Kenmare River SAC (site code 2158)
Conservation objectives supporting document -coastal habitats

NPWS

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

Please note that this document should be read in conjunction with the following report: NPWS (2013). Conservation Objectives: Kenmare River SAC 002158. 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.

Kenmare River SAC is a long and narrow south-west facing bay situated in the south west of Ireland. It is a deep, drowned, glacial valley, approximately 12km wide at the mouth and 55km long. Dursey Island marks the south-west point. The bedrock is mainly Old Red Sandstone with Devonian-Carboniferous marine clastics on the south-west coast. It is deeply fissured in a NE/SW direction. The bedrock is emergent throughout the length of the bay. Exposure to prevailing winds and swells at the mouth of the river diminishes towards the head of the bay. Numerous islands and inlets along the length of the bay provide further areas of additional shelter in which a variety of habitats and unusual communities occur. Kenmare River has an exceptional complement of marine and terrestrial habitats associated with exposed coasts and ultra-sheltered bays.

Kenmare River SAC (site code: 2158) is designated for a range of coastal habitats including vegetated shingle, saltmarsh, sand dunes and sea cliffs. The following six coastal habitats are included in the list of qualifying interests for the site:

- Perennial vegetation of stony banks (1220)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330)
- Mediterranean salt meadows (*Juncetaliea maritimi*) (1410)
- Shifting dunes along the shoreline with *Ammophila arenaria* (2120)
- Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)
- Vegetated sea cliffs of the Atlantic and Baltic coasts (1230)

The first habitat represents vegetated shingle, the next two are saltmarsh habitats, the fourth and fifth are associated with sand dune systems, and the last represents vegetated sea cliffs. All six of these habitats are found in close association with each other.

Other Annex I habitats which are present but are not qualifying interests for the site include, 'Embryonic shifting dunes' and 'Humid dune slacks', which were recorded by the Coastal Monitoring Project (CMP) at the Derrynane sub-site (Ryle *et al*., 2009)

This backing document sets out the conservation objectives for the six coastal habitats listed above in Kenmare River 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). The distribution of known shingle sites in Kenmare River SAC is presented in Appendix I.

The NSBS visited the following 2 sub-sites within Kenmare River SAC:

1. Rossdohan Island (County Kerry)
2. Pallas Harbour (County Cork)

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. Rossdohan Island is rated a site of 'high interest' as it has a well-developed and diverse vegetation cover, including a superb cover of lichens, while Pallas Harbour is rated 'high interest' for the presence of good vegetation and its unusual tombolo formation.

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

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

The SMP surveyed, mapped and assessed a total of four sub-sites within Kenmare River SAC (McCorry & Ryle, 2009):

1. West Cove
2. Tahilla
3. Dinish
4. Dereen House

Additional saltmarsh sites occur at Sneem and Derrynane and in many of the sheltered areas from Derrynane Bay to Kilmakilloge Harbour (Curtis & Skeffington, 1998). The distribution of saltmarsh habitats within Kenmare River SAC is presented in Appendix II.

Several areas of estuarine saltmarshes have been identified within the Kenmare River SAC, however, the most extensive area of salt meadow is at Dereen House. Most of the saltmarshes occur over peat. The dominant type of saltmarsh present is Mediterranean Salt Meadows (MSM) and a suite of characteristic species occur at the site. Turf fucoids (dwarf ecotypes of the brown algae *Fucus* spp.

and *Ascophyllum* spp.) which are characteristic of western Irish Atlantic saltmarshes occur on exposed peat on the lower saltmarsh at Dereen House. Turf fucoids were also recorded at West Cove (McCorry & Ryle, 2009).

The site at West Cove consists of a small bay sheltered by a small headland called Knocknasullig. The bay contains several small rocky islands. Saltmarsh has developed at the head of this small bay. The saltmarsh development is quite variable and discontinuous along both the northern and southern shorelines. The variable topography along the shoreline divides the saltmarsh in to sections divided by exposed bedrock which forms part of the shoreline in places. The saltmarsh at this site is dominated by MSM which is typically dominated by a dense sward of sea rush (*Juncus maritimus*) that covers the shoreline. ASM is also present but is poorly developed and confined to several small patches (McCorry & Ryle, 2009).

The Dinish site is quite small and the saltmarsh development is reduced due to the topography of the shoreline. At this site there is some immature broadleaved woodland and scrub found along the shoreline and adjacent to the saltmarsh and there is also some development of wet heath/ wet grassland dominated by purple moorgrass (*Molinia caerulea*) in a transitional zone between the woodland and saltmarsh. Two main areas of ASM occur at this site in addition to several smaller patches (McCorry & Ryle, 2009).

The Tahilla saltmarsh site is located in a small enclosed bay that is connected to Conngar Harbour to the east and is sheltered from the main bay by a small outcrop of land. The small outcrop of land also encloses Drongawn Lough to the south west which is an enclosed lagoon and is an SAC in its own right (site code 2187).

As part of the SMP detailed individual reports and habitat maps were produced for each of the four sub-site and these are included in a set of Appendices to this document (Appendix III, to VI). The conservation objectives for the saltmarsh habitats in Kenmare River SAC are based on a combination of the findings of the individual reports for each of these sub-sites. There are additional areas of saltmarsh known to be present within the site, however, it is estimated that the four sub-sites as surveyed by the SMP represents approximately 54% of the total area of saltmarsh within Slaney River Valley SAC.

The targets set for the **sand dune habitats** are based primarily on the results of the Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009) and this document should be read in conjunction with that report. As part of the Coastal Monitoring Project a detailed individual report and habitat map were produced for one sub-site (Derrynane) and this is included in a set of Appendices to this document (Appendix VII).

The Derrynane site is located within the Derrynane National Park, near the village of Caherdaniel and supports embryonic shifting dunes, shifting dunes along the shoreline with *Ammophila arenaria*, fixed

coastal dunes as well as humid dune slacks. Notable species at this site include the Annex II protected mollusc *Vertigo angustior* which has been recorded from the fixed dunes and Natterjack toad (*Epidalea calamita*) which was re-introduced to the site in the 1990s. Another notable species the Kerry Lily (*Simethis planifolia),* a species listed in the Flora (Protection) Order 1999 occurs in the coastal heath within the SAC.

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

The targets set for **vegetated sea cliffs** is based on the findings of the Irish Sea Cliff Survey (ISCS) (Barron *et al.,* 2011) and this document should be read in conjunction with that report.

The distribution of vegetated sea cliffs within Kenmare River SAC is presented in Appendix VIII. The ISCS identified and carried out a detailed assessment as per the methodology outlined in Barron *et al*. (2011). This included dividing the cliff length into a series of sections to reflect the variation within the site and to give a more accurate measurement for area. This was carried out for the following eight cliff sub-sites:

1. Lamb's Head
2. Coomatloukane East
3. Coolmatloukane West
4. Reeneargh
5. Dog's Bay to Kilcatherine Point
6. Cod's Head
7. Garnish Point and Crow Head
8. Dursey Island

One of the sub-sites at Dursey Island was surveyed in the field by the ISCS and assessed using remote survey methodology (Barron *et al*., 2011).

An additional seven sites were identified by the ISCS from an examination of aerial photographs but these were not examined in any detail other than to record the total cliff length. These are referred to as undocumented sites and include:

1. Rossdohan Island, Co. Kerry
2. Ardea, Co. Kerry
3. Loughaunacreen, Co. Kerry
4. Carrignalour, Co. Kerry
5. Eyeries North, Co. Cork

6. Gortgarriff, Co. Cork
7. Eyeries South, Co. Cork

The conservation objective for the vegetated sea cliff habitat within the entire SAC is extrapolated from Barron *et al*, (2011) and the sea cliff database, which was produced as part of that project. It is estimated that the sub-site surveyed by the ISCS (Dursey Island) represents approximately 13.82% of the total length of vegetated sea cliffs within Kenmare River SAC.

2 Conservation Objectives

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

3 Perennial vegetation of stony banks

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

The Rossdohan Island site is a pronounced spit at Rossdohan Harbour. It is described as a vegetated shingle spit with excellent vegetation and lichen cover. The substrate is stony and exposure is moderate to high. The habitat is associated with intertidal shingle, rocky shore and saltmarsh.

At Pallas Harbour the site is classified as a vegetated shingle tombola/spit. The site is used as a launching area for an aquaculture operation. The substrate is stony and the site is exposed. The shingle is associated with intertidal shingle and rocky shore (Moore & Wilson, 1999).

3.1 Overall Objective

The overall objective for ‘perennial vegetation of stony banks’ in Kenmare River 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 Kenmare River SAC is unknown. The National Shingle Beach Survey recorded vegetated shingle spit from two sub-sites: Pallas Harbour and Rossdohan Island, but did not map the extent (Moore & Wilson, 1999).

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

3.3 Range

3.3.1 Habitat distribution

The distribution of known shingle sites is presented in Appendix I.

The coastline of peninsular Kerry, whilst predominantly composed of rocky cliffs, also affords some good shingle beaches of which Rossdohan Island is a well vegetated spit (Moore & Wilson, 1999).

At the Rossdohan Island sub-site there is a broad shingle spit with excellent vegetation and lichen cover. At the Pallas Harbour sub-site the vegetated shingle spit links the small island to the mainland (tombolo).

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.

The shingle beaches within the Kenmare River SAC appear to be functioning naturally, with no artificial restrictions to beach dynamics (Moore & Wilson, 1999).

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.

The target is to maintain, or where necessary restore, 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.

At the Rossdohan Island sub-site the vegetated shingle is associated with intertidal shingle, rocky shore as well as saltmarsh. The vegetated shingle at the Pallas Harbour sub-site is also associated with intertidal shingle and rocky shore.

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

3.4.3 Vegetation composition: typical species & sub-communities

The degree of exposure, as well as the coarseness and stability of the substrate determines species diversity. The shingle at Kenmare River is known to support a typical flora for this habitat.

The dominant vegetation of the shingle beaches within the SAC consists of typical shingle species as well as species typical of more stable shingle. At Rossdohan Island species present include kidney vetch (*Anthyllis vulneraria*), thrift (*Armeria maritima*), sea beet (*Beta vulgaris* ssp. *maritima*), rock samphire (*Crithmum maritimum*), wild carrot (*Daucus carota*), red fescue (*Festuca rubra*), common cleavers (*Galium aparine*), ivy (*Hedera helix*), cat's-ear (*Hypochaeris radicata*), birds foot trefoil (*Lotus*

corniculatus), long leaved plantain (*Plantago lanceolata*), sea plantain (*Plantago maritima*), willow species (*Salix* species), stonecrops (*Sedum* species), curled dock (*Rumex crispus*), bramble (*Rubus fruticosus*), sea mayweed (*Tripleurospermum maritimum*), and gorse (*Ulex europaeus*) (Moore & Wilson, 1999). Lichens are very well established. The vegetation on the upper ridge is very stable, as indicated by some of the above species.

At the Pallas Harbour sub-site, the vegetation cover is also good and lichens are present. Species present include thrift (*Armeria maritima*), scurvygrass (*Cochlearia officinalis*), rock samphire (*Crithmum maritimum*), wild carrot (*Daucus carota*), red fescue (*Festuca rubra*), common cleavers (*Galium aparine*), ivy (*Hedera helix*), ribwort plantain (*Plantago lanceolata*), common ragwort (*Senecio jacobaea*), groundsel (*Senecio vulgaris*), sheeps sorrel (*Rumex acetosella*), curled dock (*Rumex crispus*), sea mayweed (*Tripleurospermum maritimum*) and gorse (*Ulex europaeus*).

At both the Rossdohan Island and Pallas Harbour sub-sites, lichens were recorded and are an indication of stabilisation of the shingle. Both sub-sites were rated of 'high interest', owing to the quality of the vegetation present as well as the unusual formation of the Pallas Harbour spit.

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 considered to be typical of the habitat (e.g. *Pteridium aquilinum*).

The negative indicator species common ragwort (*Senecio jacobaea*) was recorded in the vegetated shingle habitat at Pallas Harbour and Rossdohan Harbour by the NSBS (Moore & Wilson 1999). The NSBS also recorded rosebay willowherb (*Chamerion angustifolium)* and bramble (*Rubus fruticosus*) at the Rossdohan sub-site.

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

The second two habitats (in bold) are listed as a Qualifying Interests for Kenmare River SAC. The last habitat is restricted in its distribution to sites in the southeast of the country.

The distribution of saltmarsh habitats within Kenmare River SAC is presented in Appendix II. The SMP surveyed, mapped and assessed the following four saltmarsh sub-sites within the SAC (McCorry & Ryle, 2009):

1. West Cove (Appendix III)
2. Tahilla (Appendix IV)
3. Dinish (Appendix V)
4. Dereen House (Appendix VI)

These sub-sites all support fringe-type saltmarshes that are underlaid by a peaty substrate.

4.1 Overall Objectives

The overall objective for 'Atlantic salt meadows' in Kenmare River SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Mediterranean salt meadows' in Kenmare River 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). 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 Kenmare River was produced based on the findings of the SMP (McCorry & Ryle, 2009) and is presented in Appendix II. A total of 14.752ha of saltmarsh habitat was mapped by the SMP within the SAC and an additional 9.364ha of potential saltmarsh habitat was identified using aerial photographs, to give a total estimated area of 24.116ha for the SAC. Of this potential saltmarsh, it is estimated that 2.232ha represents Atlantic salt meadow and 7.132ha represents Mediterranean salt meadows. Future groundtruthing may lead to an adjustment of these figures.

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

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

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

Sub-site	**Total area (ha) of ASM (excluding mosaics) from SMP**	**Total area (ha) of ASM within SAC boundary (including mosaics)**
Dereen House	0.748	0.265
Dinish	0.302	0.068
Tahilla	0.073	0.010
West Cove	0.246	0.078
Total	**1.369**	**0.421**
Potential habitat	2.232	2.232
Total	**3.601**	**2.653**

In view of the fact that all sub-sites were rated as 'Favourable' for extent by the SMP (McCorry and Ryle, 2009), the target is that the area of Atlantic salt meadows should be stable or increasing, subject to natural processes, including erosion and succession.

Sub-site	**Total area (ha) of MSM (excluding mosaics) from SMP**	**Total area (ha) of MSM within SAC boundary (including mosaics)**
Dereen House	9.021	8.927
Dinish	0.344	0.035
Tahilla	2.066	0.267
West Cove	1.952	1.539
Total	**13.383**	**10.768**
Potential habitat	7.132	7.132
Total	**20.515**	**17.90**

In view of the fact that all sub-sites were rated as 'Favourable' for extent by the SMP (McCorry and Ryle, 2009), the target is that the area of Mediterranean salt meadows 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 Derreen House. Most occur over peat and MSM is the dominant saltmarsh habitat (McCorry & Ryle, 2009).

The distribution of each habitat at each sub-site can be found in the Appendices at the end of this report (Appendices III to VII).

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 Kenmare River 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.

The target is to maintain, or where necessary 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.

At the Dinish sub-site the extent of the MSM habitat is too small for significant development of typical saltmarsh creeks, although there are some low channels present (McCorry & Ryle, 2009).

The MSM topography at the Tahilla sub-site is poorly developed and there are few salt pans and creeks within the vegetation at the site (McCorry & Ryle, 2009).

At the West Cove sub-site, the ASM topography was poorly developed and this is typical of such small patches of habitat. The MSM topography at this site is also generally poorly developed and only small salt pans are present which again is typical of relatively small saltmarshes (McCorry & Ryle, 2009).

At the Dereen House sub-site the ASM topography is poorly developed with few typical saltpans present. Within the MSM at this sub-site the underlying topography is variable and the vegetation changes from channels to mounds and there are some deep artificial drainage channels as well as natural drainage channels in places. Typical salt pans are quite rare (McCorry & Ryle, 2009).

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.

At the Dereen House sub-site the main part of the saltmarsh surrounds a small partially enclosed bay by a small waterfall or narrow tidal race. The main saltmarsh has developed in the upper part of the tidal range and is only covered by the higher spring tides. The typical upper saltmarsh communities, therefore predominate around the enclosed section and there is no development of typical mid marsh or lower marsh vegetation at this site.

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. Mediterranean salt meadows is the dominant saltmarsh habitat at Kenmare River SAC where it occurs in a mosaic with 'Atlantic 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.

At the West Cove sub-site there is natural vegetation succession along a landward gradient from typical MSM to patches of common reed (*Phragmites australis*) and sea club rush (*Bolboschoenus maritimus*) along the drains and then to a brackish wet grassland community dominated by purple moor grass (*Molinia caerulea*) but containing hollows with saltmarsh species such as sea plantain (*Plantago maritima*), saltmarsh rush (*Juncus gerardii*) and common scurvy grass (*Cochlearia officinalis*) (McCorry & Ryle, 2009)

At the Dereen House sub-site, a notable feature is the natural successions in places along a landward gradient from MSM to transitional brackish wet grassland to wet grassland then to scrub and then to developing mature wet woodland dominated by alder (*Alnus glutinosa*). Elsewhere at this sub-site there are subtle changes from MSM vegetation to adjacent wet grassland or blanket bog vegetation. While in the south western section of this sub-site there is some typical saltmarsh zonation with ASM in the lower zone and MSM developing in the upper zone and further zonation from typical ASM or

MSM stands to stands of sea club-rush (*Bolboschoenus maritimus*) in this section. There is also some transition to non-Annex I saltmarsh vegetation dominated by common couch (*Elytrigia repens*) and containing spear-leaved orache (*Atriplex prostrata*) (McCorry & Ryle, 2009).

At the Tahilla sub-site, some zonation of different species was noted and there is some development of a transitional brackish zone along the upper boundary of the saltmarsh with a mixture of purple moor grass (*Molinia caerulea*) and sea rush (*Juncus maritimus*) (McCorry & Ryle, 2009).

At the Dinish sub-site there is some transition from MSM to other saltmarsh vegetation dominated by common reed (*Phragmites australis*). There is also mosaic of ASM and MSM present (McCorry & Ryle, 2009).

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 main area of the Dinish sub-site is not grazed regularly although cattle graze the adjacent area of immature woodland, scrub and wet grassland (McCorry & Ryle, 2009).

At the Tahilla sub-site, grazing has little or no measurable impact on the saltmarsh habitats (McCorry & Ryle, 2009).

At the Dereen sub-site, a small portion of the saltmarsh habitat with a light intensity. The site is also grazed by deer and there are frequent deer tracks through the saltmarsh in places (McCorry & Ryle, 2009).

At the West Cove sub-site, some saltmarsh along the southern side of the bay is grazed by cattle, as is the saltmarsh west of the bridge. There is some localised heavy poaching in places but this only affects a minor area. Much of the remaining saltmarsh has not been regularly grazed but may have been grazed in the past. The sward height in the MSM of this sub-site is quite high between 0.5-1m high (McCorry & Ryle, 2009).

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

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. At the West Cove sub-site there is some localised poaching which only affects a small area (McCorry & Ryle, 2009)..

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 Kenmare River area.

Typical species		
Lower marsh	**Low-mid marsh**	**Mid-upper marsh**
Salicornia spp. *Suaeda maritima* *Puccinellia maritima* *Aster tripolium*	*Puccinellia maritima* *Triglochin maritima* *Plantago maritima* *Atriplex portulacoides* *Aster tripolium* *Spergularia* sp. *Suaeda maritima* *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

Turf fucoids (dwarf eco-types of the brown algae *Fucus* spp. and *Ascophyllum* spp.), which are characteristic of western Irish Atlantic saltmarshes, were recorded in the ASM at West Cove and Dereen House sub-sites (McCorry & Ryle, 2009).

4.4.8 Vegetation structure: negative indicator species

There are no negative indicator species recorded on the saltmarshes within Kenmare River SAC (McCorry & Ryle, 2009) and common cordgrass (*Spartina anglica*) has not been recorded in this part of the country (Preston *et al*., 2002).

The aim is that negative indicators should be absent or under control. As this would represent a new site for *Spartina*, the current target is that this species should remain absent.

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) *

Four dune habitats were recorded by Ryle *et al*. (2009) from Derrynane Dunes (the only dune system within this SAC) but only the two habitats indicated in bold above are listed as Qualifying Interests for Kenmare River SAC. These habitats include mobile areas at the front as well as more stabilised parts

of dune systems. An area of 1.007ha of embryonic dunes and 0.102ha of humid dune slacks were also recorded during the CMP (Ryle *et al*., 2009).

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 than in the embryonic dunes, 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 refer 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).

All of 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.

Detailed descriptions from the Coastal Monitoring Project (Ryle *et al.,* 2009) of each sand dune habitat found at Derrynane are presented in Appendix VII. A total of 23.184ha of sand dune habitat was

mapped within the Kenmare River SAC, of which 22.07ha represents habitats that are listed as qualifying interests for this particular site.

5.1 Overall objectives

The overall objective for 'Shifting dunes along the shoreline with *Ammophila arenaria* (white dune)' in Kenmare River SAC is to 'maintain the favourable conservation condition'.

The overall objective for 'Fixed coastal dunes with herbaceous vegetation' in Kenmare River 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.

5.2 Area

5.2.1 Habitat extent

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. A baseline habitat map was produced for the sand dune habitats in Kenmare River SAC during the Coastal Monitoring Project (CMP) (Ryle *et al*., 2009). This map is included with the individual site reports in Appendix II at the end of this document. The total areas of each sand dune habitat within the SAC as estimated by Ryle *et al*. (2009) are presented in the second column of the following table. These figures were subsequently checked and adjusted to take into account some overlapping polygons and mapping errors. The adjusted figures are presented in the final column.

Habitat	**Total area (ha) of habitat from CMP**	**Total area (ha) of habitat within SAC boundary**
Shifting dunes along the shoreline with *Ammophila arenaria*	1.667	1.667
Fixed coastal dunes with herbaceous vegetation	22.075	20.408
Total	**23.742**	**22.075**

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

5.3 Range

5.3.1 Habitat distribution

The distribution of sand dune habitats at Derrynane as mapped by Ryle *et al.* (2009) is presented in Appendix VII.

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

5.4.1 Physical structure: functionality and sediment supply

Coastlines naturally undergo a constant cycle of erosion and accretion. There are two main causes of erosion: (a) those resulting from natural causes and (b) those resulting from human interference. Natural causes include the continual tendency towards a state of equilibrium between coasts and environmental forces, climatic change (particularly an increase in the frequency of storms or a shift in storm tracks), relative sea level rise and natural changes in the sediment supply. Human interference is usually associated with changes in the sediment budget, either directly, through the removal of beach or inshore sediment, or indirectly, by impeding or altering sediment movement. It is important to recognise that the process of coastal erosion is part of a natural tendency towards equilibrium. Natural shorelines attempt to absorb the energy entering the coastal zone by redistributing sediment.

Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Sediment supply is especially important in the embryonic dunes and mobile dunes, as well as the strandline communities where accumulation of organic matter in tidal litter is essential for trapping sand and initiating dune formation. The construction of physical barriers such as sea defences can interrupt longshore drift, leading to beach starvation and increased rates of erosion. Sediment circulation and erosion also has a role to play in the more stabilised dune habitats. Cycles of erosion and stabilisation are part of a naturally functioning dune system, where the creation of new bare areas allows pioneer

species and vegetation communities to develop, thus increasing biodiversity. The construction of physical barriers can interfere with the sediment circulation by cutting the dunes off from the beach resulting in fossilisation or over-stabilisation of dunes.

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

5.4.2 Vegetation structure: zonation

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

Derrynane dunes support a range of dune habitats. In addition to the qualifying interest habitats (shifting dunes with *Ammophila arenaria* and fixed dunes), embryonic shifting dunes and humid dune slacks were also recorded by the CMP (Ryle *et al*., 2009). The dune habitat grades into wet woodland and mature oak woodland (Ryle *et al*., 2009).

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

5.4.3 Vegetation structure: bare ground

This target applies to fixed dunes. It does not apply to the other habitats present where high levels of bare sand are a natural component of the habitat. In the fixed 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 including invertebrates, helping to increase biodiversity.

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

5.4.4 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.

5.4.5 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).

A large portion of the fixed dunes at Derrynane have been fenced off to control grazing and the overall impact has been positive, resulting in high species diversity and a fixed dune mosaic which reflects the drainage, topography and management of the site (Ryle *et al*., 2009).

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

5.4.6 Vegetation composition: typical species & sub-communities

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

Derrynane supports a characteristic dune flora, details of which can be found in the site report from the CMP (Ryle *et al.,* 2009) which is included in Appendix VII.

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

5.4.7 Vegetation composition: negative indicator species

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

The main invasive species identified in Gaynor (2008) were bracken (*Pteridium aquilinum)* and sea buckthorn (*Hippophae rhamnoides)*. The invasion of non-native species compromises the typical plant community structure. Bracken (*Pteridium aquilinum)* is becoming increasingly dominant, particularly where sites have been abandoned or where grazing levels have been significantly reduced. The vegetation retains many elements of the original vegetation cover, but there is a reduction in biodiversity. As the canopy becomes taller and ranker, many of the low-growing species disappear. In this case, the vegetation is treated as a sub-community of the original community that was invaded. This is always the case unless the original vegetation cover has been completely destroyed, as can happen with *H. rhamnoides*, which can form dense impenetrable thickets.

Negative indicator species such as common ragwort (*Senecio jacobaea*) and perennial rye grass (*Lolium perenne*) were recorded by the CMP in fixed dunes at the Derrynane site but were not extensive (Ryle *et al*., 2009).

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

5.4.8 Vegetation composition: scrub/trees

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

At Derrynane, a small number of stunted shrubs of ash (*Fraxinus excelsior*) were recorded from the fixed dunes, and a small patch of gorse (*Ulex europaeus*) scrub was noted within the fixed dune area. Larger areas of scrub vegetation encircle areas of the fixed dune, particularly adjacent to large rock outcrops near the main strand carpark (Ryle *et al*., 2009).

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

6 Vegetated sea cliffs

Sea cliffs can be broadly divided into two categories: hard (or rocky) cliffs and soft (or sedimentary) cliffs, both of which are covered by Annex I habitat 'vegetated sea cliffs of the Atlantic and Baltic coasts'. Hard cliffs are composed of rocks such as limestone, sandstone, granite or quartzite which are hard and relatively resistant to erosion. Soft cliffs are composed of softer rock such as shale or unconsolidated material such as glacial till. Vegetation of hard sea cliffs in exposed situations exhibits a strong maritime influence and is relatively stable. Soft cliff habitats are more prone to slope failure which results in the presence of fast-colonising pioneer species.

Defining the limits of what constitutes a sea cliff is problematic and a number of different interpretations have been used in the past (Fossitt, 2000; Commission of the European Communities, 2003; JNCC, 2004; Browne, 2005). In order to address any inconsistencies, the following definition for sea cliffs was developed and used during the Irish Sea Cliff Survey (Barron *et al*., 2011):

"A sea cliff is a steep or vertical slope located on the coast, the base of which is in either the intertidal (littoral) or subtidal (sublittoral) zone. The cliff may be composed of hard rock such as basalt, or of softer substrate such as shale or boulder clay. Hard cliffs are at least 5m high, while soft cliffs are at least 3m high. The cliff top is generally defined by a change to an obvious less steep gradient. In some cases the cliff may grade into the slopes of a hillside located close to the coast. In these cases the cliff is defined as that part of the slope which was formed by processes of coastal erosion, while the cliff top is where there is the distinct break in slope. Both the cliff and the cliff top may be subject to maritime influence in the form of salt spray and exposure to coastal winds. A cliff can ascend in steps with ledges, and the top of the cliff is taken to occur where erosion from wave action is no longer considered to have been a factor in the development of the landform. The cliff base may be marked by a change in gradient at the bottom of the cliff. Where the base is exposed it can be characterised by scree, boulders, a wave-cut platform or sand, among other substrates. During this survey where cliffs occur within the subtidal zone the base was considered to be the high water mark. A cliff is considered to have reached its end point where it is no longer over 5m high (hard cliffs) of 3m high (soft cliffs), or no longer has a steep slope. To be considered in this study, a cliff had to be a minimum of 100m in length. Sea cliffs may support a range of plant communities such as grassland, heath, scrub and bare rock communities, among others."

Cliffs are known to occur along the coastline from Lambs Head in Co. Kerry to Dursey Island in Co. Cork. Both hard and soft cliffs have been noted in this SAC (Browne, 2005; Barron *et al.,* 2011). However, it is estimated that over 90% of the cliffs are of the hard type.

The sea cliffs in this SAC are also important for sea bird colonies particularly Fulmar, Great Black-backed gull, Lesser Black-backed gull, Black Guillemot, Razorbill and Herring Gull. Choughs also nest within the site (Lloyd, 1982).

6.1 Overall Objective

The overall objective for 'vegetated sea cliffs of the Atlantic and Baltic coasts' in Kenmare River SAC is to 'Maintain favourable conservation condition'. The objective is based on an assessment of the current condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings, (a) Area, (b) Range and (c) Structure and Functions.

6.2 Area

6.2.1 Habitat extent

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

The distribution of vegetated sea cliffs as identified during the Irish Sea Cliff Survey (ISCS) (Barron *et al*., 2011) is shown on a map in Appendix VIII

The Sea cliffs in Kenmare River SAC are well distributed throughout the Kenmare River SAC site and are best developed along the south-western shore of the Lamb's Head Peninsula, where the sandstone cliffs can reach heights in excess of 50m (i.e. to the east of Illaunaweelaun) (Browne, 2005; Barron *et al*., 2011).

As cliffs are linear features on maps, their extent is measured in kilometres rather than hectares, as you would with other habitats. During the ISCS (Barron *et al*., 2011), each cliff was divided in to sections based on physical characteristics and vegetation cover. Breaks (i.e. non-cliff areas) of between 80m and 500m along a length of cliff were discounted from the calculations. The total length of the cliff sections within each sub-site in Kenmare River SAC is presented in the following table. The area of each cliff that is located within the SAC boundary is also presented.

There are a number of differences in the sets of figures below. Most of the differences are explained by the fact that the ISCS mapped the total sea cliff resource at the site and not all of the sea cliff mapped is contained within the SAC boundary. In addition, the county boundary line was used to draw the line for the ISCS, while a different mapping dataset was used to draw the SAC boundary. As a result the length of cliff inside the SAC boundary may be underestimated. The total length of cliff sections for the ISCS sites was 112.2km (i.e. 3.8km + 108.4km). However when, this dataset was clipped to the SAC boundary 76.0km was included in the boundary. However in reality this figure is likely to be higher as a result of these mapping anomalies.

Site name	Total area/length (km) of undocumented sea cliff from ISCS	Total area/length (km) of sea cliff sections assessed by ISCS	Total area/length (km) of sea cliff within SAC boundary
Lamb's Head		4.416	4.4
Coomatloukane East		1.869	0.5
Coolmatloukane West		0.561	0.5
Reenearagh		0.498	0.5
Dogs Bay to Kilcatherine Point		23.183	17.3
Cod's Head		29.662	25.1
Garnish Point & Crow Head		30.999	13.4
Dursey Island		17.166	10.5
Rossdohan Island	0.1		0.1
Ardea	0.2		0.2
Loughaunacreen	0.5		0.5
Carrignalour	0.2		0.2
Eyeries (North)	1.5		1.5
Gortgarriff	0.6		0.6
Eyeries (South)	0.7		0.7
Totals	**3.8**	**108.354**	**76.0**

6.3 Range

6.3.1 Habitat Distribution

The distribution of sea cliffs throughout Kenmare River SAC as identified by the Irish Sea Cliff Survey is presented in Appendix VIII.

Sea cliffs are distributed throughout the coastline of Kenmare River SAC from Lamb's Head in County Kerry to Dursey Island in County Cork (Browne, 2005; Barron *et al*., 2011). Both hard and soft cliff types are present within the site, with hard cliffs being more common. Soft cliffs were identified from two sub-sites by the ISCS: Cod's Head and Garnish Point & Crow Head. The hard cliffs in Kenmare River SAC are unlikely to be redistributed through natural processes, unlike more dynamic coastal systems such as sand dunes and saltmarshes.

6.4 Structure and Functions

A fundamental aim of sea cliff conservation is to facilitate some degree of natural mobility through slumping. Sea cliffs can be of geomorphological interest as well as ecological interest and also erosion can expose geological features of interest.

6.4.1 Functionality and hydrological regime

Coastal protection works can disrupt the natural integrity of a sea cliff. The health and ongoing development of vegetated sea cliffs relies on natural processes such as erosion continuing without any impingement. This is generally a bigger issue for soft cliffs which require a degree of slumping and erosion to expose bare soil for pioneer species to colonise; otherwise the vegetation is replaced by hardy grasses, and scrub of little conservation value can develop. In addition, cliff erosion provides an important sediment source to sites further along the coast (e.g. sand dunes). Preventing erosion at a cliff site can lead to beach starvation at another site.

Flushes can be associated with cliffs in areas where the groundwater seeps out onto the cliff face. This is more usually associated with soft cliffs where these flushes contribute to the natural instability of the ground and provide patches of wetland habitat.

The target is to maintain, or where necessary restore, the natural geomorphological processes without any physical obstructions, and the local hydrological regime including groundwater quality.

6.4.2 Vegetation structure: zonation

Ecological variation in this habitat type depends on a number of physical and biological factors, in particular climate, degree of exposure to sea-spray, geology and soil type, as well as the level of grazing and sea bird activity. The rocky cliff flora often grades naturally into coastal heath vegetation and maritime grassland. The Annex I habitat Dry Heath occurs adjacent to the sea cliff vegetation as well as elsewhere in this SAC and is particularly common and extensive in the Derrynane area. At the sea cliff sub-site at Dursey Island, the zones recorded include: splash, crevice ledge and heath.

The target is to maintain the sea cliff habitat, as well as transitional zones, including those to terrestrial communities.

6.4.3 Vegetation structure: vegetation height

A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. Grazing increases the species diversity and is particularly important for maritime grasslands and coastal heath, which are often associated with sea cliffs. The target is to maintain the structural variation in the sward height.

6.4.4 Vegetation composition: typical species & sub-communities

Different sea cliff communities develop in a number of habitat zones related to the degree of maritime influence (exposure to wind and sea spray), geology and soil type. In general, Irish sea cliffs display a range of zones running in a series of horizontal bands up the cliff face, each of which has its own distinct sub-communities including:

- Splash zone
- Pioneer zone
- Rock crevice/cliff ledge zone
- Maritime grassland zone
- Maritime heath zone
- Maritime slope flush zone

There is considerable variation but the general pattern would be that the maritime influence is strongest near the base of the cliff and becomes gradually less dominant towards the cliff top. At the cliff base, vegetation is naturally very open and the species present have a high tolerance to salinity. The splash zone generally has a well-developed lichen flora dominated by species such as *Verrucaria maura*, *Ramalina* spp. and *Xanthoria* spp. These plant communities are dependent on rock crevices for rooting. Moving up the cliff, between the splash zone and the cliff top, vegetation on the cliff ledges is less open and can support some species which are not exclusively associated with coastal conditions. Closer to the cliff top maritime grasslands can occur. The plant communities and physical characteristics of maritime grasslands vary depending on the degree of exposure and whether or not grazing is a factor. Plant communities typical of sea bird and maritime therophyte communities are exceptions to this horizontal zonation and can occur as a mosaic with the other plant communities. The following tables present lists of species that are considered typical of the different zones associated with soft cliffs and hard cliffs by Barron *et al*. (2011), such as those found in Kenmare River SAC.

At the hard cliffs at Dursey Island, crevice ledge, coastal heath and splash zone vegetation was recorded. A wide range of typical cliff plants were recorded by the ISCS. The dominant crevice ledge species include fescues (*Festuca rubra/ovina), angelica (Angelica sylvestris),* kidney vetch *(Anthyllis vulneraria),* thrift *(Armeria maritima),* cock's foot *(Dactylis glomerata)*. While dominant coastal heath species include, common bent (*Agrostis capillaris),* bog pimpernel *(Anagallis tenella),* ling heather *(Calluna vulgaris),* bell heather *(Erica cinerea),* fescues *(Festuca ovina/rubra),* wild thyme *(Thymus polytrichus)*. In the splash zone *Verrucaria* species was dominant. The relatively unusual plant roseroot *Rhodiola rosea* has also been recorded on sea cliffs within this site.

Typical pioneer slope species on soft cliffs		
Agrostis stolonifera	*Equisetum spp.*	*Tussilago farfara*
Daucus carota	*Lotus corniculatus*	
Flush on soft cliffs		
Equisetum spp.	*Orchid species*	*Schoenus nigricans*
Coastal heath		
Calluna vulgaris	*Erica cinerea*	*Ulex gallii*
Daboecia cantabrica	*Erica tetralix*	*Vaccinium myrtillus*
Empetrum nigrum	*Scilla verna*	
Coastal grassland on soft cliffs		
Agrostis stolonifera	*Dactylis glomerata*	*Festuca rubra*
Anthyllis vulneraria	*Daucus carota*	*Lotus corniculatus*
Arrhenatherum elatius	*Elytrigia repens*	*Tussilago farfara*

Typical splash zone species on hard cliffs		
Ramalina spp	*Verrucaria maura*	*Xanthoria spp*
Typical crevice and ledge species on hard cliffs		
Anthyllis vulneraria	*Asplenium marinum*	*Armeria maritima*
Aster tripolium	*Atriplex prostrata*	*Beta vulgaris ssp. maritima*
Catapodium marinum	*Cerastium diffusum*	*Crithmum maritimum*
Festuca rubra	*Inula crithmoides*	*Lavatera arborea*
Ligusticum scoticum	*Limonium sp*	*Plantago coronopus*
Plantago maritima	*Sedum anglicum*	*Sedum rosea*
Silene uniflora	*Spergularia rupicola*	
Typical coastal heath species		
Calluna vulgaris	*Daboecia cantabrica*	*Empetrum nigrum*
Erica cinerea	*Erica tetralix*	*Scilla verna*
Ulex gallii	*Vaccinium myrtillus*	

Typical maritime grassland species on hard cliffs		
Anthyllis vulneraria	*Armeria maritima*	*Crithmum maritimum*
Daucus carota	*Festuca rubra*	*Hyacinthoides non-scripta*
Plantago coronopus	*Plantago maritima*	*Scilla verna*
Sedum anglicum	*Silene uniflora*	*Spergularia rupicola*

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

6.4.5 Vegetation composition: negative indicator species

Negative indicator species can include non-native species (e.g. *Hebe* sp.,*Carpobrotus edulis, Gunnera tinctoria*), species indicative of changes in nutrient status (e.g. *Urtica dioica*) and species not considered to be typical of the habitat (e.g. *Pteridium aquilinum*).

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

6.4.6 Vegetation composition: bracken and woody species

Encroachment of bracken (*Pteridium aquilinum*) and woody/scrub species on cliffs, particularly the maritime grasslands and coastal heath leads to a reduction in species diversity.

The target for this attribute is that in the case of maritime grassland and/or heath, bracken should make up less than 10% of the vegetation cover, while woody species should make up no more than 20% of the vegetation cover.

7 References

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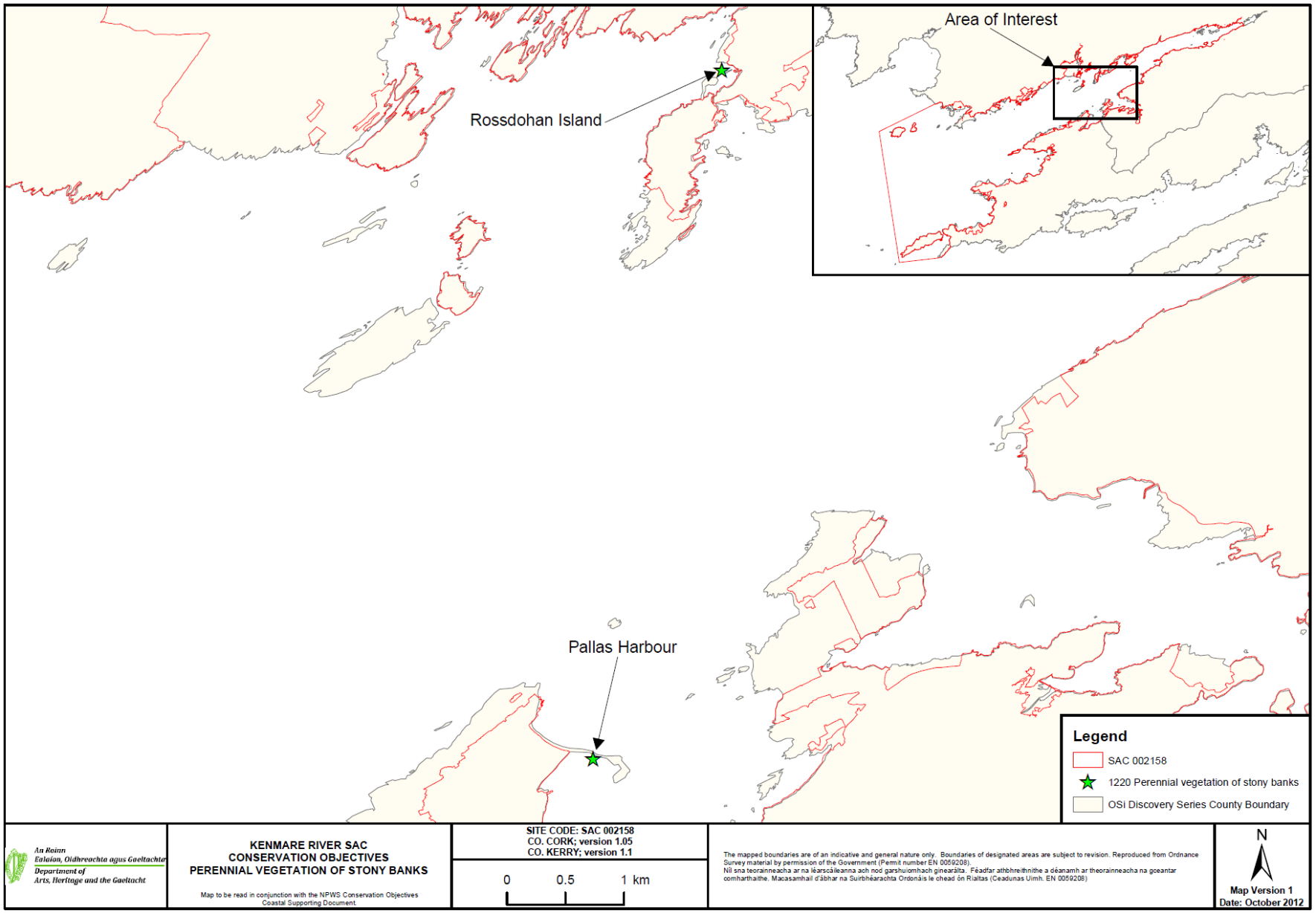
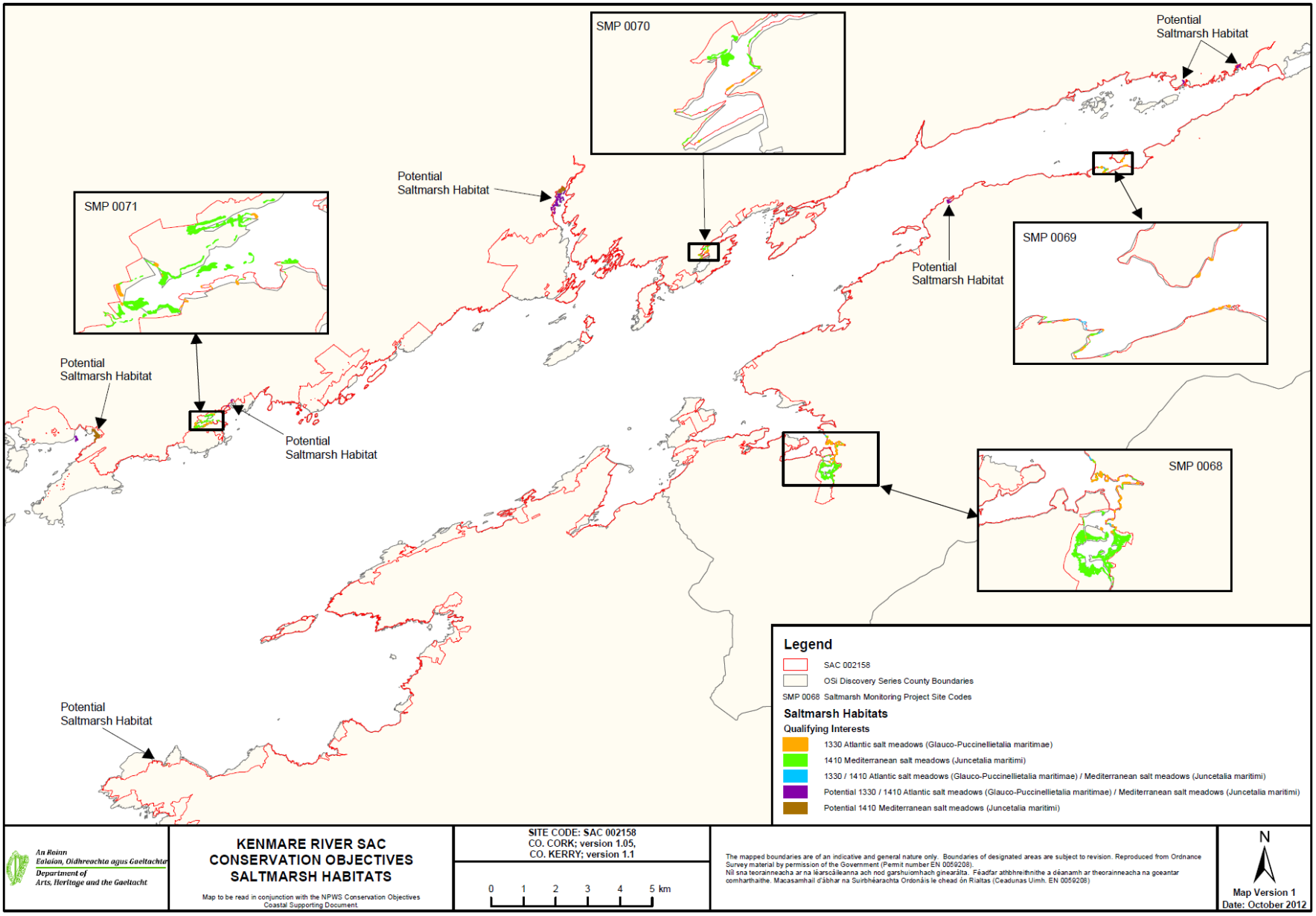
Appendix I – Distribution map of known shingle sites within Kenmare River SAC



Appendix II – Distribution map of saltmarsh habitats within Kenmare River SAC



Appendix III– West Cove site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: **West Cove**	SMP site code: **SMP0071**
Date of site visit **06/08/2008**	CMP site code: **N/A**
SM inventory site name: **West Cove**	SM inventory site code: **171**
NPWS Site Name: **Kenmare River**	
NPWS designation cSAC: **2158**	MPSU Plan: **N/A**
pNHA: **N/A**	SPA: **N/A**
County: **Kerry**	Discovery Map: **84** Grid Ref: **057330, 059005**
Aerial photos (2000 series): **O 6520-C,D**	6 inch Map No: **Ke 106**
Annex I habitats currently listed as qualifying interests for Kenmare River cSAC:	
H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	
H1410 Mediterranean salt meadows (Juncetalia maritimi)	
Other SMP sites within this SAC/NHA: **Dinish, Tahillia, Dereen House**	
Saltmarsh type: **Fringe**	Substrate type: **Phragmites**: **Peat**

2 SITE DESCRIPTION

West Cove saltmarsh is located in south-west Co. Kerry, 2.5 km east of Caherdaniel. The site is located near the mouth of Kenmare River and along the northern shoreline. The site is located in a small sheltered bay called Cove Harbour. This small bay is sheltered by a small headland called Knocknasullig. The bay contains several small rocky islands. The landscape of this area is dominated by upland habitats with hills and mountains the main landscape feature close the shoreline. The main habitats are wet heath, exposed rock and wet grassland. There is some development of improved grassland and woodland on the lower slopes close to the shoreline. The N70 road or part of the Ring of Kerry passes close to the site. There are scattered dwellings along this road and along a minor road that accesses Knocknasullig.

Saltmarsh has developed at the head of this small bay. The site is divided by a bridge/embankment that carries the minor road and some saltmarsh is found west of the road and cut off from the main bay. There is also a small amount of saltmarsh found in an adjacent small inlet further along the northern shoreline. The shoreline along the bay is quite irregular with frequent indentations and small knolls of exposed bedrock. Saltmarsh development is variable and discontinuous along both the northern and southern shorelines. The variable topography along the shoreline divides the saltmarsh into sections divided by exposed bedrock, which forms part of the shoreline in places. The small bay partially empties at low tide to expose intertidal mud and mixed sediment.

The site is located within the Kenmare River cSAC (0002158). This cSAC covers most of the marine parts of Kenmare River and it contains a diverse range of marine habitats. Some sections of coast have also been included such as the Sand dune and saltmarsh complex at Derrynane. Two Annex I

saltmarsh habitats are found at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both these habitats are listed as qualifying interests for this cSAC. Three other saltmarshes sites listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and located within this cSAC were surveyed during this project. These include Dereen House and Dinish along the southern side, and Tahillia located along the northern side of Kenmare River. Two other saltmarsh sites listed on the SM inventory along the northern side of Kenmare River, Sneen and Derrynane, were not surveyed during the SMP. There is additional minor saltmarsh development in many of the small indentations along the shoreline.

A substantial part of the saltmarsh habitat found at this site is positioned outside the digital cSAC boundary. This is mainly because the lower shoreline boundary on the OSI 6 inch map was used as the cSAC boundary along this part of the shoreline and some saltmarsh habitat is positioned above this boundary. Several fields also containing saltmarsh have also been excluded from the cSAC.

The site was easily accesses via the minor road in this area. The shoreline was accessed at the bridge and at several sites around the bay after crossing adjacent land. The saltmarsh west of the bridge was not surveyed in detail due to the presence of cattle.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh development is quite variable at this site due to the variable shoreline topography. The saltmarsh is dominated by Mediterranean salt meadows (Table 3.1). Large Flat uniform stands of MSM are located in several sections on both sides of the bridge and minor road accessing Knocknasullig. Some of this MSM is found on small isolated 'islands' and these also contain terrestrial mounds with wet grassland, scrub and rocky knolls. These sections of MSM have developed on peat and there are steep bare face-banks about 0.5-1 m high along the lower saltmarsh boundary. There are several grassy patches of ASM around the main bay shoreline.

Further MSM is distributed as a band of habitat along the shoreline and is poorly developed being only several metres wide in places on a moderately sloped shoreline. There is greater saltmarsh development in some of the lower-lying sheltered indentations along the shoreline. The band of habitat is discontinuous and much of the shoreline is marked by exposed bedrock, which is covered with brown algae below the shoreline. The lower saltmarsh boundary is generally marked by a typical saltmarsh cliff < 0.5 m high. Some old tree stumps are being exposed along the lower saltmarsh shoreline.

There is a second smaller inlet towards the north-eastern part of the bay. This inlet was partially enclosed in the past by an old seawall. This inlet leads into a low-lying area now containing wet grassland, but which previously was covered by spring tides. There is some typical MSM and ASM along the shoreline of this small inlet and there are natural transitions to other saltmarsh vegetation dominated by Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*) along the deep drains draining this area and flowing into the inlet. These stands have been classified

and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

Wet grassland is usually found adjacent to the upper boundary of the saltmarsh around the site, with some exposed rock and scrub along the upper boundary in places.

Table 3.1. Area of saltmarsh habitats mapped at West Cove.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.246
1410	Mediterranean salt meadows (Juncetalia maritimi)	1.952
	Total	**2.198**

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

3.2 Atlantic salt meadows (H1330)

The ASM at this site is poorly developed and confined to several small patches. The ASM at this site is dominated by mid-upper grassy vegetation. The ASM has developed on peat in most instances, with some of the habitat developed on mud. This community is dominated by Red Fescue (*Festuca rubra*) and contains small amounts of other species such as Sea Plantain (*Plantago maritima*), Common Scurvygrass (*Cochlearia officinalis*), Saltmarsh Rush (*Juncus gerardii*), Buck's-horn Plantain (*Plantago coronopus*), Sea Arrowgrass (*Triglochin maritimum*), Sea Milkwort (*Glaux maritima*), White Clover (*Trifolium repens*), Creeping Bent (*Agrostis stolonifera*), Curled Dock (*Rumex crispus*) and Autumn Hawkbit (*Leontodon autumnalis*). This section also contains small tussocks of Sea Rush but at low densities. There is some natural saltmarsh zonation within this vegetation and the upper saltmarsh boundary is marked by the appearance of species such as Glaucous Sedge (*Carex flacca*), Soft Rush (*Juncus effusus*) and Jointed Rush (*Juncus articulatus*).

A second mid marsh community was noted at another location and this community was dominated by a combination of Sea Plantain and Red Fescue. Lower marsh communities are poorly developed at this site but Common Saltmarsh-grass, Lax-flowered Sea Lavender (*Limonium humile*) and Sea Aster (*Aster tripolium*) were noted along the lower saltmarsh boundary in places. The saltmarsh topography was poorly developed within the ASM but this is typical of these small patches of habitat. One patch near the bridge is not grazed and has a tall sward while a second section along the southern boundary is grazed with light to moderate levels.

3.3 Mediterranean salt meadows (H1410)

This habitat was typically dominated by a dense sward of Sea Rush that covered the shoreline with an irregular topography. The cover of this species varies between dense cover of > 75% to patchier sward with frequent cover of Red Fescue and smaller amounts of Creeping Bent and Saltmarsh Rush. Other species typically found within this habitat include Sea Pink, Common Scurvy-grass, Autumn Hawkbit, Sea Arrowgrass, Sea Aster, Sea Milkwort and White Clover. Lax-flowered Sea Lavender was noted in this habitat where Sea Rush had spread into the secondary inlet, marking a lower zone habitat type.

The saltmarsh topography was generally poorly developed in this habitat and only small salt pans were present in places, which is typical of these relatively small saltmarshes. The sward height was generally quite high between 0.5-1 m high.

Common Reed and Sea Club-rush were noted spreading within the MSM near the landward boundary in the secondary inlet. There was a natural vegetation succession along a landward gradient from typical MSM to patches of Common Reed and Sea Club Rush along the drains and then to a brackish wet grassland community dominated by Purple Moorgrass (*Molinia caerulea*) but containing hollows with saltmarsh species such as Sea Plantain, Saltmarsh Rush and Common Scurvygrass.

4 IMPACTS AND ACTIVITIES

The main impact and activity around the site is grazing (Table 4.1). Some saltmarsh along the southern side of the bay is grazed by cattle (140), as is the saltmarsh west of the bridge. There is some localised heavy poaching in places but this only affects a minor area. Much of the other saltmarsh was not been regularly grazed but may have been grazed in the past.

Some of the shoreline north-west of the bridge has been modified by infilling (803) during the current monitoring period and an embankment has been created along the shoreline. However, this infilling has probably only affected a very small patch of MSM. Some of the low-lying land located adjacent to the secondary inlet has been modified by drainage in the recent past (810) with the drains cleaned and deepened at some time during the current monitoring period.

The site has been modified in the past with some of the largest sections of saltmarsh located west of the bridge and in the secondary inlet modified by drainage. The main section of saltmarsh has also been modified by the construction of the embankment and bridge in the past 100 years where there was formerly a ford. Attempts have also been made to reclaim land in the area within the secondary inlet with the construction of the seawall in the past. These impacts are not assessed as they occurred outside the current monitoring period, although some are still having a residual impact. The construction of the bridge and embankment has had the most significant impact on this saltmarsh.

There is no sign of significant erosion (900) at this site even though some erosion features are present. A comparison of the OSI 6 inch map to the current extent of saltmarsh shows that there has been no significant loss of saltmarsh at this site during this period. The impact of erosion is assessed as neutral on a relatively small proportion of the saltmarsh face.

The main Impacts and activities around the site include farming, which is not very intensive and includes mowing (120) and grazing (140). Other impacts include dispersed habitation (403) and minor roads (502). These activities have little or no measurable impact on the saltmarsh habitats.

Table 4.1. Intensity of various activities on saltmarsh habitats at West Cove.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	0.05	Inside
1330	900	C	0	0.01	Inside
1410	140	C	-1	0.5	Inside
1410	803	A	-2	0.001	Inside
1410	900	C	0	0.05	Inside

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

5 CONSERVATION STATUS

5.1 Overall Conservation Status

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

West Cove is a relatively small saltmarsh, with few features of significant conservation interest. Most of the saltmarsh is in good condition with few negative impacts. The vegetation communities found at this site are similar to the other saltmarshes found in Kenmare River. The site has been affected by the construction of the road bridge and by attempted reclamation in a secondary inlet in the past. This attempted reclamation has reduced the area of saltmarsh with brackish wet grassland found in an area formerly covered by spring tides. The presence of this wet grassland area with some brackish features along the drains is one notable feature about this site.

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

Table 5.1. Conservation status of Annex I saltmarsh habitats at West Cove.

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

5.2 Atlantic salt meadows (H1330)

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.2.1 Habitat structure and functions

The structure and functions of this habitat were assessed as *favourable*. Two monitoring stops were carried out in this habitat and they all passed. All the attributes required for favourable conservation status reached their targets. There was some damage from poaching in places although this only affected a minor area. The ASM only covers a very small area and is generally poorly developed.

Several typical ASM communities are present and the diversity is typical of this habitat. Some zonation was noted between different ASM communities at one location. There are some natural successional communities to terrestrial vegetation present but these are generally poorly developed due to the relatively steep shoreline topography. The saltmarsh topography is relatively poorly developed but this is typical of these relatively small fragments of ASM. Turf fucoids were recorded in this habitat but these are fairly typical of heavily grazed fringe type saltmarshes along the west coast of Ireland.

5.2.2 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

5.3 Mediterranean salt meadows (H1410)

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to land use changes, development or erosion within the current monitoring period. A very small area of MSM was lost due to the construction of an embankment, but was only a minor loss.

5.3.1 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Seven monitoring stops were carried out in this habitat and they all passed. All the attributes required for favourable conservation status reached their targets. The structure and functions of the MSM are in generally good condition. Most of the MSM is not grazed at all and there is no significant overgrazing in sections that were grazed. There are no significant negative indicators within this habitat. Some minor poaching was noted.

The species assemblage of the MSM is typical of this vegetation type. There is some zonation of the MSM into different communities and some zonation of different species was noted. There is some development of a transitional brackish zone along the upper boundary of the saltmarsh in places with a mixture of Purple Moor-grass and Sea Rush. The saltmarsh topography within this habitat is poorly developed due to its relatively small size although some sections contain small salt pans and natural drainage channels. Most of the saltmarsh has been modified in the past by drainage, although this drainage occurred outside the current monitoring period.

5.3.2 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present. Some of the saltmarsh habitat is located outside the cSAC.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

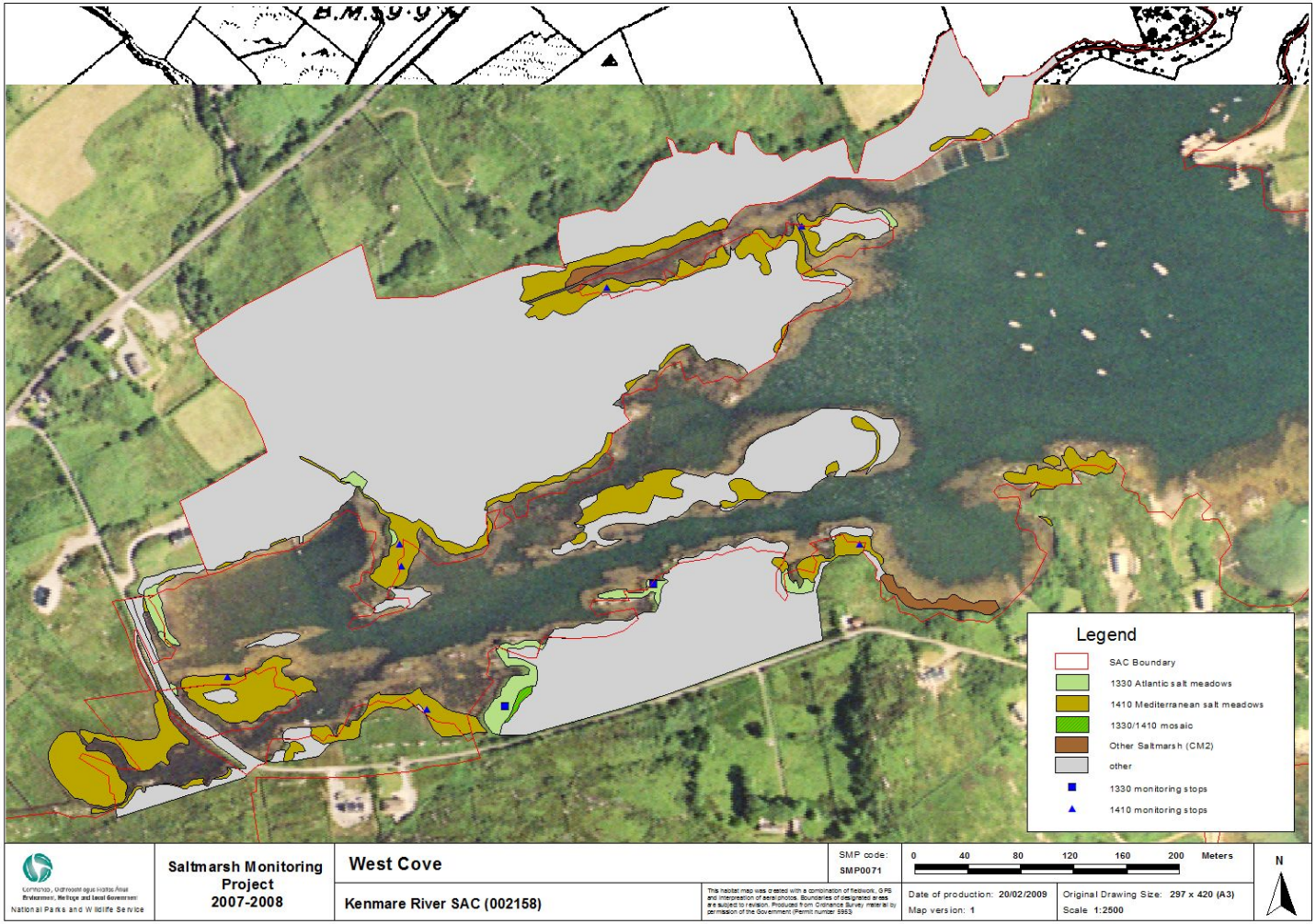
7 REFERENCES

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

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.239		0.239			
4	1410 Mediterranean salt meadow	1.945			1.945		
5	ASM/MSM mosaic (50/50)	0.014		0.007	0.007		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	10.536					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)						
12	pioneer 1330/1310/*Spartina* mosaic						
13	1410/other SM (CM2) mosaic						
14	*Spartina* sward dominated, with some ASM						
15	1310/*Spartina* mosaic						
16	ASM dominated with some Spartina						
17	1330/sand dune mosaic						
18	Other SM (CM2)	0.102					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**12.836**		**0.246**	**1.952**		


Legend
SAC Boundary
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
Other Saltmarsh (CM2)
other
1330 monitoring stops
1410 monitoring stops
0 40 80 120 160 200 Meters
N
Saltmarsh Monitoring Project 2007-2008
West Cove
SMP code: SMP0071
Kenmare River SAC (002158)
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 6953)
Date of production: 20/02/2009
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:2500
National Parks and Wildlife Service

Appendix IV– Tahilla site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: **Tahilla**		SMP site code: **SMP0070**
Date of site visit **05/08/2008**		CMP site code: **N/A**
SM inventory site name: **Tahilla**		SM inventory site code: **173**
NPWS Site Name: **Kenmare River & Drongawn Lough**		
NPWS designation	cSAC: **2158/2187**	MPSU Plan: **x**
	pNHA: **N/A**	SPA: **N/A**
County: **Kerry**		Discovery Map: **84** Grid Ref: **073000, 064375**
Aerial photos (2000 series): **O 6446-C; O 6485-A**		6 inch Map No: **Ke 100**

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

H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

H1410 Mediterranean salt meadows (Juncetalia maritimi)

Annex I habitats currently listed as qualifying interests for Drongawn Lough cSAC:

None

Other SMP sites within this SAC/NHA: **West Cove, Dinish, Dereen House**

Saltmarsh type: **Fringe** Substrate type: **Peat Humus, Stumps**

2 SITE DESCRIPTION

Tahilla saltmarsh is located in south-west Co. Kerry along the northern shore of Kenmare River and 4.8 km south-east of Sneem. The survey site is located in a small enclosed bay that is connected to Conngar Harbour to the east and is sheltered from the main bay by a small outcrop of land. This small outcrop of land also encloses Drongawn Lough to the south-west, which is an enclosed lagoon. There is a rocky ridge separating Drondawn Lough from the outer channel. The landscape of this area is dominated by semi-natural habitats with hilly knoll and hollows mainly covered with wet heath, wet grassland, exposed rock and some blanket bog. There are also some small lakes and wetland areas in hollows. This area is quite remote and accessed by some minor roads and there are some scattered houses in the area. The survey site includes the part of the shoreline west of a small bridge that crosses the very narrow channel and divides the enclosed bay into two sections.

Drongawn Lough is known as a coastal lagoon and has been included in some national surveys of Irish lagoons for NPWS (Healy *et al.* 1997, Oliver 2005, NPWS 2007). Oliver (2005) classified Drongawn Lough as a 'saline lake' lagoon type, which generally has a rock barrier. The vegetation of this lagoon was classified a '*Ruppia/Zostera'* type lagoon by Oliver

(2005), which generally have a high salinity. Healy *et al.* (1997) surveyed the marginal vegetation around the lough. There is a very narrow tidal connection between the outer bay and Drongawn Lough.

Saltmarsh has developed in several small sheltered patches around the shoreline and there are also several small 'islands' within the bay containing saltmarsh. The patches of saltmarsh are fragmented and other habitats are found along the shoreline including exposed rock. The saltmarsh fringe extends along the shoreline and into Drongawn Lough.

This saltmarsh is one of the few saltmarsh sites that is found in two different cSACs that are located adjacent to each other. The outer section is located within the Kenmare River cSAC (0002158) while the inner section is located in Drongawn Lough cSAC. Kenmare River SAC covers most of the marine parts of Kenmare River and it contains a diverse range of marine habitats. Some sections of coast have also been included such as the sand dune and saltmarsh complex at Derrynane. Dongawn Lough was designated as a cSAC chiefly for the presence of a coastal lagoon. Two Annex I saltmarsh habitats are found at this saltmarsh, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both these habitats are listed as qualifying interests for Kenmare River but are not listed for Drongawn Lough.

Three other saltmarshes sites listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and located within this cSAC were surveyed during this project. These include Dereen House and Dinish along the southern side of Kenmare River, and West Cove located further west of Dinish along the northern side. Two other saltmarsh sites listed on the SM inventory along the northern side of Kenmare River, Sneen and Derrynane, were not surveyed during the SMP. There is additional minor saltmarsh development in many of the small indentations along the shoreline.

Most of the saltmarsh habitat found at this site is positioned inside the digital SAC boundaries of both SACs. There are several small fragments of habitat found outside the SAC boundary where the lower shoreline was used to mark the SAC boundary and the saltmarsh extends above this mark in several instances.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh at this site is dominated by Mediterranean salt meadows (MSM) (Table 3.1). There are only several small patches of Atlantic salt meadows (ASM) around the site. The saltmarsh is generally not well developed and is mainly represented as a narrow fringe of habitat along the shoreline. The saltmarsh habitat is fragmented into different sections and some of the shoreline around the outer bay section is marked by exposed bedrock where the shoreline is too steep to allow development of saltmarsh. Much of the saltmarsh has developed on peat, particularly in the outer bay and this is typical of a 'fringe' type saltmarsh. Some of the saltmarsh is perched on quite deep peat with tall peat face-banks along the lower

saltmarsh boundary. The saltmarsh around the margins of Drongawn Lough can be classified as a 'lagoon' type saltmarsh. Curtis and Sheehy-Skeffington (1998) classified this site as a 'fringe' type saltmarsh although their classification probably does not include Dromgawn Lough.

There is some development of transitional brackish vegetation along the upper saltmarsh boundary in places where saltmarsh has developed in low-lying narrow inlets. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. Saltmarsh transitions to stands of Common Reed (*Phragmites australis*) and some Sea Club-rush (*Bolboschoenus maritimus*) in these low-lying areas and there are also further transitions to wet grassland along a gentle landward gradient. These types of vegetation succession are rarely seen around the site as most of the saltmarsh is found on quite steeply sloped land so the upper saltmarsh boundary is quite distinct. The saltmarsh is mainly found adjacent to wet or dry heath with Heather (*Calluna vulgaris*), Purple Moor-grass (*Molinia caerulea*), Deergrass (*Trichophorum cespitosum*) Bell Heather (*Erica cinerea*), Bog Cottons (*Eriophorum* spp.) and Gorse (*Ulex europaeus*) most prominent. Some of the saltmarsh found in the outer bay is found adjacent to broad-leaved woodland.

There is also some transitional brackish vegetation developing along a channel that connects to a small lough to the east called Drongaun Lough Little. This area contains a mosaic of more typical peat-influenced wet grassland and heath vegetation dominated by Purple Moor-grass (*Molinia caerulea*) and also containing terrestrial species such as Black-Bog-rush (*Schoenus nigricans*), Bog Cottons, Creeping Bent (*Agrostis stolonifera*) and brackish species such as Brookweed (*Samolus valerandi*). This area has been disturbed by drainage in past and the natural channel connecting the small lough to the larger lagoon has been deepened in the past. The emergent and marginal vegetation in the Drongaun Lough Little is dominated by Common Reed beds and wet grassland is prominent around the east sides of this lough. A transitional type vegetation zone with a mixture of Sea Rush and Purple Moor-grass is also found along the upper boundary of the saltmarsh around the south side of Dongawn Lough.

The marginal saltmarsh vegetation transitions to open water in the lagoon at the lower saltmarsh boundary and there is no significant intertidal zone. The outer section has a more typical intertidal zone and there is bare peat exposed along the lower saltmarsh boundary and some patches of mud and mixed substrate are exposed at low tide along the lower saltmarsh boundary.

The marginal vegetation around Drongawn Lough is typical MSM saltmarsh vegetation. This is an indication of the high salinity and tidal influence on this lough and saltmarsh vegetation was more extensive and there were fewer brackish indicators in the saltmarsh vegetation around this lagoon compared to other lagoons examined during the SMP. There are some sections along the south-east margin of Drongaun Lough where the upper saltmarsh

boundary is quite difficult to map because the marginal habitats are quite heterogeneous and wet grassland and Gorse-dominated scrub may extend to the margin of the lough.

Table 3.1. Area of saltmarsh habitats mapped at Tahillia.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.073
1410	Mediterranean salt meadows (Juncetalia maritimi)	2.066
	Total	**2.139**

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

3.2 Atlantic salt meadows (H1330)

There are few patches of ASM at this site. These patches are mainly dominated by Red Fescue (*Festuca rubra*) and Sea Plantain (*Plantago maritima*). Other species present include Sea Pink (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritimum*) and Common Scurvy-grass (*Cochlearia officinalis*). Some of these patches are poached. This habitat is quite poorly developed at this site and there are only several ASM vegetation communities found at this site.

3.3 Mediterranean salt meadows (H1410)

This habitat was typically dominated by dense Sea Rush (*Juncus maritimus*). Some of the vegetation is quite dense with almost complete Sea Rush cover and has few other species. Other sections are typically dominated by tussocks of Sea Rush and also contain frequent cover of Red Fescue and Creeping Bent. Other species noted in this habitat include Sea Pink, Sea Plantain, Lax-flowered Sea Lavender (*Limonium humile*), Sea Spurrey (*Spergularia media*), Common Scurvy-grass, Sea Aster (*Aster tripolium*), Sea Milkwort (*Glaux maritima*), Autumn Hawkbit (*Leontodon autumnalis*), White Clover (*Trifolium repens*), Long-bracted Sedge (*Carex extensa*), Distant Sedge (*Carex distans*), Brookweed and Sea Arrowgrass.

There is no significant zonation within the MSM vegetation. The main indication of zonation is the appearance of Purple Moor-grass and other terrestrial species, which may also be found within this vegetation along the upper boundary in places. Common Reed also spreads into the MSM in places around the lagoon. Small patches of ASM vegetation may also be found within the MSM vegetation.

The saltmarsh topography at this site is poorly developed. Much of the habitat is quite narrow (1-3 m wide) along the shoreline, although there are several sections where there is more extensive MSM about 50 m wide. There are few salt pans and creeks within the vegetation at this site.

4 IMPACTS AND ACTIVITIES

There are few impacts and activities affecting the saltmarsh habitat at this site (Table 4.1). The main impact affecting this site is cattle grazing (140) and some of the saltmarsh is damaged somewhat by poaching (143).

There is no sign of significant erosion (900) at this site even though some erosion features are present. A comparison of the OSI 6 inch map to the current extent of saltmarsh shows that there has been no significant loss of saltmarsh at this site during this period. Most of the saltmarsh is quite sheltered within the lagoon. Erosion is assessed as having a neutral impact on the saltmarsh of this site

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	0.073	Inside
1410	140	C	0	1.566	Inside
1410	143	C	-1	0.05	Inside

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

There are few impacts and activities around this site. The main impact is cattle grazing with some cattle roaming over the heath and wet grassland found around the site. Farming is not intensive around this site. Other impacts and activities include scattered dwellings (403) and minor roads and tracks accessing land around this area (502). These activities have little or no measurable impact on the saltmarsh habitats.

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the NHA survey, the 1995, 2000 and 2005 OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There was no specific information available for this site from the NHA survey. There is more detailed information available from the Drongawn Lough lagoon survey (Healy *et al.* 1997).

Tahillia saltmarsh is a small site with few features of particular conservation interest in the saltmarsh habitat. One key point of interest is the development of MSM around the margins of Drongaun Lough lagoon. The overall conservation status of the site is *favourable*. The saltmarsh is in good condition. NPWS (2007) assessed the conservation status of lagoons around the county and assessed Drongaun Lough lagoon as having a favourable conservation status. The lagoon is not considered to be affected by any damaging activities.

This site is located within Drongaun Lough and Kenmare River cSAC. A NPWS Conservation management plan is not available for this cSAC.

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

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

5.2 Atlantic salt meadows (H1330)

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.2.1 Habitat structure and functions

The structure and functions of this habitat were assessed as *favourable*. Due to the relatively small extent of habitat no monitoring stops were recorded. However, a visual assessment indicated that the ASM habitat was in generally good condition. There was some damage from poaching in places although this affected a minor area.

5.2.2 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *favourable*. Five monitoring stops were carried out in this habitat and they all passed. All the attributes required for favourable conservation status reached their targets. The structure and functions of the MSM are in generally good condition. There are no significant negative indicators within this habitat. Some minor poaching was noted.

The species assemblage of the MSM is typical of this vegetation type. There is no zonation of the MSM into different communities although some zonation of different species was noted and there is some development of a transitional brackish zone along the upper boundary of the saltmarsh with a mixture of Purple Moor-grass and Sea Rush. The saltmarsh topography within this habitat is poorly developed due to its relatively small size and most of the habitat is quite narrow (< 5m wide).

Healy *et al.* (1997) described and mapped the marginal vegetation around the lagoon. A comparison to this survey shows that the vegetation around the site has not changed significantly.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

7 REFERENCES

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

Healy, B., Hatch, P., Oliver, G., & Good, J. (1997). Coastal lagoons in the Republic of Ireland. Vol III. Lissagriffin Lake. Unpublished report for NPWS. www.npws.ie

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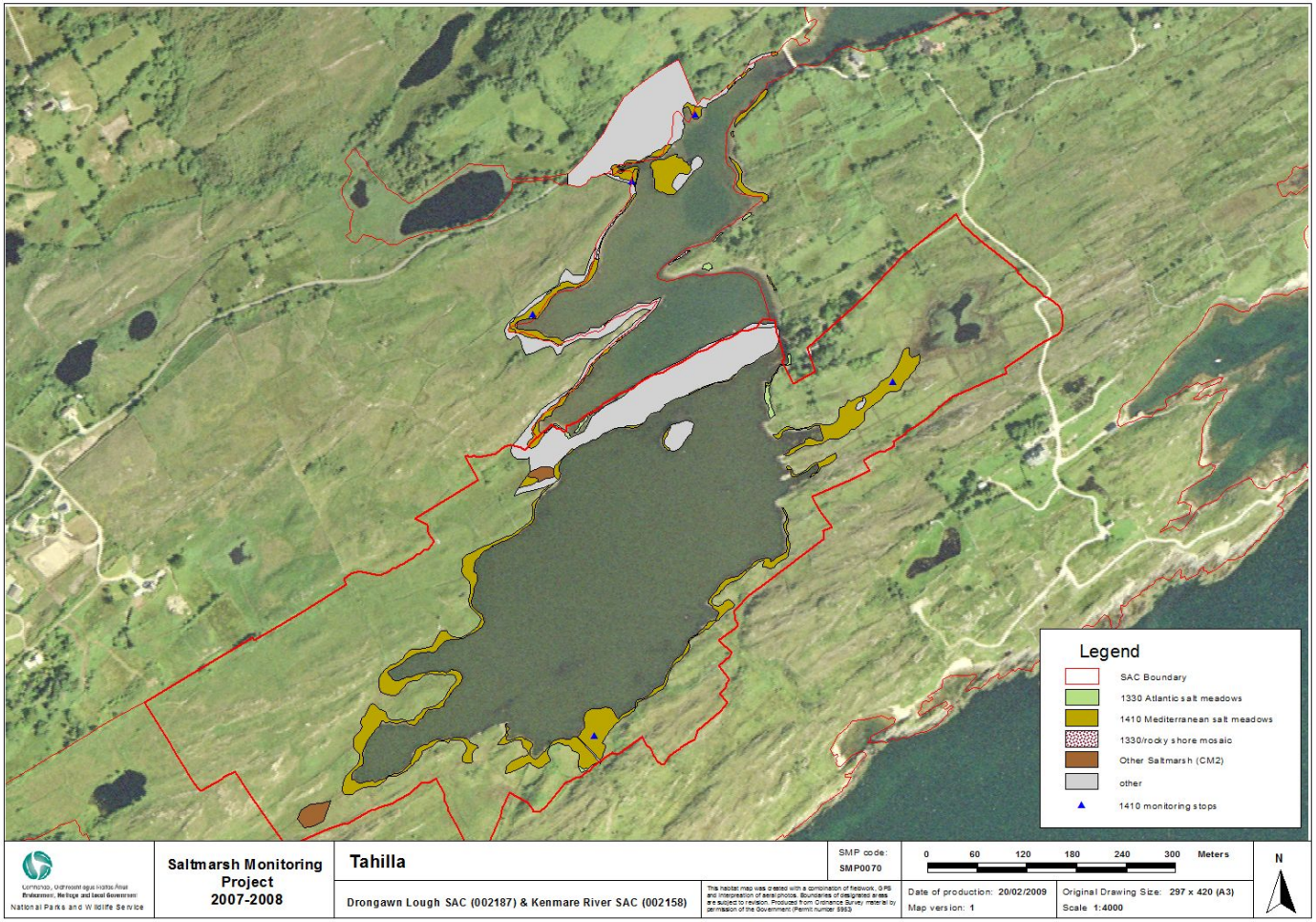
Oliver, G. A. (2005). *Seasonal changes and biological classification of Irish coastal lagoons*. Ph. D Thesis. University College Dublin. www.irishlagoons.ie

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.064		0.064			
4	1410 Mediterranean salt meadow	2.066			2.066		
5	ASM/MSM mosaic (50/50)						
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	2.892					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)						
12	pioneer 1330/1310/*Spartina* mosaic						
13	1410/other SM (CM2) mosaic						
14	*Spartina* sward dominated, with some ASM						
15	1310/*Spartina* mosaic						
16	ASM dominated with some Spartina						
17	1330/sand dune mosaic						
18	Other SM (CM2)	0.117					
19	1330/rocky shore mosaic	0.018		0.009			
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**5.157**		**0.073**	**2.066**		


Legend
SAC Boundary
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Tahilla
SMP code: SMP0070
0 60 120 180 240 300 Meters
N
Drongawn Lough SAC (002187) & Kenmare River SAC (002158)
Date of production: 20/02/2009
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:4000

Appendix V– Dinish site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: **Dinish**		SMP site code: **SMP0069**	
Date of site visit **19/06/2008**		CMP site code: **N/A**	
SM inventory site name: **Dinish**		SM inventory site code: **174**	
NPWS Site Name: **Kenmare River**			
NPWS designation	cSAC: **2158**	MPSU Plan: **N/A**	
	pNHA: **N/A**	SPA: **N/A**	
County: **Kerry**		Discovery Map: **85**	Grid Ref: **087410, 67738**
Aerial photos (2000 series): **O 6407-C,D; O 6449-A,B**		6 inch Map No: **Ke 092, 092, 101**	
Annex I habitats currently listed as qualifying interests for Kenmare River cSAC:			
H1330	**Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**		
H1410	**Mediterranean salt meadows (Juncetalia maritimi)**		
Other SMP sites within this SAC/NHA: **West Cove, Tahillia, Dereen House**			
Saltmarsh type: **Fringe**		Substrate type: **Peat**	

2 SITE DESCRIPTION

Dinish saltmarsh is located in south-west Co. Kerry on the Beara Peninsula and along the southern shore of Kenmare River. This site is located quite far up the peninsula and is 6.5 km south-east of Kenmare Town. The survey site is located in a small bay or indentation in the shoreline where Dinish Island is found. The landscape of this area is dominated by upland habitats with hills and mountains the main landscape feature along the peninsula. The main habitats with wet heath, wet grassland and some blanket bog found in the higher areas. There is some development of improved grassland and woodland on the lower slopes close to the shoreline. Exposed rock covered with brown algae is the main habitat along this part of the shoreline and there is very little development of saltmarsh due to the relatively steep shoreline topography. The main regional road between Kenmare and Castletownbere (R571) is positioned close to the shoreline along this small cove and there is an embankment along parts of the cove to support this road. There are scattered dwellings along this road.

Saltmarsh is mainly developed on the west side of this small indentation. This is quite a small site with little saltmarsh development due to the topography of the shoreline. There are several tiny patches further east along the shoreline and on the east side of the cove. There is also some saltmarsh development around Dinish Island. However, this part of the site could not be surveyed due to access difficulties.

The site is located within the Kenmare River cSAC (0002158). This cSAC covers most of the marine parts of Kenmare River and it contains a diverse range of marine habitats. Some sections of coast have also been included such as the Sand dune and saltmarsh complex at Derrynane. Two Annex I saltmarsh habitats are found at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both these habitats are listed as qualifying interests for this SAC. Three other saltmarshes sites listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and located within this SAC were surveyed during this project. These include Dereen House located further south-west of Dinish along the southern side, and Tahillia and West Cove located along the northern side of Kenmare River. Two other saltmarsh sites listed on the SM inventory along the northern side of Kenmare River, Sneen and Derrynane, were not surveyed during the SMP. There is additional minor saltmarsh development in many of the small indentations along the shoreline.

Most of the saltmarsh habitat found at this site is positioned outside the digital cSAC boundary. This is mainly because the lower shoreline boundary on the OSI 6 inch map was used as the cSAC boundary along this part of the shoreline and most of the saltmarsh habitat is positioned above this boundary.

This site was accessed by crossing the road embankment and entering the shoreline area.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh habitat at this site is mainly located at the western side of the small sheltered cove around Dinish Island. Most of the saltmarsh has developed on a small peninsula and there are also some fragments of habitat found along the base of the roadside embankment. These fragments are found along a mainly rocky shoreline. There is some immature broad-leaved woodland and scrub found along the shoreline and adjacent to the saltmarsh. There is minor development of wet heath/wet grassland dominated by Purple Moor-grass (*Molinia caerulea*) in a transitional zone between the woodland and the saltmarsh. Some of the upper shoreline around the western shoreline is marked by a low dry stone wall. There are several patches of Common Reed (*Phragmites australis*) and Sea Club-rush (*Bolboschoenus maritimus*) along the shoreline, generally situated higher up on the shoreline. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification.

A small stream flows into the cove at the western end and there is some ASM development along this stream. There is also minor development of a brackish community at the mouth of this stream. There is some intertidal mud and mixed sediment along the shoreline and adjacent to the saltmarsh. However the intertidal zone is quite narrow as the shoreline is quite steep and the intertidal zone shelves quickly to sub-tidal and marine water.

The saltmarsh on the peninsula dominated by MSM that has developed on peat. There is a small mound present dominated by Sea Rush (*Juncus maritimus*) but with some terrestrial species such as Birdsfoot (*Lotus corniculatus*), Silverweed (*Potentilla anserina*) and Curled Dock (*Rumex crispus*) indicating that it is out of reach of most tides. An irregular and highly indented saltmarsh cliff marks the lower edge of the MSM with some exposed peat. Other sections have no distinct cliff between the saltmarsh vegetation and the lower shore and the lower boundary is marked by the lower limit of Sea Rush clumps or other saltmarsh vegetation on the shoreline.

The saltmarsh around Dinish Island is dominated by ASM. This was confirmed with a visual assessment.

Table 3.1. Area of saltmarsh habitats mapped at Dinish.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.302
1410	Mediterranean salt meadows (Juncetalia maritimi)	0.344
	Total*	**0.646**

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

3.2 Atlantic salt meadows (H1330)

Most of the ASM mapped at this site is located on Dinish island was not examined in detail. There are very small patches of ASM vegetation along the roadside embankment and on the sides of the small peninsula feature on the west side of the cove. The ASM patches are generally dominated by a mid-marsh *Plantago-Armenia* sward. Other species present include Lax-flowered Sea Lavender (*Limonium humile*) and Common Saltmarsh-grass (*Puccinellia martima*). There is some zonation present on a relatively steep shoreline along the road with patches dominated by Saltmarsh Rush (*Juncus gerardii*) or Red Fescue (*Festuca rubra*) positioned higher up the shoreline.

The ASM generally forms a mosaic with the rocky shoreline and there is no significant development of saltmarsh topography. The ASM has developed on thin relic patches of peat or on muddy substrate. There are also small patches of ASM within the main area of saltmarsh and these form a mosaic with the MSM or contain scattered clumps of Sea Rush.

3.3 Mediterranean salt meadows (H1410)

This habitat was dominated by Sea Rush and contained a typical species assemblage with some patches dominated by Saltmarsh Rush, Creeping bent or Red Fescue. Other species present within the tall tussocks of Sea Rush included Sea Plantain (*Plantago maritima*), Sea Pink (*Armeria maritima*), Long-bracted Sedge (*Carex extensa*), Sea Arrowgrass (*Triglochin maritimum*), Greater Sea-Spurrey (*Spergularia media*), Spear-leaved Orache (*Atriplex prostrata*), Common Scurvy-grass (*Cochlearia officinalis*), Sea Milkwort (*Glaux maritima*),

White Clover (*Trifolium repens*) and Autumn Hawkbit (*Leontodon autumnalis*). There are small patches of ASM within the area mapped as MSM that are dominated by Red Fescue, Sea Plantain and Sea Pink.

The MSM is found on peat and has an irregular topography with mounds and shallow hollows and channels present. This topography has created some zonation of species into the MSM and species like Common Saltmarsh-grass and Sea Aster (*Aster tripolium*) are found with Sea Rush along the lower saltmarsh boundary. There are some deep small salt pans present within this habitat. The extent of habitat was too small for significant development of typical saltmarsh creeks, although there are some low channels present.

4 IMPACTS AND ACTIVITIES

This site is affected by few impacts and activities (Table 4.1). The main area is not grazed regularly. Cattle (141) graze the adjacent area of immature woodland, scrub and wet grassland. There are some signs of minor poaching within the saltmarsh area. There are also indications of poaching-induced erosion in places.

There is no sign of any significant erosion at this site even though some erosion features are present. A comparison of the OSI 6 inch map to the current extent of saltmarsh shows that there has been no significant loss of saltmarsh at this site during this period. The impact of erosion is assessed as neutral.

The main Impacts and activities around the site are related to farming such as mowing/cutting (102), fertilization (120) and grazing (140), although farming is not intensive in this area. Other impacts include dispersed habitation (403) and minor roads (502). A water sports centre (621) is also located in this small cove towards the eastern side. These activities have little or no measurable impact on the saltmarsh habitats.

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

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	0.05	Inside
1330	900	C	0	0.005	Inside
1410	140	C	0	0.344	Inside
1410	900	C	0	0.005	Inside

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

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the NHA survey, the 1995, 2000 and 2005 OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There was no specific information available for this site. The assessment of the site is confirmed to the saltmarsh habitat on the mainland and not on Dinish Island.

Dinish saltmarsh is a very small site with no features of particular conservation interest. The overall conservation status of the site is *favourable*. Its small size means there is no significant development of saltmarsh topography but some zonation of vegetation was noted and several communities were present. The saltmarsh is in relatively good condition. It was probably grazed in the past by cattle but there was no grazing of this site in recent times.

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

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

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

5.2 Atlantic salt meadows (H1330)

5.2.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.2.2 Habitat structure and functions

The structure and functions of this habitat were assessed as *favourable*. Due to the relatively small extent of habitat along the mainland no monitoring stops were recorded. However a visual assessment indicated that the ASM habitat was in good condition. The ASM is poorly

developed due to its relatively small size but several different vegetation types were noted along the shoreline.

5.2.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

5.3 Mediterranean salt meadows (H1410)

5.3.1 Extent

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.3.2 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Three monitoring stops were carried out in this habitat and they all passed. All the attributes required for favourable conservation status reached their targets. The structure and functions of the MSM are in generally good condition. There are few negative indicators. The habitat is likely to have been grazed in the past causing some damage but there was no recent grazing of the site.

The species assemblage of the MSM is typical of this vegetation type. There is no zonation of the MSM into different communities although some zonation of different species was noted and one small mound within the MSM contains some terrestrial species along with MSM. There is some transition from MSM to other saltmarsh vegetation dominated by Common Reed. There are also mosaic of ASM and MSM present. The saltmarsh topography within this habitat is poorly developed due to its relatively small size.

5.3.3 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

6 MANAGEMENT RECOMMENDATIONS

There are no specific recommendations for this site.

7 REFERENCES

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

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.273		0.273			
4	1410 Mediterranean salt meadow	0.315			0.315		
5	ASM/MSM mosaic (50/50)	0.058		0.029	0.029		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic						
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	0.015					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)						
12	pioneer 1330/1310/*Spartina* mosaic						
13	1410/other SM (CM2) mosaic						
14	*Spartina* sward dominated, with some ASM						
15	1310/*Spartina* mosaic						
16	ASM dominated with some Spartina						
17	1330/sand dune mosaic						
18	Other SM (CM2)	0.013					
19	1330/rocky shore mosaic	0.009					
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**0.683**		**0.302**	**0.344**		


Legend
SAC Boundary
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
1330/rocky shore mosaic
Other Saltmarsh (CM2)
other
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dinish
SMP code: SMP0069
Kenmare River SAC (002158)
0 50 100 150 200 250 Meters
Date of production: 20/02/2009
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:3500
N
National Parks and Wildlife Service

Appendix VI– Derreen House site report and habitat map from the SMP (McCorry & Ryle, 2009)

1 SITE DETAILS

SMP site name: **Dereen House**		SMP site code: **SMP0068**
Date of site visit **19/20/06/2008**		CMP site code: **N/A**
SM inventory site name: **Dereen House**		SM inventory site code: **175**
NPWS Site Name: **Kenmare River**		
NPWS designation	cSAC: **2158**	MPSU Plan: **N/A**
	pNHA: **N/A**	SPA: **N/A**
County: **Kerry**		Discovery Map: **84** Grid Ref: **076968, 057663**
Aerial photos (2000 series): **O 6524-C; O 6559-A**		6 inch Map No: **Ke 108**
Annex I habitats currently listed as qualifying interests for Kenmare River cSAC:		
H1330	**Atlantic salt meadows (Glauco-Puccinellietalia maritimae)**	
H1410	**Mediterranean salt meadows (Juncetalia maritimi)**	
Other SMP sites within this SAC/NHA: **Dinish, Tahillia, Dereen House**		
Saltmarsh type: **Fringe**		Substrate type: **Phragmites**: **Peat**

2 SITE DESCRIPTION

Dereen House saltmarsh is located in south-west Co. Kerry on the Beara Peninsula and along the southern shore of Kenmare River. This site is located about 19 km south-west of Kenmare Town. The survey site is located at the head of a small bay called Kilmakilloge Harbour. The Croanshagh River flows into the head of the bay. The head of Kilmakilloge Harbour has an irregular and inundated shoreline with several small islands and knolls. One of these knolls cuts off most of the head of the bay creating a somewhat circular almost enclosed intertidal area with a small narrow tidal connection to the rest of the bay. The R571 regional road between Kenmare and Castletownbere passes through the village of Lauragh and crosses the head of the bay. A road bridge (Cappaul Bridge) links the two sides of the bay. The majority of the saltmarsh habitat is located around the shoreline of this area cut off from the rest of the harbour.

Dereen House is a large ornamental garden and estate woodland found on the shoreline of this harbour near the village of Lauragh. The Dereen House gardens are located to the north of this bridge. The survey site also includes the shoreline between Cappaul Bridge and Derreen House gardens. There is scattered habitation in the area around the village of Lauragh and along the minor roads around the site.

The landscape of this area is dominated by upland habitats with hills and mountains the main landscape feature along the peninsula. The main habitats include wet heath, wet grassland and some blanket bog found in the higher areas. There is some development of woodland on the lower slopes close to the shoreline around the harbour. The main part of the site is quite isolated and difficult to access. The main section of this site is notable for the presence of semi-natural habitats around the saltmarsh that form a buffer zone. There is a natural transition from intertidal saltmarsh to wet grassland and blanket bog and then to developing semi-natural woodland along a landward gradient. Much of this land around the enclosed bay is not farmed intensively anymore and is generally unmanaged although it may be grazed in places. There are frequent signs of previous land-use in this area with old face-backs where peat was cut and drainage channels around the site. However, woodland and scrub is spreading into the adjacent terrestrial land around the southern side of the bay.

The site is located within the Kenmare River cSAC (0002158). This cSAC covers most of the marine parts of Kenmare River and it contains a diverse range of marine habitats. Some sections of coast have also been included such as the Sand dune and saltmarsh complex at Derrynane. Two Annex I saltmarsh habitats are found at this site, Atlantic salt meadows (ASM) and Mediterranean salt meadows (MSM). Both these habitats are listed as qualifying interests for this cSAC. Three other saltmarshes sites listed on the SM inventory (Curtis and Sheehy-Skeffington 1998) and located within this cSAC were surveyed during this project. These include Dinish located further north-east of Dinish along the southern side, and Tahillia and West Cove located along the northern side of Kenmare River. Two other saltmarsh sites listed on the SM inventory along the northern side of Kenmare River, Sneen and Derrynane, were not surveyed during the SMP. Dereen House saltmarsh is the largest saltmarsh site surveyed in Kenmare River. There is additional minor saltmarsh development in many of the small indentations along the shoreline.

Most of the saltmarsh habitat found at this site is positioned inside the digital cSAC boundary. This is mainly because the lower shoreline boundary on the OSI 6 inch map was used as the cSAC boundary along this part of the shoreline and most of the saltmarsh habitat is positioned above this boundary.

This site was accessed by crossing adjacent land at various access points including Croanshagh Bridge and Capaul Bridge.

3 SALTMARSH HABITATS

3.1 General description

The saltmarsh at this site is dominated by Mediterranean salt meadows (MSM) (Table 3.1). This is a typical ‘fringe’ type site and the main saltmarsh has developed in a small basin on thick blanket peat with some relic blanket bog vegetation adjacent to the saltmarsh. The

natural topography of the basin with gentle inclines around the shoreline has allowed the development of a relatively wide band of saltmarsh habitat between 50-100 m wide.

One notable aspect of this site is that the main part of the saltmarsh surrounds a small partially enclosed bay that is linked to the outer bay by a small waterfall or narrow tidal race. This means that the main saltmarsh has developed in the upper part of the tidal range and is only covered by the higher spring tides. Therefore, typical upper saltmarsh communities predominate around the enclosed section and there is no development of typical mid marsh or lower marsh vegetation. There is also a significant area of other or non-Annex I vegetation types dominated by stands of Common Reed (*Phragmites australis*) around the enclosed bay. These stands have been classified and mapped as CM2 or other Non-Annex saltmarsh vegetation in accordance with the SMP project classification. There are also frequent transitional indicators within the saltmarsh vegetation such as some more typical wet grassland and blanket bog species. This gives an indication of the freshwater influence on this marsh.

The main enclosed intertidal area empties at low tide to expose intertidal mud. There are tall peat saltmarsh cliffs along the lower saltmarsh boundary. The lower boundary is fringed by typical MSM vegetation. However within the saltmarsh the surface topography is irregular in places and there are sections where low mounds are vegetated by a mixture of Sea Rush (*Juncus maritimus*) and Common Reed.

Some of these mounds are also vegetated with a transitional vegetation type, which is characterised by a mixture of Sea Rush with other species such as Purple Moor-grass (*Molinia caerulea*) and Black Bog-rush (*Schoenus nigricans*). The natural topography of the basin with gradual inclines means that there is substantial development of transitional vegetation. This transitional vegetation type is also frequently seen at the landward boundary of much of the saltmarsh. There are subtle changes from MSM vegetation to adjacent wet grassland or blanket bog vegetation. The dominance of the two latter species was used to map the upper saltmarsh boundary.

The south-western section shows signs of peat cutting and there is a complex network of face-banks, channels and peat ridges. This area was difficult to map accurately with the upper saltmarsh boundary difficult to distinguish at times. The ridges contain typical bog vegetation and scrub such as Gorse (*Ulex europaeus*) whereas the channels contain Sea Rush dominated vegetation that extends into the blanket bog. Small mounds or relic peat hags from the cutting are found towards the lower boundary may contain isolated Gorse bushes surrounded by Sea Rush. There are natural vegetation successions in places along a landward gradient from MSM to transitional brackish wet grassland to wet grassland then to scrub and then to developing mature wet woodland dominated by Alder (*Alnus glutinosa*).

The outer part of the survey site contains less developed saltmarsh habitat that generally forms a narrow strip along the shoreline. The shoreline is generally more steeply sloped and the saltmarsh habitat is only a few metres wide. This saltmarsh is more fragmented and

patchy in places and much of the shoreline is marked by exposed bedrock in places. The saltmarsh has developed on a layer of much thinner mud/peat substrate. This section contains some patches of ASM/MSM mosaic in places. There is also some typical saltmarsh zonation with ASM in the lower zone and MSM developing along the upper zone. There is some zonation from typical ASM or MSM to stands of Sea Club-rush (*Bolboschoenus maritimus*) in this section. There is also some zonation from saltmarsh to non Annex I saltmarsh vegetation dominated by Twitch (*Elytrigia repens*) and containing Spear-leaved Orache (*Atriplex prostrata*).

Table 3.1. Area of saltmarsh habitats mapped at Dereen House.

EU Code	Habitat	Area (ha)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	0.748
1410	Mediterranean salt meadows (Juncetalia maritimi)	9.021
	Total	**9.769**

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

3.2 Atlantic salt meadows (H1330)

Some small narrow patches of ASM vegetation have developed in the north-east corner of the main area. The ASM has developed on thinner substrate that overlays the rocky material along the shoreline. The ASM contains some narrow zones with a typical mid marsh and upper marsh zone developing in places. The mid marsh vegetation is dominated by Sea Plantain (*Plantago maritima*) and Red Fescue (*Festuca rubra*) in this section. There is also a community dominated by Saltmarsh Rush (*Juncus gerardii*) and containing frequent Buck's-horn Plantain (*Plantago coronopus*). Other species present include Creeping Bent (*Agrostis stolonifera*), Sea Pink (*Armeria maritima*), Sea Aster (*Aster tripolium*), Sea Milkwort (*Glaux maritima*), Autumn Hawkbit (*Leontodon autumnalis*), Sea Arrowgrass (*Triglochin maritimum*), Long-bracted Sedge (*Carex extensa*) and Sea Plantain. The surface topography of this habitat is quite variable and there are frequent small mounds and hollows present that influence the vegetation and introduce zonation of ASM species into the habitat. The ASM also contains small amounts of Sea Rush and tussocks of this species are occasionally scattered through the ASM. The saltmarsh topography is poorly developed in this habitat and there are few typical salt pans present.

There are small patches of typical mid marsh Sea Pink-Sea Plantain sward in the narrow fringe of saltmarsh found around the outer bay. Turf fucoids were recorded in this habitat.

3.3 Mediterranean salt meadows (H1410)

The majority of the MSM habitat is characterised by a dense sward with a very high cover of Sea Rush. The MSM contains variable cover of Red Fescue and Saltmarsh Rush, both of which may be quite frequent. This vegetation type generally contains small amounts of Sea Pink, Creeping Bent, Sea Plantain, Sea Arrowgrass and Sea Milkwort. It also occasionally or

rarely contains species such as Sea Aster, Common Scurvygrass (*Cochlearia officinalis*), Sea Club-rush, Distant Sedge (*Carex distans*), Long-bracted Sedge and Brookweed (*Samolus valerandi*). Small amounts of peat or bare mud is occasionally exposed at ground level under the tall sward of Sea Rush.

One notable feature of the MSM vegetation is that Common Reed is widespread in this habitat but generally at low cover values. There are also frequent patches dominated by Common Reed and mapped as other saltmarsh vegetation (CM2). There are frequently gradual transitions from the sparse Common Reed cover in vegetation dominated by Sea Rush to patches dominated by Common Reed. Turf fucoids are present on exposed peat along the lower saltmarsh boundary.

Zonation within the MSM is most typically seen where the surface topography is variable and the vegetation changes from channels to mounds. The vegetation is quite heterogeneous in places due to the underlying topography. This site is also notable for the presence of a significant amount of Sea Rush-dominated vegetation with frequent brackish or transitional indicators such as Purple Moor-grass and Black-Bog-rush. These species are frequently found within Sea Rush-dominated vegetation on some of the mounds and along the upper transitional zone that are inundated by fewer spring tides. There is some typical saltmarsh zonation in places where typical MSM vegetation found at the lower saltmarsh boundary transitions to a mixed community with Purple Moor-grass and other species along a landward gradient. There are small patches of Spike-Rush (*Eleocharis* sp.) dominated vegetation within the MSM in places along the upper boundary.

The MSM habitat contains some deep artificial drainage channels. There are also natural drainage channels present in places. Typical salt pans are quite rare. The sward height is generally quite high as the overall level of grazing is low.

There is a band of heterogeneous marginal brackish vegetation near Croanshagh Bridge with species such as Grey Club-rush (*Schoenoplectus lacustris* spp. *tabernaemontani*), Autumn Hawkbit, Sea Pink, Spike Rush, White Clover (*Trifolium repens*), Common Reed, Sea Rush, Brookweed, Black Bog-rush, Sea Arrow-grass and Purple Moor-grass. This zone also contains tussocks with species such as Gorse and Birdsfoot present. This zone is patchy and fragmented in places and contains exposed rock in places. This species assemblage reflects the greater freshwater influence on the marginal vegetation along the river channel at this point.

The outer part of the bay also contains some MSM vegetation that is typically dominated by Sea Rush with frequent cover of Saltmarsh Rush and Red Fescue. Other transitional MSM vegetation is present near the shoreline of Dereen Gardens where saltmarsh has developed in a sheltered area behind a small shingle spit. This vegetation is dominated by Sea Rush but also contains species such as Birdsfoot (*Lotus corniculatus*), Sea Arrowgrass, Bindweed, Curled Dock (*Rumex crispus*), Silverweed (*Potentilla anserina*), Yorkshire Fog (*Holcus lanatus*) and Purple Moorgrass in the upper zone.

4 IMPACTS AND ACTIVITIES

There are few impacts and activities affecting this site. The main impact affecting the site is cattle grazing (140). However most of the saltmarsh is not grazed and the majority of the habitat that is grazed, is only grazed with a light intensity. The site is also grazed by deer and there are frequent deer tracks (501) though the saltmarsh in places. There are few other activities directly affecting the saltmarsh habitat as it is quite isolated.

There are frequent signs of old land-use around the site with drainage channels cut through the adjacent wet grassland and blanket bog into the bay. There are also signs that peat from the blanket bog has been cut in the past and there are old face-banks present. Some of the adjacent grassland may have been more improved in the past but has now been left unmanaged and has become semi-natural. These impacts are not assessed as they occurred outside the current monitoring period. However, they have had a significant residual impact on the structure and topography of the habitat.

There are few signs of natural erosion (900) at this site. There are tall saltmarsh cliffs with exposed peat marking much of the lower saltmarsh boundary in the main section. However, a comparison of the 1995, 2000 and 2005 OSI aerial photos series indicates shows that there has been no measurable loss of habitat during the monitoring period. A comparison of the OSI 2nd edition 6 inch map to the OSI 2005 series aerial photos also shows that there have been no significant changes to the shoreline during this period. There is some cliff toppling in the north-west corner but this is probably related to erosion along the river channel. This intertidal area is likely to be quite sheltered at the head of the bay and not prone to erosion. The impact of erosion is assessed as neutral.

The main impacts and activities around the site are related to farming such as grazing (140), although farming is not intensive in this area. Other impacts include dispersed habitation (403) and minor roads (502). These activities have little or no measurable impact on the saltmarsh habitats.

Table 4.1. Intensity of various activities on saltmarsh habitats at Dereen House.

EU Habitat Code	Activity code	Intensity	Impact	Area affected (ha)	Location of activity
1330	140	C	0	0.300	Inside
1410	140	C	0	2.000	Inside
1410	143	C	-1	0.050	Inside
1410	501	C	0	0.050	Inside
1410	900	C	0	0.050	Inside

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

5 CONSERVATION STATUS

5.1 Overall Conservation Status

The conservation status of a site is assessed on the condition of the site and on baseline information. The main source of baseline information for this site is the NHA survey, the 1995, 2000 and 2005 OSI aerial photo series. The baseline information from the NHA survey is generally limited to some descriptions of saltmarsh habitat and does not record the specific condition of the saltmarsh during the survey at this site. There was no specific information available for this site.

Dereen saltmarsh is a moderately sized site. Its size is one feature of particular conservation interest and it is the largest saltmarsh surveyed in Kenmare River. The position of the site in a small basin at the head of a bay and positioned at an elevation near the upper limit of saltmarsh development means that the vegetation contains many transitional features and the site is a mosaic of typical MSM and stands of Common Reed and other transitional vegetation. The overall conservation status of the site is *favourable*. The saltmarsh is in relatively good condition. A small area was badly poached but this only affects a very minor area compared to the rest of the site. Most of the site is not grazed. Few other impacts affect the site due to its relative isolation and the fact that it is surrounded by scrub and woodland. The relatively natural succession along a landward gradient from saltmarsh to wet woodland is also a notable feature.

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

Table 5.1. Conservation status of Annex I saltmarsh habitats at Dereen House.

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

5.2 Atlantic salt meadows (H1330)

The extent of this habitat is assessed as *favourable*. There are no indications of any loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.2.1 Habitat structure and functions

The structure and functions of this habitat were assessed as *favourable*. Two monitoring stops were carried out in this habitat and they all passed. All the attributes required for favourable conservation status reached their targets. The ASM only covers a small area and is generally poorly developed.

Several typical ASM communities are present and the diversity is typical of this habitat. Some zonation was noted between different ASM communities at one location. There are some natural successional communities to other saltmarsh vegetation present but these are generally poorly developed due to the relatively steep shoreline topography where the ASM is generally found. The saltmarsh topography is relatively poorly developed but this is typical of these relatively small fragments of ASM. Turf fucoids were recorded in this habitat but these are fairly typical of heavily grazed fringe type saltmarshes along the west coast of Ireland.

5.2.2 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present.

5.3 Mediterranean salt meadows (H1410)

The extent of this habitat is assessed as *favourable*. There are no indications of any significant loss of habitat due to land use changes, development or erosion within the current monitoring period.

5.3.1 Habitat structure and functions

The structure and functions of this habitat are assessed as *unfavourable-inadequate*. Fourteen monitoring stops were carried out in this habitat and one stop failed. Most the attributes required for favourable conservation status reached their targets. The structure and functions of the MSM are in generally good condition. One stop failed due to excessively heavy poaching at one location. However, the overall grazing level is low and much of the site is not grazed at all. There are no other significant negative indicators within this habitat.

The species assemblage of the MSM is typical of this vegetation type. There is typical zonation of the MSM into different communities with the appearance of Common Reed and transitional species such as Purple Moorgrass the most obvious indicator of zonation within this habitat. There is some development of a transitional brackish zone along the upper boundary of the saltmarsh in places with a mixture of Purple Moor-grass and Sea Rush. There are natural drainage channels present within the MSM but the topography and

structure of the habitat has been modified in the past by drainage, peat cutting and previous reclamation.

5.3.2 Future prospects

The future prospects of this habitat are assessed as *favourable*. This assessment assumes that the current management activities and level of impacts such as grazing continue in the near future. The habitat is not affected by any significantly damaging impacts or activities at present. Some of the saltmarsh habitat is located outside the cSAC.

6 MANAGEMENT RECOMMENDATIONS

There are no specific management recommendations for this site.

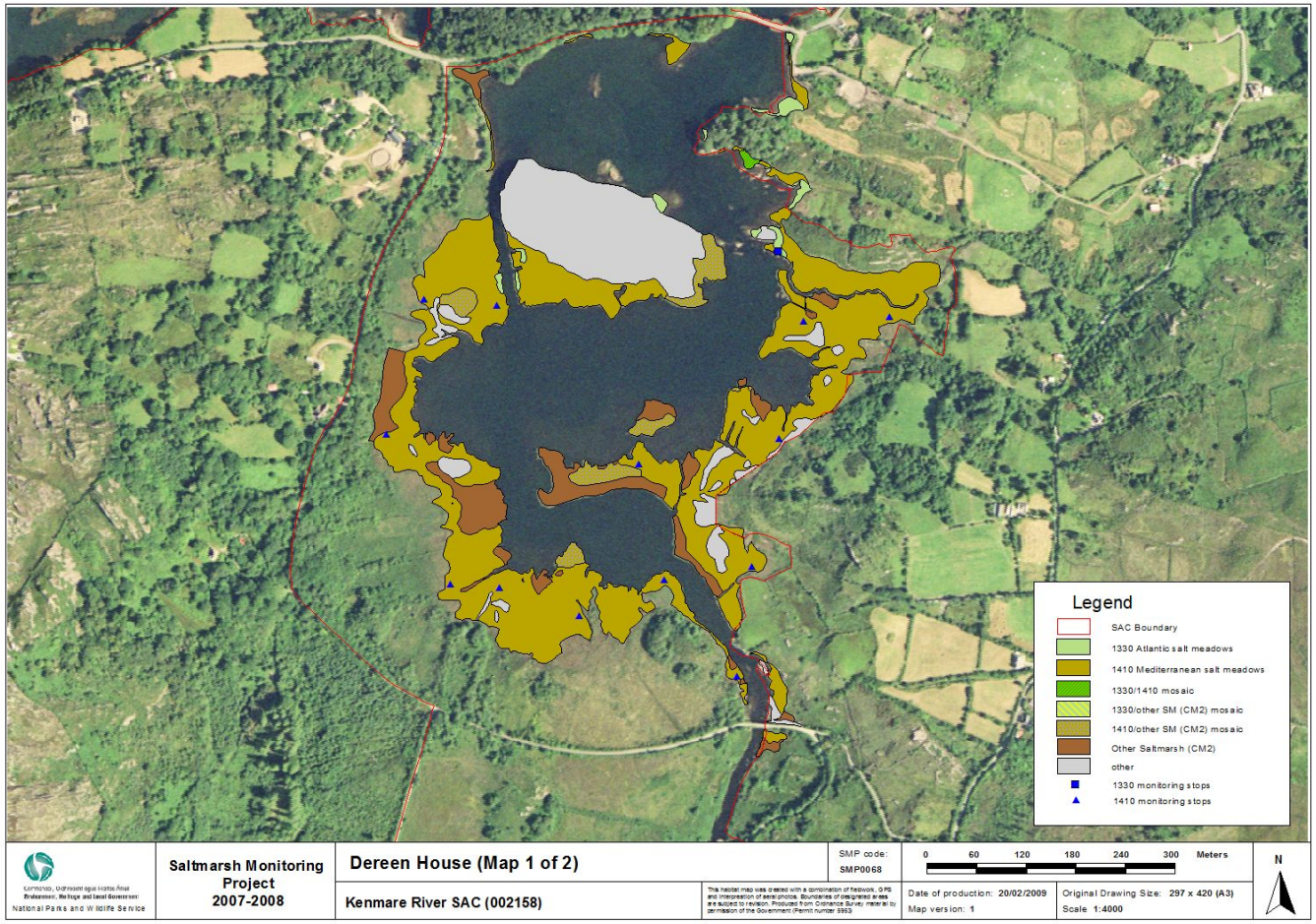
7 REFERENCES

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

8 APPENDIX I

Table 8.1. Areas of SMP habitats mapped using GIS.

SM Habitat code	SM habitat description	Mapped Area (ha)	Area (ha)				
			1310	1330	1410	1420	Spartina swards
1	1310 *Salicornia* flats						
2	Spartina swards						
3	1330 Atlantic salt meadow	0.719		0.719			
4	1410 Mediterranean salt meadow	8.676			8.676		
5	ASM/MSM mosaic (50/50)	0.056		0.028	0.028		
6	ASM/*Spartina* mosaic						
7	1330/other SM (CM2) mosaic	0.002		0.001			
8	1330/coastal grsld mosaic						
9	Other (non saltmarsh)	3.199					
10	*Spartina* clump/mudflat mosaic (50/50)						
11	Isolated *Spartina* clumps on mud (5%)						
12	pioneer 1330/1310/*Spartina* mosaic						
13	1410/other SM (CM2) mosaic	0.633			0.317		
14	*Spartina* sward dominated, with some ASM						
15	1310/*Spartina* mosaic						
16	ASM dominated with some Spartina						
17	1330/sand dune mosaic						
18	Other SM (CM2)	1.666					
19	1330/rocky shore mosaic						
20	1420 Mediterranean scrub						
21	1310/1330 mosaic						
	Total	**14.951**		**0.748**	**9.021**		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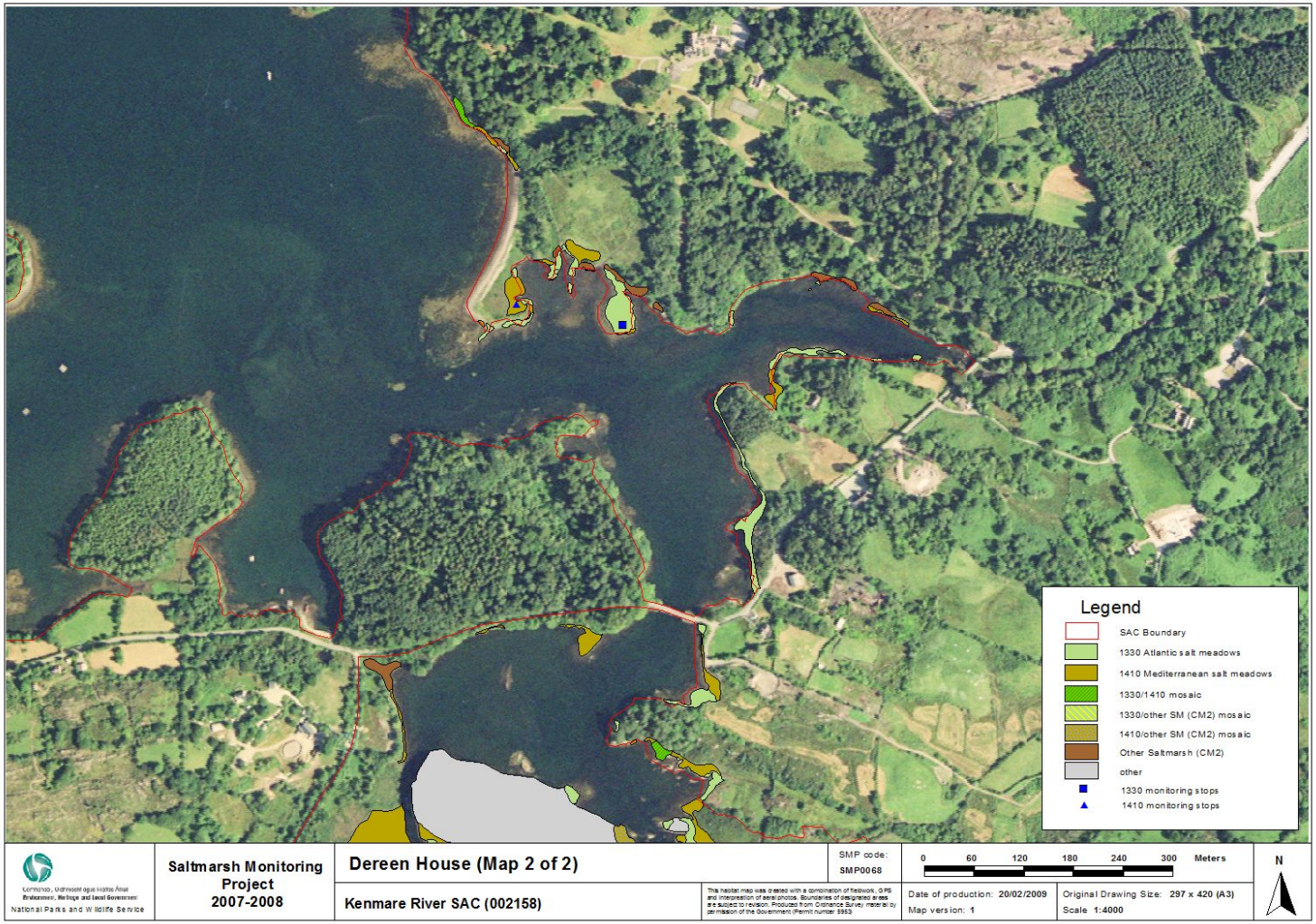
SAC Boundary
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
1330/other SM (CM2) mosaic
1410/other SM (CM2) mosaic
Other Saltmarsh (CM2)
other
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dereen House (Map 1 of 2)
SMP code: SMP0068
0 60 120 180 240 300 Meters
N
Kenmare River SAC (002158)
Date of production: 20/02/2009
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:4000
National Parks and Wildlife Service


Legend
SAC Boundary
1330 Atlantic salt meadows
1410 Mediterranean salt meadows
1330/1410 mosaic
1330/other SM (CM2) mosaic
1410/other SM (CM2) mosaic
Other Saltmarsh (CM2)
other
1330 monitoring stops
1410 monitoring stops
Saltmarsh Monitoring Project 2007-2008
Dereen House (Map 2 of 2)
Kenmare River SAC (002158)
SMP code: SMP0068
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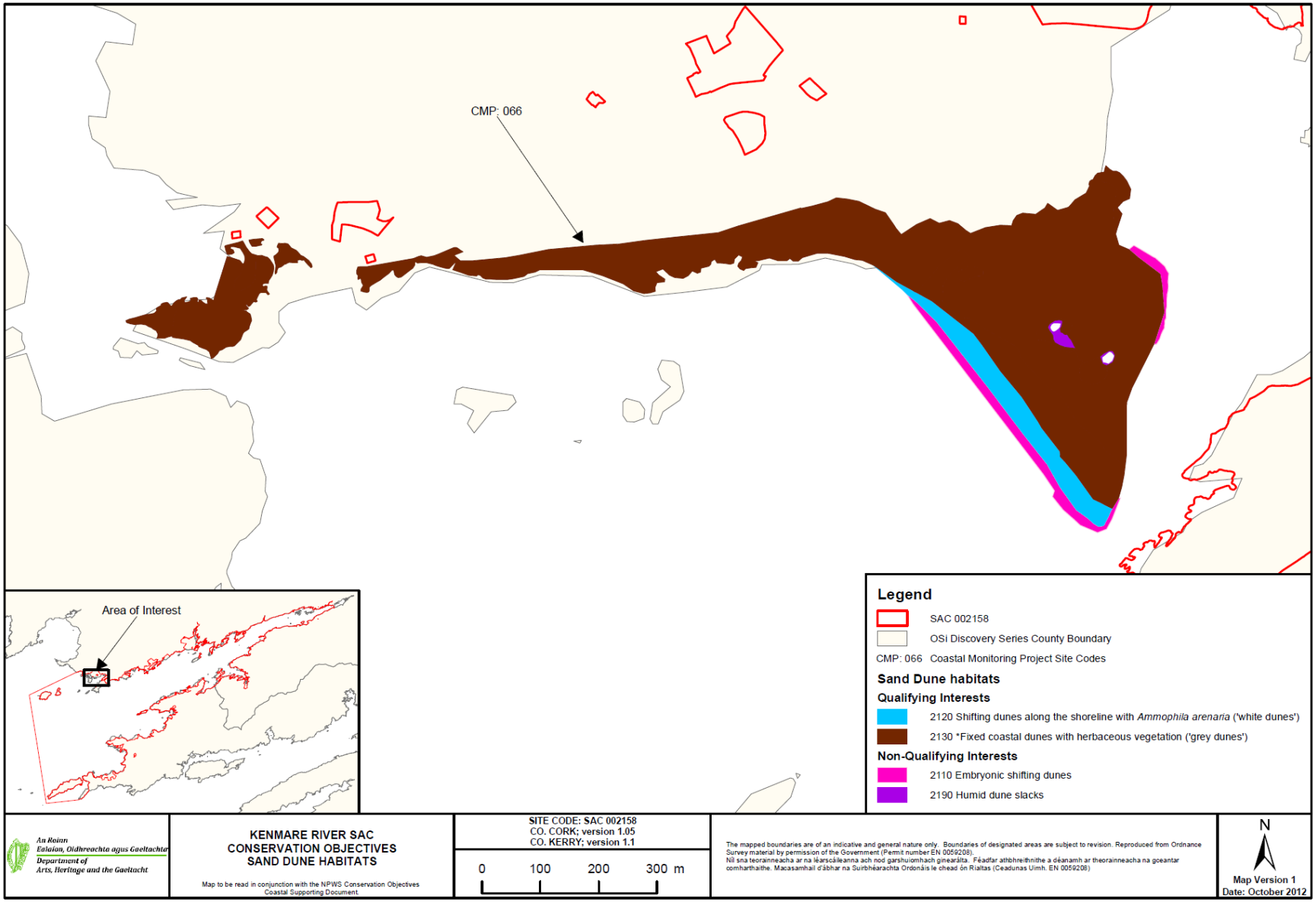
N
Date of production: 20/02/2009
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:4000
National Parks and Wildlife Service

Appendix VII– – Distribution map of sand dune habitats within Kenmare River SAC



Appendix VIII- Derrynane site report and habitat map from the CMP (Ryle *et al*., 2009)

SITE DETAILS

CMP05 site name: **Derrynane** CMP05 site code: **066** CMP Map No.: **63**

County: **Kerry** Discovery map: **84 (& 83)** Grid Reference: **V 053 058**

6 inch Map No.: **Ke 1065**

Aerial photographs (2000 series): **O 6518-D; O 6519-C, D; O 6555-A, B**

NPWS Site Name: **Kenmare River**

NPWS designation: pNHA: **2158** cSAC: **2158**

Other designations: **Blue Flag 2005; National Historic Park**

Ranger Area: **Kerry – South**

MPSU Plan: **N/A**

Report Author: **Tim Ryle**

SITE DESCRIPTION

Derrynane National Historic Park, near the rural village of Caherdaniel, was originally the ancestral home of Daniel O'Connell. It still houses a museum and extensive gardens and woodlands with its South American Plants, which attract many visitors during the year. A mass rock from penal times and a two thousand-year-old Ogham stone are still standing within the sand dunes.

Derrynane estate is located within the Kenmare River SAC (candidate Special Area of Conservation 2158). The long drowned glacial valley was primarily designated for its wide range of marine communities, including reefs, large shallow bay and caves. Records show it to contain unusually large and interesting numbers of sea-fans and sponges.

The Derrynane site is of ecological interest, supporting a wide range of habitats from sand dune and residual saltmarsh to reedmarsh and planted woodland with exotic tree species. The value of the park in terms of its natural history is becoming increasingly important and explored by the public with useful publications such as the OPW's

"Derrynane Dunes". More recently a report prepared for the NPWS (Bleasdale & Conaghan, 1998) provided a baseline vegetation report based on detailed survey work. This report made a number of recommendations in relation to the management of the Park. A number of these recommendations have been implemented. For example, a large portion of the fixed dune habitat has been fenced to control grazing and sustain the Natterjack toad population that was reintroduced in the early 1990's (F. Marnell, NPWS, pers comm.).

Local flora and fauna includes the Annex II protected mollusc, *Vertigo angustior* which is reported from the fixed dunes. The Kerry Lily (*Simethis planifolia*), a Flora protection Order species is found in the coastal heath. This species was the cause of some notoriety in 2005 during the widening of a 3-kilometre stretch of road in the vicinity.

The sand dune system occupies an area of approximately 25ha (Table 66A). Most of the dunes are managed to varying degrees either for conservation or recreational purposes. The beach is popular with recreational users – both swimmers and walkers, many of whom arrive via the house, although a number of carparks facilitate ready access onto the sand dunes.

Table 66A **Areas of EU Annex I habitats mapped at Derrynane**

EU Code	***EU Habitat***	Area (ha)
H2110	Embryonic shifting dunes	1.007
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	1.667
H2130	Fixed coastal dunes with herbaceous vegetation	22.075
H2190	Humid Dune Slacks	0.103
	8.1.1 Total Sand dune	**24.852**

Fixed Dunes (H2130)

There was great diversity in species diversity present within the fixed dunes at Derrynane. This reflected the drainage, topography and management of the site, which results in a fixed dune mosaic. Typical species throughout the habitat include *Festuca rubra* (Red fescue), *Lotus corniculatus* (Common bird's-foot-trefoil), *Carex arenaria* (Sand sedge), *Galium verum* (Lady's bedstraw) and *Plantago lanceolata* (Ribwort plantain). Lichens, mostly *Peltigera* spp. (Dog lichen) were abundant in

some areas, particularly on shallow open sandy soils, while mosses were more common in damp hollows.

As part of the management regime of the dunes, a large area of the fixed dunes has been fenced off to control grazing and to ensure the continued viability of the Natterjack toad (*Bufo calamita*). Much of this undulating topography is heterogeneous in character with some rank marram-dominated vegetation along with shallow depressions, some of which are damp, and two of which have small pools. Other hollows are moss-rich and may in future be used to create additional pools for the Natterjack toads.

To the seaward side of the long enclosure, much of the ground is semi-fixed dominated by *Ammophila arenaria* (Marram) and the sand is not fully consolidated. A small number of stunted shrubs such as *Fraxinus excelsior* (Ash) were also recorded from the semi-fixed dunes.

The only scrub recorded on the fixed dune was a small patch of *Ulex europaeus* (Gorse), although larger areas of scrub vegetation encircled areas of the fixed dune, particularly adjacent the large rock outcrops near the main strand carpark.

The greatest volume of recreational traffic on the dunes occurs to the South of Derrynane house, whilst many beach users make for the western end of the strand which is sheltered from the prevailing winds by Abbey Island. The short sward is species rich and not rank. Much of the dune grassland is managed by mowing tracks in the vegetation thus encouraging less traffic on the sensitive dune vegetation. Towards the back of this short turf grassland, the area becomes wetter, with *Phragmites australis* (Common reed) before the expansion into wet woodland and mature oak woodland.

Negative indicator species such as *Senecio jacobaea* (Common ragwort) or *Lolium perenne* (Perennial ryegrass) whilst recorded, were not frequent contributors to ground cover within the turf.

Dune Slacks (H2190)

While a number of hollows noted in the fixed dune system are damp, only two discrete dune slacks are recorded (CMP Map 63). An Foras Forbartha's 1972 site description makes reference to an old record for the Natterjack toads in the area. Natterjack toads were recently reintroduced by the NPWS in the 1990's, when two pools were created for the toads through the mechanical excavation of a portion of the slack vegetation.

The most common species recorded from the wet slacks are *Hydrocotyle vulgaris* (Marsh pennywort), *Potentilla anserina* (Silverweed), *Mentha aquatica* (Water mint) and the moss *Calliergonella cuspidata*. Other less frequently recorded species include the occasional *Salix repens* ssp. *argentea* (Creeping willow) while *Rhinanthus minor* (Yellow rattle) and other fixed dune species increase towards the outer the boundaries of the slack.

Mobile Dunes (H2120)

The mobile dunes occur as a wide band of *Ammophila arenaria*-dominated (Marram) vegetation. In addition, *Calystegia soldanella* (Sea bindweed) and *Eryngium maritimum* (Sea holly) are common. While the sand is accumulating at the south-eastern part of the site, where the Coomnahorna River finally flows out to sea, the mobile dunes gradually narrow out into a steep band further west before disappearing at the centre of the site (CMP Map 63).

Embryonic Dunes (H2110)

The embryonic dunes are dominated by *Elytrigia juncea* (Sand couch), although *Honckenya peploides* (Sea sandwort) occurs locally. Negative indicator species infrequently recorded included *Senecio jacobaea* (Common ragwort). Two areas of embryonic dunes were recorded. The greatest expanse of foredunes are found to the

seaward side of the mobile dunes. A second, narrow band is recorded at the landward side of the low-lying fixed dune grassland, in a sheltered cove beside the saltmarsh.

IMPACTS

Derrynane is an important national historic park, which according to Kerry County Council attracts a great many people. Many of these visitors take walks within the woodlands and make use of the beach. The various impacts and activities are shown in Table 66B, which differ from those listed in the NATURA 2000 dataform, for which the sand dunes account for only 1% of the designated site.

Pedestrian traffic (code 622) has a significant impact on the sand dunes, although many of the tracks (code 501) have been purposely created or maintained to encourage walkers to stay off large portions of the fragile sand dune system. Much of the maintenance of these tracks simply involves mowing (code 102). Other forms of non-motorised activity (code 622) have less of an impact. A local horseriding school makes use of the bay and back of the dunes during low tide.

Table 66B Intensity and impact of various activities on sand dune habitats at Derrynane

EU Habitat Code[1]	**Activity Code**[2]	**Intensity**[3]	**Impact**[4]	***Area affected/ha***	**Location of Activity**[5]
2130	102	C	2	0.5	Inside
2130	140	B	2	15.5	Inside
2130	149	B	-1	5.0	Inside
2130	501	C	2	0.75	Inside
2130	622	A	2	0.75	Inside
2130	900	A	0	Unknown	Inside
2110	900	C	0	Unknown	Inside
2120	900	C	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 site is positively managed to facilitate nature conservation objectives with recreational pressures. Controlled grazing (code 140) inside the enclosure maintains the short turf sward, which benefits the Natterjack toad. Some areas could benefit from a moderate grazing regime. Undergrazing (code 149) is most noticeable outside

the fence where large swathes of the dunes at the eastern side of the site are dominated by Marram.

Coastal erosion (code 900) is a natural feature of the sand dunes, particularly in the relative shelter of eastern side of Abbey Island. Neither embryonic nor mobile dunes were recorded in 2005 along a considerable stretch of the strand, and the eroding face of the fixed dune was in places perilous.

CONSERVATION STATUS

Derrynane is an important tourist stop on the Ring of Kerry, both in terms of its historical appeal and its blue flag beach. However, the site's continued importance is afforded considerable protection, as it actively managed in terms of conservation aims and recreational use. The overall site conservation assessment for the Derrynane site is favourable, and is reflected in the overall results for each habitat as shown in Table 66C. The numbers and results of the monitoring stops that were used in the analysis of the structure and function of the sand dune habitats at Derrynane are presented in Table 66D.

Table 66C Conservation status of Annex I sand dune habitats at Derrynane

HABITAT[1]	EU Conservation Status Assessment				
	FAVOURABLE	**Unfavourable - Inadequate**	**Unfavourable - Bad**	**Overall EU conservation status assessment**	**Proposed Irish conservation status system[2]**
FIXEDDUE (H2130)	**Extent / Future Prospects / Structure and Functions**			**Favourable**	**Favourable - Maintained**
DUNE SLACK (H2190)	Extent / Future Prospects / Structure and Functions			**Favourable**	**Favourable – Maintained**
MOBILE DUNE (H2120)	Extent / Future Prospects / Structure and Functions			**Favourable**	**Favourable – Maintained**
EMBRYONIC DUNE (H2110)	Extent / Future Prospects / Structure and Functions			**Favourable**	**Partially - Destroyed**

[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)

Fixed dune (H2130)

Not surprisingly, the fixed dune occupies the greater part of the sand dune system and its extent is assessed as *favourable*. A large section on the projecting sandy headland is characterised by a vegetation mosaic and undulating topography which is encompassed within the conservation area that is delineated by an fenced enclosure. Bleasdale & Conaghan (1998) make reference to the fact that a local herd of Kerry cattle were being used as the main management tool in these dune grassland areas. Much of the remainder of the fixed dune is managed to minimise recreational damage and erosion of the fixed dune.

All but 2 of 12 monitoring stops in fixed dune passed the target, resulting in conservation assessment for structure and function as *favourable*. The two stops that failed were located outside the enclosure and are characterised by rank vegetation that accounted for a sward height of 35 and 50cm respectively, which is greater than the uppermost limit of 20cm for good quality fixed dune habitats. In addition, both stops failed to meet the typical species criteria of 6 species.

The future prospects for the fixed dune habitat are *favourable*. Although the semi-fixed grassland could benefit from an appropriate grazing regime, a large area is fenced off for conservation purposes. The area between the strand and Derrynane house is heavily trafficked, but is managed in such a way as to minimise impacts on the fixed dunes.

The overall conservation assessment for the fixed dune habitat is *favourable*.

TABLE 66D PASS/FAIL RESULTS OF MONITORING STOPS FOR ANNEX I SAND DUNE HABITATS AT DERRYNANE

	Monitoring stops		
HABITAT	**Pass**	**Fail**	**Conservation status**
FIXED DUNE (H2130)	10	2	**Favourable**
DUNE SLACK (H2190)	4	0	**Favourable**
MOBILE DUNE (H2120)	4	0	**Favourable**
EMBRYONIC DUNE (H2110)	4	0	**Favourable**

Dune slack (H2190)

While two discrete slacks were noted, the area occupied by dune slacks at Derrynane is actively managed for conservation purposes. It would appear from analysis of the aerial photographs (year 2000) and the extent of dune slack shown on CMP map 63 that there has been no loss of habitat. Thus its assessment of its extent is *favourable*.

All four monitoring stops passed and therefore structure and function parameter is assessed as *favourable*.

The future prospects are *favourable* as the area is purposely managed for the benefit of the Natterjack toad. A number of damp hollows within the fixed dune habitat and not containing dune slack species may in future be dug out to create additional pools for the Natterjack toad. Future assessment of this habitat will need to take this into account.

The overall conservation assessment for the dune slacks habitat at Derrynane is *favourable*.

Mobile dune (H2120)

The mobile dune though limited to the south-eastern half of the site, is *favourably* assessed, as the dunes are healthy and accreting sand at the tip.

All four stops carried out in the mobile dunes satisfied the target criteria, indicating a *favourable* conservation status. The condition of the Marram was healthy and there was little impact of negative indicator species such as *Senecio jacobaea* (Ragwort).

Future prospects are *favourable,* as the mobile dunes appear to be actively accreting, particularly at the eastern end of the site.

Their overall conservation status assessment for the habitat is *favourable.*

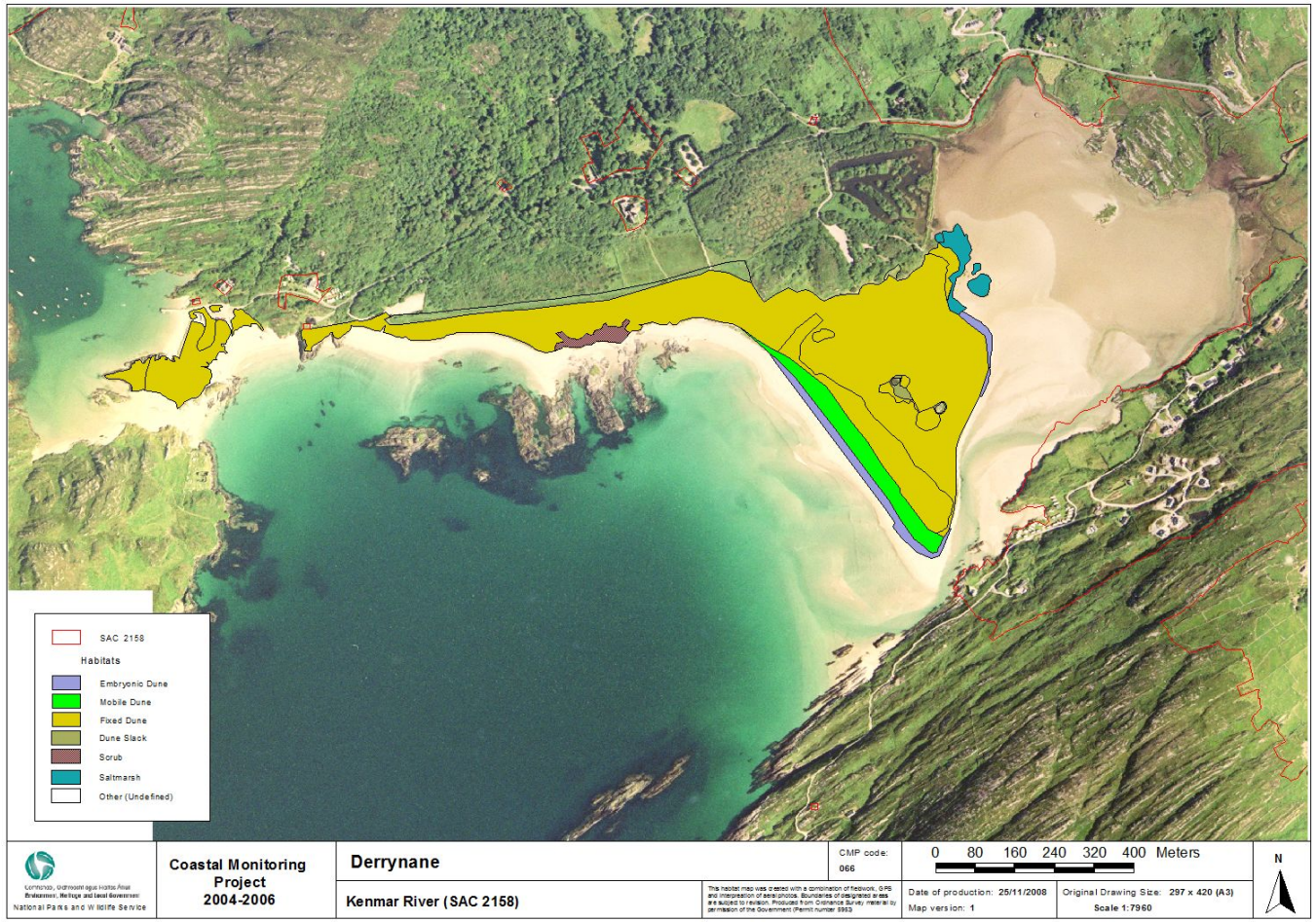
Embryonic dunes (H2110)

The embryonic dunes are healthy in appearance with apparent accumulation towards the river at the eastern end of the site. Thus in terms of their extent, they are assessed as *favourable.*

The foredunes passed the target criteria at all four monitoring stops, indicating a *favourable* conservation status assessment.

Similarly, the future prospects of the embryonic dunes are *favourable,* as they show no signs of net habitat loss.

The overall EU conservation assessment for the embryonic dunes at Derrynane is *favourable*.


SAC 2158
Habitats
Embryonic Dune
Mobile Dune
Fixed Dune
Dune Slack
Scrub
Saltmarsh
Other (Undefined)
Coastal Monitoring Project 2004-2006
Derrynane
Kenmar River (SAC 2158)
CMP code: 066
0 80 160 240 320 400 Meters
N
Date of production: 25/11/2008
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:7960

Appendix IX– Distribution map of sea cliffs within Kenmare River SAC