitats indicated above occur as a complex mosaic of constantly changing and evolving vegetation communities. They are inextricably linked in terms of their ecological functioning and should be regarded as single geomorphological units. As such, no dune habitat should be considered in isolation from the other dune habitats present at a site, or the adjoining semi-natural habitats with which they often form important transitional communities.

The CMP surveyed one sub-site within Tramore Dunes and Backstrand SAC:

1. Tramore (Appendix IV)

Detailed descriptions from the Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009) of each sand dune habitat found at Tramore are presented in Appendix IV. A total area of 66.59ha of sand dune habitats was mapped within the SAC, of which 66.33ha is of qualifying interest.

Tramore dunes and Backstrand are located in Tramore Bay, east of Tramore town. The main sand dune system (Tramore Burrow) has formed on a sand and shingle spit that almost closes the Bay. The Backstrand lies to the north of the spit and is connected to the sea by a narrow channel at Rinnashark, at the eastern end of the burrow. The CMP also surveyed a smaller sand dune area on the eastern side of the Bay at Bass Point (also known locally as Saleen Strand) separated from the Burrow by the narrows at Rinnashark. The spit (Tramore Burrow) is quite narrow where it joins the mainland, but widens to over 700m near the eastern end. Material accumulates at the tip of the spit as longshore drift from the west. There is currently a wide area of foredune development at this end of the site. The highest and largest dunes occur near the channel at the eastern end of the spit (Ryle *et al.*, 2009).

5.1 Overall objectives

The overall objective for 'Annual vegetation of drift lines' in Tramore Dunes and Backstrand SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Embryonic shifting dunes' in Tramore Dunes and Backstrand SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Shifting dunes along the shoreline with *Ammophila arenaria*' in Tramore Dunes and Backstrand SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Fixed coastal dunes with herbaceous vegetation' in Tramore Dunes and Backstrand SAC is to 'restore the favourable conservation condition'.

These objectives are based on an assessment of the recorded condition of each habitat under a range of attributes and targets. The assessment is divided into three main headings (a) Area (b) Range and (c) Structure and Functions.

5.2 Area

5.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. A baseline habitat map was produced for the sand dune habitats at the sub-site in Tramore Dunes and Backstrand SAC during the Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009). This map is included with the individual site report in the Appendices at the end of this document.

Annual strandline vegetation at The Burrow is restricted to two separate patches amounting to just under 0.3ha. This habitat is absent along considerable stretches of the beach, particularly at the western end, where recreational pressures are most intense. A further 0.143ha was mapped at Bass Point where the habitat was also confined to a small part of the beach (Ryle *et al.*, 2009).

Embryonic dunes are present along much of the southern side of Tramore Burrow. They are particularly well developed towards the tip, but they are absent where recreational pressures are greatest such as near the western end of the site (Ryle *et al.*, 2009).

The Shifting dunes are present along much of the southern side of Tramore Burrow, particularly at the accreting east end of the site where they are over 30m in width. Only in the western parts of the site, where there are greater amenity pressures, is the habitat absent (Ryle *et al.*, 2009).

Fixed dunes account for over 57ha of the sand dune habitats at Tramore, most of which is within The Burrow, while less than 5ha of fixed dune occurs at Bass Point (Ryle *et al.*, 2009).

The total areas of each sand dune habitat within the SAC as estimated by Ryle *et al.* (2009) are presented in the second column of the following table. These figures were subsequently checked and adjusted to take into account some overlapping polygons and mapping errors. The adjusted figures are presented in the final column.

Habitat	Total area (ha) of habitat from CMP	Total area (ha) of habitat within SAC boundary
Annual vegetation of driftlines	0.44	0.44
Embryonic shifting dunes	4.30	4.30
Shifting dunes along the shoreline with <i>Ammophila arenaria</i>	4.12	4.12
Fixed coastal dunes with herbaceous vegetation	57.53	57.47
Total	66.39	66.33

The general target for this attribute in the case of each habitat is that the area should be stable, or increasing. Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is always assessed subject to natural processes, including erosion and succession.

5.3 Range

5.3.1 Habitat distribution

There are two areas of sand dune, at The Burrow and Bass Point, which lie on opposite sides of the mouth of the narrows at Rinnshark.

Strandlines, embryonic dunes, mobile dunes and fixed dunes, were recorded at both The Burrow and Bass Point. The distribution of sand dune habitats within the SAC as mapped by Ryle *et al.* (2009) is presented in Appendix II.

There should be no decline or change in the distribution of these sand dune habitats, unless it is the result of natural processes, including erosion, and succession.

5.4 Structure and Functions

The location, character and dynamic behaviour of sand dunes are governed by a combination of geographic, climatic, edaphic and anthropogenic factors. Sand dunes are highly complex, dynamic systems, where the habitats occur in a complex and constantly evolving and changing mosaic. They function as systems in terms of geomorphology and hydrology and maintaining the favourable conservation condition of the habitats present depends on allowing these processes to continue unhindered. Maintaining the favourable conservation condition of all of the sand dune habitats in Tramore Dunes and Backstrand SAC in terms of structure and functions depends on a range of attributes for which targets have been set as outlined below.

5.4.1 Physical structure: functionality and sediment supply

Coastlines naturally undergo a constant cycle of erosion and accretion. There are two main causes of erosion: (a) those resulting from natural causes and (b) those resulting from human interference. Natural causes include the continual tendency towards a state of equilibrium between coasts and environmental forces, climatic change (particularly an increase in the frequency of storms or a shift in storm tracks), relative sea level rise and natural changes in the sediment supply. Human interference is usually associated with changes in the sediment budget, either directly, through the removal of beach or inshore sediment, or indirectly, by impeding or altering sediment movement. It is important to recognise that the process of coastal erosion is part of a natural tendency towards equilibrium. Natural shorelines attempt to absorb the energy entering the coastal zone by redistributing sediment. Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Sediment supply is especially important in the embryonic dunes and mobile dunes, as well as the strandline communities where accumulation of organic matter in tidal litter is essential for trapping sand and initiating dune formation. The construction of physical barriers such as sea defences can interrupt longshore drift, leading to beach starvation and increased rates of erosion. Sediment circulation and erosion also has a role to play in the more stabilised dune habitats. Cycles of erosion and stabilisation are part of a naturally functioning dune system, where the creation of new bare areas allows pioneer species and vegetation communities to develop, thus increasing biodiversity. The construction of physical barriers can interfere with the sediment circulation by cutting the dunes off from the beach resulting in fossilisation or over-stabilisation of dunes.

Rock gabions and fencing have been erected at Tramore and sand extraction was noted from the fixed dunes at Bass Point by the CMP (Ryle *et al.*, 2009).

The target for this attribute is to maintain the natural circulation of sediment and organic matter throughout the entire dune system, without any physical obstructions.

5.4.2 Vegetation structure: zonation

The range of vegetation zones on a dune system should be maintained. Gaynor (2008) highlights the highly transitional nature of much of the vegetation; therefore, it is important that the transitional communities are also conserved, including those to the saltmarsh communities.

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

5.4.3 Vegetation structure: bare ground

This target only applies to fixed dunes. It does not apply to the other habitats present where high levels of bare sand are a natural component of the habitat (e.g. mobile dunes). In the fixed dunes some degree of instability is vital. Constant cycles of erosion and stabilisation provide the necessary conditions for the establishment of pioneer species and species that favour open conditions including invertebrates, helping to increase biodiversity.

Within the fixed dunes on the Burrow, recreational pressures are quite intense, particularly at the western end of the site, where all visitors gain access to the beach and dunes. Erosion extends from the foredunes in to the fixed dunes, where localised patches of severe erosion were recorded by the CMP (Ryle *et al.*, 2009).

The target is to achieve up to 10% bare sand. This target is assessed subject to natural processes.

5.4.4 Vegetation structure: vegetation height

This attribute applies to the fixed dunes, where a varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. The ecological benefits of moderate levels of grazing on dunes have been well documented (Gaynor, 2008). Moderate grazing regimes lead to the development of a species-rich vegetation cover. The animals increase biodiversity by creating micro-habitats through their grazing, dunging and trampling activities. Grazing slows down successional processes and in some cases reverses them, helping to achieve a diverse and dynamic landscape. The effects of trampling assist the internal movement of sand through the development of small-scale blowouts, while dunging can eutrophicate those dune habitats whose nutrient-poor status is crucial for the survival of certain vegetation types. Many species, from plants to invertebrates, benefit immensely from the open and diverse system created by a sustainable grazing regime. Many dune species are small in size and have relatively low competitive ability. Consequently, the maintenance of high species diversity on a dune system is dependent on the existence of some control to limit the growth of rank coarse vegetation (Gaynor, 2008).

Grazing is absent from Tramore Burrow (Ryle *et al.*, 2009) and as a result the dunes are becoming rank. Cattle graze the dunes at Bass Point, and damage to the dunes is being caused by supplementary feeding of stock, which has led to considerable areas becoming dominated by nitrophilous species within the dune grassland. As a result of these practises, the fixed dunes at Tramore have failed to meet their targets under Structure & Functions (Ryle *et al.*, 2009)

The target for this attribute is to maintain structural variation within the sward.

5.4.5 Vegetation composition: plant health of dune grasses

This attribute applies to foredunes and mobile dunes, where blowing sand is a natural feature. The health of the dune grasses (particularly *Ammophila arenaria* and *Elytrigia juncea*) is assessed by the plant parts above the ground (they should be green) and the presence of flowering heads. This gives a clear indication of the status of the supply of blown sand, which is required for these species to thrive.

The target for this attribute is that more than 95% of the dune grasses should be healthy.

5.4.6 Vegetation composition: typical species & sub-communities

Species diversity and plant distribution in dunes is strongly controlled by a range of factors, including mobility of the substrate, grazing intensities, moisture gradients, nutrient gradients and human disturbance. In the younger, more mobile dunes, marram (*Ammophila arenaria*) is common, while groundsel (*Senecio vulgaris*), sea rocket (*Cakile maritima*) and dandelion (*Taraxacum* sp.) are also present. The fixed, more stable dune vegetation includes lady's bedstraw (*Galium verum*), common birdsfoot trefoil (*Lotus corniculatus*), wild thyme (*Thymus polytrichus*), kidney vetch (*Anthyllis vulneraria*), wild pansy (*Viola tricolor*) and biting stonecrop (*Sedum acre*).

The Burrow and Bass Point sand dunes support a characteristic dune flora, details of which can be found in the site report from the CMP (Ryle *et al.*, 2009) which is included in Appendix IV. Rare elements of the site flora include wild asparagus (*Asparagus officinalis* var. *prostratus*) and bee orchid (*Ophrys apifera*), which had been previously recorded at the site as well as by the CMP survey (Ryle *et al.*, 2009).

At Tramore Burrow there are occasional patches of wild privet (*Ligustrum vulgare*) which is a notable feature of the dunes as it is uncommon on Irish dune systems (Ryle *et al.*, 2009).

The target for this attribute is to maintain a typical flora for the particular sand dune habitat.

5.4.7 Vegetation composition: negative indicator species

Negative indicators include non-native species (e.g. *Hippophae rhamnoides*), species indicative of changes in nutrient status (e.g. *Urtica dioica*) and species not considered characteristic of the habitat. Sea-buckthorn (*Hippophae rhamnoides*) should be absent or effectively controlled.

The main invasive species identified in Gaynor (2008) were bracken (*Pteridium aquilinum*) and sea buckthorn (*Hippophae rhamnoides*). The invasion of non-native species compromises the typical plant community structure. Bracken (*Pteridium aquilinum*) is becoming increasingly dominant, particularly where sites have been abandoned or where grazing levels have been significantly

reduced. The vegetation retains many elements of the original vegetation cover, but there is a reduction in biodiversity. As the canopy becomes taller and ranker, many of the low-growing species disappear. In this case, the vegetation is treated as a sub-community of the original community that was invaded. This is always the case unless the original vegetation cover has been completely destroyed, as can happen with *H. rhamnoides*, which can form dense impenetrable thickets.

Bracken (*Pteridium aquilinum*) was recorded at Tramore Burrow and Bass Point dunes (Ryle *et al.*, 2009). No buckthorn (*Hippophae*) was recorded on the dunes by the CMP, although it has been recorded in the area (Preston *et al.*, 2002).

Other negative indicator species recorded at the site include creeping thistle (*Cirsium arvense*) and common ragwort (*Senecio jacobaea*) (Ryle, *et al.* 2009).

The target is that negative indicators (including non-native species) should represent less than 5% of the vegetation cover.

5.4.8 Vegetation composition: scrub/trees

This attribute only applies to the fixed dunes. Scrub encroachment leads to reduction in dune biodiversity and needs to be controlled. The presence of scrub and trees which have deep roots can also lower the groundwater table which can have significant impacts on any slack communities.

At Tramore Burrow, scrub consisting mostly of dewberry (*Rubus caesius*) occurs throughout the fixed dunes (Ryle *et al.* 2009).

The target for this attribute therefore is that the cover of scrub and tree species should be under control or represent no more than 5% of the vegetation cover.

6 References

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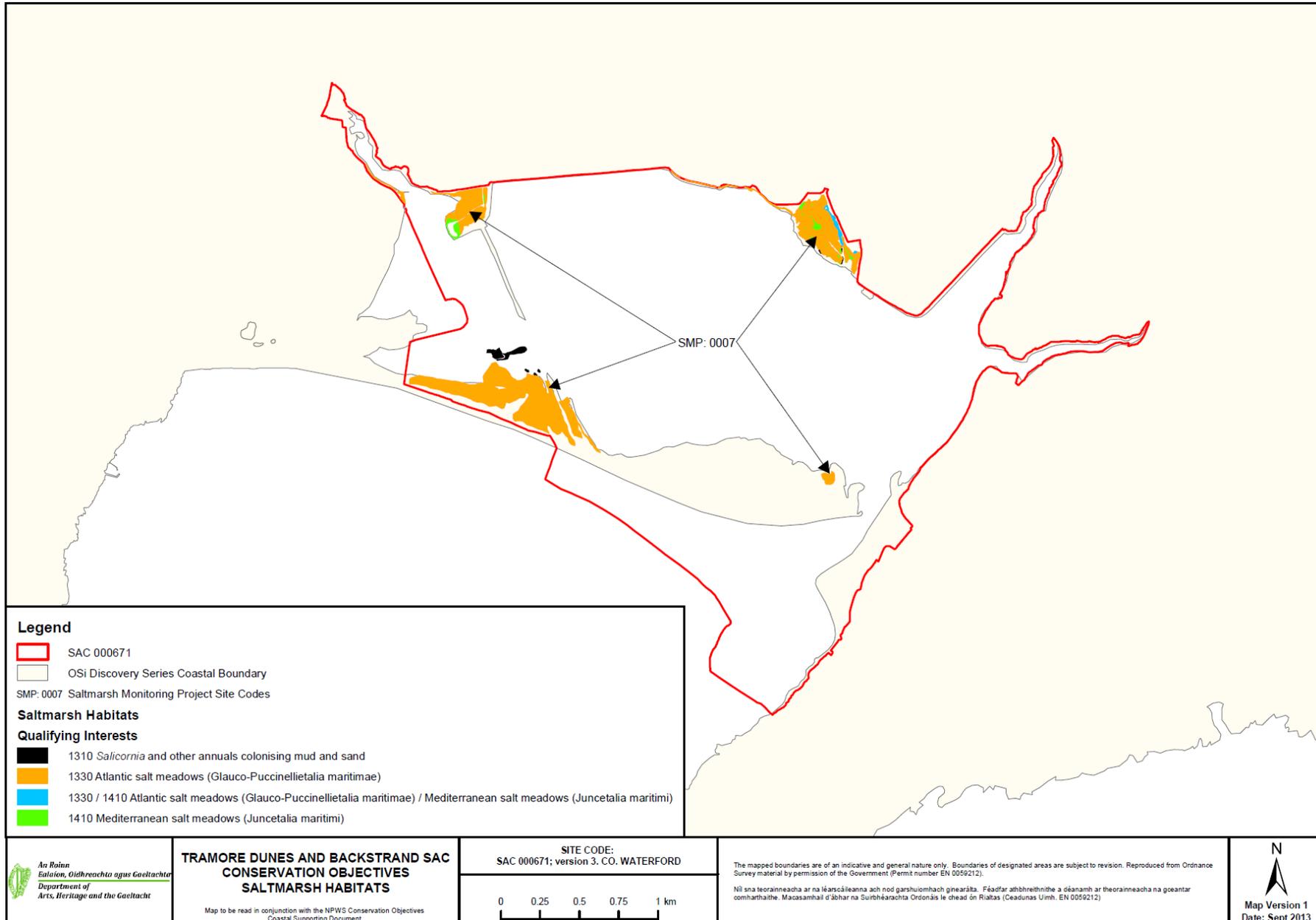
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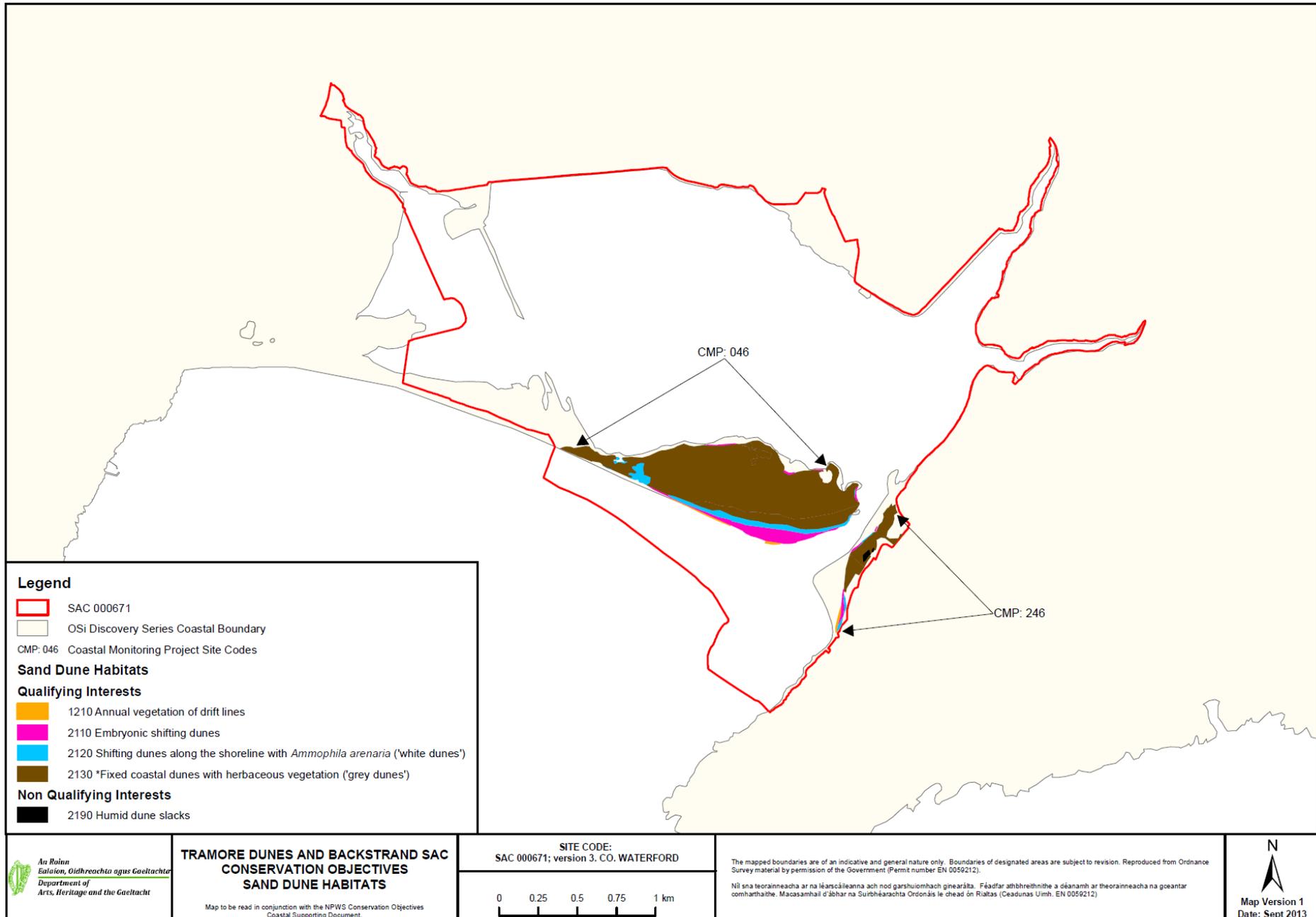
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Appendix I – Distribution map of saltmarsh habitats within Tramore Dunes and Backstrand SAC.



Appendix II – Distribution map of sand dune habitats within Tramore Dunes and Backstrand SAC.



Appendix III – Tramore site report and habitat map from the SMP (McCorry, 2007)

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
	pNHA: 671
	SPA: Tramore Backstrand SPA 671
County: Waterford	Discovery Map: 76
6 inch Map No: Wa026, Wa027	Grid Ref: 260110, 100940
	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 Backstrand cSAC:	
<i>Salicornia</i> and other annuals colonizing mud and sand (1310)	
Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) (1330)	
Mediterranean salt meadows (<i>Juncetalia maritimi</i>) (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 Backstrand, 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 Backstrand 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 Backstrand and this dump was built on the intertidal flats.

There are several patches of saltmarsh around the shoreline of the Backstrand 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 Backstrand, 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 Backstrand contains several hills that separate low-lying areas. Rivers flow into the Backstrand at the north-west and north-east corners. The land around Tramore Bay is dominated by farmland. The Backstrand 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 Malcolmsen embankment after the family who built it) was built across the western side of the Backstrand 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 Malcolmsen embankment. This embankment was breached in 1911. A large intertidal area along the north side of the Backstrand (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 Backstrand (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 Backstrand.

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 Backstrand 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 Backstrand SPA. The Backstrand 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 Backstrand 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 Backstrand. 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 Backstrand 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 Backstrand. 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 Backstrand. 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	<i>Salicornia</i> and other annuals colonizing mud and sand (1310)	0.99
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	29.55
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	1.76
	<i>Spartina</i> swards and clumps	28.71
	Total (not including <i>Spartina</i> 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 Backstrand, 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 are 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 km² 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 Backstrand. 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 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 Backstrand 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 distinct 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. On 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 Backstrand. The largest area is within the partially enclosed Malcolmson embankment to the west of the Backstrand, 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 Backstrand, 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 Backstrand. 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 Backstrand. 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 Backstrand 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 Backstrand. 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 Cordgrass 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 Backstrand 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			Overall EU conservation status assessment
	Favourable	Unfavourable - inadequate	Unfavourable - Bad	
<i>Salicornia</i> flats (1310)	Extent, Structure and functions,	Future prospects		Unfavourable - inadequate
Atlantic salt meadows (1330)	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 ramosissima*, *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 Backstrand, 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 Backstrand 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

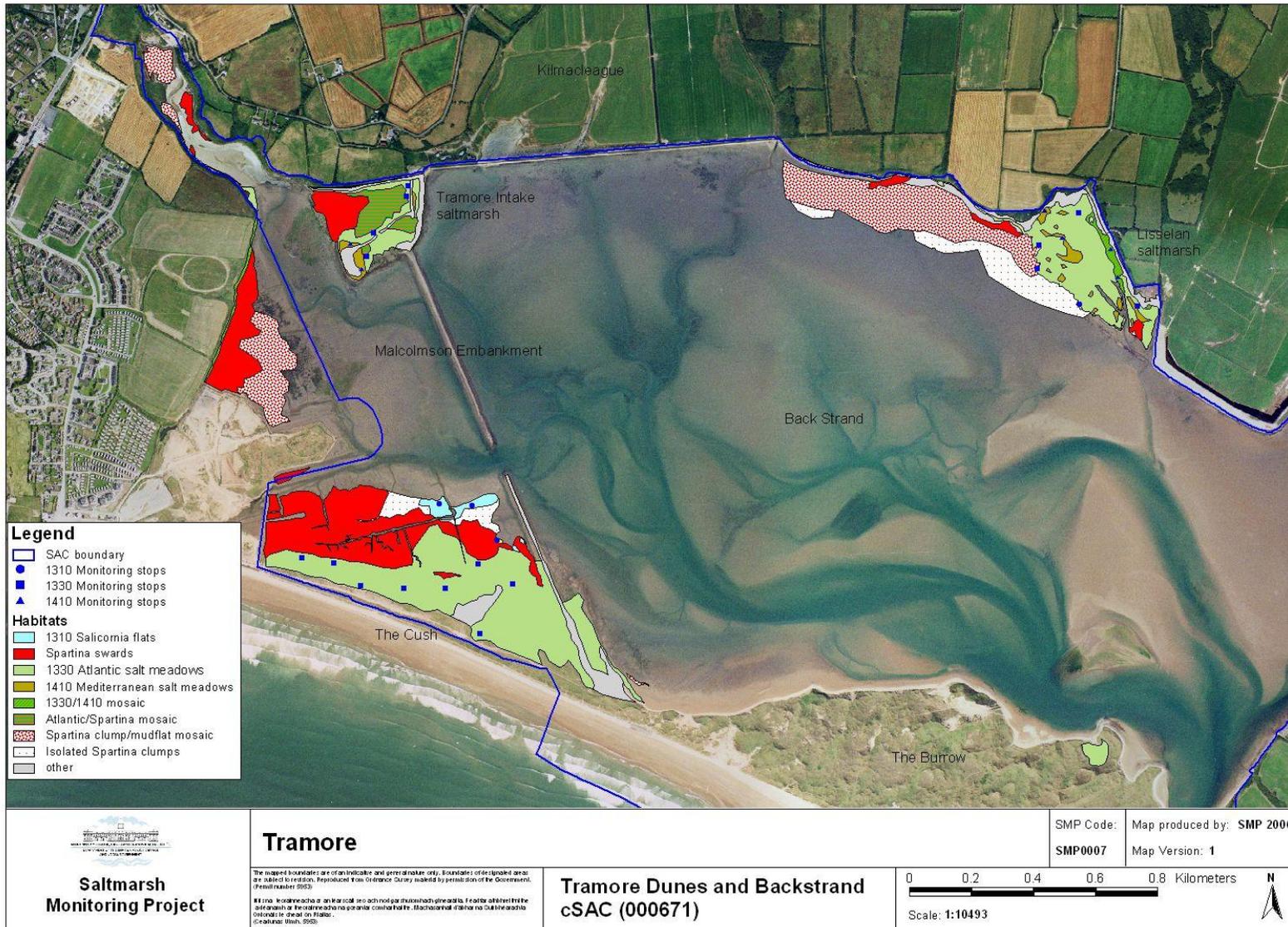
The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts continue in the near future. There are no major impacts or activities affecting this habitat. The largest area of this habitat is located at Lisselan 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 Backstrand, to record any trends in the expansion of Common Cordgrass quickly.

7 REFERENCES

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



Appendix IV – Tramore site report and habitat map from the CMP (Ryle *et al.*, 2009)

SITE DETAILS

CMP05 site name: **Tramore** CMP05 site code: **046** CMP Map No.: **43**

County: **Waterford** Discovery map: **76** Grid Reference: **S 261 100**

6 inch Map No.: **Wa 026**

Aerial photographs (2000 series): **O 5915-C, D; O 5916-A, B, C, D; O 5979-A, B**

NPWS Site Name: **Tramore Dunes and Backstrand**

NPWS designation: pNHA: **671** cSAC: **671** SPA: **4027**

Ranger Area: **South-East**

MPSU Plan: **Draft 2**

Report Author: **Kieran Connolly**

SITE DESCRIPTION

Tramore dunes and Backstrand are located in Tramore Bay, to the east of Tramore town. The main sand dune system (Tramore Burrow) has formed on a sand and shingle spit that almost closes the Bay. The Backstrand lies to the north of the spit and is connected to the sea by a narrow channel at Rinnashark, at the eastern end of the Burrow. Included in the survey is a smaller sand dune area on the eastern side of the Bay at Bass Point (also known locally as Saleen Strand) separated from the Burrow by the narrows at Rinnashark.

The dunes are included in Tramore Dunes and Backstrand cSAC, which has been listed due to the presence of the priority Annex I habitat – fixed dunes, and several other Annex I habitats, including the sand dune habitats listed in Table 46A. Also included in the cSAC are large areas of mud and sand flats and both Atlantic and Mediterranean salt meadows, located in the sheltered inner part of the site, behind the spit. The saltmarsh is of the lagoon type, which is the rarest in Ireland.

The spit (Tramore Burrow) is quite narrow where it adjoins the mainland, but widens to over 700 m near the eastern end. Material accumulates at the tip of the spit, as longshore drift is from the west. There is currently a wide area of foredune development at this end of the site. The highest and largest dunes occur near the channel at the eastern end of the spit.

The dunes on the Burrow are well developed and contain a number of Annex I habitats, including a large expanse of the priority habitat – fixed dune (Table 46A). However, the absence of grazing has led to the development of a tall, rather rank dune grassland, in which species diversity is lower than might otherwise be the case. Scrub species are also common in the fixed dunes.

The dunes are used intensively for recreational purposes, as Tramore town has a sizeable population and is a very popular resort. The adverse affects of excessive trampling and associated activities are particularly evident in the western end of the site, adjacent to Tramore town.

Table 46A Areas of EU Annex I habitats mapped at Tramore

EU Code	EU Habitat	Area (ha)
H1210	Annual vegetation of driftlines	0.437
H1220	Perennial vegetation of stony banks	0.211
H2110	Embryonic shifting dunes	4.302
H2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i>	4.122
H2130	Fixed coastal dunes with herbaceous vegetation	57.530
	Total Sand dune	66.602

The importance of the site to several Annex I species, listed under the EU Birds Directive, is the basis for the designation of Tramore Backstrand SPA. Light-bellied Brent Goose (*Branta bernicula hrota*) occurs on the site in internationally important numbers, while nationally important numbers of Golden Plover and Bar-tailed Godwit are also known. Other species occurring regularly or occasionally at the site include Little Egret, Red-throated Diver and Peregrine Falcon.

The site is also important for other groups of organisms. The abundance of snails and insects (particularly beetles) was noted in An Foras Forbartha report (1972) concerning areas of scientific interest in Co. Waterford. The presence in considerable numbers of a bloody-nosed beetle (*Timarcha* sp.) was noted in that report. During the present survey, *Timarcha tenebricosa* was seen several times at both Tramore Burrow and Bass Point. Choughs were heard at Bass Point, while a number of Whitethroats were seen.

Fixed Dunes (H2130)

Fixed dunes account for over 57 ha of the sand dune habitats at Tramore (Table 46A). Most of this is within the sand dune system of Tramore Burrow, with less than 5 ha of fixed dune at Bass Point. As indicated by the name, the fixed dunes at Tramore Burrow were grazed in the past by rabbits. However, the current lack of grazing has led to the dominance of tall and rank grasses throughout

much of the dunes. Marram, *Ammophila arenaria*, is common in the fixed dunes - a situation reflected in the high proportion of fixed dune monitoring stops in which it was a significant component. Other common grasses in the dune grassland include *Festuca rubra* (Red fescue) and *Arrhenatherum elatius* (False oat-grass).

Because of the absence of stock grazing at Tramore Burrow, species diversity is probably lower than would otherwise be the case. However, many typical species, including *Anthyllis vulneraria* (Kidney vetch), *Galium verum* (Lady's bedstraw), *Ononis repens* (Common restharrow), *Sedum acre* (Biting stonecrop), *Thymus polytrichus* (Wild thyme) and *Tortula ruraliformis* were noted. In the occasional short turf areas, *A. vulneraria* was particularly abundant (Photo 2).

Among the negative indicator species noted were *Cirsium arvense* (Creeping thistle) and *Senecio jacobaea* (Common ragwort). However, none of these were present in sufficient quantities, either individually or collectively, to exceed the 5% cover limit in fixed dune monitoring stops.

Scrub, consisting mostly of *Rubus caesius* (Dewberry), which was found throughout the fixed dunes, and occasional patches of *Ligustrum vulgare* (Wild privet), is a notable feature of the dunes. The presence of Wild Privet is considered an important feature of this site as it is uncommon on Irish dune systems. There is also a large area of *Pteridium aquilinum* (Bracken) on the lee slopes of some dune ridges towards the north of the site.

Intensive recreational use, mostly in the form of walking and associated activities, has led to severe localised patches of erosion in the fixed dunes, particularly at the western end of the site – the only part of the site from which access may be gained. Some areas of fixed dune have been fenced off in an attempt to stabilise the more severe areas of erosion. However, the fencing has fallen into disrepair and is no longer effective in excluding the public from these areas. As a result the dunes are continuing to suffer erosion.

The rare and protected *Asparagus officinalis* ssp. *prostratus* (Wild asparagus) is known from the fixed dunes, and was observed at a number of locations in the present survey. Two such locations are included as miscellaneous information points on the site digital map. Edible Asparagus, *Asparagus officinalis* ssp. *officinalis*, is also present at the site.

The Red Data Book species, *Ophrys apifera* (Bee orchid) has previously been recorded and was found at two locations on the fixed dunes during the present survey. Eight individual plants were noted on the lee side of a fixed dune ridge in the northwest of the site. Another four plants were noted further west near the ‘neck’ of the spit. Both locations are included as miscellaneous information points on the site digital map.

The area surrounding the larger cluster of *O. apifera* contained several species typical of wetter parts of a dune system, including *Linum catharticum* (Fairy flax), *Succisa pratensis* (Devil’s-bit scabious), *Blackstonia perfoliata* (Yellow-wort) and *Carlina vulgaris* (Carline thistle). There are no dune slacks in the Burrow and these species, although located low down on the lee side of a tall dune ridge, were not in a topographically low area. The site conservation plan (Draft 2) suggested the presence of *S. pratensis* may be indicative of leaching. This may also explain the concentration of all the above-named species in a small area.

The second area of sand dune, separated from Tramore Burrow by the narrows at Rinnashark is on the eastern edge of the bay at Bass Point. There is a small area of poor fixed dune grassland on this part of the site, with lower species diversity than at Tramore Burrow. Much of the area is dominated by ‘weed’ species such as *Cirsium arvense* (Creeping thistle), *Urtica dioica* (Common nettle) and *Rumex crispus* (Curled Dock). Bracken, *Pteridium aquilinum*, is also common in some places (Photo 12). Although much of the fixed dune vegetation at Bass Point is of a disturbed or rank nature, there are occasional patches of shorter turf (Photo 13), where several of the typical fixed dune species are seen.

There is evidence of sand extraction towards the southeast with steep bare ridges towards the back of the dunes. Cattle graze the dunes, although none were present on the survey date. No rare or protected species were found on these dunes.

Annual Vegetation of Driftlines (H1210)

Annual strandline vegetation at the Burrow was restricted to 2 separate patches of habitat, extending in total to just under 0.3 ha (Table 46A). The habitat is absent along considerable stretches of the beach, particularly at the western end, where recreational pressures are most intense. A further 0.143 ha was mapped at Bass Point, where the habitat was also confined to a small portion of the beach. Among the species noted were *Cakile maritima* (Sea rocket) and *Honckenya peploides* (Sea sandwort).

Perennial Vegetation of Stony Banks (H1220)

There is a shingle ridge at the western end of the beach at Tramore, although its location in the area of greatest pedestrian traffic and interference reduces its interest as a habitat. It is excluded from the cSAC. There were however, a number of typical species noted, including *Beta vulgaris* ssp. *maritima* (Sea beet), *Crithmum maritimum* (Rock samphire), *Honckenya peploides* (Sea sandwort), *Rumex crispus* (Curled Dock) and *Tripleurospermum maritimum* (Sea Mayweed). The habitat was rated as being of ‘medium interest’ in a recent national shingle beach survey (Moore & Wilson, 1999).

Embryonic dunes (H2110)

Embryonic dunes are present along much of the southern side of Tramore Burrow. They are particularly well developed towards the tip, in an area of notable foredune development (Photo 8). As is the case with mobile dunes, they are absent from the areas of heaviest recreational pressures, near the west end of the site. As is also the case with mobile dunes, they are all but absent from the Backstrand, where erosion, apparently attributable to changes in the drainage pattern (NATURA 2000 report), has been severe. The habitat at the site is characterised by the presence of *Elytrigia juncea* (Sand couch). Also noted occasionally in the habitat were *Leymus arenarius* (Lyme-grass) and *Eryngium maritimum* (Sea-Holly).

Mobile Dunes (H2120)

Mobile dunes are present along much of the southern side of Tramore Burrow, and in places - particularly at the accreting east end of the site – were over 30 m in width. Only in the more westerly parts of the site, towards the areas of greater amenity pressures, is the habitat absent. There are no mobile dunes along the Backstrand, on the north side of the spit, which, as is the case with embryonic dunes, is believed to be due to changes in drainage patterns in this area. The total mapped area of the habitat, which was characterised by the presence of *Ammophila arenaria* (Marram), exceeded 4 ha (Table 46A). The negative indicator species *Senecio jacobaea* (Common ragwort) was noticeable in places, and was recorded in some of the monitoring stops, although not at such a level as to bring about a fail rating in any of them. Other species commonly found were *Calystegia soldanella* (Sea bindweed), *Elytrigia juncea* (Sand couch) and *Eryngium maritimum* (Sea holly).

Dune Slacks (H2190)

Dune slack type habitats were restricted to the sub-site at Bass Point (Saleen Strand), where 2 separate closely adjacent areas of habitat were mapped. The total mapped area of 0.263 ha was almost all accounted for by the larger of the two areas, which extended to 0.227 ha. However, as is the case with the relevant NATURA 2000 survey report, it is thought more appropriate here to omit the habitat from consideration as true dune slack. The vegetation resembles that of a freshwater marsh, with *Filipendula ulmaria* (Meadowsweet), *Lathyrus pratensis* (Meadow vetchling), and *Lythrum salicaria* (Purple loosestrife) among the most common species found. Monitoring stops were not carried out, nor was the conservation status of the habitat assessed, although the habitat is included as humid dune slack on the site digital map.

There are no humid dune slacks on Tramore Burrow.

The explanatory notes accompanying the NATURA 2000 data form mention the possible existence, based on the opinion of NPWS staff, of Dunes with *Salix repens* (code 2170) at the site. However, there is no information in NHA file material or published literature to suggest that the habitat does exist at the site, nor was it observed in this or previous surveys.

IMPACTS

Activities observed or known to be impacting on the sand dune habitats at Tramore are shown in Table 46B.

Tramore Burrow is undergrazed (code 149), with the result that much of the dune grassland consists of a long sward, dominated by *Ammophila arenaria* (Marram). Although many typical species are known from the fixed dunes, particularly from the occasional short turf areas, the lack of grazing has probably resulted in lower species diversity than would otherwise be expected. A suitable grazing regime could greatly enhance the vegetation structure and composition.

Cattle graze the dunes at Bass Point, although none were present on the survey date. Rabbits are also present there in small numbers. Grazing may not of itself be a problem there, but supplementary feeding of stock (code 171) is an ongoing problem, and is at least partly responsible for the existence of considerable areas dominated by nitrophilous species within the dune grassland. Dumping of old silage bales has also been noted at the site recently.

Table 46B Intensity and impact of various activities on sand dune habitats at Tramore

EU Habitat Code ¹	Activity Code ²	Intensity ³	Impact ⁴	Area affected/ha	Location of Activity ⁵
H2130	149	B	-1	50	Inside
H2130	171	A	-1	0.5	Inside
21BB	220	C	-1	2	Inside
H2130	421	C	-1	0.1	Inside
H1220	512	B	-1	0.5	Inside
H1210	622	A	-1	0.5	Inside
H2110	622	A	-1	2	Inside
H2120	622	A	-1	2	Inside
H2130	622	A	-1	40	Inside
H2130	623	A	-1	5	Inside
21BB	701	C	-1	Unknown	Outside
H2130	871	C	0	2	Inside
H2110	900	A	0	N/A	Inside
H2120	900	A	0	N/A	Inside

¹EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.

²Description of activity codes are found in Appendix 5

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

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

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

Erosion on the northern side of Tramore Burrow is thought to be mostly attributable to natural processes (code 900). Blowouts and wind erosion may also be observed at the site. However, foredune accretion, particularly towards the tip of the spit, has occurred at considerable rates for some time. As is often the case at a site at which natural erosion and accretion are occurring simultaneously, it is difficult to assess the net affect of these processes. However, as foredune accretion has been a feature of the site for some time, it is thought appropriate to assess the overall impact of natural erosion as neutral.

Recreational pressures at Tramore Burrow are quite intense, particularly at the western end of the site, where all visitors gain access to the beach and dunes. Foredune development is retarded here, and in places, erosion extends into the fixed dunes where there are localised patches of severe erosion. Most of the amenity use of the site is accounted for by activities such as walking, picnicking and bird-watching (code 622). A local watersports and activities centre also conducts guided nature walks through the dunes in summer. Horse riding is common on the beach, while motorbikes are also used on the beach and dunes (code 623). In addition to causing erosion, the use of motorised vehicles on the dunes may contribute to soil compaction, although their use is probably not intensive enough to have a major impact in this regard. Recreational pressures are less intense at Bass Point, although it is a popular fishing location (code 220). This activity is probably impacting on the sand dunes only insofar as it leads to a certain amount of pedestrian traffic through

the dunes. It is accounted for in the list of impacts at the site (Table 46B) as having a low intensity influence on a certain area of all sand dune habitats at Bass Point.

Some protection from recreational pressures is afforded the dunes at Tramore Burrow by the fact that they are situated at the east end of the beach, away from the town. The beach may be accessed without traversing the dunes, and the more easterly stretches of the system may be further than many beach users wish to walk. The more severe levels of erosion in the western end of the site are largely attributable to the greater usage levels there. Inaccessibility to cars and other large vehicles also provides some protection to the Burrow, as does the fact that it is surrounded on 3 sides by water.

Measures aimed at halting erosion or enhancing the condition of damaged sand dune habitats have included the erection of fencing and rock gabions (Photo 1). Much of the fencing (and associated signage) has fallen into disrepair, and is currently ineffective in halting erosion. The gabions may have had some positive affect in trapping sand (code 871), although attempts to plant these areas with foredune grasses seem to have met with limited success, which may also be attributable to the ineffectiveness of the fencing in excluding the public. Old Christmas trees have also been used in an attempt to trap windblown sand.

There is a licensed landfill next to the Backstrand with leachate possibly seeping from the landfill to the surrounding area (code 701). The negative affects of such operations are likely to have a greater influence on the salt marsh and mud and sand flats habitats than on the sand dune habitats. Operations at the site, which were formerly conducted in an environmentally unsustainable manner, are believed to have improved recently, although the dispersal of waste material by tidal action, which can result in the spread of debris in the dunes, still occurs. Some occasional littering may also result from the dumping of domestic waste (code 421).

There have been recent serious incidences of malicious burning at the site, which caused damage to the dunes, although the affects are no longer recognisable. Burnt areas were not observed during the present survey.

Bait digging is carried out on the Backstrand, and the collection of crabs for bait – usually amongst the seaweed at the tide line - takes place at Bass Point. The name derives from the popularity of the

strand as a site for sea bass fishing. As is the case with fishing itself, negative impacts on the dunes from bait collection are probably limited to the pedestrian traffic generated by these activities.

The extension of the Tramore Wastewater Treatment Plant outfall pipeline to Tramore Bay had commenced by the survey date. Approval for the construction activities (code 512), which were concentrated at Tramore Strand, was granted by NPWS. Disturbance to the sand dune habitats resulting from the works was minimal, although the shingle bank that supports an expanse of *Perennial vegetation of stony banks* is in the area of greatest activity and has suffered a degree of disruption.

CONSERVATION STATUS

The overall conservation status assessment of each habitat at Tramore is based on a combination of *Habitat Extent, Structure & Functions*, and *Future Prospects* assessments (Table 46C). In the absence of sufficient data from previous studies with which the present results could be compared, much of the conservation status assessment is based on ‘best expert judgement’.

Table 46C Conservation status assessment of Annex I sand dune habitats at Tramore

Habitat ¹	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system ²
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
TRAMORE BURROW					
Fixed Dune (H2130)		Extent/ Future prospects	Structure & functions	Unfavourable - Bad	Unfavourable - Unchanged
Annual Strandline (H1210)	Structure & Functions	Extent/ Future prospects		Unfavourable - Inadequate	Unfavourable - Unchanged
Shingle Banks (H1220)	Extent/ Structure & Functions	Future prospects		Unfavourable - Inadequate	Unfavourable - Unchanged
Embryonic Dune (H2110)	Extent/ Structure & functions	Future prospects		Unfavourable - Inadequate	Unfavourable - Unchanged
Mobile Dune (H2120)	Extent/ Structure & functions	Future prospects		Unfavourable - Inadequate	Unfavourable - Unchanged

¹EU Codes as per Interpretation Manual

²Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)

Fixed Dunes (H2130)

Tramore Burrow

Fixed dune habitat extent is rated as *unfavourable – inadequate*. Some quite severe areas of erosion, particularly at the west end of the site, were observed. Restorative measures, such as the fencing of eroded areas, have not been successful, and the structural integrity of the dunes has probably continued to decline in recent times.

Of the 12 fixed dune monitoring stops carried out in Tramore Burrow, only 8 satisfied the target criteria. This failure rate of 33% indicates an *unfavourable - bad* structure and functions rating. In each of the 4 failed stops, there was a lack of short turf, and an average sward height that exceeded the 20 cm limit. All 4 stops also had less than the minimum requirement of 6 typical species. Some of the failed stops were considered to be representative of semi-fixed dune, and in these cases, the initial 2 m x 2 m area was increased to 4 m x 4 m. However, in all such cases, the increased stop areas did not yield sufficient extra typical species for the minimum target to be attained.

Table 46C (Cont'd) Conservation status assessment of Annex I sand dune habitats at Tramore

Habitat ¹	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system ²
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
BASS POINT					
Fixed Dune (H2130)	Extent		Structure & functions/ Future prospects	Unfavourable - Bad	Unfavourable - Declining
Annual Strandline (H1210)	Extent/ Structure & Functions/ Future Prospects			Favourable	Favourable - Maintained
Embryonic Dune (H2110)	Extent/ Structure & Functions/ Future Prospects			Favourable	Favourable - Maintained
Mobile Dune (H2120)	Extent/ Structure & Functions/ Future Prospects			Favourable	Favourable - Maintained

¹EU Codes as per Interpretation Manual

²Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)

The future prospects of the fixed dunes at Tramore Burrow are thought to be *unfavourable – inadequate*. The dunes continue to be adversely affected by heavy recreational use, particularly in the western end of the site, where such pressures are greatest. Attempts at replanting and repair have met with limited success, as fencing in the dunes has fallen into disrepair. As a result of undergrazing of the dunes, the sward is mostly dominated by long grasses, and species diversity is low throughout much of the site. There are apparently no plans to implement a grazing regime that could improve the vegetation structure and functions element of the dunes.

The overall habitat conservation status assessment is *unfavourable – bad*, as it is determined by a combination of *unfavourable – inadequate* and *unfavourable – bad* assessments (Table 46D).

The Irish conservation status assessment that most appropriately corresponds to the EU *unfavourable – bad* rating is *unfavourable – unchanged*, as there is no evidence of a recent serious decline in the condition of the habitat.

Details of the numbers and pass/failure rates of monitoring stops used to assess habitat structure & functions are shown in Table 46D.

Table 46D Pass/Fail results of monitoring stops for Annex I sand dune habitats at Tramore

Habitat	Monitoring stops		Conservation status
	Pass	Fail	
Tramore Burrow			
Fixed dune (H2130)	8	4	Unfavourable - Bad
Embryonic dune (H2110)	8	0	Favourable
Mobile dunes (H2120)	8	0	Favourable
Bass Point			
Fixed dune (H2130)	2	2	Unfavourable - Bad

Bass Point

The area of fixed dunes at Bass Point is not known to have declined due to human-induced disturbance in recent times, so habitat extent is thought to be *favourable*. Evidence of erosion into the fixed dunes was seen at Bass Point (Photo 10), although this may be attributable to natural erosion, caused by the realignment of the narrow sea channel at Rinnashark.

Of the 4 monitoring stops carried out in fixed dune at Bass Point, only 2 passed the target criteria, indicating an *unfavourable – bad* habitat structure and functions assessment. As was the case with the Burrow, the failed stops were accounted for by a less than adequate number of typical species, and average sward heights that exceeded the maximum limit of 20 cm. One of the failed stops also had a bare ground component of greater than 10%, reflecting the disturbed nature of parts of the habitat at Bass Point.

The future prospects of the fixed dunes at Bass Point are rated as *unfavourable – bad*. Damaging agricultural practices and sand extraction are ongoing and likely to continue. As this area is of less interest than Tramore Burrow, and the habitat already quite degraded in terms of conservation value, it is also less likely to be the focus of management strategies aimed at restoring the habitat to *favourable* status.

As the 3 parameters for conservation status assessment include *unfavourable - bad* evaluations, the overall habitat assessment is also *unfavourable – bad*.

The Irish conservation status assessment that most appropriately corresponds to the EU *unfavourable – bad* rating is *unfavourable – declining*, as the integrity of the site continues to be undermined by damaging activities.

Annual Vegetation of Driftlines (H1210)

Tramore Burrow

There are no previous data with which the current results are directly comparable. However, based on the absence of the habitat from the western end of the site, where recreational pressures have the greatest impact, it is assigned an *unfavourable – inadequate* rating for extent.

Monitoring stops were not carried out in the strandline habitat at Tramore Burrow. However, the presence of typical species and absence of significant cover of negative indicator species, indicates a *favourable* structure and functions rating.

The largest expanse of annual strandline habitat at Tramore Burrow is at the east end of the site in an area of notable foredune development, where recreational pressures are less intense. The prospects for the continued existence of the habitat in this area are good. However, because of the

disruption caused by trampling and associated activities in a significant portion of the site, the overall future prospects are rated *unfavourable – inadequate*.

As the three components of conservation status assessment are a combination of *favourable* and *unfavourable – inadequate*, the overall conservation status assessment is *unfavourable – inadequate*.

The corresponding Irish conservation assessment thought most appropriate is *unfavourable – unchanged*, as the habitat has probably been in a similar condition for some time.

Bass Point

Annual strandline vegetation at Bass Point was confined to a small area of just over 150 m in length, at the southern extreme of the sand dune system. Recent erosion - indicated by the differences between the site aerial photograph and the overlain habitats recorded in the present survey - may have accounted for significant areas of foredune habitats, although this may be largely due to natural processes. Recreational pressures are also considerably lighter here than at the west end of Tramore Burrow, and habitat extent is therefore rated as *favourable*.

Monitoring stops were not carried out in the strandline habitat at Bass Point. However, the presence of typical species and absence of a significant cover of negative indicator species, indicates a *favourable* structure and functions rating.

The future prospects of the habitat are also thought to be *favourable*, largely because recreational pressures in this area are relatively light.

As all 3 components of conservation status assessment are favourable, the overall habitat assessment is also *favourable*.

The Irish conservation status assessment which corresponds most aptly to the EU rating is *favourable – maintained*.

Perennial Vegetation of Stony Banks (H1220)

Tramore Burrow

In the absence of any evidence of a previously greater area of habitat, the shingle banks extent is thought to be *favourable*. Although the habitat was adjacent to the sewage pipe outfall works, which were in progress during the survey, there appeared to be no loss of habitat.

Monitoring stops were not carried out in the habitat, although there were a sufficient number of typical species, and a lack of negative indicator species, to indicate a *favourable* vegetation structure and functions assessment.

As the habitat is in the area of greatest pedestrian traffic and interference, its future prospects are rated *unfavourable – inadequate*. It is also excluded from the cSAC.

As the three components of conservation status assessment are a combination of *favourable* and *unfavourable – inadequate*, the overall conservation status assessment is *unfavourable – inadequate*.

The corresponding Irish conservation assessment thought most appropriate is *unfavourable – unchanged*.

There was no shingle banks habitat at Bass Point.

Embryonic dune (H2110)

Tramore Burrow

Habitat extent for embryonic dunes at Tramore Burrow is rated as *favourable*. There is a large expanse of the habitat, particularly towards the east end of the site, where foredunes are actively accreting. Habitat zonation at the site is good, with only the west end, where recreational pressures are most severe, lacking embryonic dunes. It is unlikely that this represents a recent decline in condition, as similar pressures have existed at the site for some time.

Eight monitoring stops, all of which satisfied the target criteria, were carried out in the embryonic dunes, indicating a *favourable* assessment for vegetation structure and functions.

The future prospects for the habitat are rated as *unfavourable-inadequate*. There is a degree of disturbance in the west end of the site, which continues to retard foredune development. Although this may result in more material becoming available for deposition at the east end of the spit, where foredune accretion is actively occurring, it will continue to negatively impact on habitat zonation at the site. In addition, there is no reason to believe that recreational pressures will decrease at the site.

As the 3 parameters of conservation status assessment are a combination of *favourable* and *unfavourable – inadequate* evaluations, the overall habitat assessment is *unfavourable – inadequate*.

The corresponding Irish conservation assessment thought most appropriate is *unfavourable – unchanged*, as the habitat has probably been in a similar condition for some time.

Bass Point

This smaller beach and sand dune system is known to be an area of sediment accumulation, as longshore drift from the west side of Tramore Bay deposits material at the tip of Tramore Burrow and on Bass Point on the east side of the Bay. However, comparison with the habitats mapped during this survey and those on the aerial photograph on which they are overlain (site digital map), indicates a recent episode of considerable erosion. It may be however, that this is attributable to changes in the alignment of the narrow sea channel at Rinnashark. The presence of recently developed habitat further south suggests, that like Tramore Burrow, Bass Point is an area at which natural erosion and accretion occur simultaneously at considerable rates. As recreational pressures are not as great at Bass Point as those at Tramore Burrow, it may be assumed that no significant human-induced loss of habitat has recently occurred, and for this reason, habitat extent is rated as *favourable*.

Monitoring stops were not carried out in the embryonic dunes at Bass Point. However, the presence of typical species and absence of significant cover of negative indicator species, indicates a *favourable* structure and functions rating.

As Bass Point is less susceptible than Tramore Burrow to the adverse affects of recreational use, the embryonic dunes are rated *favourable* for future prospects. It should be borne in mind however, that certain undesirable practices in the system, such as the sand extraction that takes place in the fixed dunes, may, if not controlled, ultimately undermine the entire site.

As all 3 components of conservation status assessment are *favourable*, the overall habitat assessment is also *favourable*.

The Irish conservation status assessment which corresponds most aptly to the EU rating is *favourable – maintained*.

Mobile dunes (H2120)

Tramore Burrow

Habitat zonation at Tramore Burrow is good, with foredunes, including mobile dunes, present along much of the length of the site. The almost total absence of foredune habitat on the north side of the spit is attributable to natural erosion. There is also no suggestion that the mobile dunes have decreased in area in recent times, and for these reasons, habitat extent is considered *favourable*.

Eight monitoring stops, all of which satisfied the target criteria, were carried out in the mobile dunes, indicating a *favourable* assessment for vegetation structure and functions.

As is the case with embryonic dunes at Tramore Burrow, the mobile dunes continue to be adversely affected at the west end of the site by unsustainable levels of recreational use. As this will almost certainly continue to be the case, the future prospects for the habitat are rated *unfavourable – inadequate*.

As the 3 parameters of conservation status assessment are a combination of *favourable* and *unfavourable – inadequate* evaluations, the overall habitat assessment is *unfavourable – inadequate*.

The corresponding Irish conservation assessment thought most appropriate is *unfavourable – unchanged*, as there is no reason to believe the habitat has recently undergone a significant change in condition.

Bass Point

Habitat extent is rated as *favourable*, for similar reasons to those outlined for the embryonic dunes at Bass Point. The system appears to be in dynamic equilibrium with regard to foredune development, and no recent trend of overall habitat loss has been identified.

Monitoring stops were not carried out in the mobile dunes at Bass Point. However, the presence of typical species and absence of significant cover of negative indicator species, indicates a *favourable* structure and functions rating.

As Bass Point is less susceptible than Tramore Burrow to the adverse affects of recreational use, the mobile dunes are rated *favourable* for future prospects. However, as is the case with the embryonic dunes, a further deterioration in the condition of the fixed dunes, may ultimately adversely affect the other habitats.

As all 3 components of conservation status assessment are *favourable*, the overall habitat assessment is also *favourable*.

The corresponding Irish conservation assessment thought most appropriate is *favourable – maintained*.



- | | |
|-----------------|---------------------------|
| | SAC 671 |
| Habitats | |
| | Strandline |
| | Strandline - shingle |
| | Embryonic Dune |
| | Mobile Dune |
| | Fixed Dune |
| | Dune Slack |
| | Scrub |
| | Agricultural land |
| | Rocky cliff +- vegetation |
| | Soft cliff +-vegetation |
| | Other (Undefined) |

	Coastal Monitoring Project 2004-2006	Tramore	SMP code: SMP0130	0 100 200 300 400 500 Meters 	
		Tramore dunes & backstrand (SAC 671)	<small>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: 9993)</small>	Date of production: 25/11/2008 Map version: 1	