NPWS

Dog's Bay SAC
(site code: 001257)

Conservation objectives supporting document- Coastal habitats

Version 1

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Contents

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

Please note that this document should be read in conjunction with the following report: NPWS (2017) Conservation Objectives: Dog's Bay SAC 001257. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

1 Introduction

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

Dog's Bay SAC is a small site located 3.5km south-west of Roundstone village in Co. Galway. The site consists of a granite 'island' which is linked to the mainland by a sand spit, a feature which is known as a tombolo. Dog's Bay curves along the west side of this tombolo, with Gorteen Bay to the east. There are also two other beaches located in the SAC on the rocky outcrop, beyond the spit. One to the south called Tra Gárbh and one to the west called Lady's Beach (Ryle *et al*., 2009).

Dog's Bay SAC is an important site as it encompasses a good example of a tombolo. This is formed from sand, which is 90% calcium carbonate, composed of the calcareous shells of tiny, single-celled marine animals, called Foraminfera. These shells have been swept up from deeper water into the channel between the island and the mainland. This site is one of the few locations worldwide where Foraminiferan sand is found onshore (NPWS, 2013).

The main habitat present is fixed dune grassland which dominates the middle of the SAC. Landwards, this fixed dune habitat grades into dry heath. Other habitats present include sandy beach, rocky shoreline, strandline vegetation, shingle beach, embryonic dunes, mobile dunes and dune slacks with small areas of brackish pools, saltmarsh, freshwater lake, freshwater marsh and grassland also occurring. The granite bedrock forms prominent outcrops, particularly in the south-western part of the SAC (NPWS, 2015).

Dog's Bay SAC (site code: 001257) is selected for sand dune habitats and European dry heath. The following four coastal habitats are included in the list of Qualifying Interests for the SAC (* denotes a priority habitat):

1210	Annual vegetation of drift lines
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)*

The distribution of all the sand dune habitats recorded in Dog's Bay SAC is presented in Appendix I.

2 Conservation Objectives

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

This supporting document sets out the conservation objectives for the four coastal habitats listed above in Dog's Bay SAC, which is defined by a list of parameters, attributes and targets. The main parameters are (a) Range (b) Area and (c) Structure and Functions, the last of which is broken down

into a number of attributes, including physical structure, vegetation structure and vegetation composition.

The targets set for the sand dune habitats are based primarily on the results of the Sand Dune Monitoring Project (SDM) (Delaney *et al*., 2013) and this document should be read in conjunction with that report. It is also recommended that this document be read in conjunction with the final report from the Coastal Monitoring Project (CMP) (Ryle *et al*., 2009). The CMP was a comprehensive national baseline survey of all known sand dune systems in Ireland. The SDM subsequently reviewed and modified the methodology used during the CMP to map and assess the conservation status of dune habitats. A subset of 40 sites (including Dog's Bay) was selected as a representative sample of the national dune resource for the SDM survey.

The distribution of sand dune habitats within Dog's Bay SAC is presented in Appendix I. As part of the SDM, detailed individual reports and habitat maps (a revised baseline habitat map and an updated habitat map) were produced for all 40 sub-sites and the relevant ones for the sub-site Dog's Bay (SDM site ID: 097) are included in Appendix II.

The conservation objectives for the sand dune habitats in Dog's Bay SAC are based on the findings of the SDM, combined with the results of Gaynor (2008) and Ryle *et al.* (2009). The site was also visited during the Biomar Survey of Irish Machair Sites (Crawford *et al*., 1998). It is thought that the sub-site as surveyed by the SDM represents the entire area of sand dunes within Dog's Bay SAC.

3 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 nine 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* (white dunes) (2120)**
- **Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130) ***
- Decalcified dunes with *Empetrum nigrum* (2140) *
- Atlantic decalcified fixed dunes (Calluno-Ulicetea) (2150) *
- Dunes with *Salix repens* subsp. a*rgentea* (Salicion arenariae) (2170)
- Humid dune slacks (2190)
- Machairs (21A0) *

Five sand dune habitats were recorded by Ryle *et al*. (2009) and Delaney *et al*. (2013) from Dog's Bay, four of which, indicated in bold above, are listed as Qualifying Interests for Dog's Bay SAC. These habitats include mobile areas at the front as well as more stabilised parts of dune systems. Humid dune slacks were also recorded during the SDM at Dog's Bay SAC, as well as the Annex I coastal habitat Perennial vegetation of stony banks, but neither habitat is listed as a Qualifying Interest (QI) for the SAC.

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

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

Where sand accumulation is more rapid 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 Sand Dune Monitoring Project (Delaney *et al*., 2013) of each sand dune habitat found at the Dog's Bay sub-site are presented in Appendix II. A total of 45.62ha of sand dune habitat was mapped within Dog's Bay SAC, of which 45.52ha (99.8%) represents habitats that are listed as Qualifying Interests for this particular SAC.

3.1 Overall objectives

The overall objective for 'Annual vegetation of drift lines' in Dog's Bay SAC is to '*restore the favourable conservation condition*'.

The overall objective for 'Embryonic shifting dunes' in Dog's Bay SAC is to '*maintain the favourable conservation condition*'.

The overall objective for 'Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)' in Dog's Bay SAC is to '*restore the favourable conservation condition*'.

The overall objective for 'Fixed coastal dunes with herbaceous vegetation (grey dunes)' in Dog's Bay SAC is to *'restore the favourable conservation condition*'.

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

3.2 Area

3.2.1 Habitat area

Habitat extent is a basic attribute to be assessed when determining the condition of a particular habitat. A baseline habitat map was produced for the sand dune habitats at the Dog's Bay sub-site during the Coastal Monitoring Project (CMP) (Ryle *et al*., 2009). During the Sand Dunes Monitoring Project (SDM) (Delaney *et al*., 2013), these baseline maps were checked and revised to account for changes in habitat interpretation and omissions. Updated maps were then produced to reflect the current situation on the ground. The revised baseline habitat maps and updated habitat maps from the SDM are included with the individual site report in Appendix II at the end of this document.

The total areas of each Qualifying Interest (QI) sand dune habitat within the Dog's Bay sub-site as estimated by the Sand Dune Monitoring Project (Delaney *et al*., 2013) are presented in the second column of the following table. The total areas of each QI habitat within the boundary of Dog's Bay SAC are presented in the third column.

Habitat	Total area (ha) of habitat from SDM	Total area (ha) of habitat within SAC boundary
Annual vegetation of drift lines (1210)	0.22	0.22
Embryonic shifting dunes (2110)	0.18	0.18
Shifting dunes along the shoreline with *Ammophila arenaria* (2120)	0.36	0.36
Fixed coastal dunes with herbaceous vegetation (2130)	46.09	44.76
Total	**46.85**	**45.53**

The total area of sand dune habitat recorded at the Dog's Bay sub-site was slightly greater during the SDM than during the CMP (Ryle *et al*., 2009) and this was the result of natural processes (Delaney *et al*., 2013).

The area of embryonic shifting dunes had decreased from 0.53ha during the CMP to 0.18ha during the SDM because of natural succession to marram dunes (white dunes) and fixed dunes (grey dunes) (Delaney *et al*., 2013).

The area of marram dunes (white dunes) decreased from 0.46ha during the CMP to 0.36ha during the SDM. This was mainly because part of the dunes on the eastern side of the tombolo which was previously mapped as marram dunes (white dunes) had undergone succession and was mapped as fixed dunes (grey dunes) (Delaney *et al*., 2013).

During the SDM, the area of fixed dunes (grey dunes) increased slightly from 45.41ha during the CMP to 46.09ha due to succession. In addition, the baseline area of fixed dunes (grey dunes) increased to include an extra field in the north of Dog's Bay. The field covered an additional area of 1.21ha. A small part of the habitat mapped during the CMP was found to be composed of a rocky outcrop and was excluded. These revisions resulted in an increase in the area of fixed dunes (grey dunes) (Delaney *et al*., 2013).

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.

3.3 Range

3.3.1 Habitat distribution

The distribution of sand dune habitats at Dog's Bay SAC, as mapped by the Sand Dunes Monitoring Project (Delaney *et al*., 2013), is presented in Appendix I.

Annual strandline habitat is best developed on the Gorteen side of the tombolo and stretches the entire length of the beach (Ryle *et al*., 2009). A small portion was also found on the beach at Dog's Bay that faces south-west (Delaney *et al*., 2013).

At Dog's Bay, there are two short, narrow bands of embryonic shifting dunes. The first strip is on the beach that faces south-west, while the second is on an isolated patch of dune vegetation beside Gorteen Bay (Delaney *et al*., 2013).

There is also a narrow band of embryonic dunes present on Tra Gárbh in the south of the site and this is fronted by perennial vegetation of stony banks. There is very little development of mobile or embryonic dunes on the smaller beach to the north-east of Gorteen, although some planting of marram (*Ammophila arenaria*) has taken place (Ryle *et al*., 2009).

Marram dunes (white dunes) occur at Dog's Bay on a strip facing north-west. According to the SDM, they had colonised the area formerly composed of embryonic shifting dunes and had extended south-west of their former location and abutted the rock gabions (Delaney *et al*., 2013).

The fixed dunes comprise a relatively large area covering the sandy spit and extend south to the granite outcrop where the beach Tra Gárbh occurs. There is also an area of fixed dune located on the mainland, east of the smaller Gorteen beach (Ryle *et al*., 2009).

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.

3.4 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 Dog's Bay SAC in terms of structure and functions depends on a range of attributes for which targets have been set as outlined below.

3.4.1 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. It should be borne in mind that natural processes such as erosion, deposition and succession are primary drivers of change on coastal habitats.

Dog's Bay SAC is of particular interest from the point of view of geomorphology and sand dune development (NPWS, 2015).

Severe erosion of the foredunes has occurred at this site in the past, as a result of natural processes, which were exacerbated by overgrazing and heavy volumes of summer visitors. This led to intervention by Galway County Council to curtail further erosion. The main focus was placed on the more exposed western side of the tombolo at Dog's Bay as well as at the long Gorteen Strand. A series of measures were put into place, including re-profiling of some of the dunes, a planting regime and the installation of rock gabions at the south end of Dog's Bay. Several habitats at Dog's Bay have benefitted from these measures. Fencing has restricted access to sensitive areas which have now re-vegetated. There is no longer any obvious sign of the soft stabilisation works, as the sand trapping using brash, marram planting and dune slope re-grading have resulted in natural-looking transitions from foredune to fixed dune habitats (Delaney *et al*., 2013).

However, the placing of rock armour in the form of gabions along the southern part of Dog's Bay to try to curb further erosion of the habitats has interfered with the natural habitat transitions from beach to foredunes and may result in changed erosion and accretion patterns in the future (Delaney *et al*., 2013).

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.

3.4.2 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.

Dog's Bay SAC displays a good diversity of coastal habitats in a relatively small area. Of particular note is the area of fixed dunes, parts of which are fairly intact. The shifting dunes form a narrow band before grading into embryonic dunes to the front. Annual drift line vegetation is associated with the front of the embryonic dunes. An interesting transition from fixed dune to coastal heath is present. The dry heath, though small in area, is of note as it is strongly influenced by the sea (NPWS, 2015).

The rock gabions in the south-western corner of Dog's Bay have interfered with wind and wave action at the foot of the dunes here and the typical transition of habitats from beach to dunes is absent and the steep dune profile has not re-graded naturally (Delaney *et al*., 2013).

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 structure: bare ground

This target applies to the fixed dunes. It does not apply to the other QI sand dune habitats present in the SAC 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 fixed dune located on the mainland to the east of the smaller Gorteen beach is a very popular recreational area and as a result the fixed dune has been somewhat eroded here (Ryle *et al*., 2009).

In the fixed dunes, tracks can cause vegetation fragmentation and increase vulnerability to storm damage by breaking up the vegetation binding the substrate. Off-road driving results in sand compaction (Delaney *et al*., 2013).

The fixed dunes at Dog's Bay were very damaged by over-exploitation in the past and there were extensive areas of bare sand and blowouts, particularly on the tombolo. The aforementioned programme of measures has helped to reduce bare ground and the success of the remediation project can be seen by comparing aerial photographs of the site taken since the 1990s (Delaney *et al*., 2013).

The target is not to exceed 10% bare sand. This target is assessed subject to natural processes.

3.4.4 Vegetation structure: sward height

This attribute applies to the fixed dune habitat. A varied vegetation structure is important for maintaining species diversity and is particularly important for invertebrates and birds. The ecological benefits of moderate levels of grazing on dunes have been well-documented (Gaynor, 2008). Moderate grazing regimes lead to the development of a species-rich vegetation cover. The animals increase biodiversity by creating micro-habitats through their grazing, dunging and trampling activities. Grazing slows down successional processes and in some cases, reverses them, helping to achieve a diverse and dynamic landscape. The effects of trampling assist the internal movement of sand through the development of small-scale blowouts, while dunging can eutrophicate those dune habitats whose nutrient-poor status is crucial for the survival of certain vegetation types.

Many species, from plants to invertebrates, benefit immensely from the open and diverse system created by a sustainable grazing regime. Many dune species are small in size and have relatively low competitive ability. Consequently, the maintenance of high species diversity on a dune system is dependent on the existence of some control to limit the growth of rank coarse vegetation (Gaynor, 2008).

Grazing by cattle and sheep is the predominant land-use over most of Dog's Bay SAC. According to Ryle *et al*. (2009), the commonage is grazed by cattle in the summer and autumn, and by sheep for the month of November.

The fixed dune habitat is also grazed by rabbits (*Oryctolagus cuniculus*) and hares (*Lepus timidus hibernicus*) (Ryle *et al*., 2009).

During the SDM, the sward height was between 2cm and 5cm on the open grazed fixed dunes. The taller vegetation was located within the fenced-off areas. Outside of the fenced areas, the stocking density had resulted in a uniformly closely cropped sward (Delaney *et al*., 2013).

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

3.4.5 Vegetation composition: plant health of dune grasses

This attribute applies to the embryonic dunes and mobile dunes, where blown sand is a natural feature. 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 Coastal Monitoring Project (CMP) indicated that there is healthy growth of sand couch (*Elytrigia juncea*) within the embryonic dune habitat (Ryle *et al*., 2009).

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

3.4.6 Vegetation composition: typical species and 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 bird's-foot trefoil (*Lotus corniculatus*), wild thyme (*Thymus polytrichus*), kidney vetch (*Anthyllis vulneraria*), wild pansy (*Viola tricolor*) and biting stonecrop (*Sedum acre*).

Typical strandline species found in places at Dog's Bay SAC include sea rocket (*Cakile maritima*), sea mayweed (*Tripleurospermum maritimum*), frosted orache (*Atriplex laciniata*), sea sandwort (*Honkenya peploides*), spear-leaved orache (*Atriplex prostrata*) and saltwort (*Salsola kali*), with sand couch (*Elytrigia juncea*) scattered throughout the habitat (Ryle *et al*., 2009).

The typical species found in the embryonic dunes is sand couch (*Elytrigia juncea*), which dominates. Marram grass (*Ammophila arenaria*) is also present, as well as biting stonecrop (*Sedum acre*), common bird's-foot trefoil (*Lotus corniculatus*), smooth meadow-grass (*Poa pratensis*) and sand sedge (*Carex arenaria*) (Ryle *et al*., 2009).

Typical species found in the mobile dunes are marram (*Ammophila arenaria*) along with other species such as sand couch (*Elytrigia juncea*), red fescue (*Festuca rubra*), sea mayweed

(*Tripleurospermum maritimum*) and sea radish (*Raphanus raphanistrum* subsp. *maritimus*) (Ryle *et al*., 2009).

The typical plant species present in the species-rich fixed dunes at Dog's Bay SAC include red fescue (*Festuca rubra*), common bird's-foot trefoil (*Lotus corniculatus*), eyebright (*Euphrasia officinalis* agg.), selfheal (*Prunella vulgaris),* wild thyme (*Thymus polytrichus*), cat's-ear (*Hypochaeris radicata*), ribwort plantain (*Plantago lanceolata*), sand sedge (*Carex arenaria*), glaucous sedge (*C. flacca*), yellow-rattle (*Rhinanthus minor*), white clover (*Trifolium repens*), mouse-ear hawkweed (*Pilosella officinarum*)*,* lady's bedstraw (*Galium verum*), field wood-rush (*Luzula campestris*), common mouse-ear (*Cerastium* fontanum), fairy flax (*Linum catharticum*)*,* common centaury (*Centaurium erythraea*), harebell (*Campanula rotundifolia*) and biting stonecrop (*Sedum acre*) (Ryle *et al*., 2009).

Other species found in the fixed dunes are annual meadow-grass (*Poa annua*), Yorkshire-fog (*Holcus lanatus*), crested dog's tail (*Cynosurus cristatus*), creeping bent (*Agrostis stolonifera*), cock's-foot (*Dactylus glomerata*), spreading meadow-grass (*Poa subcaerulea*), daisy (*Bellis perennis*), ox-eye daisy (*Leucanthemum vulgare*), wild carrot (*Daucus carota*), vetch species (*Vicia* spp.), buck's-horn plantain (*Plantago coronopus*), sea holly (*Eryngium maritimum*), red clover (*Trifolium pratense*), scarlet pimpernel (*Anagallis arvensis*), sheep's sorrel (*Rumex acetosella*), autumn hawkbit (*Leontodon autumnalis*), lesser hawkbit (*L. saxitilis*), common knapweed (*Centaurea nigra*), squinancywort (*Asperula cynanchica*), bulbous buttercup (*Ranunculus bulbosus*), dandelion (*Taraxacum* agg.), primrose (*Primula vulgaris*), yarrow (*Achillea millifolium*) and wild radish (*Raphanus raphanistrum*) (Ryle *et al*., 2009).

Locally uncommon species that have been recorded from this habitat include autumn lady's-tresses (*Spiranthes spiralis*), which occurs on the western part of the granite outcrop, blue moor-grass (*Sesleria albicans*) and yellow-wort (*Blackstonia perfoliata*). In places there is an abundance of pyramidal orchid (*Anacamptis pyramidalis*), as well as early purple orchid (*Orchis mascula*). These are especially apparent in the areas behind the fences, which are slightly undergrazed. These areas are semi-fixed with an abundance of marram grass (*Ammophila arenaria*) present. Another important species recorded in the past is dense flowered orchid (*Neotinia intacta*) (Ryle *et al*., 2009).

The typical moss *Rhytidiadelphus squarrosus* was found throughout and other mosses such as *Pseudoscleropodium purum, Eurynchium* spp., *Brachythecium albicans* and *Homalothecium lutescens* were also noted along with lichen species (*Peltigera* spp.) (Ryle *et al*., 2009).

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

3.4.7 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 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 sea buckthorn, which can form dense impenetrable thickets.

The negative indicator common ragwort (*Senecio jacobaea*) appears in the mobile dune habitat at Dog's Bay SAC. The mobile sand dunes above the gabions at Dog's Bay SAC are very steep, and some species which are not generally associated with the seaward edge of a dune system are found there. A small stand of common nettle (*Urtica dioica*) has become established just behind the gabions (Delaney *et al*., 2013).

Ragwort (*Senecio jacobaea*) is also found throughout the fixed dune habitat and is quite common in patches. Supplementary feeding occurs during harsh winters and this may be causing localised patches of common ragwort. Some fertilization has occurred in the past, but wasn't thought to be occurring in the recent time preceding the CMP (Ryle *et al*., 2009).

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

3.4.8 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.

No scrub or trees have been recorded in any of the dune habitats at Dog's Bay SAC (Crawford *et al*., 1998; Ryle *et al*., 2009; Delaney *et al*., 2013).

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.

4 References

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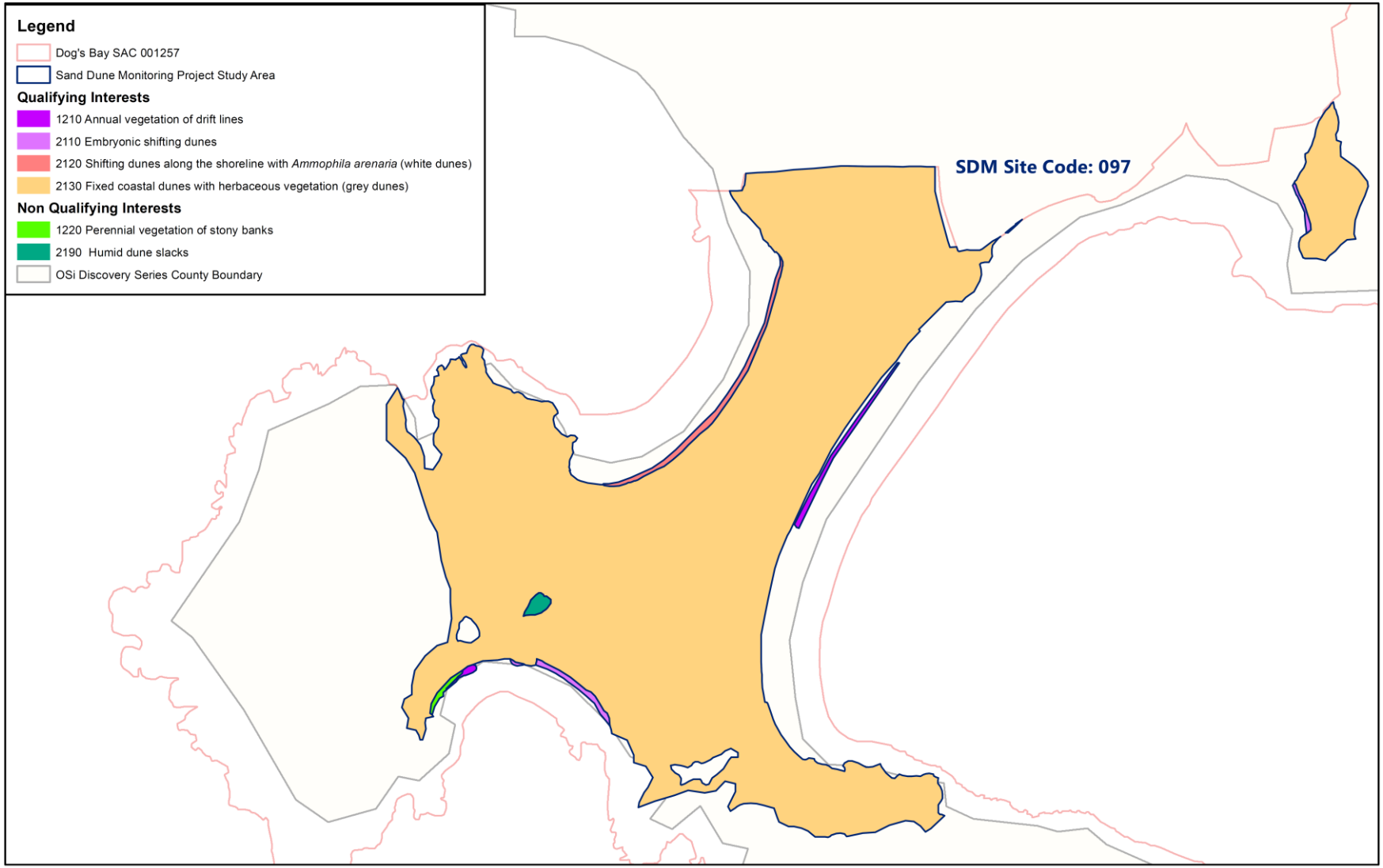
Appendix I – Distribution map of Sand Dune Habitats within Dog's Bay SAC



Appendix II – Dog's Bay site report and habitat map from the Sand Dune Monitoring Project (Delaney *et al*., 2013)

SITE 097 DOG'S BAY

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

1 SITE DESCRIPTION

Dog's Bay is a small site located approximately 3.5 km south-west of Roundstone in Connemara, Co. Galway. It forms part of the Dog's Bay SAC (SAC 001257). Six Annex I sand dune habitats (* indicates a priority habitat) were recorded here during the CMP: **1210 Annual vegetation of drift lines, 1220 Perennial vegetation of stony banks, 2110 Embryonic shifting dunes, 2120 Marram dunes (white dunes), *2130 Fixed dunes (grey dunes)** and **2190 Humid dune slacks** (Ryle *et al.*, 2009). Other Annex I habitats that are associated with the sand dunes at Dog's Bay include **4030 European dry heaths.** This habitat is found on the adjoining granite island which is linked to the mainland by a sandy spit (Dog's Bay site). This feature is known as a tombolo. The tombolo faces Dog's Bay to the west and Gorteen Bay to the east. The beach is composed of sands formed by Foraminifera shells, an unusual occurrence for onshore beaches on a worldwide scale (NPWS, 2001). The Annex V species the Irish hare (*Lepus timidus hibernicus*) and common frog (*Rana temporaria*) were observed on site during the SDM and the Annex II species Narrow-mouthed whorl snail (*Vertigo angustior*) has been recorded on the site in the past.

The site is used as both an amenity area and as pasture. Two caravan parks are in the immediate vicinity of the site, with two parking areas and two roads leading to the site. Overgrazing and large numbers of visitors to the site in the past led to severe erosion, and several projects were put in place to try and curtail this erosion and restore the dunes. These projects included the installation of rock gabions at the southern end of the site, a planting regime and re-profiling some dunes (Ryle *et al.*, 2009).

2 CONSERVATION ASSESSMENTS

2.1 Overview

Dog's Bay was surveyed on the 12th and 13th of July, 2011. All six Annex I sand dune habitats that were recorded during the CMP were recorded in 2011. These habitats and the results of the conservation assessments are presented in Table 1. **1220 Perennial vegetation of stony banks, 2110 Embryonic shifting dunes** and **2190 Humid dune slacks** were assessed as Favourable, while the rest were assessed as Unfavourable-Inadequate. The main factors contributing to the Unfavourable-Inadequate assessments were cattle grazing and amenity use of the dunes.

Table 1. Conservation assessment results for all Annex I dune habitats surveyed at Dog's Bay, Co. Galway.

Habitat	Area	Structure & Functions	Future Prospects	Overall result
1210 Annual vegetation of drift lines	Favourable (stable)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)
1220 Perennial vegetation of stony banks	Favourable (stable)	Favourable (stable)	Favourable (stable)	Favourable (stable)
2110 Embryonic shifting dunes	Favourable (stable)	Favourable (stable)	Favourable (stable)	Favourable (stable)
2120 Marram dunes (white dunes)	Unfavourable-Inadequate (stable)	Unfavourable-Inadequate (stable)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)
*2130 Fixed dunes (grey dunes)	Favourable (stable)	Unfavourable-Inadequate (stable)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)
2190 Humid dune slacks	Favourable (stable)	Favourable (stable)	Favourable (stable)	Favourable (stable)

2.1.1 Area

The areas of Annex I sand dune habitats at Dog's Bay are presented in Table 2. The baseline area of ***2130 Fixed dunes (grey dunes)** was increased to include an extra field in the north of Dog's Bay. The additional field covered an area of 1.21 ha, but as it had not been included in the original site, no monitoring was carried out in it, and it was mapped as "not surveyed". A small part of the habitat mapped during the CMP was found to be composed of a rocky outcrop and was excluded. On balance, the revisions resulted in an increase in the area of ***2130 Fixed dunes (grey dunes).** The total area of sand dune habitat present at Dog's Bay was slightly greater during the SDM than during the CMP, and this was the result of natural processes.

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

Habitat	Baseline survey (ha)	Revised baseline (ha)	Sand Dunes Monitoring
1210 Annual vegetation of drift lines	0.23	0.22	0.22
1220 Perennial vegetation of stony banks	0.16	0.16	0.06
2110 Embryonic shifting dunes	0.53	0.53	0.18
2120 Marram dunes (white dunes)	0.46	0.46	0.36
*2130 Fixed dunes (grey dunes)	44.66	45.41	46.09
2190 Humid dune slacks	0.10	0.10	0.10
Total	46.14	46.88	47.01

2.1.2 Structure and Functions

Structure and Functions were assessed for six Annex I sand dune habitats at Dog's Bay. Table 3 shows the results of the Structure and Functions assessment. All criteria passed for **1220 Perennial vegetation of stony banks**, **2110 Embryonic shifting dunes** and **2190 Humid dune slacks**, and they were therefore assessed as having Favourable Structure and Functions. One criterion failed in the assessment of **1210 Annual vegetation of drift lines**, while **2120 Marram dunes (white dunes)** and ***2130 Fixed dunes (grey dunes)** had two failed criteria. All three habitats were therefore assessed as

having Unfavourable Structure and Functions. Structure and Functions were impaired due to trampling, overgrazing and the presence of rock armour at the site.

Table 3. Annex I Habitats at Dog's Bay for which Structure and Functions were assessed, with the number of monitoring stops, assessment criteria and the number of criteria that failed.

Habitat	No. monitoring stops	Total no. assessment criteria	No. failed criteria
1210 Annual vegetation of drift lines	2	6	1
1220 Perennial vegetation of stony banks	1	6	0
2110 Embryonic shifting dunes	1	7	0
2120 Marram dunes (white dunes)	2	7	2
*2130 Fixed dunes (grey dunes)	8	11	2
2190 Humid dune slacks	2	11	0

2.1.3 Future Prospects

Impacts and activities recorded at Dog's Bay are presented in Table 4. Impact codes are assigned according to Ssymanck (2010). The impacts that affect the sand dune habitats at Dog's Bay are mainly associated with agriculture (cattle grazing) or amenity use (trampling, walking, football goalposts). There are also impacts associated with the management of the site such as rock gabions, fencing and driving on the dunes. Vehicles are used to remove rubbish gathered by hand. Cattle grazing and trampling were the most significant negative impacts recorded for the site.

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

Habitat code	Impact code	Impact description	Intensity	Effect	Percent of habitat	Source
1210	G05.01	Trampling	Medium	Negative	25	Inside
1210	J02.12.01	Rock armour	-	Neutral	0	Outside
1220	J02.12.01	Rock armour	-	Neutral	0	Outside
2110	A04.02.01	Non intensive cattle grazing	Low	Neutral	65	Inside
2110	G01.02	Walking	Medium	Neutral	50	Inside
2110	J02.12.01	Rock armour	-	Neutral	0	Outside
2120	A04.02.01	Non intensive cattle grazing	Low	Negative	90	Inside
2120	G05.01	Trampling	Medium	Negative	90	Inside
2120	J02.12.01	Rock armour	Medium	Negative	1	Outside
*2130	A04.02.01	Non intensive cattle grazing	Low	Negative	90	Inside
*2130	D01.01	Paths and tracks	High	Negative	1	Inside
*2130	G01.02	Walking	Low	Neutral	60	Inside
*2130	G01.03.02	Off-road driving	Medium	Negative	5	Inside
*2130	G02.07	Football goalposts	Low	Negative	1	Inside
*2130	G05.09	Fencing	Medium	Neutral	1	Inside
*2130	J02.12.01	Rock armour	Medium	Neutral	1	Outside
2190	A04.02.01	Non intensive cattle grazing	Medium	Neutral	100	Inside
2190	G01.02	Walking	Low	Neutral	40	Inside
2190	J02.12.01	Rock armour	-	Neutral	0	Outside

2.2 Annex I habitat assessments

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

2.2.1 1210 Annual vegetation of drift lines

The largest area of **1210 Annual vegetation of drift lines** was found on the east-facing beach at Dog's Bay, but a small portion was also found on the beach that faces southwest.

Area

The area of **1210 Annual vegetation of drift lines** did not change, but remained stable at 0.22 ha from the CMP survey to the SDM. During the CMP, Area was assessed as Unfavourable-Inadequate because it was patchy on the Dog's Bay side of the tombolo. No indication was given that human activities had resulted in a reduction in extent or prevention of accretion. Under the current methodology, variations in habitat zonation are considered natural unless there is clear evidence of human intervention. Area was assessed as Favourable (stable) during the SDM.

Structure and Functions

One of the monitoring stops was located on a beach which receives high amenity use. Trampling had caused damage to the habitat here. All of the other criteria passed in the assessment. During the CMP, Structure and Functions were assessed as Favourable on the basis of expert judgement as no monitoring stops were carried out. However, trampling was recorded as an impact affecting 40% of the habitat. It is likely that such widespread disturbance would have resulted in an Unfavourable-Inadequate assessment under the current methodology. Structure and Functions were assessed as Unfavourable-Inadequate (stable) during the SDM.

Future Prospects

Only one negative impact was recorded during the SDM. Trampling had a medium-intensity effect on 25% of the habitat. During the CMP, Future Prospects were assessed as Favourable although pollution and trampling were each recorded as affecting 0.1 ha, over 40% of the habitat. It is likely that this level of disturbance would have resulted in an assessment of Unfavourable-Inadequate had the current methodology been applied. Future Prospects were assessed as Unfavourable-Inadequate (stable) during the SDM.

Conservation assessment

Area was assessed as Favourable (stable), while Structure and Functions and Future Prospects were assessed as Unfavourable-Inadequate (stable). Because of the effects of recreation on Structure and Functions and Future Prospects, the conservation status of **1210 Annual vegetation of drift lines** was assessed as Unfavourable-Inadequate (stable).

2.2.2 1220 Perennial vegetation of stony banks

1220 Perennial vegetation of stony banks is found in the small south-facing strand, in the same general location where it was mapped during the CMP.

Area

The area has decreased from 0.16 ha during the CMP to 0.06 ha during the SDM. There was no obvious relationship between the loss of area and human activities. During the CMP, area was assessed as Favourable. Area was assessed as Favourable (stable) during the SDM.

Structure and Functions

All of the criteria passed the Structure and Functions assessment. During the CMP, the habitat was assessed as Favourable, although no monitoring stops were carried out. Structure and Functions were assessed as Favourable (stable) during the SDM.

Future Prospects

No negative impacts were recorded in this habitat during the SDM, although rock armour was recorded as having a neutral impact. Future Prospects were assessed as Favourable during the CMP, although walking was recorded as a negative impact. During the SDM, Future Prospects were assessed as Favourable (stable).

Conservation assessment

All of the parameters were assessed as Favourable during SDM, as they were during the CMP. The conservation status of **1220 Perennial vegetation of stony banks** was assessed as Favourable (stable).

2.2.3 2110 Embryonic shifting dunes

There are two short, narrow bands of **2110 Embryonic shifting dunes** at Dog's Bay. One strip is present on the beach that faces southwest, while the other one is on an isolated patch of dune vegetation beside Gorteen Bay.

Area

The area of **2110 Embryonic shifting dunes** has decreased from 0.53 ha during the CMP to 0.18 ha during the SDM because of succession to **2120 Marram dunes (white dunes)** and ***2130 Fixed dunes (grey dunes)**. During the CMP, Area was assessed as Favourable. Area was assessed as Favourable (stable) during the SDM.

Structure and Functions

All of the criteria passed the Structure and Functions assessment. During the CMP, Structure and Functions were assessed as Favourable. Structure and Functions were assessed as Favourable (stable) during the SDM.

Future Prospects

No negative impacts were recorded in **2110 Embryonic shifting dunes** in 2011. During the CMP, Future Prospects were assessed as Favourable. Future Prospects were assessed as Favourable (stable) during the SDM.

Conservation assessment

Area and Structure and Functions and Future Prospects were assessed as Favourable during the SDM. During the CMP, all three parameters were assessed as Favourable, although walking, trampling and fertilisation were recorded as negative impacts. The conservation status of **2110 Embryonic shifting dunes** was assessed as Favourable (stable) during the SDM.

2.2.4 2120 Marram dunes (white dunes)

2120 Marram dunes (white dunes) are found in a strip facing northwest, overlooking Dog's Bay. Prior to the baseline survey, a program of marram planting and other soft engineering measures had been put in place to tackle severe erosion at the site. The **2120 Marram dunes (white dunes)** mapped in 2011 had a natural appearance and had colonised the area formerly composed of **2110 Embryonic shifting dunes**. The extent of the damage to the dune habitats can be clearly seen on OSI aerial photographs dating from the 1990s and early 2000s.

Area

The area of **2120 Marram dunes (white dunes)** decreased from 0.46 ha during the CMP to 0.36 ha during the SDM. This was mainly because part of the dunes on the eastern side of the tombolo which was previously mapped as **2120 Marram dunes (white dunes)** had undergone succession and was mapped as ***2130 Fixed dunes (grey dunes)** in 2011. On Dog's Bay, the **2120 Marram dunes (white dunes)** had extended southwest of their former location and abutted the rock gabions in 2011. The gabions are an obstacle to further extension of the habitat. It is difficult to quantify the area of **2120 Marram dunes (white dunes)** which has failed to develop because of the gabions, but the morphology of the site and the existing dunes suggest that it would be less than 350 m^2, or 0.9% of the area in 2011. Area was assessed as Unfavourable-Inadequate during the CMP because the damage which had led to the restoration programme was still visible in places, and foredune habitats were still in the process of regenerating. Area was assessed as Unfavourable-Inadequate (stable) during the SDM.

Structure and Functions

Two of the criteria failed the Structure and Functions assessment during the SDM. Trampling by visitors and by cattle has resulted in damage to the **2120 Marram dunes (white dunes)**. Rock armour was recorded, and this was affecting the fore dunes functioning. Although damage was noted in the habitat during the CMP, it was not considered to have a negative effect on the dunes, but the rock gabions were considered to be having a negative effect on the substrate at that time, and the habitat was assessed as Unfavourable-Inadequate. Structure and Functions were assessed as Unfavourable-Inadequate (stable) during the SDM.

Future Prospects

Cattle grazing and trampling were recorded as negative impacts affecting 90% of the habitat in 2011. Rock armour had a negative effect on up to 1% of the habitat. During the CMP, nine negative impacts were reported to affect the habitat; these included fertilisation, trampling, nautical sports (bringing equipment through the dunes), walking and horse-riding, off-road driving, camping and caravans, sea defences and other recreational activities. Poaching was also recorded as hares had been removed from the site for coursing in the years prior to the survey. However, Future Prospects were assessed

as Favourable during the CMP because of the efforts of the local conservation committee. The level of trampling by visitors and livestock observed in 2011 represented a threat to the future condition of the habitat, while the rock armour restricted the area, so Future Prospects were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Conservation assessment

All of the parameters were assessed as Unfavourable-Inadequate during the SDM. During the CMP, Future Prospects were assessed as Favourable while the other two parameters were assessed as Unfavourable-Inadequate. The conservation status of **2120 Marram dunes (white dunes)** was assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

*2.2.5 *2130 Fixed dunes (grey dunes)*

The ***2130 Fixed dunes (grey dunes)** at Dog's Bay were very damaged by over-exploitation in the past. OSI aerial photographs dating from the 1990s show extensive areas of bare sand and blowouts, particularly on the tombolo. Remedial works were undertaken to stabilise the sand using soft engineering techniques and a maximum stocking density was imposed. Parts of the ***2130 Fixed dunes (grey dunes)** which were particularly vulnerable to erosion were fenced off to prevent trampling and allow revegetation. The success of the remediation project can be seen by comparing aerial photographs of the site taken since the 1990s.

Area

The area of ***2130 Fixed dunes (grey dunes)** increased slightly from 45.41 ha during the CMP to 46.09 ha during the SDM due to succession. During the CMP, Area was assessed as Unfavourable-Inadequate because of the presence of an unpaved vehicle track through the dunes. Under the current methodology this damage would have been considered under the Structure and Functions assessment, and not as a loss of area. Area was assessed as Favourable (stable) during the SDM.

Structure and Functions

Two of the criteria failed the Structure and Functions assessment. The sward height was between 2 and 5 cm at all but one of the eight monitoring stops. The stop with taller vegetation was located within a fenced area. Outside of the fenced areas, the current stocking density has resulted in a uniformly closely cropped sward. Rock gabions were recorded during the baseline survey and these were clearly visible and exposed in the south-western corner of Dog's Bay. The sand dunes above the gabions are very steep, and some species which are not generally associated with the seaward edge of a dune system are found there. A small stand of *Urtica dioica* has become established just behind the gabions. Because the rock gabions have interfered with wind and wave action at the foot of the dunes here, the typical transition of habitats from beach to dunes is absent and the steep dune profile has not regraded naturally. Structure and Functions were assessed as Unfavourable-Inadequate during the CMP because one stop was rank and had too few indicator species. The damage which was assessed under the Area parameter during the CMP would have been assessed within the Structure and Functions parameter under the current methodology. Structure and Functions were assessed as Unfavourable-Inadequate (stable) during the SDM.

Future Prospects

Negative impacts recorded at Dog's Bay include goalposts, off-road driving, paths and tracks and cattle grazing. Although cattle grazing is considered to be a suitable land use for ***2130 Fixed dunes (grey dunes)**, the stocking density is too high at this site. Off-road driving results in sand compaction and paths and tracks can cause vegetation fragmentation and increase vulnerability to storm damage by breaking up the vegetation binding the substrate. Future Prospects were assessed as Favourable during the CMP on the basis of expert judgement and in the context of the MPSU management plan, although negative impacts including walking, trampling, fertilisation, and motorised vehicles were recorded. Future Prospects were assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

Conservation assessment

Area was assessed as Favourable while Structure and Functions and Future Prospects were assessed as Unfavourable-Inadequate during the SDM. This is less positive than the CMP assessment when two parameters were assessed as Favourable and one was assessed as Unfavourable-Inadequate. The conservations status of ***2130 Fixed dunes (grey dunes)** was assessed as Unfavourable-Inadequate (deteriorating) during the SDM.

2.2.6 2190 Humid dune slacks

There is one dune slack at Dog's Bay, and it is found in the south-western part of the site, between the two rocky headlands.

Area

The area of **2190 Humid dune slacks** has remained unchanged since the baseline survey. During the CMP, area was assessed as Favourable. During the SDM, area was assessed as Favourable (stable).

Structure and Functions

Two monitoring stops were carried out in the **2190 Humid dune slacks** habitat, and all of the criteria passed the assessment. Although no bare soil was found within the monitoring stops, cattle have access to the habitat and break up the vegetation cover occasionally, so the criterion was allowed to pass on expert judgement. During the CMP, no monitoring stops were recorded but the habitat was assessed as Favourable on the basis of expert judgement. Structure and Functions were assessed as Favourable (stable) during the SDM.

Future Prospects

Two impacts, cattle grazing and walking, were recorded in the **2190 Humid dune slacks** habitat, and both of these had a neutral effect. Future prospects were assessed as Favourable during the baseline survey, although walking was recorded as a negative impact. During the SDM, Future Prospects were assessed as Favourable (stable).

Conservation assessment

All of the parameters were assessed as Favourable during both the SDM and the CMP. The conservation status of **2190 Humid dune slacks** at Dog's Bay was assessed as Favourable (stable) during the SDM.

3 DISCUSSION

3.1 Qualifying interests for SAC

The Natura 2000 standard data form for Dog's Bay SAC (SAC 001257) records five Annex I habitats as Qualifying Interests. Of these, four are sand dune habitats. These are shown in Table 5. The conservation status assessments for **2110 Embryonic shifting dunes, 2120 Marram dunes (white dunes)** and ***2130 Fixed dunes (grey dunes)** in 2011 were in line with those in the Natura 2000 standard data form, while **1210 Annual vegetation of drift lines** was assessed less favourably during the SDM than in the Natura 2000 standard data form.

Table 5. Relevant Qualifying Interests for Dog's Bay SAC 001257 (NPWS, 1999)

Habitat	Area (%)	Representativity	Relative surface	Conservation status	Global assessment
1210 Annual vegetation of drift lines	1	C	C	B	C
2110 Embryonic shifting dunes	4	C	C	B	C
2120 Marram dunes (white dunes)	5	C	C	C	C
*2130 Fixed dunes (grey dunes)	29	B	C	C	B

3.2 Conservation management

The Area and Structure and Functions of several habitats at Dog's Bay have benefitted from measures which were put in place after erosion was recognised as a threat to the site. Fencing has restricted access to sensitive areas which have now revegetated and litter is now collected by hand before being removed from the site by County Council vehicles. There is no longer any obvious sign of the soft stabilisation works, as the sand trapping using brash, marram planting and dune slope regrading reported in the CMP report have resulted in natural-looking transitions from fore-dune to fixed-dune habitats. The conservation committee at Gurteen and Dog's Bay has been cited as an example of successful community driven conservation (Cummins *et al*., 2004). However, a decision to put rock armour in place in the southern part of the west-facing beach has interfered with the natural habitat transitions and may result in changed erosion patterns in future.

3.3 Amenity use

Dog's Bay is a popular amenity site. Good access routes along with caravan parks and holiday homes in the vicinity allow large number of visitors to use the site during the holiday season. Sensitive removal of litter and fencing of parts of the site have limited the negative aspects of amenity use, but trampling still has a negative effect on habitats which are found on or very near to the beach, particularly close to access points. Vehicles drive through the ***2130 Fixed dunes (grey dunes)** habitat to remove rubbish collected by hand. Leaving rubbish gathered from the beach closer to the main access route would reduce the damage caused by vehicles.

3.4 Grazing

Cattle grazing was observed on the site in 2011. The parts of the site outside fenced areas are uniformly tightly grazed, and cattle have access to much of the sensitive fore-dune area. Over-grazing was noted during the CMP and management measures quoted from the MPSU (Management Planning Services Unit) plan for the site by Ryle *et al.* (2009) include suggestions to limit the stocking

density to below 0.5 cattle per hectare and to limit cattle grazing to the winter. It would appear that such alterations to the grazing regime have not been carried out.

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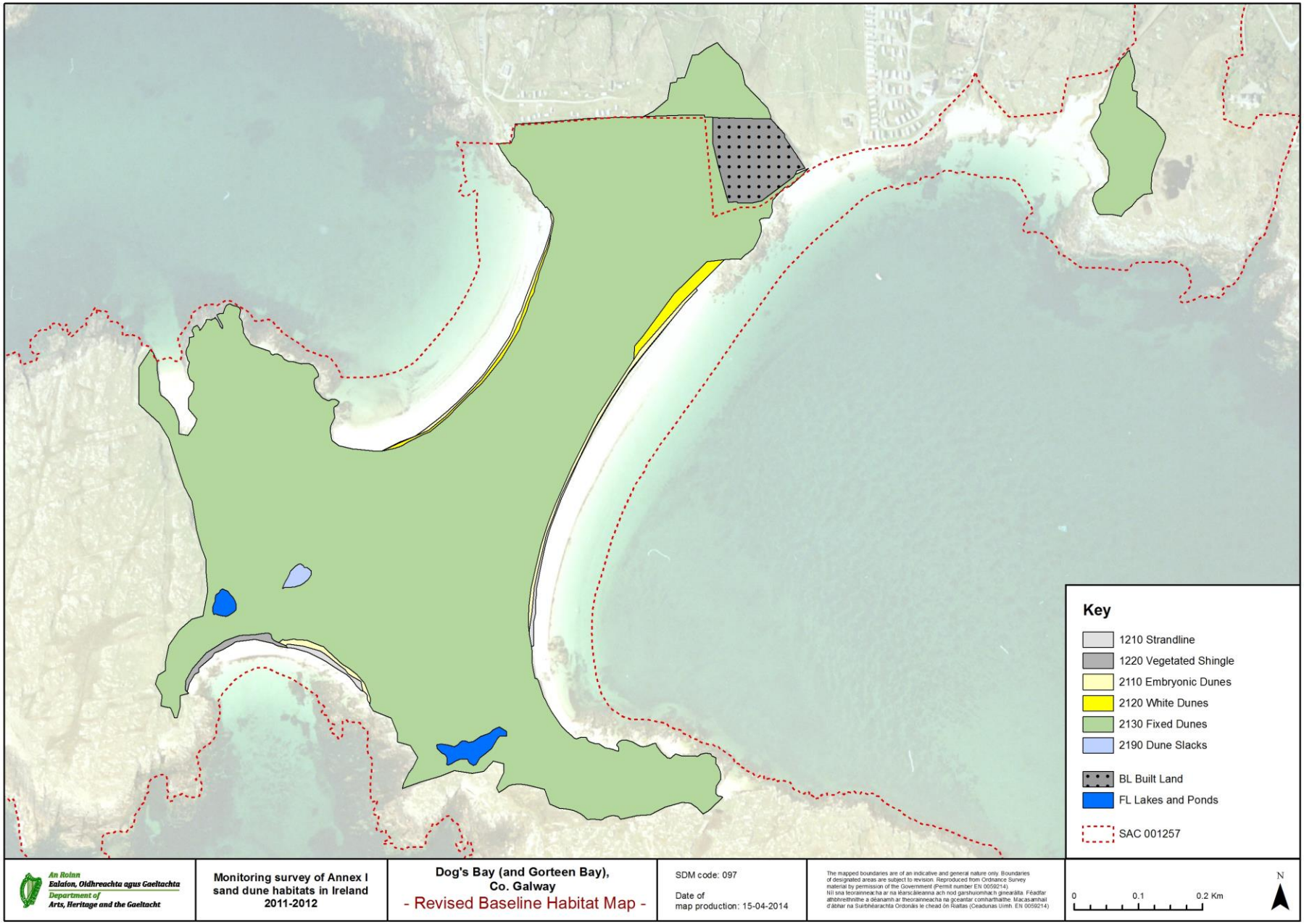
Key
1210 Strandline
1220 Vegetated Shingle
2110 Embryonic Dunes
2120 White Dunes
2130 Fixed Dunes
2190 Dune Slacks
BL Built Land
FL Lakes and Ponds
SAC 001257
An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht
Monitoring survey of Annex I sand dune habitats in Ireland 2011-2012
Dog's Bay (and Gorteen Bay), Co. Galway
- Revised Baseline Habitat Map -
SDM code: 097
Date of map production: 15-04-2014
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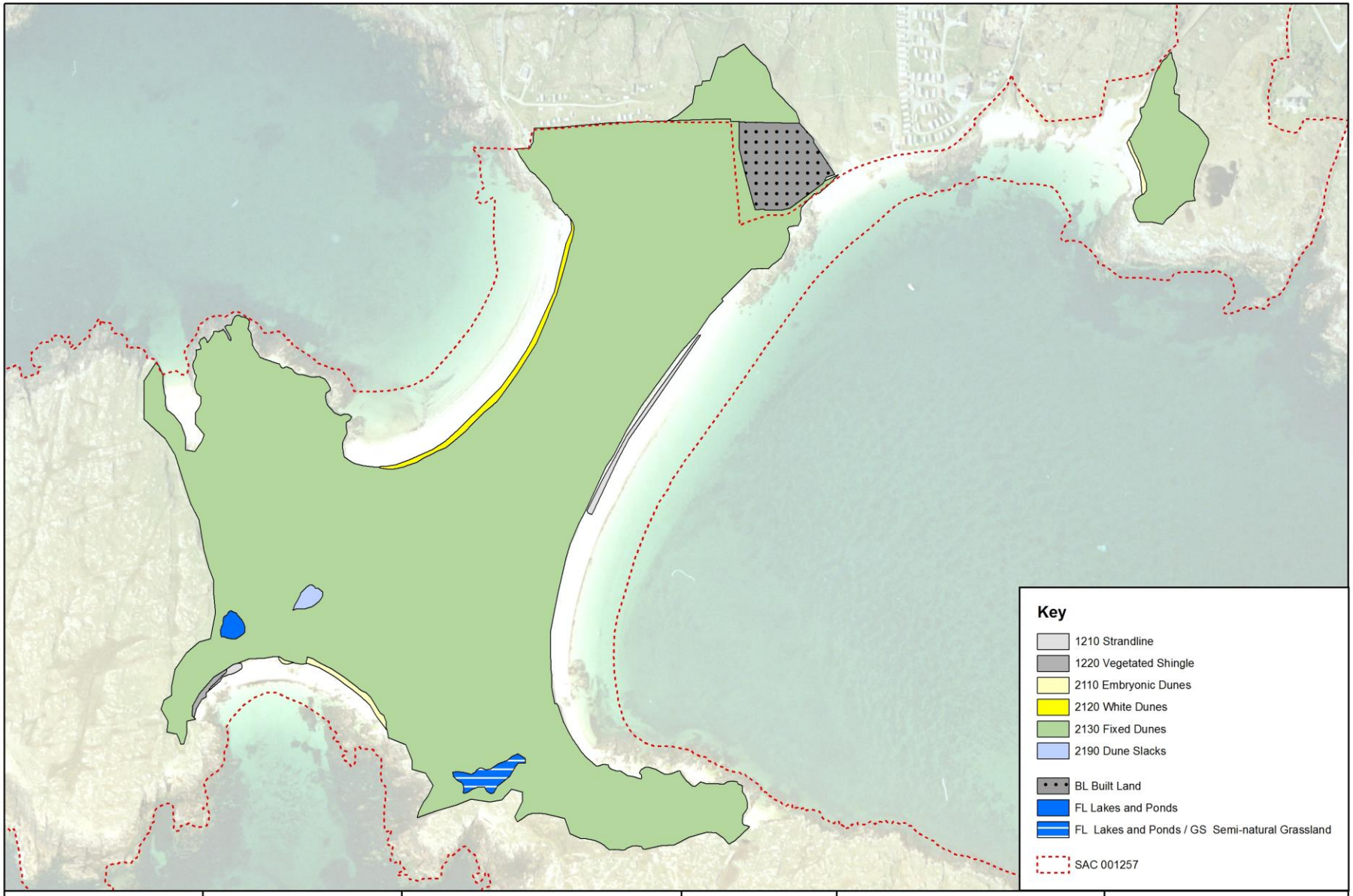
Key
1210 Strandline
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2190 Dune Slacks
BL Built Land
FL Lakes and Ponds
FL Lakes and Ponds / GS Semi-natural Grassland
SAC 001257
An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht
Monitoring survey of Annex I sand dune habitats in Ireland 2011-2012
Dog's Bay (and Gorteen Bay), Co. Galway
- Updated SDM Map -
SDM code: 097
Date of map production: 15-04-2014
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision. Reproduced from Ordnance Survey material by permission of the Government (Permit number EN 0059214)
Níl sna teorainneacha ar na hIarscáileanna ach nod garshuiomhaíh ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le cead ón Rialtas (Ceadunas Uimh. EN 0059214)
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0.1
0.2 Km
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