Tralee Bay and Magharees Peninsula, West to Cloghane SAC (site code 2070) Conservation objectives supporting document -coastal habitats

NPWS

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Please note that the opinions expressed in the site reports from the Coastal Monitoring Project (CMP), the Saltmarsh Monitoring Project (SMP) and the Sand Dunes Monitoring Project (SDM) 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: Tralee Bay and Magharees Peninsula, West to Cloghane SAC 002070. 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.

Tralee Bay and Magharees Peninsula, West to Cloghane SAC is a large site that stretches from Tralee town westwards to Fenit Harbour and Cloghane, encompassing Tralee Bay, Brandon Bay and the Magharees Peninsula. It includes extensive mudflats at the eastern end, the beaches of Derrymore Island, the sand dunes and lagoons of the Magharees Peninsula, as well as the rocky headlands at its end. The site includes two statutory Nature Reserves: Tralee Bay and Derrymore Island. The Magharees Peninsula is included in the Dingle Peninsula Important Bryophyte Area (IBrA), with the dune slacks at Castlegregory holding populations of chalk hook moss (*Drepanocladus sendtneri*) and the Annex II species petalwort (*Petalophyllum ralfsii*) (Lockhart *et al*., 2012). Lough Gill supports the Red Data Book stonewort (*Chara canescens*). Castlegregory is considered one of the most important areas in Ireland for natterjack toad (*Bufo* (*Epidalea*) *calamita*). Thousands of toads breed in the ponds and dune slacks of the Magharees, in Lough Gill and along the coastal strip in this area (Beebee, 2002; Bécart, Aubry and Emmerson, 2007; Sweeney, Sweeney and Hurley, 2013).

The site is mostly underlain by limestone with significant parts covered with glacial drift or windblown sand. The main exposures occur at Fenit port, Oyster Hall, Blennerville and Rough Point and Fahamore, as well as some low outcrops on the beaches west to Castlegregory. Elsewhere the sandstones and slates of the Dingle Beds appear.

Tralee Bay and Magharees Peninsula, West to Cloghane SAC (site code: 2070) is designated for a range of coastal habitats including vegetated shingle, saltmarsh and sand dunes. The following nine coastal habitats are included in the list of qualifying interests for the site:

- Perennial vegetation of stony banks (1220)
- *Salicornia* and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330) (ASM)
- Mediterranean salt meadows (*Juncetalia maritimi*) (1410) (MSM)
- Annual vegetation of drift lines (1210)
- Shifting dunes along the shoreline with *Ammophila arenaria* (2120)
- Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)
- Dunes with *Salix repens ssp. argentea* (*Salix arenariae*) (2170)
- Humid dune slacks (2190)

The first habitat represents vegetated shingle, the next three are saltmarsh habitats, the last five are associated with sand dune systems. All nine of these habitats are usually found in close association with each other.

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

The targets set for the **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). Some vegetated shingle was also recorded at Derrymore Island and Castlegregory sub-sites by the Coastal Monitoring Project (Ryle *et al*., 2009). The vegetated shingle habitat at Castlegregory was not present during the Sand Dunes Monitoring Project (SDM) (Delaney *et* al., 2013). The distribution of known shingle sites in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is presented in Appendix I.

The NSBS visited the following sub-site within Tralee Bay and Magharees Peninsula, West to Cloghane SAC:

1. Magherabeg

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. The vegetated shingle at Magherabeg is rated of high interest owing to the presence of a superb population of sea spurge (*Euphorbia paralias*) (Moore & Wilson, 1999).

The habitat was not mapped at the 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. Although the SMP did not survey any saltmarsh sites within the Tralee Bay and Magharees Peninsula, West to Cloghane SAC, areas of potential saltmarsh habitat were identified and their extent estimated by viewing aerial photographs (McCorry & Ryle, 2009).

Curtis and Sheehy-Skeffington (1998) also recorded the presence of saltmarsh at the following sites:

1. Blennerville
2. Annagh
3. Derrymore Island
4. Castlegregory
5. Cloghane

The distribution of saltmarsh habitats within Tralee Bay and Magherees Peninsula, West to Cloghane SAC is presented in Appendix II.

The conservation objectives for the saltmarsh habitats in this SAC are based on a combination of sources including NPWS internal files and the Coastal Monitoring Project (Ryle *et al*., 2009). The conservation objectives set for the saltmarsh habitats are therefore quite generic and may be adjusted in the future in light of additional information.

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 the Sand Dunes Monitoring Project (SDM) (Delaney *et al*., 2013). This document should be read in conjunction with those reports.

The distribution of sand dune habitats within Tralee Bay and Magharees Peninsula, west to Cloghane SAC is presented in Appendix III.

The CMP was a comprehensive national baseline survey of all known sand dune systems in Ireland. A total of three sub-sites were surveyed, mapped and assessed within Tralee Bay and Magharees Peninsula, West to Cloghane SAC (Ryle *et al*., 2009):

1. Fermoyle
2. Derrymore Island
3. Castlegregory

As part of the CMP detailed individual reports and habitat maps were produced for each of the three sub-sites and these are included in a set of Appendices to this document (Appendix IV to VI).

The SDM subsequently reviewed and modified the methodology used during the CMP to map and assess the conservation status of dune habitats. A subset of 40 sites (including Castlegregory) was selected as a representative sample of the national dune resource for the SDM survey.

As part of the SDM, detailed individual reports and habitat maps (a revised baseline habitat map and an updated habitat map) were produced for each sub-site and the relevant ones for Castlegregory are included in Appendix VII.

The Fermoyle site (Appendix IV) runs along the western edge of the Magharees and fronting Lough Gill and consists of a tombolo with a sand-covered rocky outcrop. Drom Hill is a sub-site of Fermoyle and comprises a roughly triangular landmass at the foothills of Drom Hill, which is located west of Fermoyle across the channel where the Scorid and Glennahoo Rivers enter the sea (Ryle *et al*., 2009).

Derrymore Island (Appendix V) is a compound spit composed of a series of pebble beaches and is thought to be one of the best spits in Ireland. To the east of Derrymore Island there is a narrow saltmarsh beyond which there are extensive mud flats (Ryle *et al*., 2009).

Castlegregory sand dune system (Appendices VI and VII) is located on the Magharees Peninsula, a large sand spit/tombolo of post-glacial age that connects some of the limestone Magharee Islands to the mainland. It is situated between Brandon and Tralee Bays on the north side of the Dingle Peninsula. The dune complex extends from Derrymore Island in Tralee Bay westward as far as Kilcummin Strand at Cloghane in Brandon Bay. The dunes are of international scientific importance in terms of ecology, vegetation, flora and fauna. A typical range of dune habitats is displayed, including some extensive and species-rich dune slacks. The dunes surround Lough Gill, which is a sedimentary lagoon on a sand tombolo, with a long artificial, sluiced outlet (Gaynor, 2008). A 9-hole golf course is located on the seaward side of Lough Gill.

The conservation objectives for the sand dune habitats in Tralee Bay are based on the findings of the individual reports for each of these sites from both the CMP (Ryle et al., 2009) and the SDM (Delaney *et al*., 2013), combined with the results of Gaynor (2008). It is thought that the three sub-sites as surveyed by the CMP and SDM represent the total area of sand dunes within Tralee Bay and Magharees Peninsula, west to Cloghane SAC.

2 Conservation Objectives

A conservation objective aims to define the favourable conservation condition of a habitat or species at a particular site. Implementation of 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, supports 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.

3.1 Overall Objective

The overall objective for 'perennial vegetation of stony banks' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to 'maintain the favourable conservation condition'. This objective is based on an assessment of the current condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings (a) 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 Tralee Bay and Magharees Peninsula, West to Cloghane SAC is unknown. The National Shingle Beach Survey recorded vegetated shingle ridge from one sub-site: Magherabeg, but did not map the extent (Moore & Wilson, 1999). A total area of 2.797ha of vegetated shingle was also recorded and mapped at Castlegregory (0.012ha) and Derrymore Island (2.785ha) by Ryle *et al.* (2009).

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

3.3 Range

3.3.1 Habitat distribution

Northern Kerry holds few shingle beaches of note, being mostly storm deposits of unvegetated shingle (Moore & Wilson, 1999).

At Magherabeg there is an extensive mixed cobble ridge that is stabilised in places (Moore & Wilson, 1999).

An extensive but largely unvegetated cobble beach was recorded by the CMP on the eastern edge of the Magharees peninsula. A small area of vegetated shingle (0.57ha) occurs at Corralouhgha Strand on the north west of the peninsula. Considerable stretches of this habitat occur on the north and north-west sides of the spit at Derrymore Island (Ryle *et al*., 2009).

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 extraction or coastal defence structures in particular, can interrupt the supply of sediment and lead to beach starvation.

Moore & Wilson (1999) recorded rock armour at Magherabeg. The level of impact that this structure is having on the site functionality and sediment supply is unclear.

The target is to maintain and restore where possible 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 habitat in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is known to support a typical flora for this habitat type.

The dominant vegetation of the shingle beaches within the site is that of a mosaic of *Annual vegetation of driftlines* (1210) and *Perennial vegetation of stony banks* (1220). The more stable areas of shingle support characteristic species of both EU Habitat types such as sea beet (*Beta vulgaris* ssp. *maritima*), sea mayweed (*Tripleurospermum maritimum*), sea campion (*Silene uniflora*), curled dock (*Rumex crispus)*, orache species (*Atriplex* species), sea sandwort (*Honckenya peploides*) and silverweed (*Potentilla anserina*).

A superb population of sea spurge (*Euphorbia paralias*) was recorded at the Magherabeg sub-site, which also supports a range of species associated with sand dune habitats (Moore & Wilson, 1999). The vegetated shingle at Corralougha strand is dominated by sea mayweed (*Tripleurospermum maritimum*) (Ryle *et al*., 2009).

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 the 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
The NSBS recorded thistle (*Cirsium* sp.) at Magherabeg. The negative indicator species ragwort (*Senecio jacobaea*) was recorded in the vegetated shingle habitat at Corralough Strand by the CMP (Ryle *et al*., 2009).

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*) (1330) (ASM)**
- **Mediterranean salt meadows (*Juncetalia maritimi*) (1410) (MSM)**
- Mediterranean and thermo-Atlantic Halophilous scrubs (*Sarcocornetea fruticosi*) (1420)

The first three habitats (in bold) are listed as Qualifying Interests for Tralee Bay and Magharees, West to Cloghane SAC. The last habitat is restricted in its distribution to sites in the southeast of the country.

Curtis and Sheehy-Skeffington (1998) recorded the presence of saltmarsh at the following sites:

1. Blennerville
2. Annagh
3. Derrymore Island
4. Castlegregory
5. Cloghane

The first three sub-sites support estuary-type saltmarsh that is mostly underlain by a mud substrate, while Castlegregory is a sandflat type and Cloghane is a fringe saltmarsh underlain by a mixture of mud and *Phragmites* peat.

The most extensive areas of salt meadow occur at Blennerville, at the back of Derrymore Island, and in the vicinity of Fermoyle in Brandon Bay. The dominant type of saltmarsh present is ASM and a suite of characteristic species occur. Turf fucoids (dwarf ecotypes of the brown algae *Fucus* spp. and *Ascophyllum* spp.) which are characteristic of western Irish Atlantic saltmarshes occur within the Atlantic salt meadows.

A feature of Tralee Bay is the large expanses of interdial mudflats, which are often fringed with saltmarsh vegetation. Specialised colonisers of mud such as glasswort (*Salicornia europaea* agg.) predominate in the transition zone between the mudflats and saltmarsh. Swards of common cord-grass (*Spartina anglica*) frequently occur in sheltered areas of mudflat, particularly in the vicinity of Derrymore Island.

Although the SMP did not survey any saltmarsh sites within Tralee Bay and Magharees Peninsula, West to Cloghane SAC, areas of potential saltmarsh habitat were identified and their areas calculated by viewing aerial photographs (McCorry & Ryle, 2009). The distribution of saltmarsh habitats within the SAC is presented in Appendix II.

4.1 Overall Objectives

The overall objective for '*Salicornia* and other annuals colonising mud and sand' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to '*maintain the favourable conservation condition'*.

The overall objective for 'Atlantic salt meadows' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Mediterranean salt meadows' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to '*maintain the favourable conservation condition*'.

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

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 and Ryle (2009), although it is acknowledged that this baseline is speculative and requires ground-truthing. Bearing in mind that coastal systems are naturally dynamic and subject to change, this target is assessed subject to natural processes, including erosion and succession.

A baseline habitat map of all saltmarsh in the Tralee Bay and Magharees Peninsula, west to Cloghane SAC was produced based on the findings of the SMP (McCorry and Ryle, 2009) and is presented in Appendix II. Although the site was not surveyed during the SMP an area of 134.02ha of potential Annex I saltmarsh habitat was identified within the SAC using aerial photographs. Of this potential saltmarsh, it is estimated that 97.7ha represents Atlantic salt meadow and 36.32ha represents Mediterranean salt meadows. It is not possible to identify *Salicornia* mudflats through this exercise. Future groundtruthing may lead to an adjustment of these figures.

The following rules were applied when calculating the areas for habitat mosaics 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.

The total areas of each potential saltmarsh habitat within the SAC as estimated and mapped by the SMP are presented in the following table.

Potential saltmarsh habitat	**Area (ha)**
Atlantic salt meadow	97.7
Mediterranean salt meadow	36.32
Total	**134.02**

For all of the saltmarsh habitats, the target 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 with the most important and extensive areas at Blennerville, at the back of Derrymore Island and in the vicinity of Fermoyle in Brandon Bay. Patches of *Salicornia*-dominated mud are scattered throughout the site. Atlantic salt meadows are the dominant saltmarsh habitat and are sometimes associated

with areas of MSM, characterised by clumps of sea rush (*Juncus maritimus*) and sea aster (*Aster tripolium)*.

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 habitat in Tralee Bay and Magharees Peninsuls, West to Cloghane SAC 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.

It is not known if there are any physical impediments to the sediment supply to the saltmarsh sites within this SAC.

The target is to maintain and where possible restore 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 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 Tralee Bay 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.

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.

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 Tralee Bay area.

Turf fucoids (dwarf eco-types of the brown algae *Fucus* spp. and *Ascophyllum* spp.), which are characteristic of western Irish Atlantic saltmarshes are found in abundance within this SAC.

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

4.4.8 Vegetation structure: negative indicator species

The only invasive and non-native species known to occur with some frequency on saltmarshes within Tralee Bay and Magharees Peninsula, West to Cloghane SAC is common cord-grass (*Spartina anglica*).

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. 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) *

Six dune habitats were recorded by Ryle *et al*. (2009) but only the five habitats indicated in bold above are listed as Qualifying Interests for Tralee Bay and Magharees Peninsula, West to Cloghane SAC. These habitats include mobile areas at the front as well as more stabilised parts of dune systems. Embryonic shifting dunes were also recorded at the three sub-sites: Fermoyle, Derrymore Island and Castlegregory.

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).

Humid dune slacks are wet or moist depressions between dune ridges. They are characterised by the occurrence of a water-table that is maintained by a combination of groundwater (which may or may not be slightly saline), precipitation and an impermeable layer in the soil. In the winter, the water-table normally rises above the soil surface and inundation occurs. In spring and summer, the water-table drops, but the top layer of the soil remains wet. Proximity of the water-table to the surface is evidenced in the vegetation, in which rushes, sedges and moisture-loving herbs such as marsh pennywort (*Hydrocotyle vulgaris*), bog pimpernel (*Anagallis tenella*), grass of Parnassus (*Parnassia palustris*), common marsh-bedstraw (*Galium palustre*) and marsh helleborine (*Epipactis palustris*) are obvious features. The frequency and duration of flooding, as well as the level of salinity, determines the vegetation composition. In addition,

nutrient-enrichment can occur as a result of leaching from the surrounding dune ridges (Gaynor, 2008).

Dunes with creeping willow (*Salix repens*) occur where this shrub forms a dense ground cover and are found in close association with dune slacks. The distinguishing feature is the proximity of the water-table to the surface, which in the case of dunes with *S. repens* is below a level where it exerts an influence on the vegetation. As a result, the moisture-loving plants generally associated with dune slacks are noticeably reduced or absent. Dunes with *S. repens* are often found on sandy hummocks within slacks, or on the sides of dune ridges adjacent to slacks.

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 three sub-sites within Tralee Bay and Magharees Peninsula, West to Cloghane SAC:

1. Fermoyle
2. Derrymore Island
3. Castlegregory

Detailed descriptions from the Coastal Monitoring Project (Ryle *et al.,* 2009) of each sub-site and each sand dune habitat found at Fermoyle, Derrymore Island and Castlegregory are presented in Appendices IV to VI. The updated report and habitat maps for Castlegregory are presented in Appendix VII. The data from the SDM is considered to be more accurate and overrides the data from the CMP for the Castlegregory site. A total of 359.02ha of sand dune habitat was mapped within the Tralee Bay and Magharees Peninsula, West to Cloghane SAC, of which 6.79ha represents embryonic dune, which is not listed as a qualifying interest for this particular site.

5.1 Overall objectives

The overall objective for ‘Annual vegetation of drift lines’ in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to ‘restore the favourable conservation condition’.

The overall objective for ‘Shifting dunes along the shoreline with *Ammophila arenaria* (white dune)’ in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to ‘restore the favourable conservation condition’.

The overall objective for 'Fixed coastal dunes with herbaceous vegetation' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to 'restore the favourable conservation condition'.

The overall objective for 'Dunes with *Salix repens ssp argentea*' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Humid dune slacks' in Tralee Bay and Magharees Peninsula, West to Cloghane SAC is to 'restore the favourable conservation condition'.

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

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. Baseline habitat maps were produced for the sand dune habitats in Tralee Bay and Magharees Peninsula, West to Cloghane SAC during the Coastal Monitoring Project (CMP) (Ryle *et al*., 2009). These maps are included with the individual site reports in the set of Appendices at the end of this document (Appendices IV to VI). The updated site report and habitat maps for Castlegregory produced during the SDM are presented in Appendix VII.

The total areas of each sand dune habitat within the SAC as estimated by Ryle *et al*. (2009) for the Fermoyle and Derrymore Island sub-sites and by Delaney *et al*. (2013) for the Castlegregory sub-site are presented in following table

Habitat	**Total area (ha) of habitat within SAC boundary**
Annual vegetation of driftlines	6.07
Shifting dunes along the shoreline with *Ammophila arenaria*	14.59
Fixed coastal dunes with herbaceous vegetation	263.31
Dunes with *Salix repens* ssp. *argentea*	41.36
Humid dune slacks	22.24
Total	**347.57**

The SDM reported losses of area for the humid dune slacks and so the aim is that the area should be increasing for this habitat. For the remaining habitats no significant losses have been recorded either during the CMP or the SDM, so the general target for this attribute in each of these habitats 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

The distribution of sand dune habitats as mapped by Ryle *et al.* (2009) and Delaney *et al*. (2013) is presented in Appendix III.

All five sand dune habitat qualifying interest habitats occur at the Castlegregory sub-site, while all habitats other than 'dunes with *Salix repens* ssp*. argentea*' have been recorded at Fermoyle. Derrymore Island does not have 'humid dune slacks' or 'dunes with *Salix repens* ssp *argentea*'.

The target is that 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, accretion 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 Tralee Bay and Magharees Peninsula, West to Cloghane 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, 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.

The CMP recorded that much of the frontline along Fermoyle was eroded and the rate of erosion at the eastern edge of the site had led to the installation of extensive rock armour to prevent further flooding of already wet agricultural land (Ryle *et al.,* 2009). The CMP also noted that rock armour had been installed along a short stretch of the strand along the west side of the spit at Derrymore Island. These physical barriers are likely to effect sediment accretion and erosion at both sites into the future.

Cycles of accretion and erosion occur throughout the dune systems, as seen at Derrymore Island, where the shifting dunes appear to have formed over old or previously eroded fixed dune. At Magherabeg, at the Castlegregory sub-site, it was noted by the CMP that large blowouts and eroded fixed dune had re-vegetated with marram (*Ammophila arenaria*) (Ryle *et al*, 2009).

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

5.4.2 Physical structure: hydrological and flooding regime

The conservation of dune slacks and dunes with *S. repens* is inextricably linked with the local hydrological regime. Dune slacks are characterised by the proximity of a groundwater table that is maintained by the combination of an impermeable layer in the soil, or deeper salt water and precipitation. Dunes with *S. repens* are closely associated with dune slacks but are distinguished from them by a water-table that is at a depth that no longer exerts an influence on the vegetation. Most dune slacks are fed by a range of water sources, including precipitation water, surface water or groundwater. The latter two sources are usually somewhat calcareous while the former is acid.

The most important influence on the nature and vegetation of a dune slack is the groundwater-table, which can fluctuate considerably throughout the year. The frequency and duration of periods of flooding or inundation determines the vegetation composition. The water-table depth has been identified as the primary determining factor in vegetation variation, followed by weak trends in calcium and sodium availability. Other contributing factors include stage of development, precipitation, distance from the sea, the grazing regime, recreational pressure, nature of the sediment, soil pH and the porosity of the sediment.

Dune slack habitats should never be considered in isolation, but as part of the larger dune system that functions as an eco-hydrological unit. Dune slacks are highly sensitive to human influences on their hydrology, either through water abstraction or drainage works. Most dune slacks are fed by a range of water sources, including precipitation, surface water or groundwater. Generally, the maintenance of a naturally functioning dune slack depends on both the amount of (a) precipitation and (b) groundwater discharge. Water abstraction interferes with the local hydrology, potentially having serious implications for the plant and animal communities of slacks. Abstraction can lower the level of the groundwater-table, causing the slacks to dry out. It can also lead to saline infiltration in slacks formed close to the front of a dune system and particularly where the underlying substrate is highly permeable (e.g. shingle).

The target is to ensure that the hydrological regime continues to function naturally and that there are no increased nutrient inputs in the groundwater.

5.4.3 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.

5.4.4 Vegetation structure: bare ground

This target applies to fixed dunes, dunes with *S. repens* and dune slacks. It does not apply to the other habitats present where high levels of bare sand are a natural component of the habitat. In the fixed and slack areas 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 such as petalwort (*Petalophyllum ralfsii*) and a range of invertebrates, helping to increase biodiversity.

The target is to achieve up to 10% bare sand, with the exception of pioneer slacks which can have up to 20% bare sand. This target is assessed subject to natural processes.

5.4.5 Vegetation composition: plant health of dune grasses

The health of the dune grasses (particularly *Ammophila arenaria* and *Elytrigia juncea*) are 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 structure: vegetation height

This attribute applies to the more fixed habitats (fixed dunes, dunes with *S. repens* and dune slacks). 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).

The sand dunes at Castlegregory are moderately grazed by cattle and rabbits and the overall impact has been positive, resulting in high species diversity and preventing rank vegetation and scrub from becoming dominant (Gaynor, 2008). Some areas, however, have been overgrazed and heavily trampled by cattle (Ryle *et al*., 2009).

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

5.4.7 Vegetation structure: vegetation cover

The only habitat where this is a specific attribute is humid dune slacks where that target is to maintain less than 40% cover of *S. repens.* This species forms a natural component of many dune slack communities in Ireland. However, high covers of this shrub can lower the level of water-table causing the slacks to dry out. It can also form a dense canopy that shades out slack species leading to a reduction in biodiversity.

The target is therefore to keep the cover of *S. repens* below 40%.

5.4.8 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 praecox*), kidney vetch (*Anthyllis vulneraria*), wild pansy (*Viola tricolor*) and biting stonecrop (*Sedum acre*).

The Fermoyle, Derymore Island and Castlegregory sub-sites support a characteristic dune flora, details of which can be found in the site reports from the CMP (Ryle *et al.,* 2009) which are included in Appendices IV to VI.

Rare elements of the site flora include wild asparagus (*Asparagus officinalis ssp. prostratus*) as well as petalwort (*Petallophyllum ralfsii*), and chalk hook moss (*Drepanocladus sendtneri*). Also at Castlegregory, dodder (*Cuscuta epithymum*) and Autumn Lady's tresses (*Spiranthes spiralis*) were recorded frequently by the CMP on fixed dune. These species are rare beyond the south/west of Ireland (Ryle *et al*., 2009). The dune slacks are also very important breeding sites for the internationally endangered species, Natterjack toad (*Bufo calamita*).

Other relatively scarce plants found on the dunes within the SAC include the following: fringed rock-cress (*Arabis brownii*), fragrant orchid (*Gymnadenia conopsea*), squinancywort (*Asperula cynanchica*) and Autumn Lady's–tresses (*Spiranthes spiralis*). Notable dune slack species

include strawberry clover (*Trifolium fragiferum*), chaffweed (*Anagallis minima*) and a fungus *Inocybe halophile*. In addition, Lough Gill supports the Red Data Book stonewort *Chara canescens*.

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

5.4.9 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.

Sea buckthorn (*H. rhamnoides*) was recorded by the CMP and SDM at Castlegregory, where it forms dense extensive stands and appears to be spreading at the expense of the fixed dune habitat in particular. Bracken (*Pteridium aquilinum*) was also noted at Fermoyle (Ryle *et al*., 2009).

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The target is that negative indicators (including non-native species) such as *Hippophae* should make up less than 5% of the vegetation cover.

5.4.10 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 the slack communities.

At Derrymore Island, numerous clumps of gorse (*Ulex europaeus*) were noted by the CMP (Ryle *et al*., 2009).

The target for this attribute therefore is that the cover of scrub and tree species should make up less than 5% of the vegetation cover.

6 References

Bécart E., Aubry A. and Emmerson M. (2007) Monitoring the conservation status of natterjack toad (Bufo calamita) in Ireland, 2004 - 2006. *Irish Wildlife Manuals*, No. 31. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Beebee, T.J.C. (2002). The natterjack toad *Bufo calamita* in Ireland: current status and conservation requirements. *Irish Wildlife Manuals*, No. 10, Dúchas, The Heritage Service.

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

Delaney, A., Devaney, F.M., Martin, J.R. and Barron, S.J. (2013). Monitoring survey of Annex I sand dune habitats in Ireland. *Irish Wildlife Manuals*, No. 75. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Fossitt, J.A. (2000).*A guide to habitats in Ireland.* The Heritage Council, Kilkenny.

Gaynor, K. (2008). *The phytosociology and conservation value of Irish sand dunes*. Ph.D. Thesis, National University of Ireland, Dublin.

Lockhart, N., Hodgetts, N. and Holyoak, D. (2012). *Rare and threatened Bryophytes of Ireland*. National Museums Northern Ireland.

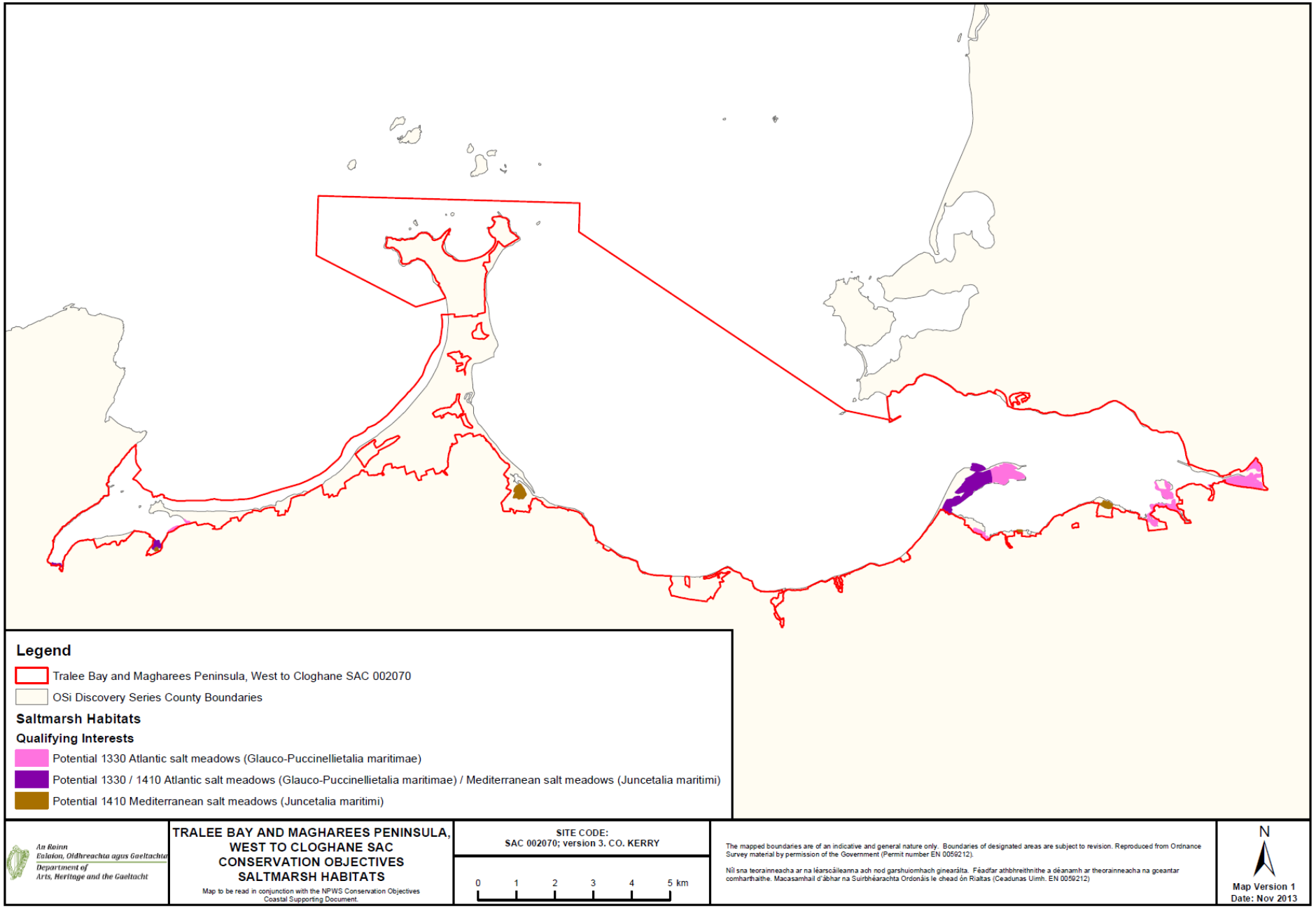
McCorry, M. and Ryle, T. (2009). *Saltmarsh Monitoring Project 2007-2008*. Unpublished report to the National Parks and Wildlife Service, Dublin.

Moore D. and Wilson, F. (1999) *National Shingle Beach Survey of Ireland 1999.* Unpublished report to NPWS, Dublin.

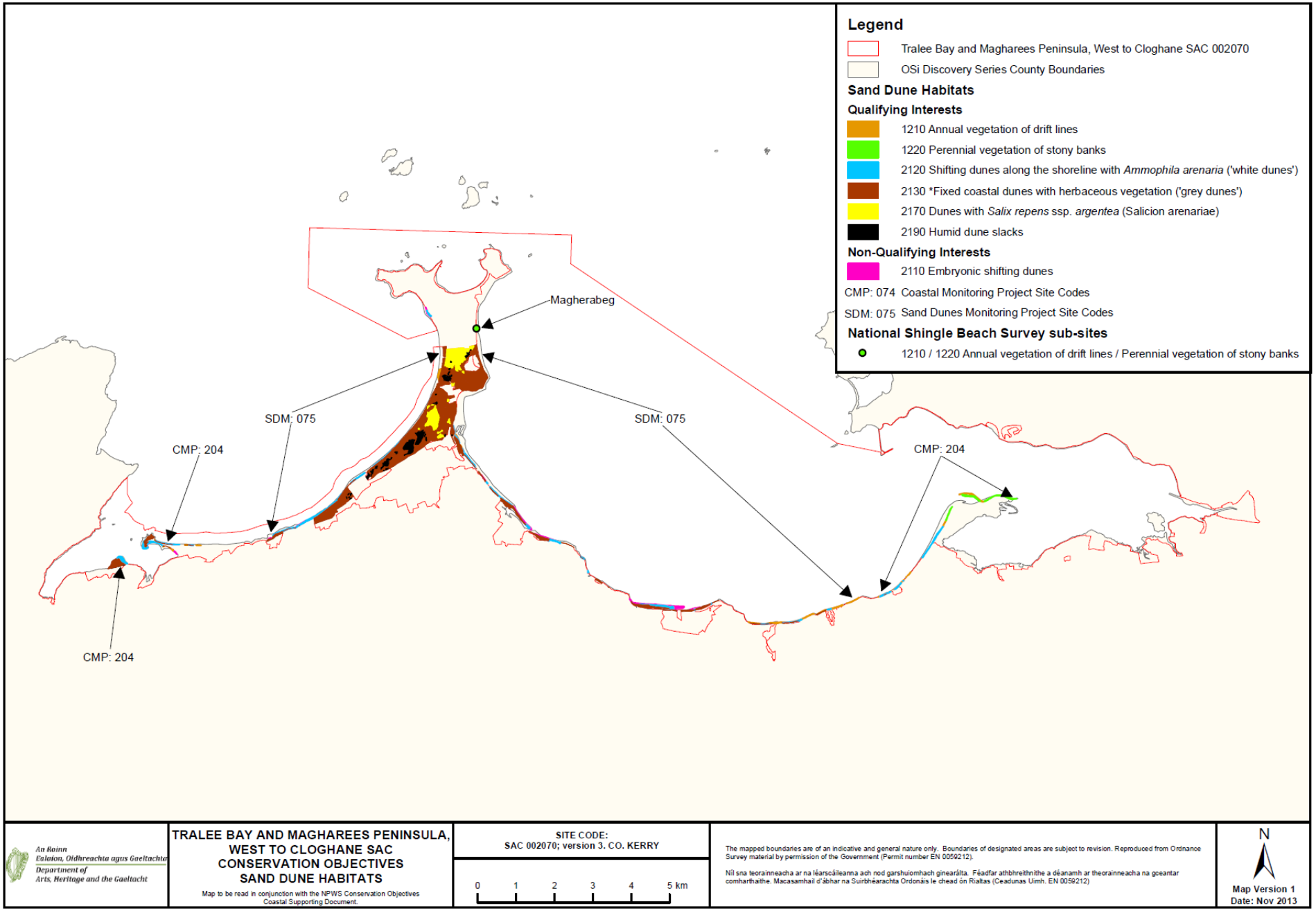
Ryle, T., Murray, A., Connolly, K. and Swann, M. (2009). *Coastal Monitoring Project 2004-2006*. Unpublished report to the National Parks and Wildlife Service, Dublin.

Sweeney, P., Sweeney, N. and Hurley C. (2013) Natterjack toad monitoring project, 2011 - 2012. *Irish Wildlife Manuals,* No. 67. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Appendix I – Distribution map of saltmarsh habitats within Tralee Bay and Magharees Peninsula, West to Cloghane SAC**.**



Appendix II – Distribution map of sand dune habitats within Tralee Bay and Magharees Peninsula, West to Cloghane SAC



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

SITE DETAILS

CMP05 site name: **Fermoyle** CMP05 site code: **074** CMP Map No.: **71**

County: **Kerry** Discovery map: **70** Grid Reference: **Q 055 112**

6 inch Map No.: **Ke 035**

Aerial photographs (2000 series): **O 5582-C, D; O 5583-C; O 5650-A, B**

NPWS Site Name: **Tralee Bay & Magherees Peninsula, West to Cloghane**

NPWS designation: pNHA: **2070** cSAC: **2070**

Ranger Area: **Kerry – North**

MPSU Plan: **2004**

Report Author: **Tim Ryle**

SITE DESCRIPTION

Nestled at the eastern foothills of Mount Brandon, Fermoyle is best known as a surf beach with most swimmers preferring the beach at Castlegregory. Watersports enthusiasts congregate at Fermoyle, as the tidal conditions are ideal for both surfing and windsurfing.

Fermoyle forms part of the extensive candidate Special Area of Conservation (cSAC 2070) that stretches from Tralee Bay to Cloghane in the West and includes the Magherees and Castlegregory, a straight-line distance of approximately 40 kilometres. Among the many features for which the designation was proposed, it covers many coastal habitats including priority fixed dunes and lagoon as well as alluvial forests. The expansive site includes many plants and animals, though the presence of a Natterjack toad (*Bufo calamita*) stronghold is probably the most well known feature of the area.

Within the cSAC, three sand dune sites have previously been recognised, namely, Fermoyle, Castlegregory and Derrymore Island to the east. Fermoyle is merely a westerly extension of the beach running along the western edge of the Magherees and fronting Lough Gill. For the purposes of this project, it is taken that the boundary between Castlegregory beach and Fermoyle is the access onto Kilcummin strand.

In its 1972 county report, An Foras Forbartha reckoned that the tombolo was in a constant state of change, regularly inundated with fresh sand that suited the vigorous growth of

Ammophila arenaria (Marram). Indeed, the report's authors considered that the marsh was the centre of biological interest and that very little stabilised dune grassland occurred and that its flora was not as diverse as other sand dune systems in the area.

Fermoyle proper consists of a tombolo with a sand-covered rocky outcrop. Drom Hill, however, is a subsite of Fermoyle and comprises a roughly triangular landmass at the foothills of Drom Hill. It is located to the west of Fermoyle across the channel where the Scorid and Glennahoo Rivers enter the sea. This area was not described by either An Foras Forbartha, or included within NPWS literature such as NHA notes or the NATURA 2000 maps. It is shown as a sand dune complex on the MPSU maps, with no mention within the management plan as to its make-up however. It was overlooked in the MPSU draft management plan and is not shown on the vegetation map. The areas of sand dune habitats recorded at Fermoyle and Drom Hill are presented in Table 74A and the subsite is discussed separately within each section of the site report.

Table 74A Areas of EU Annex I habitats mapped at Fermoyle and its subsite Drom Hill

EU Code	EU Habitat	Area (ha)
Fermoyle		
H1210	Annual vegetation of driftlines	0.336
H2110	Embryonic shifting dunes	0.173
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	2.102
H2130	Fixed coastal dunes with herbaceous vegetation	3.246
Drom Hill		
H1210	Annual vegetation of driftlines	0.161
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	1.153
H2130	Fixed coastal dunes with herbaceous vegetation	6.750
H2190	Humid Dune Slacks	0.420
	Total Sand dune	**14.335**

Fixed Dunes (H2130)

Fermoyle

Two small patches of moderate quality short turf fixed dune grassland were recorded from the tombolo, both of which were in dry depressions of the sand covered rocky outcrop. Typical fixed dune species include *Festuca rubra* (Red fescue), *Taraxacum* agg. (Dandelion) and *Daucus carota* (Wild carrot). Other species present are *Achillea millefolium* (Yarrow) and *Heracleum sphondylium* (Hogweed). Species which are occasionally found in fixed dune habitat reflecting the agricultural influences, including *Bellis perennis* (Daisy), *Arrhenatherum elatius* (False-oat grass) and *Cynosurus cristatus* (Crested dog's tail).

Negative indicator species *Senecio jacobaea* (Common ragwort) and *Lolium perenne* (Perennial ryegrass) are abundant throughout the area, while locally common species include *Pteridium aquilinum* (Bracken), *Rubus fruticosus* (Bramble), *Urtica dioica* (nettle) and *Cirsium* spp. (Thistle).

Much of the remainder of the fixed dune mapped is of poor quality and occurs on markedly damp soils, where the land grades into freshwater marsh. The continuing grazing regime is having deleterious effects upon its composition and any future prospects of recovery. The remainder of the fixed dune has been mapped as agricultural land, as it is considerably altered, is heavily poached and unlikely to be reinstated as fixed dune in the future.

Drom Hill

Across the channel, Drom Hill displays many of the characteristics of fixed dune grassland. Though rank for the most part, it is relatively undisturbed by grazing animals other than rabbits. Dominated by *Ammophila arenaria* (Marram), other species include *Festuca rubra* (Red fescue), *Taraxacum* agg. (Dandelion), *Holcus lanatus* (Yorkshire fog), *Galium verum* (Lady's bedstraw) and *Euphrasia* sp. (Eyebright). Mosses are locally abundant with species such as *Rhytidiadelphus* spp. and *Scleropodium purum* recorded. Negative species such as Ragwort are not common and the agricultural influence that dominated the fixed dune habitat of the tombolo is not apparent.

Dune Slacks (H2190)

Drom Hill

Slacks were only recorded from Drom Hill and occupied an area of 0.420ha. Four small discrete slacks occurred at the foot of Drom Hill. Regularly recorded species included *Potentilla anserina* (Silverweed), *Hydrocotyle vulgaris* (Marsh pennywort), *Agrostis stolonifera* (Creeping bent) and *Prunella vulgaris* (Selfheal). The moss *Calliergonella cuspidata* was common, recorded in 3 of the 4 stops. This vegetation is typical of wet slacks and the waterlogged soils benefit from water draining Drom Hill.

Another species that was recorded in the corner of one slack is *Sagina nodosa* (Knotted pearlwort). This is a species typically associated with pioneer slacks. Other occasional species included *Juncus effusus* (Soft rush), *Galium palustris* (Marsh bedstraw) and *Ranunculus repens* (Buttercup). Creeping Willow (*Salix repens*) was not a feature of these

slacks, although scrub species, including other *Salix* species, were noted nearby amongst the wooded glen of Drom hill.

Mobile Dunes (H2120)

Fermoyle

At Fermoyle, mobile dunes were confined largely to three areas. A narrow discontinuous band of mobile dunes was recorded along the seaward side of the tombolo. Towards the front of the sand dune system, a narrow mobile band is recorded fronting the eroded fixed dune or fenced agricultural land. Characterised by *Ammophila arenaria* (Marram), other species were indicative of the adjacent agricultural influences including *Cirsium arvense* (Creeping thistle).

The main body of the mobile dune dunes was recorded from the western and southern end of the tombolo. The mobile dunes are mapped as separate polygons, owing to differences in structure and composition. The outermost (most westerly) polygon is the most recent and its composition reflects the influence of the tidal patterns that inundate the low-lying sand, with *Cakile maritima* (Sea rocket) sporadically recorded. Behind that is an area of significant sediment build-up with extensive marram cover. The shifting sands can sink up to 30cm. The final stretch of mobile dune is a long narrow band running for most of the southern flank of the tombolo. Characterised by Marram, the mobile dunes are highly disturbed and the vegetation reflects this in the occurrence of nettles, thistles, brambles and agricultural grasses.

Drom Hill

Mobile dunes occupy an area of 1.153ha of mobile dunes at Drom Hill. At its widest extreme, the mobile dunes were 65metres in width. The mobile dunes are characterised by the dominance of *Ammophila arenaria* (Marram). Although embryonic dunes were not recorded at Drom Hill, *Elytrigia juncea* (Sand couch) was occasional throughout the mobile dunes. In addition, bare patches were not uncommon on the level sections of the mobile dunes and in some cases, *Cakile maritima* (Sea rocket) or *Honckenya peploides* (Sea sandwort) were recorded. The level strandline gives way to small mobile hummocks before the slope increased to the front of the semi-fixed ridge and the fixed dune grassland.

Embryonic Dunes (H2110)

Fermoyle

Embryonic dunes are only recorded from a sheltered cove at the back of the tombolo, where they were actively accreting. Soft sediment gathering at the front of the mobile dunes was vegetated by *Elytrigia juncea* (Sand couch) and *Honckenya peploides* (Sea sandwort).

Strandline (H1210)

Fermoyle & Drom Hill

Strandline vegetation was recorded in a number of areas along the north and south faces of the tombolo, and along the eastern face of Drom Hill. It is not extensive in terms of length or width and may well be subjected to repeated cycles of tidal erosion and later re-establishment. Floristically it is not diverse and the main species were annuals such as *Cakile maritima* (Sea rocket), *Honckenya peploides* (Sea sandwort) and *Atriplex laciniata* (Orache).

IMPACTS

Recreational activities are not an issue at Fermoyle, as much of the land is fenced off from public use. Most activities are centred on watersports or walking along the strand, each of which does not greatly impact on the vegetation and its habitats.

The activities (Table 74B) which are considered to impact upon the sand dune habitats at Fermoyle are distinct from those listed in the NATURA 2000 dataform, which covers a far greater area and range of habitats and species. Much of the Fermoyle sand dune system has been agriculturally modified to such an extent that no vestiges of its fixed dune habitat remain. This is not the case, however, at Drom hill, which except for rabbits is undergrazed (code 149) and characterised by rank vegetation. Most of the wet land at Fermoyle is grazed, except where reedmarsh is found. Portions of the land are in REPS, but the damp land is vulnerable to trampling and poaching and this activity is further exacerbated by stock feeding, with the provision of feeders (code 171) on the ‘dune areas’. Storage of silage was common with over 70 silage bales recorded in one location, metres above the eroding strand.

Table 74B Intensity and impact of various activities on sand dune habitats at Fermoyle

EU Habitat Code[1]	Activity Code[2]	Intensity[3]	Impact[4]	Area affected/ha	Location of Activity[5]
2130	143	A	-2	8	Inside
2130	149	B	-1	6.7	Inside
2130	171	A	-1	5	Inside
2130	954	A	-1	7.5	Inside
21BB	900	A	0	Unknown	Inside

[1] EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[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 = repairable 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 sand dune habitat. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the sand dune habitat

The sand dunes are vulnerable to erosion (code 900). Considerable differences were noted between the mapped frontline against the boundary visible on the aerial photographs. Much of the frontline along Fermoyle was eroded, resulting in narrow habitat extents. The degree of erosion between the carparks of Fermoyle and Kilcummin strand at the eastern perimeter of the site led to the installation of extensive boulder armour to prevent further flooding of already wet, agricultural land. However, it has not prevented a breach in the integrity of the front ridge, which is clearly visible on the aerial photographs and extends approximately 200metres inland.

The accumulation of sediment was restricted to the western edge of the tombolo and in the relative shelter at the landward side of the tombolo. Much of the sand though vegetated, was unconsolidated, and prone to blowouts, during storms. Another significant impact is the invasion by species (code 954) such as ragwort, thistle and other agricultural weeds which are frequent outside of the fenced agricultural land and in places comprise extensive swathes.

Drom Hill, across the river channel, has suffered the loss of land to erosion (code 900) on its western edge. This is clear when the mapped vegetation of 2005 is overlain against the aerial photograph of 2000 (CMP map 71). The loss of habitat is balanced, however, by the considerable accretion on its eastern side.

CONSERVATION STATUS

The conservation status assessment of each habitat at Fermoyle is based on the extent, structure & functions and future prospects (Table 74C). The assessments are broken down separately into Fermoyle proper and its subsite Drom Hill across the channel, as some habitats vary in ‘quality’ or are only recorded from one site e.g. Dune slacks.

Table 74C Conservation status of Annex I sand dune habitats at Fermoyle and its subsite Drom Hill

Habitat[1]	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**		
Fermoyle					
***Fixed Dune (H2130)**		Structure and Function	Extent , Future Prospects	**Unfavourable-Bad**	**Completely Destroyed**
Mobile Dunes (H2120)	Structure and Function	Extent, Future Prospects		**Unfavourable-Inadequate**	**Unfavourable-Recovering**
****Embryonic Dunes (H2110)**		Extent, Structure and Function, Future Prospects		**Unfavourable-Inadequate**	**Unfavourable-Recovering**
Drom Hill					
Fixed dune (H2130)	Extent / Structure and Function / Future prospects			**Favourable**	**Partially Destroyed**
Dune Slack (H2190)	Extent / Structure and Function / Future prospects			**Favourable**	**Favourable-Maintained**
Mobile Dunes (H2120)	Extent / Structure and Function / Future prospects			**Favourable**	**Favourable-Enhanced**
Annual Strandline (H1210)	Extent / Structure and Function / Future prospects			**Favourable**	**Favourable-Enhanced**

[1]EU Codes as per Interpretation Manual
[2] Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)
* Only 2 monitoring stops were carried out as much of the area previously identified in the NATURA 2000 site report and map as fixed dune habitat at Fermoyle is intensively managed grassland.
** Only 2 monitoring stops were carried out as the embryonic dunes were less extensive at Fermoyle than initially thought.

Fixed Dune (H2130)

Fermoyle

The fixed dune habitat at Fermoyle is not large and its extent is rated as *unfavourable-bad*. Much of the area that had previously been identified in both the NATURA 2000 and MPSU vegetation maps no longer warrants this classification, as it has been seriously damaged through agricultural practices.

As much of this land was fenced off and intensively managed, only two monitoring stops were carried out in fixed dune. They are assessed as *unfavourable-inadequate*, based on one of two monitoring stops passing. The second stop failed on negative indicator species and sward height, which reflects the agricultural management of the surrounding land.

Future prospects of the remaining fixed dune habitat are considered *unfavourable-bad* on the basis that it is unlikely that the any improvement will occur unless a conservation management strategy is agreed for the site.

The overall reduction in extent of the habitat and a continuance of the current agricultural management regime merit an *unfavourable-bad* conservation assessment, while the Irish rating is *completely destroyed*.

Table 74D Pass/Fail results of monitoring stops for Annex I sand dune habitats at Fermoyle and its subsite Drom Hill

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Fermoyle			
Fixed Dune (H2130)	1	1	**Unfavourable-Bad***
Mobile Dunes (H2120)	4	0	**Favourable**
**Embryonic Dunes (H2110)	2	0	**Unfavourable-inadequate****
Drom Hill			
Fixed dune (H2130)	4	0	**Favourable**
Dune Slack (H2190)	4	0	**Favourable**
Mobile Dunes (H2120)	4	0	**Favourable**

* Only 2 monitoring stops were carried out as much of the area previously identified in the NATURA 2000 site report and map as fixed dune habitat at Fermoyle is intensively managed grassland.
** The embryonic dunes were less extensive at Fermoyle than initially thought.

Drom Hill

Unlike Fermoyle, the fixed dune habitat at Drom Hill is extensive. Although considerable erosion has occurred along the western face of the dune ridge since at least the year 2000, its extent is rated as *favourable* as the site is actively accreting on its eastern edge.

The structure and functions of the fixed dune habitat is assessed as *favourable*. All four monitoring stops passed on structure and functions, although 3 stops had sward heights ranging from 50-100cm, which is indicative of a lack of grazing.

Notwithstanding this fact, its future prospects are *favourable,* as the area is relatively undisturbed and subject to few damaging impacts.

The overall rating for the fixed dune at this subsite is *favourable* and the Irish rating is *partially destroyed.*

Dune Slacks (H2190)

Fermoyle

Although much of the ground at Fermoyle is wet, and the land is intensively managed and highly disturbed, dune slacks were not recorded.

Drom Hill

In the context of a combined sand dune system Fermoyle and Drom Hill, the slacks represent a negligible extent. However, the slacks occupy 0.420ha of the Drom hill subsite, which represents 5% of this system. Thus its extent is *favourable*.

In total four monitoring stops were carried out, which all passed on structure and functions.

The future prospects of the slacks are *favourable,* as they are unlikely to radically change or increase in area in the future.

Over the conservation status assessment for the slacks at Drom Hill is *favourable* and the Irish rating is *favourable-maintained*.

Mobile dunes (H2120)

Fermoyle

Although mobile dunes are restricted to a narrow eroded band at the seaward side of the tombolo, they are considerably more extensive at the western side of the tombolo. Indeed their extent is expanding and the conservation assessment is *favourable*.

Four monitoring stops were carried at Fermoyle. Despite the limited extent of mobile dunes at the seaward side of the tombolo and the invasion of negative indicator species, associated with the agricultural management of the site, all stops passed indicating the structure and function is *favourable*.

The future prospects are assessed as *unfavourable-inadequate* as result of the impacts (present and future) of net erosion and invasion of negative indicator species.

Overall, the conservation assessment is *unfavourable-inadequate* while the Irish rating is *unfavourable-recovering*.

Drom Hill

A *favourable* conservation assessment is made for the mobile dunes at Drom Hill as they are extensive and are found along the entire eastern side of the subsite.

Four monitoring stops were carried out, all of which passed indicating the structure and function is *favourable*.

Its future prospects are *favourable* as the dunes are actively accreting and are expanding eastwards across the channel.

The overall assessment for the mobile dunes at Drom Hill is *favourable* and the Irish rating is *favourable-enhanced.*

Embryonic dunes (H2110)

Fermoyle

Embryonic dunes are rated as *unfavourable-inadequate* as they are not extensive at Fermoyle and they were not recorded from the seaward side of the tombolo.

The structure and function of the two monitoring stops is ranked as *unfavourable-inadequate* as potential habitat when surveyed was found to be too disturbed to assess. There was many negative indicator species, indeed in places small sedge-dominated communities were noted.

Although some accretion was mapped along the western edge, the remainder of the embryonic dunes are highly disturbed and this is unlikely to change in the near future. For this reason the future prospects of the foredunes are rated as *unfavourable-inadequate*.

The overall rating for the habitat is *unfavourable-inadequate* and the Irish rating is *unfavourable-unchanged*.

Drom Hill

Embryonic dunes were not recorded from Drom Hill, hence no conservation assessment is made.

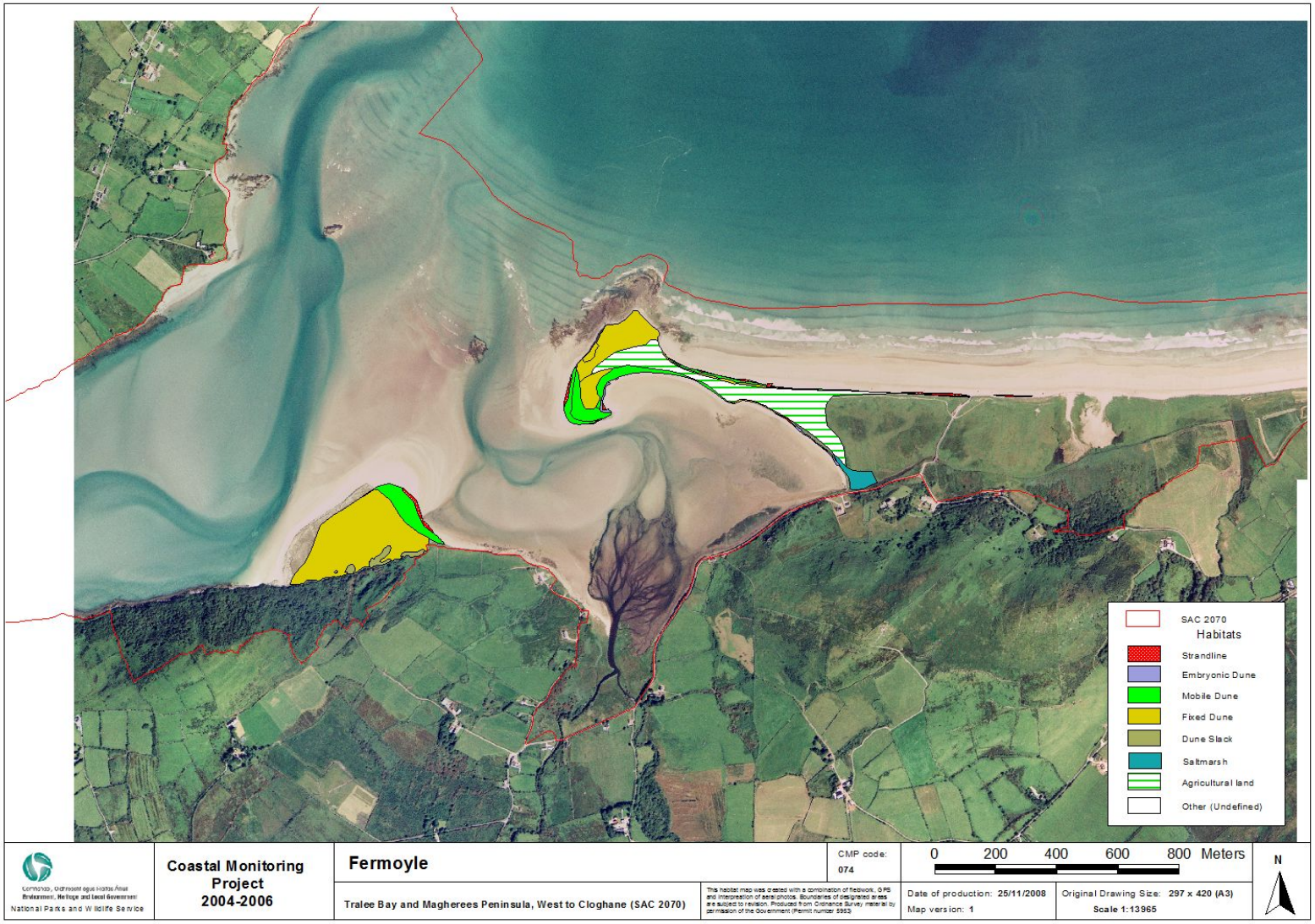
Strandline (H1210)

Fermoyle

No assessment was made for the strandline owing to its limited extent and poor character. It is an ephemeral habitat, in the sense that it is repeatedly washed away only to become re-established. However, it is not extensive, occurring as it does as a narrow discontinuous tract. Its component species are sometimes more frequent within the mobile dunes, to which some degree of shelter is afforded.

Drom Hill

No monitoring stops were carried out in the strandline at Drom Hill. However, its extent, structure and functions and its prospects in the future are good, so its overall conservation status assessment is *favourable*, while the Irish rating is *favourable-enhanced*.



National Parks and Wildlife Service

Coastal Monitoring Project 2004-2006

Fermoyle

CMP code: 074

Tralee Bay and Magherees Peninsula, West to Cloghane (SAC 2070)

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

Date of production: 25/11/2008
Map version: 1

Original Drawing Size: 297 x 420 (A3)
Scale 1:13965

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

SITE DETAILS

CMP05 site name: **Derrymore Island** CMP05 site code: **076** CMP map No.: **75**

County: **Kerry** Discovery map: **71** Grid Reference: **Q 074 113**

6 inch Map No: **Ke 028 & 037**

Aerial photographs (2000 series): **O 5585-B,C,D; O 5586-A,C; O 5655-A, B**

NPWS Site Name: **Tralee Bay & Magherees Peninsula, West to Cloghane**

NPWS designation: pNHA: **2070** cSAC: **2070** SPA: **4018**

Other designation: **Private Nature reserve**

Ranger Area**: Southwest**

MPSU Plan**: 2004**

Report Author: **Kieran Connolly**

SITE DESCRIPTION

Derrymore Island, in Tralee Bay, is a compound spit composed of a series of pebble beaches, and is thought to be one of the best spits in Ireland. It is within *Tralee Bay and Magherees Peninsula, West to Cloghane* cSAC (2070), which extends to over 11,000 ha.

The greater portion of the cSAC comprises marine areas and sea inlets, while tidal rivers, estuaries, mud and sand flats and lagoons also account for significant areas. Sand dunes form a significant portion of the terrestrial habitats of the site, although most of the areas of interest are within the Magherees Peninsula. On the Peninsula there is a very large expanse of fixed dune, and other Annex I habitats including Humid dune slacks, Dunes with *Salix repens* ssp *argentea*, Mobile dunes, and Annual vegetation of driftlines.

The Magheree Peninsula and narrow bands of sand dune habitats along the southern shore of the cSAC between Castlegregory and Derrymore Strand are dealt with as Castlegregory (CMP site 75) in the current project.

The sand dune component of Derrymore Island is of limited interest, forming only a narrow strip along the west side of the Island, and including only a very small area of the priority Annex I fixed dune habitat (Table 76A). The only sand dune habitats on the northerly reaches of the Island are strandline types, including Annual Vegetation of Driftlines on both sand and shingle substrates. Much of the habitat, particularly that described as mobile dune and fixed dune is disturbed, with few typical species and considerable amounts of negative indicator species and species associated with disturbance. There are considerable stretches of the Annex I habitat *Perennial Vegetation of Stony Banks*, on the north and northwest sides of the spit.

Table 76A Areas of EU Annex I habitats mapped at Derrymore Island

EU Code	EU Habitat	Area (ha)
H1210	Annual vegetation of driftlines	2.053
H1220	Perennial vegetation of stony banks	2.784
H2110	Embryonic shifting dunes	0.013
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	2.537
H2130	Fixed coastal dunes with herbaceous vegetation	0.334
	Total Sand dune	**7.721**

To the east of Derrymore Island is a narrow saltmarsh, beyond which there are extensive mudflats, which support large populations of wintering waterfowl and waders, among the most important of which are Wigeon, Brent geese, Pintail and Teal.

Most of the plant communities of Derrymore Island, which include a number of rare species, are saltmarsh types. Some bog species, such as *Calluna vulgaris* (Ling heather) are found in the interior of the spit, where peat substrates are often visible in exposed areas. Purple moor-grass, *Molinia caerulea* was common in these areas. There are also numerous clumps of *Ulex europaeus* (Gorse) in the interior of the spit. Occasional pools in troughs between pebble ridges, support aquatic species. Between the narrow dune ridge and the saltmarsh to the east, is a considerable area of upper marsh, where saltmarsh species such as *Armeria maritima* (Thrift), *Aster tripolium* (Sea aster), *Glaux maritima* (Sea milkwort) and *Plantago maritima* (Sea plantain) occur throughout a *Festuca*-dominated grassland (Photo 11). Also common here is *Carex arenaria* (Sand sedge), while in occasional hollows, *Juncus* spp. and *Potentilla anserina* (Silverweed) are found.

The sand dune habitats in the southwest of site, to the left of the access road (marked on the site digital map), are bordered on the landward side by fenced fields, which are mostly of bog and wetland habitats.

A privately owned nature reserve, of 106.07 ha, was established on Derrymore Island in 1989.

The site was not included in a recent shingle beach survey of Ireland (Moore & Wilson, 1999). However, it is stated in that report, that rather than reflecting a lack of interest, the omission of certain sites may have more to do with a lack of prior information when selecting the most appropriate sites for survey.

Fixed Dunes (H2130)

The total area of fixed dunes mapped is confined to the southern end of the site, where Derrymore Island adjoins the mainland. The habitat is quite disturbed, with considerable cover of negative indicator species such as *Cirsium arvense* (Creeping thistle) and *Rubus fruticosus* (Bramble). The flora is quite limited although there are a number of typical species found, including *Daucus carota* (Wild carrot), *Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Hypochaeris radicata* (Cat's ear), *Lotus corniculatus* (Bird's-foot trefoil) and *Thymus polytrichus* (Wild thyme).

Approximately half of the mapped fixed dunes are within the cSAC boundary, while the other half, along with some of the mobile dunes and annual vegetation of driftlines, are excluded.

Annual Vegetation of Driftlines (H1210)

Annual vegetation of driftlines are found on both sand and shingle substrates at Derrymore Island, although they are considered as a single habitat and mapped as such. The species that characterise the habitat on sand substrates at the site include *Atriplex laciniata* (Frosted orache), *Cakile maritima* (Sea rocket) and *Honckenya peploides* (Sea sandwort). The list of species on which the typical species target is based is more extensive for shingle substrates, and in addition to the above-mentioned species, *Tripleurospermum maritimum* (Sea Mayweed) was also a common feature. Of the typical species list, *Galium aparine* (Cleavers) was also noted in the habitat.

The total mapped area of the habitat, which slightly exceeded 2 ha (Table 76A), consisted of a number of discontinuous bands throughout the site. At the northern tip of the site, where both sand and shingle forms of the habitat were found, the total width of the habitat exceeded 20 m for considerable stretches.

The growth of strandline vegetation was often quite luxuriant (Photo 4), particularly in the case of *Cakile maritima* (Sea rocket).

Embryonic Dunes (H2110)

The mapped area of embryonic dunes consisted of a very small strip of *Elytrigia juncea* (Sand couch), in the extreme southwest corner of the site. Such a negligible area (0.013 ha) is considered insignificant and is not assessed here for conservation status.

Mobile Dunes (H2120)

Mobile dunes at the site consist of a narrow strip, mostly over 10m wide, along much of the west side of Derrymore. The habitat is characterised by the presence of *Ammophila arenaria* (Marram), although much of the habitat is quite disturbed, with *Tussilago farfara* (Colt's-foot) and shrub sized specimens of *Acer pseudoplatanus* (Sycamore) and *Alnus glutinosa* (Alder) commonly found. Fuchsia, *Fuchsia magellanica*, and *Rubus fruticosus* (Bramble) are frequently abundant at the landward edge of the dune ridge. Sand couch, *Elytrigia juncea*, is also found occasionally. To the west of the access road and car park, *Lathyrus pratensis* (Meadow vetchling) is very common in the disturbed mobile dune habitat.

In some places where mobile dunes are found, they appear to have formed over old or previously eroded fixed dune.

Perennial Vegetation of Stony Banks (H1220)

Among the common species noted in the habitat were *Beta vulgaris* ssp. *maritima* (Sea beet), *Cakile maritima* (Sea rocket), *Crithmum maritimum* (Rock samphire), *Honckenya peploides* (Sea sandwort), *Rumex crispus* (Curled dock), *Salsola kali* (Prickly saltwort) and *Tripleurospermum maritimum* (Sea mayweed). Yellow horned–

poppy, *Glaucium flavum*, was among the more uncommon species noted. As the attribute targets for this habitat have not been finalised, lists of all the species found in monitoring stops were compiled.

Some areas of the habitat contained significant amounts of negative indicator species, of which the most common species were *Senecio jacobaea* (Common ragwort) and *Cirsium vulgare* (Spear thistle). One of the four monitoring stops in the habitat failed on the basis of 15% cover of *S. jacobaea*.

Small amounts of lichen, mostly of *Xanthoria* sp. were noted on cobbles and boulders in the habitat.

IMPACTS

The activities noted as impacting on the sand dunes at Derrymore Island are shown in Table 76B.

Table 76B Intensity and impact of various activities on sand dune habitats at Derrymore Island

EU Habitat Code[1]	Activity Code[2]	Intensity[3]	Impact[4]	Area affected/ha	Location of Activity[5]
21BB	200	D	0	N/A	Outside
H1220	411	A	-2	1	Inside
H1220	421	C	-1	0.5	Inside
H1220	422	C	-1	0.5	Inside
H2120	622	B	-1	1.0	Inside
H2130	622	B	-1	0.3	Inside
H1220	623	C	-1	0.5	Inside
21BB	701	D	0	N/A	Outside
H2120	871	C	0	0.5	Inside

[1] EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[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 = repairable 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 sand dune habitat. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the sand dune habitat

Recreational pressures are not intense throughout the site, as convenient access points are limited. Most visitors enter the strand via the road (marked on the site digital map) and car park, at the extreme south end of the site. The more northerly parts of the site are some distance from this access point and are relatively undisturbed. The activities that do occur include walking, swimming and water sports (code 622). A gun club, with licence to shoot wigeon and teal also operates on Derrymore Island.

There is a shellfish farming operation on the spit, with a number of buildings and a surrounding fenced area on the northern tip (code 411). Cultivation (code 200) takes place in the sub-tidal zone and is unlikely to directly affect the sand dune habitats, although it may be a concern in the conservation of mud and sand flats habitats and associated bird populations. Tractors associated with the shellfish plant travel the beach and a route through the shingle near the north tip (623).

Much of the adjacent land to the south is farmed intensively, which may result in pollution or eutrophication from run-off. In this situation the marsh and mud and sand flats may be vulnerable, with possible consequences for the bird populations which utilise these areas. However, there are unlikely to be any serious direct impacts on the sand dune habitats.

Occasional littering, and dumping of steel frames and other materials associated with the shellfish farming operations were observed (codes 421 & 422). Dumping of large amounts of tree and shrub material associated with a nearby development was observed at the site.

The narrow strip of sand dune habitat on the west side of the spit is subject to natural erosion and in places, a steeply eroded

Rock Armour (code 871) was installed along a short stretch of the strand on the west side of the spit (Photo's 7&8), but has subsequently subsided somewhat. It may have had a positive impact in the immediately affected area, as there are some relatively healthy stretches of fresh Marram growth to the landward side, along some of its length. However, there may also be some unquantifiable negative impacts relating to sediment starvation in other areas of the dunes. For this reason, it is considered to be exerting a neutral influence on the mobile dunes.

CONSERVATION STATUS

The conservation status assessment of each habitat at Derrymore Island is based on a combination of Habitat extent, Habitat structure & Functions, and Future Prospects assessments (Table 76C). In the absence of any substantial previous data with which

the current results could be compared, much of the assessment was based on the current condition of habitats.

Table 76C Conservation status assessment of Annex I sand dune habitats at Derrymore Island

Habitat[1]	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
Fixed Dunes (H2130)			Extent/ Structure & functions/ Future Prospects	**Unfavourable - Bad**	Unfavourable - Declining
Annual Strandline (H1210)	Extent/ Structure & functions/ Future Prospects			**Favourable**	Favourable – Maintained
Shingle Banks (H1220)	Extent/ Future Prospects	Structure & functions		**Unfavourable - Inadequate**	Unfavourable - Declining
Mobile Dune (H2120)	Extent		Structure & functions/ Future Prospects	**Unfavourable - Bad**	Unfavourable - Unchanged

[1]EU Codes as per Interpretation Manual
[2] Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)

Details of the numbers and pass/failure rates of monitoring stops used to assess habitat structure & functions are shown in Table 76D.

Table 76D Pass/Fail results of monitoring stops for Annex I sand dune habitats at Derrymore Island

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Strandline (H1210)	8	0	**Favourable**
Shingle strandline (H1220)	3	1	**Unfavourable - Inadequate**
Mobile Dunes (H2120)	2	2	**Unfavourable - Bad**

Fixed Dunes (H2130)

Fixed dunes are currently confined to the extreme southwest corner of the site, where natural erosion, compounded by disturbance from recreational use is affecting the existing habitat. Conservation status assessment of habitat extent is therefore considered *unfavourable – bad.*

Monitoring stops were not carried out in the fixed dunes due to their limited extent, and the degree of disturbance throughout the habitat. Species such as *Cirsium arvense* (Creeping thistle) and *Rubus fruticosus* (Bramble) were common throughout. Also common, though not among the species listed as negative indicators, were *Angelica sylvestris* (Wild angelica) and *Lathyrus pratensis* (Meadow vetchling). Such observations were sufficient to establish an *unfavourable – bad* conservation status assessment for structure and functions. The area mapped as fixed dunes is also very narrow and exposed, and contains a high proportion of Marram. Most of the area would be most appropriately considered as semi-fixed dune.

As the site is bordered on the landward side by agricultural fields, bog, saltmarsh, and shingle banks, there is little prospect of fixed dunes becoming an interesting element of the habitats at Derrymore Island. What little habitat exists is also subject to considerable disturbance. For these reasons, future prospects are rated as *unfavourable – bad.*

As all three elements of conservation status assessment are considered *unfavourable – bad*, that is the rating that applies to the habitat as a whole.

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

Annual Vegetation of Driftlines (H1210)

As there is quite a large expanse of annual strandline habitats, on both sand and shingle substrates, and in the absence of any indication of a recent loss of area, the conservation status of habitat extent is rated as *favourable*.

Eight monitoring stops were carried out in the annual strandline habitat, of which 4 were on sand substrates and 4 on shingle substrates. All stops met the necessary criteria for attribute targets (Table 76D), indicating a *favourable* structure and functions conservation status assessment.

The future prospects of annual strandline habitats are also thought to be *favourable*. The greater part of the habitat is removed from areas of recreational pressures, while those areas of habitat which do adjoin the more heavily used parts of the site are currently in good condition.

As all parameters of conservation status assessment are *favourable,* the overall rating for the habitat is also *favourable*.

The Irish conservation status assessment that best reflects the condition of the habitat is *favourable – maintained*.

Perennial Vegetation of Stony Banks (1220)

Because the habitat area is quite extensive, and in the absence of any indication of a recent loss of extent, the conservation status assessment habitat for extent is judged to be *favourable*.

Although the attribute targets for this habitat have yet to be confirmed, it may be tentatively assumed that 3 of the 4 monitoring stops will pass the necessary criteria. All had several typical species, while the stop which is deemed to fail, had 15% cover of *Senecio jacobaea* (Common ragwort) - a figure that will almost certainly exceed any modified target for negative indicator species cover. A failure rate of 25% of monitoring stops indicates a structure and functions conservation assessment of *unfavourable – inadequate*.

Future prospects for the habitat are thought to be *favourable*. The system is quite stable, and the habitat is largely unrestrained by any man-made structures. Much of the site is also free from serious recreational or other human-induced pressures.

As the conservation status assessment of the mobile dunes is a combination of *favourable* and *unfavourable – inadequate* judgements, the overall assessment is *unfavourable – inadequate*.

The Irish conservation status assessment thought most appropriate is *unfavourable-unchanged*, as there is no evidence of a recent decline in the extent or integrity of the habitat.

Mobile dunes (H2120)

The mobile dunes consist of a thin band along much of the length of the site, indicating that habitat zonation is of a certain standard. Along the more northerly stretches, sand dunes give way to shingle banks. As previous information suggests the habitat is currently at least as extensive now as any time in recent decades, conservation status assessment for habitat extent is thought to be *favourable*.

Four monitoring stops were carried out in the mobile dunes, of which only 2 passed the necessary structure and functions criteria. Those that failed to meet the required standards had excessive amounts of unhealthy *Ammophila arenaria* (Marram), reflecting the general disturbed appearance of the habitat. The conservation status assessment is therefore *unfavourable – bad.*

The future prospects for the mobile dunes are considered *unfavourable – bad*. Much of the habitat is highly disturbed and of poor quality. There is little to suggest that this is likely to change, particularly as much of the habitat is outside the cSAC boundary.

As two of the components of conservation status assessment are considered *unfavourable – bad*, that is the rating that applies to the habitat as a whole.

The corresponding Irish conservation status is thought to be *unfavourable – unchanged*, reflecting the historical information on the site, which suggests the sand dunes, including the foredune habitats, have long been of little interest.


SAC 2070
Habitats
Strandline
Strandline - shingle
Embryonic Dune
Mobile Dune
Fixed Dune
Coastal Monitoring Project 2004-2006
Derrymore Island
CMP code: 076
0 200 400 600 800 Meters
N
Tralee Bay and Magherees Peninsula, West to Cloghane (SAC 2070)
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 9953)
Date of production: 25/11/2008
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:22082
National Parks and Wildlife Service

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

SITE DETAILS

CMP05 site name: **Castlegregory** CMP05 site code: **075**

CMP Map No.: **72,73&74**

County: **Kerry** Discovery map: **71** Grid Reference: **Q 074 113**

6 inch Map No.: **Ke 027 & Ke 035**

Aerial photographs (2000 series): **O 5517-A,B,C,D; O 5453-AA,C,CC,D; O 5583-B,C,D; O 5584-A,B,C,D; O5653-A; O5654-B**

NPWS Site Name: **Tralee Bay & Magharees Peninsula, West to Cloghane**

NPWS designation: pNHA: **2070** cSAC: **2070** SPA: **4011 Lough Gill, 4018 Tralee Bay**

Nature Reserve: **Tralee Bay Derrymore Island** Other: **Wildlife Sanctuary – Lough Gill Corine Biotope - 559**

Ranger Area: **Southwest**

MPSU Plan: **2004**

Report Author: **Anne Murray**

SITE DESCRIPTION

Castlegregory sand dune system is located on the Magharees Peninsula, a tombolo that links the Magharee Islands to the mainland. The dune complex extends from Derrymore Island in Tralee Bay westward as far as Kilcummin Strand at Cloghane in Brandon Bay. The sand dune habitat is part of the larger cSAC of Tralee Bay. The EU Annex I sand dune habitats for which Tralee Bay cSAC is designated are Fixed dunes (priority habitat) and Dune slack. Other habitats for which the site is designated are: Lagoons, Estuaries, Mudflats and sandflats, Atlantic saltmeadows and Rocky seacliffs.

The main EU Annex I sand dune habitats recorded at Castlegregory during this project include; Fixed dunes, Dune slack, Dunes with *Salix repens* spp. *argentea*, Mobile dunes, Annual vegetation of driftlines and Perennial vegetation of stony banks.

Most of the sand dune system is located on the Magharees Peninsula with smaller areas of sand dune habitat edging the coastline east and west of the peninsula. The total sand dune area is 322 ha (Table 75A) and it is one of the largest sand dune systems on the south coast. It is also one of a few sand dune systems in Ireland that contains Dunes with *Salix repens*. This habitat is located at Magharbeg on the Magharees peninsula and occurs as a mosaic with humid dune slack.

The sand dune system on the Magharees Peninsula is strongly impacted by farming practices and recreational activities. The dunes at Magharbeg are in commonage and winter and summer grazing is carried out on the dunes. There are a number of caravan parks and associated recreational activities. Surfing, scuba diving and horse riding are very popular past-times. Sea Buckthorn (*Hippophae rhamnoides*) was planted by Kerry County Council in the past, to stabilise the fixed dune and it is now invading the dunes in places. The presence of Castlegregory golf course, agriculturally improved fields and caravan sites has altered the sand dune habitat of the peninsula and these are now excluded from the site.

There are two SPA sites within the cSAC site, 1) Tralee Bay SPA 4018 and 2) Lough Gill SPA 4011. The Tralee Bay SPA supports numbers of European importance of the migratory Pale-bellied Brent Geese.

Petalwort (*Petallophyllum ralfsii*) an Annex II species has been recorded in the dune slacks at the Magharees. The dunes are an important breeding site for the Red Data Book species - Natterjack toad (Annex IV species) and the Common frog (Annex V species). They are also home to two rare hoverflies.

Table 75A Areas of EU Annex I habitats mapped at Castlegregory

EU Code	EU Habitat	Area (ha)
H1210	Annual vegetation of driftlines	9.528
H1220	Perennial vegetation of stony banks	0.057
H2110	Embryonic dunes	1.281
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	9.419
H2130	Fixed coastal dunes with herbaceous vegetation	225.73
H2170	Dunes with *Salix repens* ssp. *argentea*	45.755
H2190	Humid dune slacks	29.799
	Total Sand dune	**321.569**

Fixed Dune (H2130)

The priority habitat fixed dune comprises 226 ha (approximately 70%) of the total sand dune habitat at Catlegregory (Table 75A). The main area of fixed dune occurs in the Magharees peninsula. The fixed dunes are of a characteristic undulating formation with high dune ridges throughout and dune slacks in the hollows between the ridges. Dunes with *Salix repens* occur in a mosaic with the dune slacks towards the northern end of the site on the Magharees Peninsula. The fixed dunes cover various parts of the site. The main areas are described below

Stradbally Strand

The fixed dune has been impacted from agricultural practices of fertilisation, grazing and supplementary feeding. Agricultural grasses and weeds dominate the fixed dune area. The negative indicator species - *Lolium perenne* (Perennial rye-grass) and *Senecio jacobaea* (Ragwort) occur throughout. There is no sign of recent grazing although some ring feeders are present. There are areas of short turf with a good diversity of fixed dune species as a result of grazing. The typical species: *Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Lotus corniculatus* (Common bird's-foot-trefoil), *Plantago lanceolata* (Ribwort plantain), *Trifolium pratense* (Red clover), *Taraxacum* agg. (Dandelion), *Euphrasia officinalis* (Eyebright), *Hypochaeris radicata* (Cat's ear), *Veronica chamaedrys* (Germander speedwell) and *Rhinanthus minor* (Yellow rattle). Squinancywort (*Asperula cynanchica*) occurs here also. This is a locally frequent plant in the west of Ireland that is typical of lime-rich soils**.** A small slack is located in this area of the fixed dune and it has been influenced by agricultural activities, as discussed below.

The fixed dune has been modified by the presence of a golf course to the west of Lough Gill. An eroding face of fixed dune fronts the seaward edge of the golf course. New Zealand flax (*Phormium tenax)* has been planted along the seaward ridge and some soft protection in the form of straw bales wrapped in netting has been installed in places.

Magherabeg

The fixed dune is fronted by a narrow band of mobile dunes to the west and backed by agricultural fields along the western edge of Lough Gill. Bracken (*Pteridium*

aquilinum) and *Rosa pimpinellifolia* (Burnet rose) are invading the inland portion of the fixed dunes here. Cattle and rabbits graze the dunes and there is plenty of short turf. There are large blowouts and eroded fixed dune revegetated by *Ammophila arenaria* (Marram grass) in places.

The fixed dune species become more diverse moving northwards on the peninsula. The typical species include *Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Lotus corniculatus* (Common bird's-foot-trefoil), *Plantago lanceolata* (Ribwort plantain), *Trifolium pratense* (Red clover), *Taraxacum* agg. (Dandelion), *Euphrasia officinalis* (Eyebright), *Hypochaeris radicata* (Cat's ear), *Linum catharticum* (Fairy flax), *Carex arenaria* (Sand sedge), *Luzula campestris* (Wood-rush), *Viola tricolor* (Wild pansy), *Tortula ruraliformis* and *Rhytidiadelphus triquetrus*. Dodder (*Cuscuta epithymum*) and *Spiranthes spiralis* (Autumn lady's tresses) - plants that are rare beyond the south/west of Ireland were frequent on the fixed dune.

The neck of the peninsula at Magherabeg contains a lot of large blowouts and a very large area of the negative indicator species *Hippophae rhamnoides* (Sea buckthorn). Sea buckthorn (*Hippophae rhamnoides*) occupies approximately 9ha (4%) and the bare ground is estimated at approximately 10% of the fixed dune.

North of the peninsula broadens with fixed dune to the east and a mosaic of dune slacks to the west (as far as the main road) consisting of the EU Annex I habitats - Dunes with *Salix repens* and Humid Dune Slack. Further west of the road, there is band of fixed dune dominated by *Ammophila arenaria* (Marram grass) and fronted by a steep ridge. This area is very popular with surfers and a large blowout has developed in an area of the dunes used for access to the beach and parking.

The main fixed dune area to the east is not as heavily grazed as the dune slacks and dunes with *Salix repens.* Species diversity is high with plenty of the typical species present listed above.
Marram grass (*Ammophila arenaria*) and the negative indicator species *Senecio jacobaea* (Common ragwort) and *Rubus fruticosus* (Bramble) are common throughout

the fixed dunes and *Hippophae rhamnoides* (Sea buckthorn) occurs on a large blowout along the face of one of the dune ridges.

East of Magharees Peninsula

There is very little sand dune habitat along this shoreline. There are some patches of sand dune habitat in the townlands of Aughacasla and Cappaghclogh East. However the fixed dune is rank with an average height of 1 metre. It is dominated by *Ammophila arenaria* (Marram grass) and *Festuca rubra* (Red fescue) with very few typical species present. The fixed dune is backed by caravan parks and wet grassland and fronted by a steep eroding face. The caravan park at Cappaghclogh East appears to be extending into the fixed dune area. There is no clear boundary on the ground to delineate the edge of the caravan park.

Dune Slack Habitats

The dune slack vegetation of this site is characteristic of two EU Annex I habitat types, Humid dune slack (H2190) and Dunes with *Salix repens* (2170). These are discussed below.

Dune Slack (H2190)

The area of dune slack comprises approximately 30 ha (10%) of the total sand dune habitat (Table 75A) but this does not include those smaller dune slacks that occur in the Dunes with *Salix repens*. Therefore the total area is likely to be greater than 30 ha.

Stradbally Strand-Lough Gill

There are three small slacks in the rank area of the fixed dune. These slacks are dominated by grasses including, the negative indicator species – *Lolium perenne* (Perennial ryegrass) and *Senecio jacobaea* (Common ragwort), indicating previous heavy agriculture influence.

Magherabeg

The dune slacks at Magherabeg are characterised by the high coverage of low *Salix repens* (Creeping willow) with an average height of 20cm. For the purposes of monitoring, these slacks are described as wet slacks (see main report).

There are three large dune slacks that range in area from 6 to 10 ha, along with smaller slacks of 1 to 2 ha. Other areas of dune slack appear in mosaics in the dunes on the Magharees peninsula. Creeping willow (*Salix repens)* cover is approximately 30-40% in individual slacks with greater coverage in the slacks that occur in mosaic with dunes with *Salix repens*. All the slacks are well grazed by cattle and some poaching is apparent in the soft ground of the slacks.

The grazing keeps the *Salix repens* (Creeping willow) short and prevents it from forming a dense canopy. This maintains the diversity of species and openness of the slacks. The typical species that occur in the slacks are: *Hydrocotyle vulgaris* (Marsh pennywort), *Ranunculus flammula* (Lesser spearwort), *Potentilla anserina* (Silverweed), *Mentha aquatica* (Water mint), *Juncus articulatus* (Jointed rush) and *Calliergonella cuspidata*.

The negative indicator species *Senecio jacobaea* (Common ragwort) and *Rubus fruticosus* (Bramble) occur in some of the dune slacks but their cover is not significant.

Dunes with *Salix repens* **(2170)**

The dunes with *Salix repens*/dune slack mosaic comprise approximately 46 ha (14%) of the total sand dune area. There is some difficulty in discerning boundaries between this habitat and dune slack, as transitions are very gradual especially in the more gentle sloping parts of the dunes. It occurs in the north of the site above Magherabeg. Further detailed field survey work is required to confirm its extent.

Dunes with *Salix repens* is considered a dune slack community corresponding to the British National Vegetation Classification of *Salix repens – Holcus lanatus* dune slack community (SD16). This is a community that is typical of older drier slacks. The typical species listed in the JNCC monitoring methodology omits the species *Holcus lanatus* (Appendix 1 of main report).

The typical species of the dunes with *Salix repens* at Castlegregory include: *Salix repens* (Creeping willow), *Carex* spp. (Sedge), *Festuca rubra* (Red fescue), *Lotus corniculatus* (Common bird's-foot-trefoil), along with other typical species of fixed

dune including *Galium verum* (Lady's bedstraw), *Plantago lanceolata* (Ribwort plantain), *Trifolium pratense* (Red clover), *Taraxacum* agg. (Dandelion), *Linum catharticum* (Fairy flax) and *Rhytidiadelphus triquetrus*.

A variety of factors appear to be influencing the floristics and structure of this habitat. The wet climate gives rise to less obvious transitions from wet to dry slack and the heavy grazing maintains the openness of habitat by keeping the *Salix repens* short. The species composition is influenced by grazing cattle and dunging.

Mobile Dunes (H2120)

There is very little mobile dune habitat relative to the area of sand dune habitat at this site. The total mobile dune area is 9 ha (Table 75A). Patches of mobile habitat fringe the fixed dune in places on the Magharees Peninsula and consist of narrow eroding ridges. The main area of mobile dune is to the west of the peninsula at Stradbally and Kilcummin strands. The mobile ridges here front agriculturally modified areas of fixed dune that grade into wet grassland eastwards to Fermoyle. The typical species *Ammophila arenaria* (Marram grass) dominates with other species such as, *Eryngium maritimum* (Sea holly) and *Calystegia soldanella* (Sea bindweed) throughout. Field bindweed (*Convolvulus arvense*) is also common and invading from the agricultural lands behind. There are also patches of mobile dune along the east of the peninsula mainly around river outlets.

Embryonic Dunes (H2110)

There are only a few patches of the embryonic species *Elytrigia juncea* (Sand couch), where small areas of sand have accreted. These are noted on the digital map for this site and total 1ha in area. The development of this habitat is very limited.

Annual Vegetation of Driftlines (H1210)

The annual strandline comprises 9ha of the sand dune habitat (Table 75A) and this naturally includes a lot of bare sand. This habitat is found mainly along the coastline to the east of Castlegregory towards Derrymore. It occurs in very wide bands fronting eroding clay cliffs and eroding fixed dune. The dominant typical species is *Cakile maritima* (Sea-rocket) along with the other annuals *Salsola kali* (Saltwort), *Atriplex laciniata* (Frosted orache) and the perennial *Honckenya peploides* (Sea sandwort).

Perennial Vegetation of Stony Banks (H1220)

An extensive cobble beach is located on the eastern edge of the Magharees Peninsula and is largely unvegetated. A small area (0.057ha) of perennial vegetation occurs at Corralouhgha Strand on the northwest of the peninsula. It is dominated by *Tripleurospermum maritimum* (Sea mayweed). The negative indicator species *Senecio jacobaea* (Ragwort) occurs on the cobble beach on the southeast of the peninsula.

IMPACTS

The main activities impacting the sand dunes at Castlegregory are given in Table 75B. The sand dune area at the Magharees Peninsula is affected by grazing (code 140). The impact of grazing has been positive throughout the dunes resulting in high species diversity and preventing rank vegetation and scrub from becoming dominant. Unfortunately, there are some areas of the sand dunes that have been overgrazed and heavily trampled by cattle.

Table 75B Intensity and impact of various activities on sand dune habitats at Castlegregory

EU Habitat Code[1]	Activity Code[2]	Intensity[3]	Impact[4]	Area affected/ha	Location of Activity[5]
H2120	900	A	0	0.8	Inside
H2120	954	C	-1	0.1	Inside
H2130	102	B	-1	0.1	Inside
H2130	103	B	-2	Unknown	Outside
H2130	140	A	1	20	Inside
H2130	143	A	-1	120	Inside
H2130	300	C	-1	0.1	Inside
H2130	403	C	-2	0.01	Inside
H2130	502	C	-2	0.1	Outside
H2130	601	B	-1	Unknown	Outside
H2130	608	B	-1	10	Outside
H2130	622	A	-1	20	Inside
H2130	720	B	-1	40	Inside
H2130	900	C	0	30	Inside
H2130	954	B	-1	12	Inside
H2170	143	A	-1	30	Inside
H2170	720	A	-1	30	Inside
H2190	143	A	-1	20	Inside
H2190	720	A	-1	20	Inside

[1]EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[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 = repairable 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 sand dune habitat. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the sand dune habitat

The fixed dune area on the Magharees peninsula is mainly affected by overgrazing and by recreational activities. Overgrazing (code 143) and associated trampling (code 720) affects approximately half the fixed dune total area. There was very little flowering and fruiting in areas that were overgrazed. Heavy grazing damages surface vegetation, the soil surface becomes unstable and erosion ensues. The erosion caused by grazing is visible throughout the fixed dune at Magherabeg. This erosion is compounded in places by recreational activities and natural erosion.

Some areas of the fixed dune have been improved for agriculture (code 103) and are excluded from the cSAC. The area surrounding the improved fields is impacted by the application of fertiliser and the spread of agricultural grasses. The total area affected is unknown.

The Castlegregory golf course (code 601) has modified the fixed dunes to the west of Lough Gill. Most of the activities of the course are concentrated outside of the designated site. The physical presence of the golf course on the fixed dune habitat covers approximately 22ha. There are a number of caravan parks (code 608) located adjacent to the site and these are excluded from the cSAC. The impacts associated with this type of development within the site are, fragmentation of the dunes and trampling damage due to the high pedestrian concentration around the caravan parks. Recreational activities, such as walking, horse riding (code 622) and surfing are very popular past-times at Castlegregory and damage to the dunes is visible with large blowouts developing at access areas. The dunes are fenced off but this does not discourage users from breaking the fencing to gain access.

Sea Buckthorn (*Hippophae rhamnoides*) (code 954) was planted on the fixed dunes in the past, at present it covers 9ha of fixed dune area. This non-native species is aggressively invasive and difficult to eradicate. It poses a threat to the natural flora and fauna of the sand dune system. Bramble (*Rubus fruticosus*) and *Pteridium aquilinum* (Bracken) are also invading the back of the fixed dune in places.

There is evidence of natural erosion (900) along the edge of the fixed dunes caused by winter storms. This natural erosion is compounded by human activities described above.

The dune slacks and dunes with *Salix repens* are located on the Magharees peninsula. Overgrazing (code 143) and associated trampling (code 720) affects both of these habitats located within the commonage at Magherabeg. There was evidence of poaching throughout these habitats. There was very little flowering and fruiting in areas that were overgrazed. The positive impacts of grazing could also be detected in places with high diversity of plant species and little scrub invasion.

The mobile dunes are experiencing natural erosion (code 900). There are fragmented areas of mobile habitat remaining along the coastline. It is likely that the natural erosion has been compounded by the high recreational use of this site. The invasive weed *Convolvulus arvense* (Field bindweed) is taking hold on the main mobile habitat at Kilcummin Strand (code 954).

CONSERVATION STATUS

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site was the NATURA 2000 survey. The ecological information in the NATURA 2000 survey applies to the whole SAC. For the purpose of this project Derrymore Island and Fermoyle are not included in this site. Fermoyle (Site 74) and Derrymore Island (Site 76) are dealt with in separate reports within this project.

All of the EU Annex I sand dune habitats are treated separately in this survey while some of these were assessed together in the NATURA survey e.g. annual and perennial strandline.

The method of assessment of conservation status differed in NATURA 2000 and so comparisons between the conservation status of the two surveys were not possible. The conservation status of the Annex I sand dune habitats in Castlegregory are given in Table 75C.

Fixed Dunes (2130)

The extent of fixed dunes is rated as *unfavourable-inadequate* (Table 75C). The decline in fixed dune area as a result of erosion is largely caused by human recreational activities and also by overstocking of cattle that graze the dunes. Natural

erosion is also evident along the edges of the fixed dunes in places. Loss of extent is also caused by the invasion of the negative indicator species *Hippophae rhamnoides* (Sea buckthorn).

Table 75C Conservation status of Annex I sand dune habitats at Castlegregory

Habitat[1]	**EU Conservation Status Assessment**				
	Favourable	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**	**Proposed Irish conservation status system**[2]
Fixed Dune (H2130)	Future prospects	Extent, Structure & functions		**Unfavourable - Inadequate**	Unfavourable - unchanged
Dunes with *Salix repens* **(H2170)**	Extent , Structure & functions, Future prospects			**Favourable**	Favourable - maintained
Humid Dune Slack (H2190)	Extent , Structure & functions, Future prospects			**Favourable**	Favourable - maintained
Mobile Dune (H2120)	Structure & functions		Extent , Future prospects	**Unfavourable - Bad**	Partially destroyed
Annual Vegetation of Driftlines (H1210)	Structure & functions	Extent, Future prospects		**Unfavourable - Inadequate**	Unfavourable-unchanged

[1]EU Codes as per Interpretation Manual
[2]Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)

The structure and functions parameter is rated as *unfavourable-inadequate*. A total of 24 monitoring stops were placed in the fixed dunes and seven of these failed (Table 75D). Three of the stops that failed were located in the northeastern part of the Magharees Peninsula. The stops failed due to the influence of overgrazing and the cover of the negative indicator species – *Senecio jacobaea* (Common ragwort). The average sward height in this area is 2-5cm and there was very little flowering of any of the typical species. The other monitoring stops that failed are located in the area close to Lough Gill and are mainly affected by agricultural activities.

The future prospects for this site are considered *favourable* on the basis that the strategies listed in the conservation plan (2004) are put into action. The most urgent action needed is the reduction of grazing cattle to a more sustainable level for the

dunes, the development of a management plan for the recreational activities of the site and the removal of *Hippophae rhamnoides* (Sea buckthorn) from the site.

Land tenure is an important constraint in managing Castlegregory. Common ownership of the dunes at Magherabeg has resulted in overgrazing of the dunes. The commonage is perceived to be public property and access is viewed as a public right. This has resulted in uncontrolled public access and damage to the dunes.

The dunes have been fenced off in recent times and this is viewed (by the public) as obstructing open access. This has led to removal of the fencing by the public in places. Information boards are noticeably absent from this site. Signage would help to highlight the role of the general public in the sustainable use of the dunes. The Castlegregory golf course is currently seeking to extend the course further into the fixed dunes. If this is permitted the conservation status of the habitat will decline. The erosion evident along the seaward boundary of the course may also create a demand for coastal protection in the future.

The conservation status of the fixed dune was described as *good* in the NATURA 2000 survey. The current overall EU conservation status of fixed dunes at Castlegregory is *unfavourable-inadequate* (Table 75C). This reflects the many impacts that are adversely affecting this habitat resulting in loss of extent and reduction in the quality of this habitat.

Table 75D Monitoring stop totals and pass/failure details of Annex I sand dune habitats at Castlegregory

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Fixed dune (H2130)	17	7	**Unfavourable-bad**
Dune Slack (H2190)	16	0	Favourable
Dunes with *Salix repens* **(H2170)**	4	0	Favourable
Mobile dune (H2120)	4	0	Favourable
Annual vegetation of driftlines (H1210)	4	0	Favourable

The Irish conservation status is rated as *unfavourable-unchanged*. This reflects the natural and human impacts that are adversely affecting the habitat. Land tenure is one of the main constraints in managing this site and in addressing the impacts.

Dunes with *Salix repens* **(2170)**

The extent of the dunes with *Salix repens* is rated as *favourable* (Table 75C). It is largely confined to the north of the site within the commonage of Magherabeg. This habitat occurs in a mosaic with fixed dunes and dune slack in a part of the dunes where loss of area due to development or recreational activities is not a threat.

The structure and functions parameter is rated as *favourable*. Four monitoring stops were placed in the dunes with *Salix repens* and all of these passed (Table 75D). However, it is important to note that these are trial monitoring stops for this habitat. Further studies are required for the development of targets for this habitat (See main report). The main threat to the structure and functions of this habitat is from overgrazing and associated poaching.

Dunes with *Salix repens* are not described or designated in the conservation plan (2004) for Castlegregory and may have been included in the dune slack category. The future prospects for this habitat are considered *favourable* on the basis that the strategies listed in the conservation plan (2004) for dune slacks are put into action. The most urgent action needed is the reduction of grazing cattle to a more sustainable level for this habitat.

The conservation status of this habitat was assessed along with dune slacks in the NATURA 2000 survey and it was described as *excellent*. The current overall EU conservation status of dunes with Salix at Castlegregory is *favourable* (Table 75C). It should be noted that further study of this habitat in Ireland is required in order to assess it fully.

The Irish conservation status is rated as *favourable-maintained*. The habitat is currently in good condition. In order to maintain the condition of this habitat, the number of grazing cattle must be reduced to a more sustainable level.

Dune Slack (H2190)

The extent is rated as *favourable* as there is no apparent decline in the area of dune slack. The dune slack occurs in a mosaic with fixed dune and dunes with Salix and therefore it is difficult to attribute a definitive area to these, however the slacks appear intact overall.

The structure and functions parameter is rated as *favourable*. A total of 16 monitoring stops were placed in dune slacks and all of these passed (Table 75D). The monitoring stops were placed in the five main dune slacks throughout the site. The negative indicator *Senecio jacobaea* (Ragwort) occurred in many of the slacks.

The future prospects for this site are considered *favourable* on the basis that the strategies listed in the conservation plan (2004) are put into action. The most urgent action needed is the reduction of grazing cattle to a more sustainable level for the dune slacks.

The conservation status of this habitat was assessed along with dunes with *Salix repens* in the NATURA 2000 survey and was described as *excellent* in the NATURA form. The current overall EU conservation status of dune slack at Castlegregory is *favourable* (Table 75C).

The Irish conservation status is rated as *favourable-maintained*. The habitat is in good condition and the main threat to this habitat is from overgrazing. Once the strategies listed in the conservation plan (2004) are put into action then the condition of the habitat should be maintained.

Mobile dunes (H2120)

The extent is rated as *unfavourable-inadequate* as the mobile dunes have been eroded away along much of the coastline at Castlegregory (Table 75C). This habitat is now confined to Stradbally and Kilcummin strand to the west in Brandon Bay with a small area also on the east towards Derrymore.

The structure and functions parameter is rated as *favourable*. A total of 4 monitoring stops were placed in the mobile dunes at Stradbally and all of these passed (Table

75D). However the mobile dunes are backed by agriculturally modified fixed dunes. The invasive weed *Convolvulus arvense* (Field bindweed) is invading from these agricultural fields and taking hold on the mobile ridge.

The future prospects for this site are considered un*favourable-bad.* The little mobile dune habitat remaining is very fragmented and susceptible to increasing natural erosion and erosion from anthropogenic activities. There appears to have been a shift in the sediment dynamics particularly on the western side of the tombolo. A sediment budget for the area would give a clearer indication the future prospects of this habitat at this site.

The conservation status of the mobile dunes was described as *good* in the NATURA 2000 survey. Currently, the overall EU conservation status of mobile dunes at Castlegregory is *unfavourable-bad* (Table 75C). This rating is attributable to natural coastal erosion compounded by human activities.

The Irish conservation status is rated as partially destroyed, as most of the mobile dune habitat has been lost due to natural and human induced erosion.

Embryonic Dunes (H2110)

This habitat is not assessed in the NATURA 2000 form. The habitat is not delineated on the maps associated with the NATURA report nor is the habitat defined on the maps of the management plan.

There are only a few fragmented patches of the embryonic species *Elytrigia juncea* (Sand couch) totalling 1ha in area, where small areas of sand have accreted in places along the coastline. There is no conservation status assessment for this habitat as it is of very limited extent at the site.

Annual Vegetation of Driftlines (1210)

The extent is rated as *unfavourable-inadequate* as the habitat is absent along most of the coastline on the west of the Magharees tombolo and extending as far as Kilcummin Strand. This is mainly due to the unstable beach environment caused by

current natural erosion compounded by human activities. There are some small pockets of strandline on the eastern side at the townlands of Aughacasla and Camp.

The structure and functions parameter is rated as *favourable*. A total of 4 monitoring stops were placed in a very wide area of strandline at Aughacasla and all of these passed based upon the presence of annual species (Table 75D).

The future prospects for this site are considered un*favourable-inadequate*. The strandline habitat is very fragmented and susceptible to increasing natural erosion and pressure from anthropogenic activities. There appears to have been a shift in the sediment dynamics on the western side of the tombolo. A sediment budget for the area would give a clearer indication the future prospects of this habitat at Castlegregory.

The conservation status of the annual strandline habitat was assessed together with the perennial shingle habitat and described as *good* in the NATURA 2000 survey. The assessment of the EU conservation status of a habitat that is ephemeral in nature is not exact. The total area of the strandline will vary from year to year and its location may also shift in response to coastal processes. However, it is apparent that the habitat is under threat from both natural and human impacts.

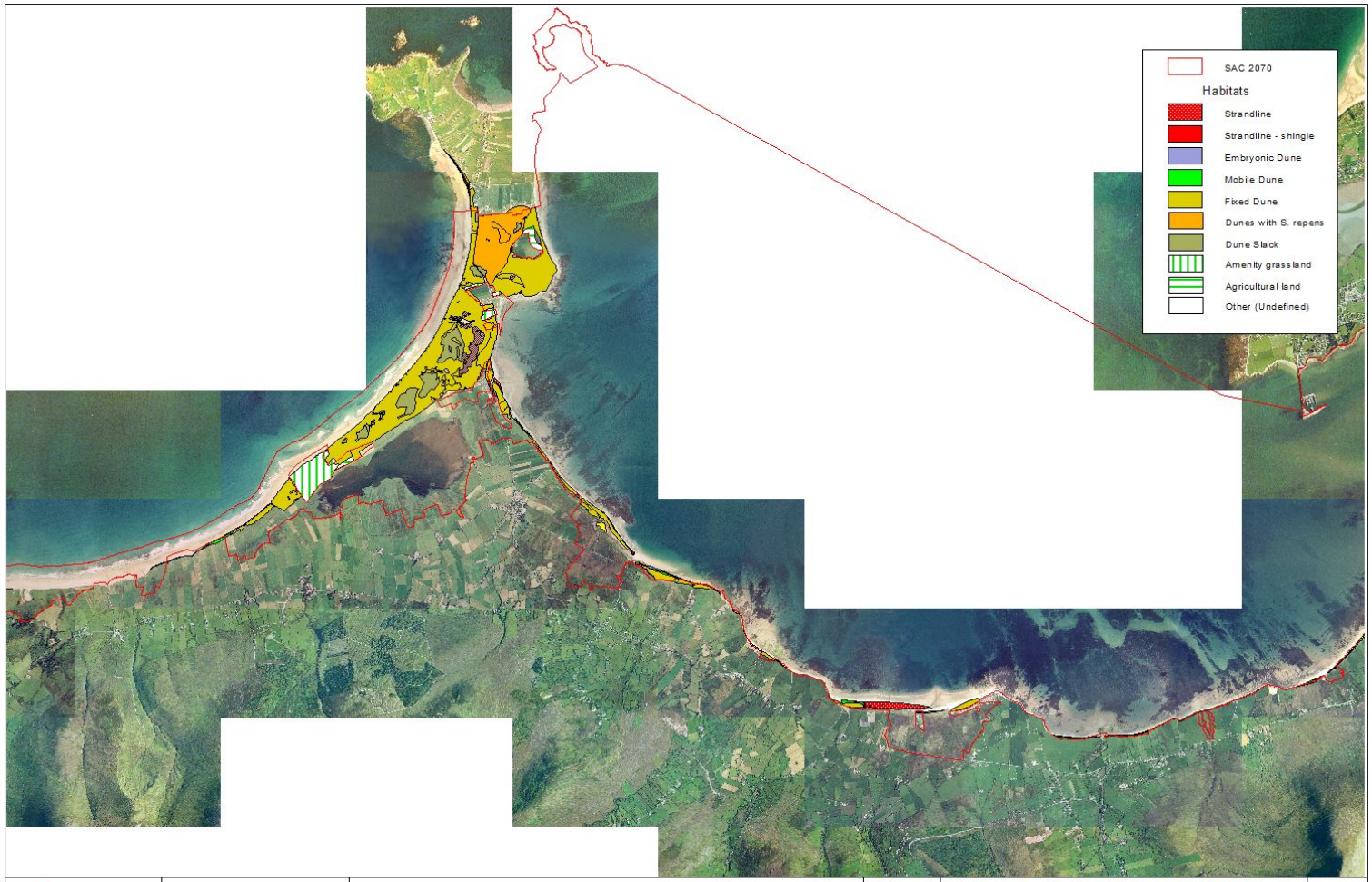
Therefore, the overall EU conservation status of annual strandline at Castlegregory is considered *unfavourable-inadequate* (Table 75C).

The Irish conservation status is rated as *unfavourable-unchanged*.

Perennial Vegetation of Stony Banks (H1220)

This habitat has been recorded and assessed along with annual strandline in the NATURA 2000 form. The habitat is not delineated on the maps associated with the NATURA report nor is the habitat defined on the maps of the management plan. It appears that this habitat is largely confined to the north shore of Tralee Bay cSAC and this is outside of the Castlegregory site.

There is some perennial vegetation at Corralouhgha Strand comprising an area of 0.057ha on the northwest of the peninsula. There is no conservation status assessment for this habitat as it is of very limited extent at the site.


SAC 2070
Habitats
Strandline
Strandline - shingle
Embryonic Dune
Mobile Dune
Fixed Dune
Dunes with S. repens
Dune Slack
Amenity grassland
Agricultural land
Other (Undefined)
Coastal Monitoring Project 2004-2006
Castlegregory
CMP code: 075
0 600 1200 1800 2400 3000 Meters
N
National Parks and Wildlife Service
Tralee Bay and Magherees Peninsula, West to Cloghane (SAC 2070)
This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are subject to revision. Produced from Ordnance Survey material by permission of the Government (Permit number 5953)
Date of production: 25/11/2008
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:58965

Appendix VI – Castlegregory and habitat maps from the SDM (Delaney *et al*., 2013)

SITE 075 CASTLEGREGORY

The following individual site report should be read in conjunction with the main report (Delaney *et al*., 2013). Please note that CMP refers to the Coastal Monitoring Project (Ryle *et al*., 2009) and SDM refers to the Sand Dunes Monitoring Project (Delaney *et al*., 2013). Unless otherwise stated, the baseline maps refer to the habitat maps produced during the CMP. These baseline maps were revised, to account for discrepancies in the original survey, before comparisons were made with the habitat maps produced during the SDM (see section 2.3 in SDM main report). These revised maps are referred to as the revised baseline maps in the following text.

1 SITE DESCRIPTION

Castlegregory is a large site located approximately 12.5 km west of Tralee, Co. Kerry. The majority of the site is situated on the Magharees Peninsula, but it extends from here both east as far as Pointanrusheen, at the western limit of Derrymore Strand, and west as far as the townland of Cappateige. It forms the southern part of both Brandon Bay and Tralee Bay, with Magharees Peninsula dividing the two. Magharees Peninsula is a tombolo, which connects the Magharee Islands to the mainland. Seven Annex I sand dune habitats (* indicates a priority habitat) were recorded during the CMP: **1210 Annual vegetation of drift lines, 1220 Perennial vegetation of stony banks, 2110 Embryonic shifting dunes, 2120 Marram dunes (white dunes), *2130 Fixed dunes (grey dunes), 2170 Dunes with creeping willow** and **2190 Humid dune slacks** (Ryle *et al.,* 2009)**.** Other Annex I habitats associated with the sand dunes at Castlegregory include ***1150 Coastal lagoons, 1160 Large shallow inlets and bays, 1170 Reefs** and ***91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*).** The rare Annex II liverwort *Petalophyllum ralfsii* (Petalwort) has been recorded in the **2190 Humid dune slacks,** but it was not found during the SDM. Other noteworthy species include the Annex IV species *Epidalea calamita* (Natterjack Toad), Annex I bird species *Pyrrhocorax pyrrhocorax* (Chough), Annex V species *Rana temporaria* (Common Frog), and two rare hoverflies. In fact, Castlegregory supports the largest Irish breeding

population of Natterjack Toads (NPWS, 2003). Natterjack toad, Common Frog and Chough were observed during the SDM.

The site has two main uses: recreation and agriculture. The dunes at Castlegregory are located in an area of scenic beauty and the area is popular with tourists. There are numerous caravan parks within the vicinity of the site, as well as car parks. Access to the site is easy, with a network of roads in place. Several recreational activities take place in this area, including horse-riding and water sports. The site also provides pasture for cattle, with the majority of the site managed as commonage (Ryle *et al*, 2009).

2 CONSERVATION ASSESSMENTS

2.1 Overview

Castlegregory was surveyed between the 21st and 26th of August, and again on the 2nd September, 2011. Of the seven Annex I habitats recorded on the site during the baseline survey, six were recorded in 2011. The habitats found at Castlegregory in 2011 and the results of the conservation assessments are presented in Table 1. **1220 Perennial vegetation of stony banks** was not found in 2011. The conservation status of **1210 Annual vegetation of drift lines, 2110 Embryonic shifting dunes**, **2120 Marram dunes (white dunes)** and **2170 Dunes with creeping willow** were assessed as Unfavourable-Inadequate, while ***2130 Fixed dunes (grey dunes)** and **2190 Humid dune slacks** were assessed as Unfavourable-Bad. **2110 Embryonic shifting dunes** was not assessed during the CMP and therefore no trends could be established for this habitat.

Part of the site could not be visited due to the presence of a bull, but external views of the habitats indicated that little change had occurred since the baseline survey. The habitats which had been mapped there during the CMP were included in the SDM maps without changes, but marked as not surveyed. There was also difficulty in accessing some of the dune slacks because of livestock, and although mapping was carried out, there were constraints on placing monitoring stops.

Table 1. Conservation assessment results for all Annex I dune habitats surveyed at Castlegregory, Co. Kerry.

Habitat	Area	Structure & Functions	Future Prospects	Overall result
1210 Annual vegetation of drift lines	Favourable (Improving)	Unfavourable-Inadequate (Stable)	Unfavourable-Inadequate (Stable)	Unfavourable-Inadequate (Improving)
2110 Embryonic shifting dunes	Favourable	Unfavourable-Inadequate	Unfavourable-Inadequate	Unfavourable-Inadequate
2120 Marram dunes (white dunes)	Favourable (Stable)	Unfavourable-Inadequate (Deteriorating)	Unfavourable-Inadequate (Stable)	Unfavourable-Inadequate (Deteriorating)
*2130 Fixed dunes (grey dunes)	Unfavourable-Inadequate (Stable)	Unfavourable-Bad (Deteriorating)	Unfavourable-Bad (Deteriorating)	Unfavourable-Bad (Deteriorating)
2170 Dunes with creeping willow	Favourable (Stable)	Unfavourable-Inadequate (Deteriorating)	Unfavourable-Inadequate (Deteriorating)	Unfavourable-Inadequate (Deteriorating)
2190 Humid dune slacks	Unfavourable-Bad (Deteriorating)	Unfavourable-Inadequate (Deteriorating)	Unfavourable-Inadequate (Deteriorating)	Unfavourable-Bad (Deteriorating)

2.1.1 Area

The areas of Annex I sand dune habitats at Castlegregory are presented in Table 2. The sand dune habitats at Castlegregory are extensive, occupying a large area of commonage as well as fenced lands. Part of the system has been developed as a golf course, and this has been excluded from the site. There were some changes to the baseline areas presented on the original CMP maps. **2120 Marram dunes (white dunes)** and ***2130 Fixed dunes (grey dunes)** were extended to include areas adjacent to those originally included in the site where they appeared to have been present on the 2005 aerial survey. The area of **2170 Dunes with creeping willow** in the north of the site, just south of Kilshannig, was considered to have been overestimated as no creeping willow was found in part of the area mapped, therefore this part of the habitat was amended to ***2130 Fixed dunes (grey dunes).** The area of **2190 Humid dune slacks** was amended as slacks were found in areas previously mapped as ***2130 Fixed dunes (grey dunes)** and **2170 Dunes with creeping willow. 1220 Perennial vegetation of stony banks** was recorded during the CMP but was no longer present in 2011. The total area of the Annex I sand dune habitats at Castlegregory increased from the CMP to the SDM, and this was due to a small amount of accretion. Parts of the site mapped during the CMP could not be accessed because of the presence of a Bull. There was no indication that any habitat in these areas had been lost due to human activities so they were mapped as they were during the CMP and are included in Table 2.

Table 2. Areas of Annex I dune habitats originally mapped at Castlegregory during the baseline survey (Coastal Monitoring Project), the revised baseline areas and areas mapped during the Sand Dune Monitoring Project in 2011.

Habitat	Baseline survey (ha)	Revised baseline (ha)	Sand Dunes Monitoring Project (ha)
1210 Annual vegetation of drift lines	9.53	9.51	3.67
1220 Perennial vegetation of stony banks	0.06	0.06	0.00
2110 Embryonic shifting dunes	1.28	1.28	7.19
2120 Marram dunes (white dunes)	6.74	6.14	12.46
*2130 Fixed dunes (grey dunes)	225.69	282.93	279.89
2170 Dunes with creeping willow	45.75	29.20	38.58
2190 Humid dune slacks	29.79	32.29	27.60
Total	318.84	361.41	369.39

2.1.2 Structure and Functions

Structure and Functions were assessed for all six habitats recorded at Castlegregory during the SDM. Table 3 shows the results of the Structure and Functions assessment. **1210 Annual vegetation of drift lines, 2110 Embryonic shifting dunes, 2120 Marram dunes (white dunes)** and **2170 Dunes with creeping willow** each had one criterion fail, resulting in an Unfavourable-Inadequate Structure and Functions assessment. **2190 Humid dune slacks** were also assessed as Unfavourable-Inadequate due to two of its criteria failing, while ***2130 Fixed dunes (grey dunes)** were assessed as Unfavourable-Bad as four of its Structure and Functions criteria failed.

Table 3. Annex I sand dune habitats at Castlegregory for which Structure and Functions were assessed, with the number of monitoring stops, assessment criteria and the number of criteria that failed.

Habitat	No. monitoring stops	Total no. assessment criteria	No. failed criteria
1210 Annual vegetation of drift lines	4	6	1
2110 Embryonic shifting dunes	3	7	1
2120 Marram dunes (white dunes)	4	7	1
*2130 Fixed dunes (grey dunes)	16	11	4
2170 Dunes with creeping willow	8	10	1
2190 Humid dune slacks	8	11	2

2.1.3 Future Prospects

Impacts and activities recorded at Castlegregory are presented in Table 4. Impacts codes are assigned according to Ssymanck (2010). Cattle grazing was identified as a positive impact on ***2130 Fixed dunes (grey dunes), 2170 Dunes with creeping willow** and **2190 Humid dune slacks.** Mowing in ***2130 Fixed dunes (grey dunes)** was the only other positive impact recorded on the site. Rock armour, sand extraction and impacts related to recreation, such as horse-riding, trampling, camping, motorised vehicles and campfires were all recorded as common negative impacts, with most affecting more than one habitat. Natural erosion was the most commonly occurring neutral impact.

Table 4. Impacts recorded in Annex I sand dune habitats at Castlegregory in 2011. Source refers to whether the impact being scored originates inside or outside the Annex I habitat being assessed.

Habitat code	Impact code	Impact description	Intensity	Effect	Percent of habitat	Source
1210	C01.01.02	Sand extraction	High	Negative	5	Inside
1210	G01.03.02	Tractors	Medium	Negative	1	Inside
1210	G05	Campfires	High	Negative	1	Inside
1210	H05.01	Litter	Low	Negative	1	Inside
1210	J02.12.01	Rock armour	Medium	Negative	10	Outside
2110	G01.02	Horse riding, walking	Medium	Negative	1	Inside
2110	J02.12.01	Rock armour	Medium	Negative	15	Outside
2110	K01.01	Natural erosion	Medium	Neutral	80	Inside
2120	C01.01.02	Sand extraction	High	Negative	5	Inside
2120	G01.02	Horse riding, walking	Low	Negative	30	Inside
2120	J02.12.01	Rock armour	High	Negative	5	Outside
2120	K01.01	Natural erosion	Medium	Neutral	50	Inside
*2130	A02.01	Agricultural intensification	Medium	Negative	10	Inside
*2130	A03.02	Non intensive mowing	Medium	Positive	10	Inside
*2130	A04.02.01	Non intensive cattle grazing	Medium	Positive	80	Inside
*2130	A05.02	Stock feeding	High	Negative	1	Inside
*2130	G01.02	Horse riding, walking	Medium	Negative	5	Inside
*2130	G01.03.02	Off-road driving	Medium	Negative	5	Inside
*2130	G01.08	Recreational use (dune surfing)	High	Negative	5	Inside
*2130	G02.01	Golf course	Low	Neutral	5	Outside
*2130	G02.08	Camping	Low	Negative	1	Inside
*2130	G05.01	Trampling	High	Negative	5	Inside
*2130	G05.09	Fencing	Medium	Neutral	1	Inside
*2130	I01	Invasive non-native species	High	Negative	5	Inside
*2130	J02.12.01	Rock armour	High	Neutral	20	Outside
*2130	K01.01	Natural erosion	Medium	Neutral	5	Inside
2170	A02.01	Agricultural intensification	Low	Negative	50	Inside
2170	A04.02.01	Non intensive cattle grazing	Medium	Positive	65	Inside
2170	I01	Invasive non-native species	High	Negative	1	Outside
2170	J02.12.01	Rock armour	-	Neutral	0	Outside
2190	A04.02.01	Non intensive cattle grazing	Medium	Positive	75	Inside
2190	A04.03	Lack of grazing	Medium	Negative	25	Inside
2190	A05.02	Stock feeding	Medium	Negative	10	Inside
2190	G01.03.02	Off-road driving	High	Negative	1	Inside
2190	G05	Campfires	High	Negative	1	Inside
2190	G05.01	Trampling	Medium	Negative	15	Inside
2190	H05.01	Litter	Medium	Negative	1	Inside
2190	J02.12.01	Rock armour	-	Neutral	0	Outside

2.2 Annex I habitat assessments

The conservation status of the Annex I habitats at Castlegregory is discussed below. The present conservation status in 2011 is compared with the baseline status and if a habitat is not in Favourable status, the main reasons for the Unfavourable assessment are given. Areas recorded in 2011 are compared with the revised baseline areas. It should be borne in mind that natural processes such as erosion, deposition and succession are primary drivers of change on coastal habitats.

2.2.1 1210 Annual vegetation of drift lines

This habitat occurs in narrow strips along the sheltered coast east of the Magharees tombolo as well as on the eastern and western sides of the tombolo itself. It is mainly found on sandy substrate at Castlegregory.

Area

The area of **1210 Annual vegetation of drift lines** decreased from 9.51 ha during the CMP to 3.67 ha during the SDM. This was the result of natural processes of erosion and succession and did not appear to be linked to human activities. During the CMP, Area was assessed as Unfavourable-Inadequate because natural erosion and human activities had caused the beaches to be unstable. Area was assessed as Favourable (improving) during the SDM as human activities did not appear to have an impact on the presence of drift line vegetation.

Structure and Functions

All of the assessment criteria passed the Structure and Functions assessment except for the criterion assessing interference with the sediment dynamics. Sea defences have been put in place close to Fahamore and several references were made in the Dail to funding provided for rock revetments at the Magharees between 1990 and 2006 (Houses of the Oireachtas, 2002; Kildare Street, 2007)). It is not entirely clear where the revetments have been placed or upgraded in that period, but it is likely that particularly exposed sections of road south of Fahamore and at Magherabeg may have been targeted. The sea defences affect sediment deposition patterns. Where **1210 Annual vegetation of drift lines** develops on the strand in front of rock armour or revetments, as it has just south of Fahamore, the transitions to other sand dune habitats are interrupted and this has a negative effect on the natural processes of sand dune formation. There is also sand extraction at Garrahies, which is a direct threat to the substrate of the drift line vegetation there. During the CMP, Structure and Functions were assessed as Favourable on the basis of four monitoring stops, all of which were recorded close together at Aughacasla. The habitat was also present close to rock armour at Fahamore at that time,

and under the current methodology Structure and Functions would have been assessed as Unfavourable-Inadequate. Structure and Functions were assessed as Unfavourable-Inadequate (stable) during the SDM.

Future Prospects

Impacts recorded from **1210 Annual vegetation of drift lines** at Castlegregory included littering, campfires, driving, sand extraction and rock armour. All of these had a negative effect. During the CMP, no impacts were listed for the habitat, but Future Prospects were assessed as Unfavourable-Inadequate because of the effects of natural erosion and pressures associated with human activities. Future Prospects were assessed as Unfavourable-Inadequate (stable) during the SDM.

Conservation assessment

Although there was no change in the Structure and Functions and Future Prospects, which were assessed as Unfavourable-Inadequate during both the CMP and SDM, the assessment of Area improved from Unfavourable-Inadequate to Favourable. As a result, the conservation status of **1210 Annual vegetation of drift lines** at Castlegregory was assessed as Unfavourable-Inadequate (improving) during the SDM.

2.2.2 1220 Perennial vegetation of stony banks

1220 Perennial vegetation of stony banks was mapped during the CMP but was no longer found during the SDM. No conservation assessment could be carried out for this habitat in 2011. There is no indication the loss of habitat is related to human activities.

2.2.3 2110 Embryonic shifting dunes

During the CMP, **2110 Embryonic shifting dunes** were not assessed because they were present in small, fragmented patches. During the SDM, isolated patches of **2110 Embryonic shifting dunes** were distributed around the coast at Castlegregory and were well-developed in the sheltered eastern part of the site near Aughacasla and Camp.

Area

The area of **2110 Embryonic shifting dunes** increased from 1.28 ha during the CMP to 7.19 ha during the SDM due to accretion and succession. Area was assessed as Favourable during the SDM.

Structure and Functions

A single criterion failed in the Structure and Functions assessment, and this assessed interference with the sediment dynamics. The rock armour placed at Fahamore has prevented the normal habitat transitions between foredune habitats and ***2130 Fixed dunes (grey dunes)** or terrestrial habitats from developing. Structure and Functions were assessed as Unfavourable-Inadequate during the SDM.

Future Prospects

Walking and horse riding were recorded as a negative impact at Castlegregory, but affect only about 1% of the **2110 Embryonic shifting dunes**. Adjacent rock armour affects about 15% of the habitat. Erosion is considered to be a neutral impact as it is part of the natural processes affecting sand dune systems. Future Prospects were assessed as Unfavourable-Inadequate during the SDM.

Conservation assessment

Area was assessed as Favourable while Structure and Functions and Future Prospects were assessed as Unfavourable-Inadequate. The conservation status of **2110 Embryonic shifting dunes** at Castlegregory was assessed as Unfavourable-Inadequate.

2.2.4 2120 Marram dunes (white dunes)

Like the other foredune communities at Castlegregory **2120 Marram dunes (white dunes)** are fragmented in their distribution. They are absent from the most exposed parts of the site, where ***2130 Fixed dunes (grey dunes)** tend to front directly onto the beach.

Area

The area of **2120 Marram dunes (white dunes)** increased from 6.14 ha during the CMP to 12.46 ha during the SDM. There was no indication of anthropogenic loss in the habitat. Area was assessed as Unfavourable-Inadequate during the CMP because the habitat has eroded from much of the coast at Castlegregory. The erosion does not appear to be particularly associated with areas where leisure activities are most intense, and there is no evidence that man-made structures have affected the sediment transport in the bay. As natural erosion is not considered to be a negative factor under the current methodology, Area was assessed as Favourable (stable) during the SDM.

Structure and Functions

A single criterion failed in the Structure and Functions assessment. The natural sediment dynamics have been altered in two locations. Sand extraction was observed at the **2120 Marram dunes (white dunes)** in Garrahies and rock armour has been placed adjacent to the habitat near Fahamore. This rock armour appears to have been put in place or upgraded in recent years, judging from aerial photographs. During the CMP, Structure and Functions were assessed as Favourable, although it should be kept in mind that all of the stops were recorded from a patch of dunes at Stradbally. Structure and Functions were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Future Prospects

Recreational activities such as walking and horse riding, interference in the sediment dynamics and sand extraction all have a negative effect the **2120 Marram dunes (white dunes)**. During the CMP, Future Prospects were assessed as Unfavourable-Bad because of a combination of natural erosion and anthropogenic activities. Much of the natural erosion occurred in the absence of human activities. Impacts listed for the habitat included natural erosion and invasion by a species (*Convolvulus arvensis*). Only anthropogenic damage or loss would have been taken into account under the current methodology and Future Prospects would have been assessed as Unfavourable-Inadequate. Future Prospects were assessed as Unfavourable-Inadequate (stable) during the SDM.

Conservation assessment

Area was assessed as Favourable, while Structure and Functions and Future Prospects were assessed as Unfavourable-Inadequate during the SDM. The CMP assessments for Area and Future Prospects were altered to take into account changes in the methodology. Area would have been assessed as Favourable under the current methodology and Future Prospects would have been assessed as Unfavourable-Inadequate. Structure and Functions were assessed as Favourable during the CMP. The conservation status of **2120 Marram dunes (white dunes)** was assessed as Unfavourable-Inadequate (deteriorating) during the SDM as the Area and Future Prospects assessments have remained the same but Structure and Functions have declined from Favourable to Unfavourable-Inadequate.

*2.2.5 *2130 Fixed dunes (grey dunes)*

***2130 Fixed dunes (grey dunes)** form the most extensive habitat at Castlegregory. In parts, they are flat and somewhat damp: similar in character to areas described as ***21A0 Machairs** farther north on the west

coast. *Cuscuta epithymum, Asperula cynanchica* and *Spiranthes spiralis* are occasional**.**

Area

The area of ***2130 Fixed dunes (grey dunes)** decreased from 282.93 ha during the CMP to 279.89 ha during the SDM. This difference was mainly due to the extension of **2170 Dunes with creeping willow** into habitat previously mapped as ***2130 Fixed dunes (grey dunes).** There has been no obvious anthropogenic loss in the area of the habitat since the baseline survey. During the baseline survey, Area was assessed as Unfavourable-Inadequate because of erosion due to human and natural causes, and because of the encroachment of *Hippophae rhamnoides*. Under the current methodology, *Hippophae rhamnoides* is considered under the Structure and Functions assessment and natural erosion is not considered to be negative. However, anthropogenic loss has occurred at the site since designation. Analysis of aerial photographs shows an area of 0.28 ha has been lost since 1995, and this loss is the result of erosion and sand compaction related to driving, camping, parking and trampling in an area known as "the dumps". No improvement has occurred since the baseline survey and Area was assessed as Unfavourable-Inadequate (stable) during the SDM.

Structure and Functions

Four of the criteria failed in the Structure and Functions assessment. The criteria which failed assessed the number of positive indicator species, negative indicator species, presence of non-native species and damage due to disturbance. Although positive indicator species were generally frequent, only three positive indicator species were present at stop 15. This was the result of agricultural pressure. Negative indicator species were frequent, in particular *Senecio jacobaea* and *Lolium perenne*, which are also indicative of habitat alteration due to agricultural activities. The invasive, non-native species *Hippophae rhamnoides* occupies 10.73 ha, 4% of the total habitat area. The decision that this was sufficient to warrant a fail was based on expert judgement as the species is very well established and had severely altered the habitat where it occurred. There are trampled animal tracks through the site, but the most severe damage is associated with the activities of visitors, particularly at Magherabeg. During the CMP, Structure and Functions were assessed as Unfavourable-Inadequate because of the effects of agricultural activities. Seven of the 24 stops assessed failed (29.2%), and this would normally have resulted in an assessment of Unfavourable-Bad according to the CMP methodology. It is not clear why the assessment was ameliorated in this case. Structure and Functions were assessed as Unfavourable-Bad (deteriorating) during the SDM.

Future Prospects

Cattle grazing has a positive effect on 80% of the ***2130 Fixed dunes (grey dunes)** at Castlegregory, but there are some associated practices such as stock feeding and agricultural intensification which have a negative effect. Mowing was carried out close to the golf course, and this was recorded as a positive impact in the absence of cattle grazing in that area. Impacts associated with recreation including trampling, walking, horse riding, and driving on the dunes as well as general recreational use (dune surfing and digging) affect 26% of the site, although the driving is partly related to agricultural practices. Non-native species also have a negative impact, and the area of the habitat affected has increased by 1.34 ha since the CMP. Natural erosion has a neutral effect. Sea defences were considered to have a neutral effect as they have not affected the habitat directly or been placed in the habitat since it was designated, and they have the most serious effect on foredune habitats. During the CMP, negative impacts recorded for the habitat included mowing, agricultural intensification, overgrazing, quarries, houses, roads, golf course, camping and caravans, walking/horse riding, trampling and invasion by a species. Of these, mowing and the golf course were no longer considered to be having a negative impact in 2011. The Future Prospects of the habitat were assessed as Favourable because a management plan had been developed for the site. The positive effects of the management plan have not been realised in the meantime, partly due to difficulties owing to the complex ownership of the site. Future Prosects were assessed as Unfavourable-Bad (deteriorating) during the SDM.

Conservation assessment

Two of the three parameters were assessed as Unfavourable-Bad and the remaining one was assessed as Unfavourable-Inadequate. During the CMP, two of the parameters were assessed as Unfavourable-Inadequate while the remaining parameter was assessed as Favourable. The conservations status of ***2130 Fixed dunes (grey dunes)** at Castlegregory was assessed as Unfavourable-Bad (deteriorating) during the SDM.

2.2.6 2170 Dunes with creeping willow

Castlegregory contained the second largest area of **2170 Dunes with creeping willow** found during the SDM. *Cuscuta epithymum and Spiranthes spiralis* were found in this habitat. Part of the habitat at Magherabeg was present in a mosaic with **2190 Humid dune slacks**. The presence of a bull in the area prevented a more detailed approach to mapping, and the percent cover of each habitat within the mosaic was estimated from the edge of the habitat. This may have resulted in an overestimation of **2170 Dunes with creeping**

willow as it tends to occur at the edges of drying dune slacks. The dominant habitat in the mosaic was **2170 Dunes with creeping willow** with approximately 80% cover, while approximately 20% was composed of **2190 Humid dune slacks.** In the north of the site, the **2170 Dunes with creeping willow** is often relatively damp as the dunes form an undulating plane, similar to a ***21A0 Machairs** type habitat.

Area

The area of **2170 Dunes with creeping willow** increased from 29.20 ha during the CMP to 38.58 ha during the SDM (including a mosaic area described in the introduction to this section). This is due to part of the **2190 Humid dune slacks** habitat drying out, and because *Salix repens* has spread into areas previously mapped as ***2130 Fixed dunes (grey dunes**). There was no indication of loss due to human activities. During the CMP, Area was assessed as Favourable. Area was assessed as Favourable (stable) during the CMP.

Structure and Functions

One of the criteria failed in the Structure and Functions assessment, and this assessed the presence of negative indicator species. *Lolium perenne* and *Senecio jacobaea* were very common on the site, and at least one of the species was present in every stop. They never had a high cover within a stop, but their widespread occurrence suggests that the site may have been reseeded in the past. All of the other criteria passed. During the CMP, Structure and Functions were assessed as Favourable, Structure and Functions were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Future Prospects

Impacts recorded from the habitat included grazing as a positive impact and agricultural intensification as a negative impact. The presence of *Hippophae rhamnoides* adjacent to the **2170 Dunes with creeping willow** represented an external pressure. During the CMP, overgrazing and trampling (by livestock) were indicated as negative impacts but Future Prospects were assessed as Favourable because a management plan had been developed for the site. The positive effects of the management plan have not been realised in the meantime, partly due to difficulties owing to the complex ownership of the site. Future Prospects were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Conservation assessment

There was no change in the assessment of Area which was assessed as Favourable. However, Structure and Functions and Future Prospects were assessed as Favourable during the CMP and Unfavourable-Inadequate during

the SDM. The Conservation status of **2170 Dunes with creeping willow** at Castlegregory was assessed as Unfavourable-Inadequate (deteriorating).

2.2.7 2190 Humid dune slacks

Although one large dune slack in Magherabeg has dried out and developed into a mosaic dominated by **2170 Dunes with creeping willow, 2190 Humid dune slacks** are still extensive at Castlegregory. Within the habitat mosaic formed by **2170 Dunes with creeping willow** and **2190 Humid dune slacks,** the wetter dune slack habitat represents about 20% of the habitat. They are preferentially grazed by cattle, but despite the effects of poaching, the grazed **2190 Humid dunes slacks** are in better condition than the one which is in a fenced area of the site and is not grazed. **2190 Humid dune slacks** at Castlegregory are vital in the lifecycle of a population of Natterjack toad, a rare Annex IV species in Ireland and the only species of toad occurring here.

Area

The area of **2190 Humid dune slacks** has decreased from to 32.29 ha during the CMP to 27.60 ha during the SDM. This decrease is the result of the habitat drying out and developing into **2170 Dunes with creeping willow**. Although the drying out of dunes is a natural process, the drying out of an area of this size is considered to be surprisingly fast, especially on the west coast where the high rainfall maintains the groundwater table close to the surface. The slack which has dried out most quickly is close to a very large stand of *Hippophae rhamnoides*, and this is likely to have a drying effect on the dunes. There are also caravan parks in this part of the site, and these may be abstracting water from the dunes for use by visitors. Area was assessed as Favourable during the CMP. The loss since the CMP equates 14.52%, which is over 1% per year since it was surveyed for the CMP in 2005 and Area was assessed as Unfavourable-Bad (deteriorating).

Structure and Functions

Two criteria failed in the Structure and Functions assessment. At monitoring stop two, only two indicator species were present, so the habitat failed the positive indicator species assessment. This stop was located in a dune slack which was fenced off from grazers and had become rank. Farther north, disturbance due to campfires, poaching, trampling and driving was frequent, and this resulted in the criterion assessing damage due to disturbance failing. During the CMP, Structure and Functions were assessed as Favourable. Structure and functions were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Future Prospects

Cattle grazing was regarded as a positive impact at Castlegregory, although damage associated with stock feeding had a negative effect on 10% of the habitat. Other negative impacts included undergrazing, campfires, driving in the dunes, littering and trampling. During the CMP, Future Prospects were assessed as Favourable, although overgrazing and trampling were recorded. Future Prospects were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Conservation assessment

Area was assessed as Unfavourable-Bad, while Structure and Functions and Future Prospects were assessed as Unfavourable-Inadequate. During the CMP, all three parameters were assessed as Favourable. The conservation status of **2190 Humid dune slacks** at Castlegregory was assessed as Unfavourable-Bad (deteriorating).

3 DISCUSSION

3.1 *Hippophae rhamnoides*

Hippophae rhamnoides has formed dense thickets in several parts of the fixed dunes at Castlegregory. This is a highly invasive species on sand dunes in Ireland, which reduces plant species diversity and excludes rare species (Bingelli *et al*., 1992). It may also contribute to drying out dune slacks through evapotranspiration. The plant spreads quickly by suckering, and the expansion of the clumps at Castlegregory can clearly be seen on aerial photographs. The spread of *Hippophae rhamnoides* is of major concern.

3.2 Natterjack toad

Castlegregory is an important site for thre rare species, the Natterjack toad. Natterjack toads are dependant on dune slacks flooding to complete their life cycle. The drying out of a dune slack so that it is now primarily composed of **2170 Dunes with creeping willow** is of concern as it may indicate that the habitat as a whole at Castlegregory is undergoing accellerated succession and it's the long-term ability to support a toad population is under threat.

3.3 Leisure activities and disturbance

Recreational activities such as dune surfing, horse riding, camping and lighting campfires and trampling have caused considerable damage to parts of the sand dune habitats. Fragmentation due to trampling is particularly

noticeable close to the caravan parks and surfing locations, and disturbance is preventing large blow-outs from revegetating.

3.4 Agriculture

The locally elevated cover of *Lolium perenne* in parts of the site indicates that an agricultural grass seed mix was probably applied in the past. Reseeding with agricultural grass species is detrimental to diversity in sand dune habitats, and is often carried out as part of a suite of agricultural improvement measures including fertilisation. It was not clear when the reseeding may have taken place at Castlegregory. If no further reseeding or fertilisation takes place, the influence of this type of intensive management is likely to diminish over time. Cattle graze the dunes and the stocking density is not excessive. However, their preference for grazing the dune slacks has resulted in some poaching along tracks in wetter areas. Parts of the dune systems no longer appear to be managed as farmland and are not mown by the golf course, and these areas show signs of becoming rank.

4 REFERENCES

Delaney, A., Devaney, F.M, Martin, J.R. and Barron, S.J. (2013) Monitoring survey of Annex I sand dune habitats in Ireland. *Irish Wildlife Manuals*, No. XX. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

Houses of the Oireachtas (2002) http://oireachtasdebatesoireachtas.ie/debates%20authoring/debateswebpack.nsf/takes/dail2002032800063?opendocument. Accessed March 2013.

Kildare Street (2007) http://www.kildarestreet.com/wrans/?id=2007-04-05.1736.0. Accessed March 2013.

NPWS (1999) Natura 2000 Standard Data Form, Site 002070. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland. http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF002070.pdf. Accessed March 2013.

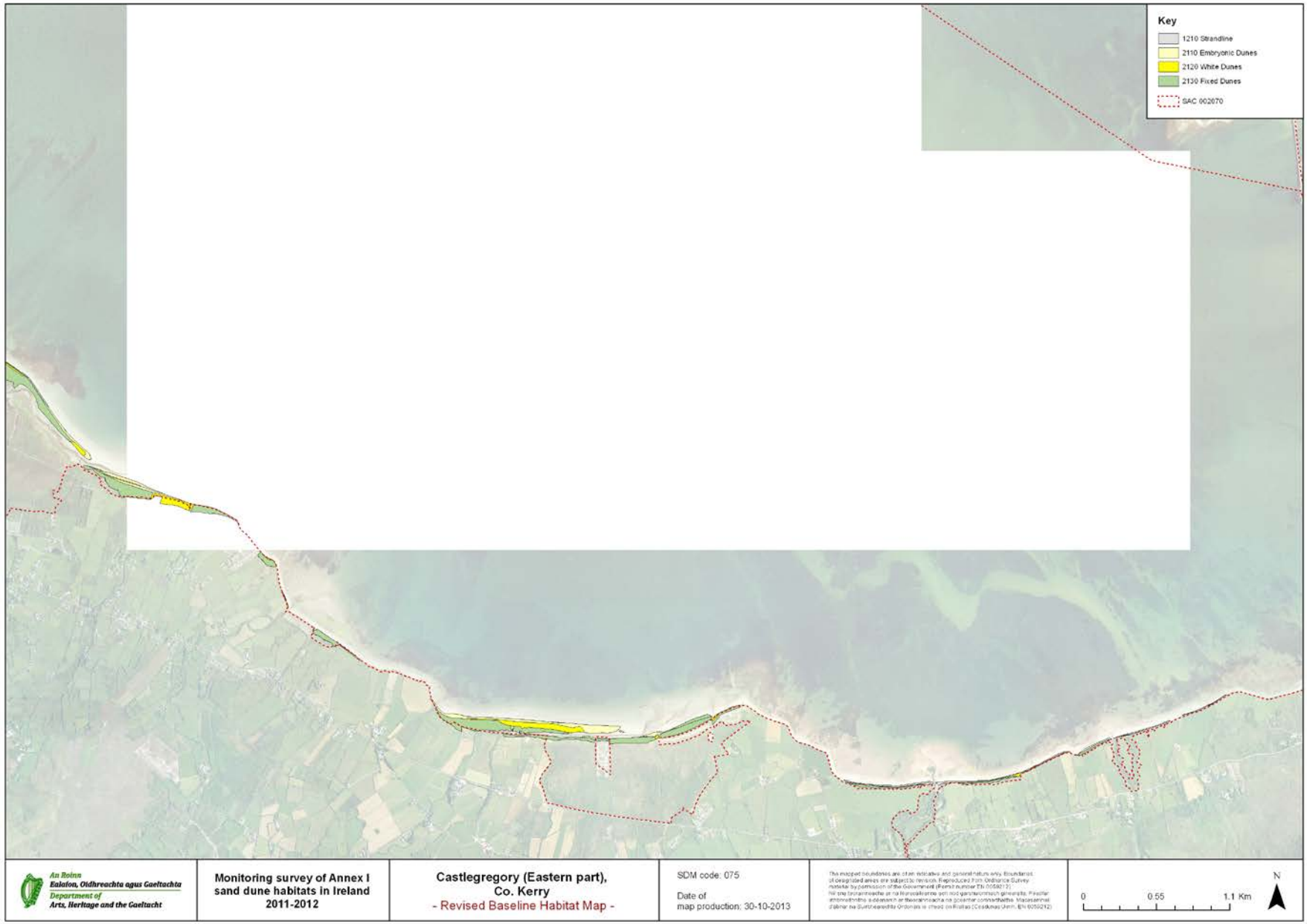
NPWS (2003) SAC site synopsis for SAC 002070 Tralee Bay and Magharees Peninsula, West to Cloghane. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

http://www.npws.ie/media/npwsie/content/images/protectedsites/sitesynopsis/SY002070.pdf. Accessed March 2013.

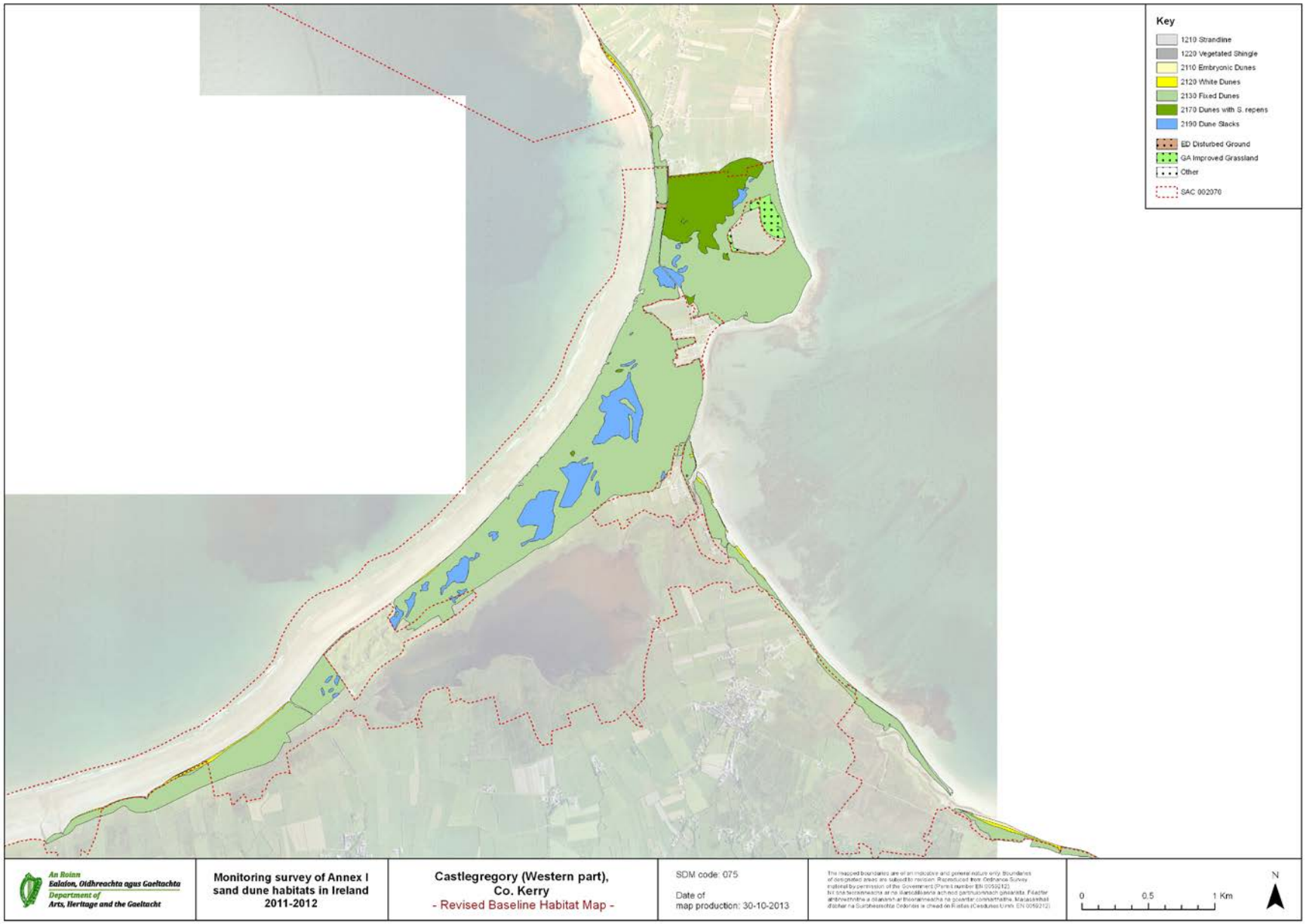
Ryle, T., Murray, A., Connolly, K. and Swann, M. (2009) Coastal Monitoring Project 2004-2006. A report submitted to the National Parks and Wildlife Service, Dublin.

Ssymank, A. (2010) Reference list threats, pressures and activities (final version). http://circa.europa.eu/Public/irc/env/monnat/library?l=/expert_reporting/work-package_____revision/sub-group_papers/pressures-threats(vm=detailed&sb=Title. Accessed March 2011.

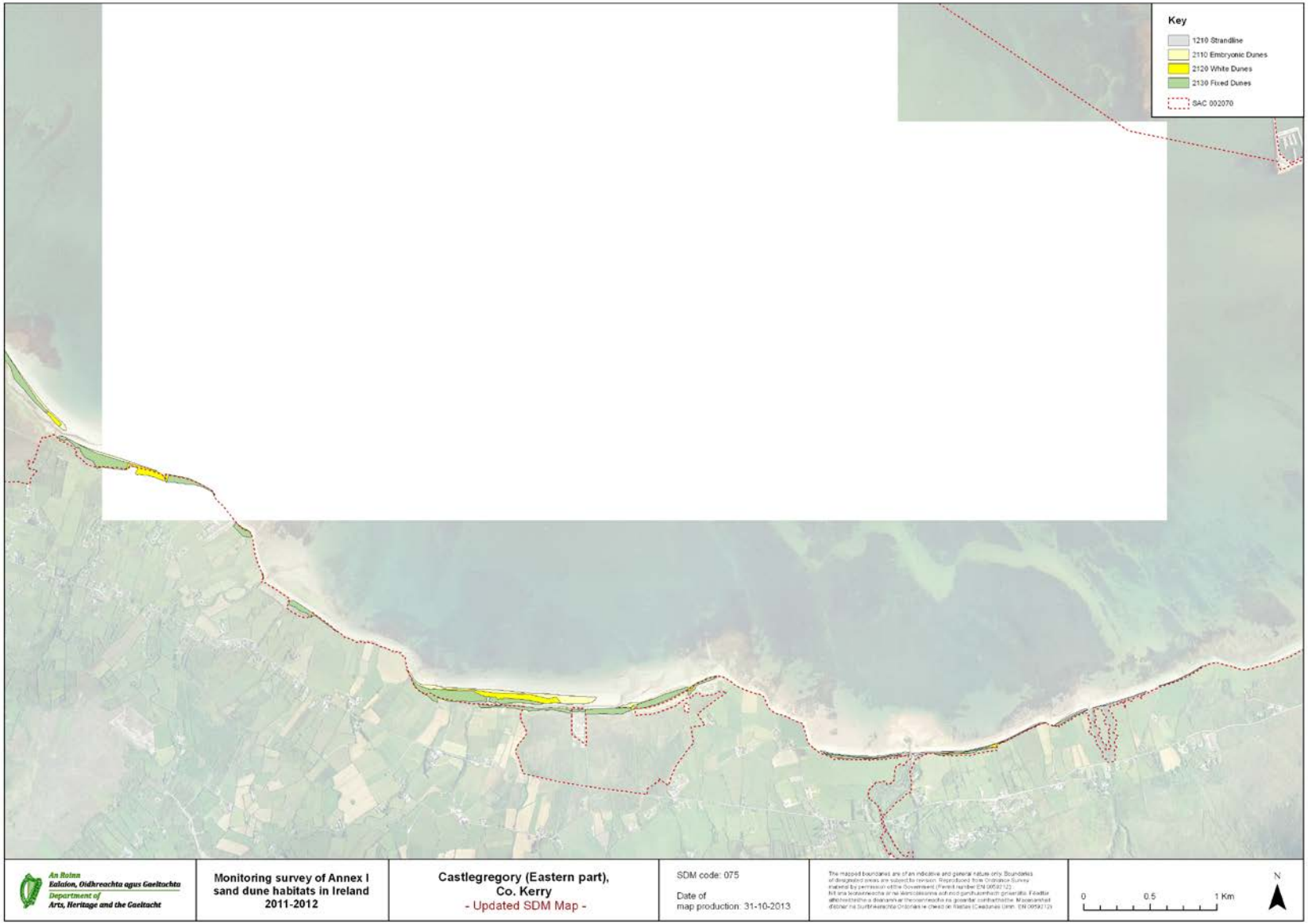
Revised baseline map (eastern section)



Revised baseline map (western section)



Updated SDM habitat map (eastern section)



Updated SDM habitat map (western section)