

NPWS

Lough Nagreany Dunes SAC  
(site code: 000164)

**Conservation objectives supporting document-  
Coastal habitats**

Version 1

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## Contents

1	Introduction.....	2
2	Conservation Objectives.....	3
3	Sand dune habitats .....	4
3.1	Overall objectives.....	6
3.2	Area.....	7
3.2.1	Habitat area .....	7
3.3	Range.....	8
3.3.1	Habitat distribution .....	8
3.4	Structure and Functions .....	8
3.4.1	Physical structure: functionality and sediment supply.....	9
3.4.2	Physical structure: hydrological and flooding regime .....	9
3.4.3	Vegetation structure: zonation .....	10
3.4.4	Vegetation structure: bare ground .....	10
3.4.5	Vegetation structure: sward height .....	11
3.4.6	Vegetation structure: cover and height of creeping willow ( <i>Salix repens</i> ).....	11
3.4.7	Vegetation composition: plant health of dune grasses.....	11
3.4.8	Vegetation composition: typical species and sub-communities.....	12
3.4.9	Vegetation composition: negative indicator species .....	12
3.4.10	Vegetation composition: scrub/trees.....	13
4	References.....	14
	Appendix I – Distribution map of sand dune habitats within Lough Nagreany Dunes SAC.....	15
	Appendix II – Lough Nagreany site report and habitat map from the Sand Dunes Monitoring Project (Delaney <i>et al.</i> , 2013).....	16
	Appendix III – Doaghmore site report and habitat map from the Coastal Monitoring Project (Ryle <i>et al.</i> , 2009).....	28

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

**Please note that this document should be read in conjunction with the following report: NPWS (2017) Conservation Objectives: Lough Nagreany Dunes SAC 000164 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.

Lough Nagreany Dunes SAC is located on the north-western side of the Fanad Peninsula, near the mouth of Mulroy Bay, approximately 30km north of Millford, Co. Donegal. The area is underlain by granite, which outcrops in places (NPWS, 2015).

Lough Nagreany Dunes SAC is a relatively small coastal SAC, but displays an excellent range of sand dune habitat types which show a fine gradation from embryonic dunes, to marram dunes, to fixed dunes, dunes with creeping willow (*Salix repens*) and machair (NPWS, 2015).

Lough Nagreany Dunes SAC is located in a valley between two rocky outcrops. The SAC is relatively undisturbed by recreational activities with the majority of the sand dune system being managed by agricultural activities (Delaney *et al.*, 2013).

Several small lakes occur within the SAC. Lough Nagreany, supports a population of the Near Threatened (Wyse Jackson *et al.*, 2016) vascular plant slender naiad (*Najas flexilis*), which is listed on Annex II of the EU Habitats Directive and also on the Flora (Protection) Order, 2015 (Statutory Instrument No. 356 of 2015) (NPWS, 2015).

Lough Nagreany Dunes SAC provides good feeding habitat for chough (*Pyrrhocorax pyrrhocorax*), a species listed in Annex I of the EU Birds Directive, which breed locally. Breeding lapwing (*Vanellus vanellus*) have been recorded in the SAC (NPWS, 2015).

Lough Nagreany Dunes SAC (site code: 000164) is selected for sand dune habitats, lakes and for slender naiad (*Najas flexilis*). The following five coastal habitats are included in the list of Qualifying Interests for the SAC (\* denotes a priority habitat):

- 2110 Embryonic shifting dunes
- 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) \*
- 2140 Decalcified fixed dunes with *Empetrum nigrum* \*
- 2150 Atlantic decalcified fixed dunes (Calluno-Ulicetea) \*
- 2170 Dunes with *Salix repens* subsp. *argentea* (*Salix arenariae*)

All five habitats are associated with sand dune systems. The distribution of sand dune habitats within Lough Nagreany Dunes SAC is presented in Appendix I.

It should be noted that the status of both Decalcified fixed dunes with *Empetrum nigrum*\* and Atlantic decalcified fixed dunes (Calluno-Ulicetea)\* are currently under review in Ireland and that the conservation objective for each may also be reviewed at a later stage.

## 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 five coastal habitats listed above in Lough Nagreany Dunes 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 Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009) and the Sand Dunes Monitoring Project (SDM) (Delaney *et al.*, 2013) and this document should be read in conjunction with those reports.

The CMP was a comprehensive national baseline survey of all known sand dune systems in Ireland. Three sub-sites associated with Lough Nagreany Dunes SAC were surveyed, mapped and assessed:

1. Lough Nagreany
2. Doaghmore
3. Gortnatraw

The first two sub-sites contain Qualifying Interest Annex I habitats for Lough Nagreany Dunes SAC. While Annex I habitats are present in the third sub-site (Gortnatraw; CMP site ID: 171), they are not Qualifying Interest habitats for the SAC.

As part of the Coastal Monitoring Project (CMP), detailed individual reports and habitat maps were produced for all sub-sites and those compiled for the sub-site Doaghmore (CMP site ID: 170) are included in Appendix III at the end of this document.

The SDM 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 Lough Nagreany, was selected as a representative sample of the national dune resource for the SDM survey. As part of the SDM, detailed individual reports and habitat maps (a revised baseline habitat map and an updated habitat map) were produced for all sub-sites and the relevant ones for the Lough Nagreany sub-site (SDM site ID: 169) are presented in Appendix II.

The conservation objectives for the sand dune habitats in Lough Nagreany Dunes SAC are based on the findings of the CMP (Ryle *et al.*, 2009) and the SDM (Delaney *et al.*, 2013), combined with the results of Gaynor (2008). It is thought that the three sub-sites as surveyed by the CMP and the SDM represent the entire area of sand dunes within Lough Nagreany Dunes 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 fixed dunes with *Empetrum nigrum* (2140) \***
- **Atlantic decalcified fixed dunes (Calluno-Ulicetea) (2150) \***
- **Dunes with *Salix repens* subsp. *argentea* (*Salix arenariae*) (2170)**
- Humid dune slacks (2190)
- Machairs (21A0) \*

Five sand dune habitats, indicated in **bold** above, are listed as Qualifying Interests for the SAC. These habitats include mobile areas at the front as well as more stabilised parts of dune systems. Three of the habitats (2110, 2130 and 2170) were recorded in the Lough Nagreany sub-site by the SDM (Delaney *et al.*, 2013) and two habitats (2130 and 2170) were recorded by the CMP (Ryle *et al.*, 2009) in the Doaghmore sub-site. There is some doubt concerning the presence of the habitats 'Decalcified fixed dunes with *Empetrum nigrum*' and 'Atlantic decalcified fixed dunes' in the SAC. The status of these habitats in Ireland is under review. The Annex I sand dune habitat shifting dunes along the shoreline with *Ammophila arenaria* (mobile dunes) was also recorded in the Lough Nagreany, Doaghmore and Gortnatraw sub-sites, humid dune slacks in Lough Nagreany and Doaghmore, and machair in Lough Nagreany and Gortnatraw, but these habitats are not selected as Qualifying Interests for this particular SAC.

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).

Atlantic decalcified fixed dune (Calluno-Ulicetea) (dune heath) occurs at the older landward edge of the fixed dunes, where leaching of basic minerals and nutrients can lower the pH over time, or where sand has blown up over rock that is siliceous (silica-rich) in nature, and conditions suitable for colonisation by heath species are created. As these decalcified or acidic conditions can only form on the older, landward extremes of dune systems, they are often vulnerable to housing or other developments. Decalcified dune heath is characterised by the presence of heathers (*Calluna vulgaris*, *Erica tetralix*, *E. cinerea*) and gorse species (*Ulex europaeus* and *U. gallii*) which differentiates it from the other dune heath habitat, decalcified dunes with *Empetrum nigrum*. Well-developed dune heath communities containing the classic dwarf ericoid shrubs, such as heathers, that are generally regarded as characterising the habitat are not well-represented in Ireland.

Decalcified fixed dunes with *Empetrum nigrum* habitat is also generally found on the landward edge of dune systems where the surface layers of sand have been leached of their calcium content, or where sand has blown up over rock that is siliceous (silica-rich) in nature. It is characterised by the presence of crowberry (*Empetrum nigrum*) which differentiates it from the other dune heath habitat. This heath-like habitat does not appear to be well developed in Ireland and is thought to be restricted to a small number of sites along the north-west coast.

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

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).

Machair is a highly specialised and complex dune habitat that is confined globally to the north-west coasts of Ireland and Scotland. It comprises a flat or gently undulating sandy plain that develops in

an oceanic location with a cool moist climate. Machair systems are highly calcareous, the sediments usually containing a high percentage of shell fragments and having pH values in excess of 7. The vegetation is herbaceous, with a low frequency of sand-binding species (Gaynor, 2006). Irish machair is a priority habitat under the EU Habitats Directive.

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 Dunes Monitoring Project (Delaney *et al.*, 2013) of each sand dune habitat found in the Lough Nagreany sub-site (SDM site ID: 169) are presented in Appendix II and detailed descriptions from the Coastal Monitoring Project (Ryle *et al.*, 2009) of each sand dune habitat found within the Doaghmore sub-site (CMP site ID: 170) are presented in Appendix III. A total of 62.99ha of sand dune habitats was mapped within Lough Nagreany Dunes SAC, 33.26ha (52.8%) of which represents habitats that are listed as Qualifying Interests for this particular SAC.

### **3.1 Overall objectives**

The overall objective for 'Embryonic shifting dunes' in Lough Nagreany Dunes SAC is to '*maintain the favourable conservation condition*'.

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

In the absence of information on the status of this habitat, the overall objective for 'Decalcified fixed dunes with *Empetrum nigrum*' in Lough Nagreany Dunes SAC is to '*maintain the favourable conservation condition*'. This objective is subject to review in light of new information.

In the absence of information on the status of this habitat, the overall objective for 'Atlantic decalcified fixed dunes (Calluno-Ulicetea)' in Lough Nagreany Dunes SAC is to '*maintain the favourable conservation condition*'. This objective is subject to review in light of new information.

The overall objective for 'Dunes with *Salix repens* subsp. *argentea* (*Salix arenariae*)' in Lough Nagreany Dunes SAC is to '*maintain the favourable conservation condition*'.

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

## 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. Revised and updated habitat maps were produced for the sand dune habitats in the Lough Nagreany sub-site during the Sand Dunes Monitoring Project (SDM) (Delaney *et al.*, 2013). These maps are included with the individual site report in Appendix II. A baseline habitat map was produced for the sand dune habitats in the Doaghmore sub-site during the Coastal Monitoring Project (CMP) (Ryle *et al.*, 2009). This map is included with the individual site report in Appendix III at the end of this document. The data from the CMP and the SDM have been combined to produce the Lough Nagreany Dunes SAC sand dune habitats map which is presented in Appendix I.

The total areas of each Qualifying Interest (QI) sand dune habitat within the Lough Nagreany sub-site as estimated by Delaney *et al.* (2013) are presented in the second column of the following table. The total areas of each QI sand dune habitat within the Doaghmore sub-site as estimated by Ryle *et al.* (2009) are presented in the third column. The areas of these QI habitats from each sub-site that are within the boundary of Lough Nagreany Dunes SAC are presented in the fourth and fifth columns. The total area of each qualifying habitat within the SAC is presented in the final column.

Habitat	Total area (ha) of habitat within sub-sites		Total area (ha) of habitat within SAC boundary		
	Lough Nagreany - from SDM	Doaghmore - from CMP	Lough Nagreany	Doaghmore	Total
Embryonic shifting dunes (2110)	0.61	-	0.61	-	<b>0.61</b>
Fixed coastal dunes with herbaceous vegetation (2130)	8.72	26.31	8.72	19.54	<b>28.26</b>
Decalcified dunes with <i>Empetrum nigrum</i> (2140)	-	-	-	-	<b>Unknown</b>
Decalcified dune heath (2150)	-	-	-	-	<b>Unknown</b>
Dunes with <i>Salix repens</i> (2170)	1.83	2.56	1.83	2.56	<b>4.39</b>
<b>Totals</b>	<b>11.16</b>	<b>28.87</b>	<b>11.16</b>	<b>22.10</b>	<b>33.26</b>

The total area of embryonic shifting dunes decreased from 0.77ha (CMP) to 0.61ha (SDM). However, this loss is the result of natural processes of succession (Delaney *et al.*, 2013).

The area of fixed dunes in the Lough Nagreany sub-site increased at the expense of the mobile dunes along a dune ridge. Fixed dune habitat increased in area from 7.65ha (CMP) to 8.72ha (SDM) (Delaney *et al.*, 2013).

The area of dunes with creeping willow (*Salix repens*) originally mapped by the CMP was remapped by the SDM to exclude creeping willow growing on hills adjacent to the sand dunes in the Lough Nagreany sub-site (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 in Lough Nagreany Dunes SAC, as mapped by Ryle *et al.* (2009) and Delaney *et al.* (2013), is presented in Appendix I.

The main sand dune system is divided into two sub-sites (Lough Nagreany and Doaghmore) by the channel that flows out from Lough Nagreany. Gortnatraw, which is a smaller system, occurs at the northern end of the SAC (Ryle *et al.*, 2009). The Gortnatraw system does not contain any habitats currently listed as qualifying interests for the SAC.

Embryonic dunes occur on the seaward edge of the Lough Nagreany sub-site, bordering Doaghmore Strand (Delaney *et al.*, 2013).

The fixed dunes occupy most of the dune system and grade into a mosaic of humid dune slacks and dunes with *Salix repens* towards the landward edge (Ryle *et al.*, 2009).

Decalcified dunes with crowberry (*Empetrum nigrum*) was not recorded within the SAC by the CMP or the SDM. However, some crowberry (*Empetrum nigrum*) was found associated with rocky outcrops during the SDM (Delaney *et al.*, 2013).

Ryle *et al.* (2009) recorded an area (1.35ha) of dune heath in the Lough Nagreany sub-site during the CMP, but this was re-classified by the SDM as heath, rather than a sand dune habitat (Delaney *et al.*, 2013).

The dunes with creeping willow (*Salix repens*) habitat is located behind the fixed dunes, close to the rocky outcrops and occurs in mosaic with humid dune slacks. The creeping willow (*Salix repens*) extends into non-dune habitats on the hills overlooking the dune system (Delaney *et al.*, 2013).

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

Lough Nagreany Dunes 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.

A sea wall is present on the Lough Nagreany sub-site, but it is now well behind the front of the dunes and has been in place for a long time as it was built during the nineteenth century. It is no longer affecting the functioning of embryonic dunes. Sand is sporadically cleared from a drain that opens onto the beach near the embryonic dunes and is dumped on the beach adjacent to the drain. The maintenance of the drain mouth on the beach could be considered interference with the sediment dynamics of the habitat (Delaney *et al.*, 2013).

The practice of sand extraction noted during the CMP survey (Ryle *et al.*, 2009), which had reduced the extent of the embryonic dunes in Lough Nagreany Dunes SAC, had since ceased by the time of the SDM and the embryonic dunes are improving. However, the on-going maintenance work on the beach affects sediment availability for the embryonic dunes (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 Physical structure: hydrological and flooding regime**

The conservation of dune slacks and dunes with creeping willow (*Salix repens*) is inextricably linked with the local hydrological regime. Dune slacks are characterised by the proximity of a groundwater table that is maintained by the combination of an impermeable layer in the soil, or deeper salt water and precipitation. Dunes with creeping willow are closely associated with dune slacks but are

distinguished from them by a water table that is at a depth that no longer exerts an influence on the vegetation. Most dune slacks are fed by a range of water sources, including precipitation, surface water or groundwater. The last two sources are usually somewhat calcareous while the first is acid.

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

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

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

### **3.4.3 Vegetation structure: zonation**

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

The dune system at Lough Nagreany Dunes SAC is of particular interest as it shows a fine gradation of sand dune habitat types. The fixed dunes are fronted by a wide band of accreting foredunes. The fixed dunes grade into a mosaic of humid dune slack and dunes with creeping willow (*Salix repens*), as well as machair (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.

### **3.4.4 Vegetation structure: bare ground**

This target applies to fixed dunes, dunes with crowberry (*Empetrum nigrum*), dune heath and dunes with creeping willow (*Salix repens*). It does not apply to the other QI habitat 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 target is not to exceed 10% bare sand. This target is assessed subject to natural processes.

#### **3.4.5 Vegetation structure: sward height**

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

It was noted in the CMP baseline survey that fixed dunes (grey dunes) were heavily grazed, with some patches of common ragwort (*Senecio jacobaea*) present. While neither of these impacts was significant at the time of the CMP, they had become a problem for the habitat at the time of the SDM survey (Delaney *et al.*, 2013).

The grazing intensity of the fixed dune habitat has generally resulted in a sward that lacks structural diversity (Delaney *et al.*, 2013). Although extensive grazing has a positive impact on sand dunes, the current grazing regime is at the upper limit of what is considered to be a positive impact (Delaney *et al.*, 2013).

Grazing levels were found to be appropriate in the dunes with creeping willow (*Salix repens*) in the Lough Nagreany sub-site (Delaney *et al.*, 2013).

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

#### **3.4.6 Vegetation structure: cover and height of creeping willow (*Salix repens*)**

This attribute only applies to the habitat dunes with creeping willow (*Salix repens*).

The target is that there is more than 10% cover of creeping willow (*Salix repens*) and vegetation height should be in the average range of 5-20cm.

#### **3.4.7 Vegetation composition: plant health of dune grasses**

This attribute applies to 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 embryonic dunes in Lough Nagreany Dunes SAC support flowering and fruiting lyme-grass (*Leymus arenarius*) as well as healthy shoots of sand couch (*Elytrigia juncea*) (Delaney *et al.*, 2013).

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

#### **3.4.8 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*).

At Lough Nagreany Dunes SAC, the embryonic dunes are dominated by sand couch (*Elytrigia juncea*). Other species present include lyme-grass (*Leymus arenarius*) and sea rocket (*Cakile maritima*) (Ryle *et al.*, 2009).

The fixed dunes at Lough Nagreany Dunes SAC have typical species such as lady's bedstraw (*Galium verum*), harebell (*Campanula rotundifolia*), common bird's-foot trefoil (*Lotus corniculatus*), kidney vetch (*Anthyllis vulneraria*), common mouse-ear (*Cerastium fontanum*) and red fescue (*Festuca rubra*). Other species present in the fixed dunes are marram grass (*Ammophila arenaria*), wild carrot (*Daucus carota*), lesser hawkbit (*Leontodon saxatilis*), wood-rush (*Luzula campestris*), cat's-ear (*Hypochaeris radicata*), common meadow-grass (*Poa pratensis*) and the mosses *Rhytidiadelphus triquetrus* and *R. squarrosus* (Ryle *et al.*, 2009). The habitat is typical of fixed dunes that are base-rich to neutral (Delaney *et al.*, 2013).

The typical species of the dunes with creeping willow (*Salix repens*) in the Lough Nagreany and Doaghmore sub-sites include creeping willow, sand sedge (*Carex arenaria*), glaucous sedge (*C. flacca*), eyebright (*Euphrasia officinalis* agg.), red fescue (*Festuca rubra*), lady's bedstraw (*Galium verum*), burnet rose (*Rosa spinosissima*) and common bird's-foot trefoil (*Lotus corniculatus*) (Ryle *et al.*, 2009).

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

#### **3.4.9 Vegetation composition: negative indicator species**

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

The main invasive species identified in Gaynor (2008) were bracken (*Pteridium aquilinum*) and sea buckthorn (*Hippophae rhamnoides*). The invasion of non-native species compromises the typical plant community structure. Bracken 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.

Frequent common ragwort (*Senecio jacobaea*), as recorded in the Lough Nagreany sub-site, can be a negative indicator of overgrazing in summer (Delaney *et al.*, 2013).

Common ragwort (*Senecio jacobaea*) was also occasional throughout the fixed dunes in the Doaghmore sub-site. Bracken (*Pteridium aquilinum*) was also invading the fixed dunes from the slopes of Crocknalarhin Hill and Feighan Hill in Lough Nagreany at the time of the CMP survey (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.

#### **3.4.10 Vegetation composition: scrub/trees**

This attribute applies to fixed dunes, dunes with crowberry (*Empetrum nigrum*), dune heath and dunes with creeping willow (*Salix repens*). 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.

Encroachment by grey willow (*Salix cinerea*) had a low negative effect on the fixed dune habitat in the Lough Nagreany sub-site (Delaney *et al.*, 2013).

The threat of invasion into the dunes with creeping willow (*Salix repens*) was evident on the slopes of Feighan Hill (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, with the exception of creeping willow (*Salix repens*) in dunes with creeping willow.

## 4 References

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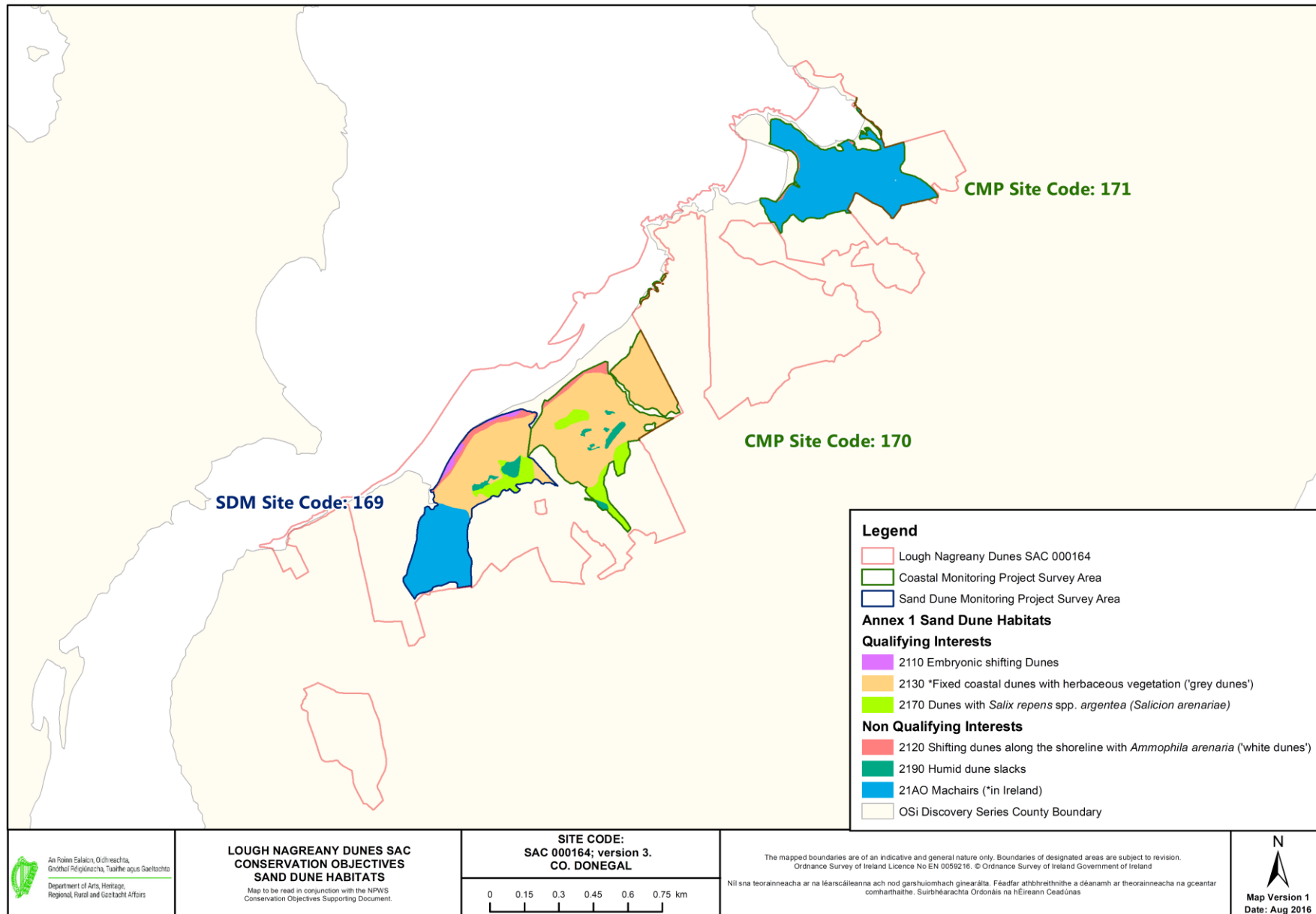
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# Appendix I – Distribution map of sand dune habitats within Lough Nagreany Dunes SAC





## Appendix II – Lough Nagreany site report and habitat map from the Sand Dunes Monitoring Project (Delaney *et al.*, 2013)

### SITE 169 LOUGH NAGREANY

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

The area of sand dunes at Lough Nagreany is located in a valley between two rocky outcrops on the Fanad Peninsula and is designated as Lough Nagreany Dunes SAC (SAC 000164). The site is accessed through private farmland, with no car-park associated with it, so it is relatively undisturbed by visitors. The majority of the sand dune system is managed as farmland and some agricultural improvement has taken place. Seven Annex I sand dune habitats (\* indicates a priority habitat) were found during the baseline survey: **2110 Embryonic shifting dunes**, **2120 Marram dunes (white dunes)**, **\*2130 Fixed dunes (grey dunes)**, **\*2150 Decalcified dune heath**, **2170 Dunes with creeping willow**, **2190 Humid dune slacks** and **\*21A0 Machairs** (Ryle *et al.*, 2009). According to the SAC site synopsis, chough (*Pyrrhocorax pyrrhocorax*) use the dunes at Lough Nagreany for forage and lapwing (*Vanellus vanellus*) breed there (NPWS, 1999a).

### 2 CONSERVATION ASSESSMENTS

#### 2.1 Overview

Lough Nagreany was surveyed on the 29th of May 2012. Table 1 shows the habitats recorded at Lough Nagreany and their conservation status as assessed in 2012. Of the seven Annex I sand dune habitats recorded at Lough Nagreany during the baseline survey, only six were assessed in 2012. **\*2150 Decalcified dune heath** dunes had been mapped at the site previously, but when the area where they were mapped was examined, the heath species were found to be associated with shallow sand overlying acidic bedrock. Where sand was deeper and no outcropping was visible, the species were more typical of calcareous fixed dunes and heath species did not occur. The area mapped as **\*2150 Decalcified dune heath** during the baseline survey did not conform to the description of dune heath habitats as described in the EU Annex I habitat interpretation manual (Commission of the European Communities, 2007) and it was excluded from the area of sand dune habitats in 2012. Three habitats, **2110 Embryonic shifting dunes**, **2120 Marram dunes (white dunes)** and **2170 Dunes with creeping willow**, were assessed as Favourable, while the other three were assessed as Unfavourable-Inadequate.

**Table 1.** Conservation status assessment results for all Annex I dune habitats surveyed at Lough Nagreany, Co. Donegal

Habitat	Area	Structure & Functions	Future Prospects	Overall result
2110 Embryonic shifting dunes	Favourable (improving)	Favourable (stable)	Favourable (improving)	Favourable (improving)
2120 Marram dunes (white dunes)	Favourable (improving)	Favourable (stable)	Favourable (improving)	Favourable (improving)
*2130 Fixed dunes (grey dunes)	Favourable (stable)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)	Unfavourable-Inadequate (deteriorating)
2170 Dunes with creeping willow	Favourable (stable)	Favourable (stable)	Favourable (stable)	Favourable (stable)
2190 Humid dune slacks	Favourable (stable)	Unfavourable-Inadequate (deteriorating)	Favourable (stable)	Unfavourable-Inadequate (deteriorating)
*21A0 Machairs	Favourable (stable)	Unfavourable-Inadequate (improving)	Unfavourable-Inadequate (stable)	Unfavourable-Inadequate (improving)

### 2.1.1 Area

Areas of Annex I sand dune habitats at Lough Nagreany according to the original baseline maps, the revised baseline maps and the Sand Dunes Monitoring Project are shown in Table 2. The area of **\*2130 Fixed dunes (grey dunes)** has been extended at the expense of the **2120 Marram dunes (white dunes)** to follow a dune ridge that was visible on the 2006 aerial photographs. The **2170 Dunes with creeping willow** were remapped to exclude *Salix repens* growing on hills adjacent to the sand dunes and **2190 Humid dune slacks** was extended to include an area previously mapped as **\*2130 Fixed dunes (grey dunes)**.

**Table 2.** Areas of Annex I dune habitats originally mapped at Lough Nagreany during the baseline survey (Coastal Monitoring Project), the revised baseline areas and areas mapped during the Sand Dune Monitoring Project in 2012.

Habitat	Baseline survey (ha)	Revised baseline (ha)	Sand Dunes Monitoring Project (ha)
2110 Embryonic shifting dunes	0.77	0.77	0.61
2120 Marram dunes (white dunes)	1.41	1.22	1.05
*2130 Fixed dunes (grey dunes)	7.64	8.24	8.72
*2150 Decalcified dune heath	1.35	0.00	0.00
2170 Dunes with creeping willow	4.20	1.83	1.83
2190 Humid dune slacks	0.65	0.72	0.72
*21A0 Machairs	8.54	8.54	8.54
Total	24.56	21.32	21.47

Some of the habitats present at Lough Nagreany could not be fully surveyed due to the presence of two bulls in separate fields. The unsurveyed areas were mapped as though no change had occurred since the CMP and the unsurveyed areas are included in the figures shown Table 2. The habitats affected, and the area of unsurveyed habitat, are presented in Table 3.

**Table 3.** Area of Annex I sand dune habitats at Lough Nagreany that could not be surveyed in 2012

Habitat	Baseline survey (ha)
*2130 Fixed dunes (grey dunes)	1.48
2170 Dunes with creeping willow	0.85
2190 Humid dune slacks	0.49
*21A0 Machairs	0.48
<b>Total</b>	<b>3.30</b>

### 2.1.2 Structure and Functions

Table 4 shows the number of monitoring stops carried out in each habitat and the number of criteria assessed. The number of criteria that failed is also shown. Structure and Functions were assessed as Unfavourable-Inadequate for three of the six habitats present at Lough Nagreany. For both **2190 Humid dune slacks** and **\*21A0 Machairs**, a single assessment criterion failed and two criteria failed in the Structure and Functions assessment of **\*2130 Fixed dunes (grey dunes)**. Structure and Functions were assessed as Favourable for the remaining habitats.

**Table 4.** Annex I sand dune habitats at Lough Nagreany 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
2110 Embryonic shifting dunes	4	7	0
2120 Marram dunes (white dunes)	8	7	0
*2130 Fixed dunes (grey dunes)	8	11	2
2170 Dunes with creeping willow	4	10	0
2190 Humid dune slacks	4	11	1
*21A0 Machairs	8	10	1

### 2.1.3 Future Prospects

The impacts recorded at Lough Nagreany are presented in Table 5. Impact codes are assigned according to Ssymank (2010). Most of the impacts affecting the site are related to agriculture. For the most part, these are positive or neutral impacts as they help to maintain the sand dune habitats. Reseeding is the most serious negative impact on the site, however, and affects 100% of **\*21A0 Machairs**. The maintenance work on the beach affects sediment availability for **2110 Embryonic shifting dunes**. Drainage has a neutral impact on **\*21A0 Machairs**.

**Table 5.** Impacts recorded in Annex I sand dune habitats at Lough Nagreany in 2012. 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
2110	J02.02	Removal of sediments	Low	Neutral	15	Outside
2110	J02.11.01	Dumping of dredged sand from drain	Low	Neutral	15	Outside
2120	X	No impacts	-	-	100	-
*2130	A04.02.01	Non-intensive cattle grazing	Medium	Neutral	80	Inside
*2130	A04.02.02	Non-intensive sheep grazing	Medium	Positive	15	Inside
*2130	A04.03	Lack of grazing	Medium	Neutral	5	Inside
*2130	A05.02	Supplementary feeding	High	Negative	1	Inside
*2130	G01.03.02	Off-road driving	High	Negative	1	Inside
*2130	K02.01	<i>Salix cinerea</i> encroachment	Low	Negative	1	Inside
2170	A04.02.01	Non-intensive cattle grazing	Medium	Positive	100	Inside
2190	A04.02.01	Non-intensive cattle grazing	Low	Positive	100	Inside
2190	K02.01	<i>Salix cinerea</i> encroachment	Low	Negative	1	Inside
*21A0	A02.01	Reseeding	Medium	Negative	100	Inside
*21A0	A04.01.02	Intensive sheep grazing	Medium	Neutral	95	Inside
*21A0	A04.02.01	Non-intensive cattle grazing	Low	Neutral	100	Inside
*21A0	G01.03.02	Farm track	High	Negative	1	Inside
*21A0	G05.09	Fencing	Low	Neutral	1	Inside
*21A0	J02.07.01	Drainage	Medium	Neutral	25	Inside

## 2.2 Annex I habitat assessments

The conservation status of the Annex I habitats at Lough Nagreany is discussed below. The present conservation status in 2012 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 2012 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 2110 Embryonic shifting dunes

Two discrete areas of **2110 Embryonic shifting dunes** were mapped in 2012. The north-eastern part has expanded since the baseline survey. The south-eastern part is located close to piles of sand on the shore, which are associated with the maintenance of a drain.

#### Area

The total area of **2110 Embryonic shifting dunes** has decreased from 0.77 ha to 0.61 ha. However, this loss is the result of natural processes of succession. The Area was assessed as Unfavourable-Inadequate during the baseline survey as a result of sand extraction. This practice has since ceased and Area was assessed as Favourable (improving).

#### Structure and Functions

**2110 Embryonic shifting dunes** was assessed on the basis of the four monitoring stops recorded. Although flowering or fruiting was only present inside one of the stops, *Leymus arenarius* flowers were frequent in the immediate vicinity of another stop and the site was surveyed before the main

flowering period for *Elytrigia juncea*. As all the stops contained healthy shoots of *E. juncea* the habitat was allowed to pass this criterion. A sea wall is present on the site, but it is now well behind the front of the dunes and has been in place since long before designation. A local landowner stated that it was built during the nineteenth century. It is no longer affecting the functioning of **2110 Embryonic shifting dunes**. Sand is sporadically cleared from a drain that opens onto the beach near the embryonic dunes and is dumped on the beach adjacent to the drain. Because no sediment is actually being removed and the activity occurs at a single point outside of the habitat, it was not considered to have a significant negative effect on the functioning of the **2110 Embryonic shifting dunes**. Structure and Functions were assessed as Favourable in the baseline survey and the Structure and Functions of **2110 Embryonic shifting dunes** were assessed as Favourable (stable) in 2012.

#### Future Prospects

The Future Prospects were assessed as Unfavourable-Inadequate during the baseline survey due to the occurrence of sand extraction. Although this has now stopped, sand is periodically dredged from a nearby drain, which is then dumped on the beach outside of the **2110 Embryonic shifting dunes**. Because no sand is removed from the site, this was considered to be a neutral impact. Future Prospects were assessed as Favourable (improving) during the SDM.

#### Conservation assessment:

All three parameters were assessed as Favourable during the SDM, which is an improvement on the CMP when Area and Future Prospects were assessed as Unfavourable-Inadequate. **2110 Embryonic shifting dunes** were assessed as Favourable (improving).

#### 2.2.2 2120 Marram dunes (white dunes)

**2120 Marram dunes (white dunes)** form a continuous band close to the beach at Lough Nagreany and are partly protected by **2110 Embryonic shifting dunes**.

#### Area

The area of **2120 Marram dunes (white dunes)** has decreased from 1.22 ha to 1.05 ha. However, this loss is the result of natural processes of succession. The Area was assessed as Unfavourable-Inadequate during the baseline survey as a result of sand extraction. This practice has since ceased and Area was assessed as Favourable (improving).

#### Structure and Functions

All of the eight monitoring stops assessed were in good condition and the site passed the Structure and Functions assessment. Although *Senecio jacobaea* was frequent and *Cirsium vulgare* was also present, they have very little cover and were not significant enough for the habitat to fail. The Structure and Functions were assessed as Favourable during the baseline survey and as Favourable (stable) in 2012.

#### Future Prospects

No significant impacts or activities were recorded for this habitat in 2012. Future Prospects were assessed as Unfavourable-Inadequate in the baseline survey due to sand extraction. This activity was not recorded in 2012 and the Future Prospects were assessed as Favourable (improving).

### Conservation assessment

The conservation status of **2120 Marram dunes (white dunes)** has changed from Unfavourable-Inadequate during the baseline survey to Favourable (improving) in 2012. This is because sand is no longer being removed from the site.

#### 2.2.3 \*2130 Fixed dunes (grey dunes)

Almost all of the **\*2130 Fixed dunes (grey dunes)** are grazed by cattle or sheep and have a short sward. There is a small area of newly fixed dunes that is inaccessible to livestock and the sward is longer here. The habitat is typical of dunes that are base-rich to neutral and the most frequent species recorded were *Lotus corniculatus*, *Hypochaeris radicata*, *Luzula campestris*, *Poa pratensis sens. lat.* and *Rhytidadelphus squarrosus*.

### Area

**\*2130 Fixed dunes (grey dunes)** increased in area from 8.24 ha to 8.72 ha. Area was assessed as Favourable in the baseline survey and as Favourable (stable) in 2012.

### Structure and Functions

Two of the criteria failed in the Structure and Functions assessment. *Senecio jacobaea* was found in six of the eight monitoring stops and the sward height was overly uniform. The sward height criterion was very close to a pass value as 75% of the sward was between 2 and 10 cm and the target value is for 30 to 70% of the sward to be between 2 and 10 cm. These impacts are associated with the use of dunes as pasture. The Structure and Functions of **\*2130 Fixed dunes (grey dunes)** were assessed as Favourable in the baseline survey. It was noted in the baseline survey that **\*2130 Fixed dunes (grey dunes)** were heavily grazed, with some patches of *Senecio jacobaea* present. While neither of these impacts was significant at the time, they have become a problem for the habitat now. Structure and Functions were assessed as Unfavourable-Inadequate (deteriorating) in 2012.

### Future Prospects

Future Prospects were assessed as Favourable in the baseline survey, although several negative impacts were recorded for the habitat, for example, trampling and stock feeding. In 2012, non-intensive sheep grazing had a positive impact on 15% of the habitat, and 5% of the habitat was not grazed, representing a neutral impact. Cattle grazing was recorded as a neutral impact on 80% of the habitat, as it had both positive and negative effects. Encroachment by *Salix cinerea* had a low-intensity negative effect on 1% of the habitat, while off-road driving had a high negative impact on up to 1% of the habitat. Supplementary feeding was also recorded as a negative impact. For these reasons the Future Prospects were assessed as Unfavourable-Inadequate (deteriorating).

### Conservation assessment

Although Area was assessed as Favourable, the Structure and Functions and Future Prospects of **\*2130 Fixed dunes (grey dunes)** were assessed as Unfavourable-Inadequate. The **\*2130 Fixed dunes (grey dunes)** were therefore assessed as Unfavourable-Inadequate (deteriorating). This represents a decline in the conservation status since the baseline survey when the habitat was assessed as Favourable. The cover of *Senecio jacobaea* seems to have increased since the baseline survey and the grazing intensity has resulted in a sward that lacks structural diversity. Although extensive grazing

has a positive impact on sand dunes, the current grazing regime is at the upper limit of what is considered to be a positive impact and driving on the dunes has caused damage to the vegetation.

#### 2.2.4 2170 Dunes with creeping willow

**2170 Dunes with creeping willow** is located behind **\*2130 Fixed dunes (grey dunes)**, close to the rocky outcrops and **2190 Humid dune slacks**. The *Salix repens* extends into non-dune habitats on the hills overlooking the dune system.

##### Area

The area of **2170 Dunes with creeping willow** has not changed since the baseline survey (1.83 ha) and Area was assessed as Favourable (stable).

##### Structure and Functions

The Structure and Functions of **2170 Dunes with creeping willow** were assessed as Favourable during the baseline survey. In 2012, the habitat passed on all of the assessment criteria. Twelve of the thirteen indicator species for the habitat were recorded within the four monitoring stops. The Structure and Functions of **2170 Dunes with creeping willow** were assessed as Favourable (stable).

##### Future Prospects

Cattle graze the **2170 Dunes with creeping willow** and this is a medium intensity, positive impact. Grazing levels were found to be appropriate during the baseline survey too, with Future Prospects assessed as Favourable. As there are no negative impacts or activities, the Future Prospects were assessed as Favourable (stable) in 2012.

##### Conservation assessment

The **2170 Dunes with creeping willow** were assessed as Favourable (stable), and their conservation status has not changed since the baseline survey.

#### 2.2.5 2190 Humid dune slacks

There are two areas of **2190 Humid dune slacks** at Lough Nagreany, but only the smaller one (0.23 ha) was accessible during the survey in 2012. The larger slack (0.49 ha) was inaccessible because of the presence of a bull. If the monitoring stops had been placed evenly over the entire habitat, the outcome of the assessment may have been different. The species present in the **2190 Humid dune slacks** indicate that the water-table is still close to the surface and the local landowner stated that the slacks had been flooded in mid-May of 2012.

##### Area

The area of **2190 Humid dune slacks** has not changed since the baseline survey (0.72 ha) and Area was assessed as Favourable (stable).

##### Structure and Functions

Structure and Functions were assessed as Favourable during the baseline survey. In 2012, the **2190 Humid dune slacks** had a relatively low forb cover, and high grass and *Salix repens* cover (36%). Due to the low forb cover, it was assessed as Unfavourable-Inadequate (deteriorating). It should be noted

that less than half the total area of dune slack on the site could be surveyed as a bull was present in the field where the larger dune slack is located. If the forb cover was high in that slack, it may have improved the Structure and Functions assessment.

#### Future Prospects

Future Prospects were assessed as Favourable during the baseline survey, with appropriate grazing levels noted. In 2012, cattle grazed the dune slacks and had a low intensity, positive effect. *Salix cinerea* encroachment was recorded with a low intensity negative impact on 1% of the habitat. Further encroachment would be expected to be controlled by the cattle. The Future Prospects were assessed as Favourable (stable).

#### Conservation assessment

**2190 Humid dune slacks** were assessed as Unfavourable-Inadequate (deteriorating) at Lough Nagreany. They were assessed as Favourable during the baseline survey. The low proportion of forbs to grasses is responsible for the Unfavourable-Inadequate assessment. The conservation assessment cannot be considered representative however, as all four of the monitoring stops were placed in the smaller of the two slacks.

#### 2.2.6 \*21A0 Machairs

The **\*21A0 Machairs** habitat at Lough Nagreany is located in a low-lying plain between the hills to the east and west, fixed dunes to the north and wet grassland to the south. The water table is very close to the surface and the indicator species recorded are indicative of damp conditions with *Agrostis stolonifera*, *Carex nigra* and *Hydrocotyle vulgaris* being recorded alongside *Bellis perennis*, *Plantago lanceolata* and *Galium verum*. Small, shallow drains run through the **\*21A0 Machairs** habitat and there is a larger drain to the west of the habitat, which brings excess water out to the beach. The mouth of this drain is occasionally blocked and when this occurs, the **\*21A0 Machairs** habitat and grasslands farther back in the valley flood.

#### Area

The area of **\*21A0 Machairs** has not changed since the baseline survey (8.54 ha) and Area was assessed as Favourable (stable). It was assessed as Unfavourable-Inadequate during the baseline survey due to building on the **\*21A0 Machairs**, but on examination of the 1995 aerial photographs, it appears that the buildings in question predate designation and do not represent a loss of the habitat within the site.

#### Structure and Functions

The **\*21A0 Machairs** habitat was assessed as Unfavourable-Bad during the baseline survey due to overgrazing and agricultural improvement. In 2012, eight stops were recorded in **\*21A0 Machairs** at Lough Nagreany. One criterion failed in the Structure and Functions assessment. There were signs that the vegetation composition has been negatively affected by agriculture; *Senecio jacobaea* was occasional and *Lolium perenne* was recorded in every stop. At one stop, *Lolium perenne* made up over half of the vegetation cover. Sixteen positive indicator species were recorded within the monitoring stops, and the indicator species were frequent to abundant throughout the habitat. Overall, the cover of bryophytes was also good. The sward height was 5.9 cm when the habitat was surveyed in May.



The target for this criterion is a sward height of 8 cm in July/August. A shorter sward indicates overgrazing. For the time of year, the sward was not considered to be too short. The habitat was assessed as Unfavourable-Inadequate (improving).

### Future Prospects

Future Prospects were assessed as Unfavourable-Inadequate during the baseline survey due to agricultural improvement and overgrazing. In 2012, the most significant impact was reseeded. This had a medium-intensity negative effect and there was evidence of reseeded on 100% of the habitat. It was not considered to be of high-intensity as the site still had plenty of positive indicator species. Sheep and cattle grazing were considered to be neutral impacts for this site as they contribute to maintaining the site as machair, but they are responsible for allowing the spread of negative indicator species. Drainage was considered to be a neutral impact as it is an alteration of the natural hydrological processes but it allows machair to persist here. If the drain were removed, the quality of the **\*21A0 Machairs** would deteriorate. The Future Prospects of **\*21A0 Machairs** at Lough Nagreany were assessed as Unfavourable-Inadequate (stable).

### Conservation assessment

The overall conservation assessment for **\*21A0 Machairs** was Unfavourable-Bad during the baseline survey. The conservation assessment has changed to Unfavourable-Inadequate (improving) because of an improvement in the Structure and Functions assessment.

## 3 DISCUSSION

### 3.1 Qualifying Interests for SAC

The qualifying interests for Lough Nagreany Dunes SAC (SAC 000164) are shown in Table 6. **2120 Marram dunes (white dunes)**, **2190 Humid dune slacks** and **\*21A0 Machairs** have been excluded from the qualifying interests despite occurring on the site. **\*2150 Decalcified dune heath** has a representativity score of B, which indicates good representativity (Commission of the European Communities, n.d.), but the habitat mapped during the baseline survey does not conform to the description in the Annex I habitat interpretation manual (Commission of the European Communities, 2007). **\*2140 Decalcified *Empetrum* dunes** were not found on the site in 2012, although some *Empetrum nigrum* was found associated with rocky outcrops. **2110 Embryonic shifting dunes** and **2170 Dunes with creeping willow** were assessed more favourably during the SDM than is indicated on the Natura 2000 Standard Data Form, while the opposite is true of **\*2130 Fixed dunes (grey dunes)**.

**Table 6.** Relevant Qualifying Interests for Lough Nagreany Dunes SAC (SAC 000164) (NPWS, 1999b)

Habitat	Area (%)	Representativity	Relative surface	Conservation status	Global assessment
2110 Embryonic shifting dunes	2	B	C	B	C
*2130 Fixed dunes (grey dunes)	20	B	C	B	C
*2140 Decalcified <i>Empetrum</i> dunes	3	C	C	B	B
*2150 Decalcified dune heath	8	B	C	B	B
2170 Dunes with creeping willow	20	A	C	B	B

### 3.2 Agriculture

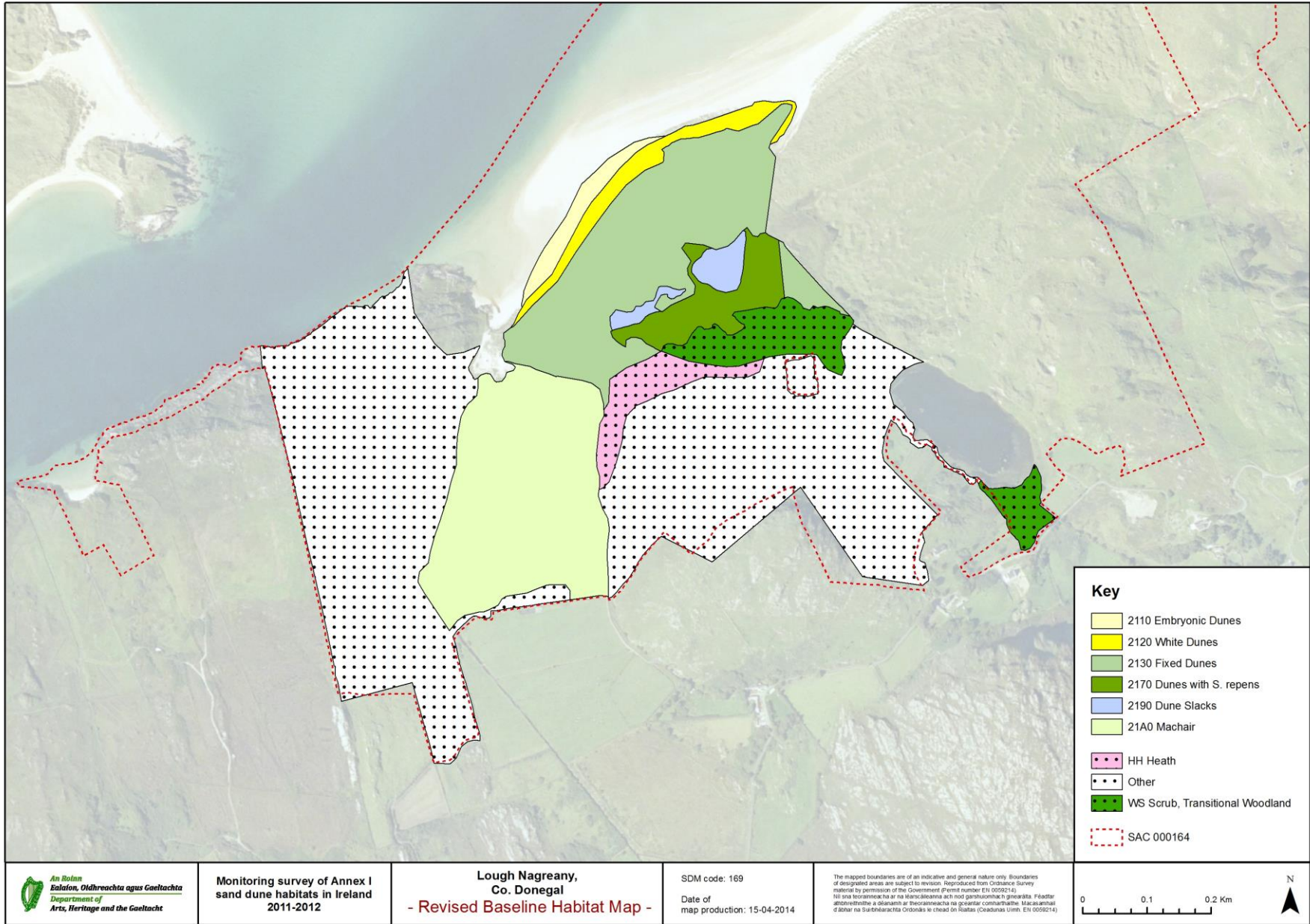
The management of the site is dominated by cattle and sheep grazing. Grazing makes a positive contribution by preventing the site from becoming rank. However, frequent *Senecio jacobaea* can be indicative of overgrazing in summer (JNCC, 2004) which suggests that the grazing regime was too intense in **\*2130 Fixed dunes (grey dunes)**. Reseeding in the past has reduced the quality of **\*21A0 Machairs**, and it has yet to recover fully.

### 3.3 Drainage and disturbance

The maintenance of the drain mouth on the beach could be considered interference with the sediment dynamics of the habitat. However, no sediment is being removed from the site and the dredging and dumping of sand on the beach outside of the habitats was considered to be a neutral impact. The drain has helped to maintain the **\*21A0 Machairs** since prior to designation, and if the drain was to become permanently blocked, the **\*21A0 Machairs** would degrade into wet grassland.

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Monitoring survey of Annex I  
sand dune habitats in Ireland  
2011-2012

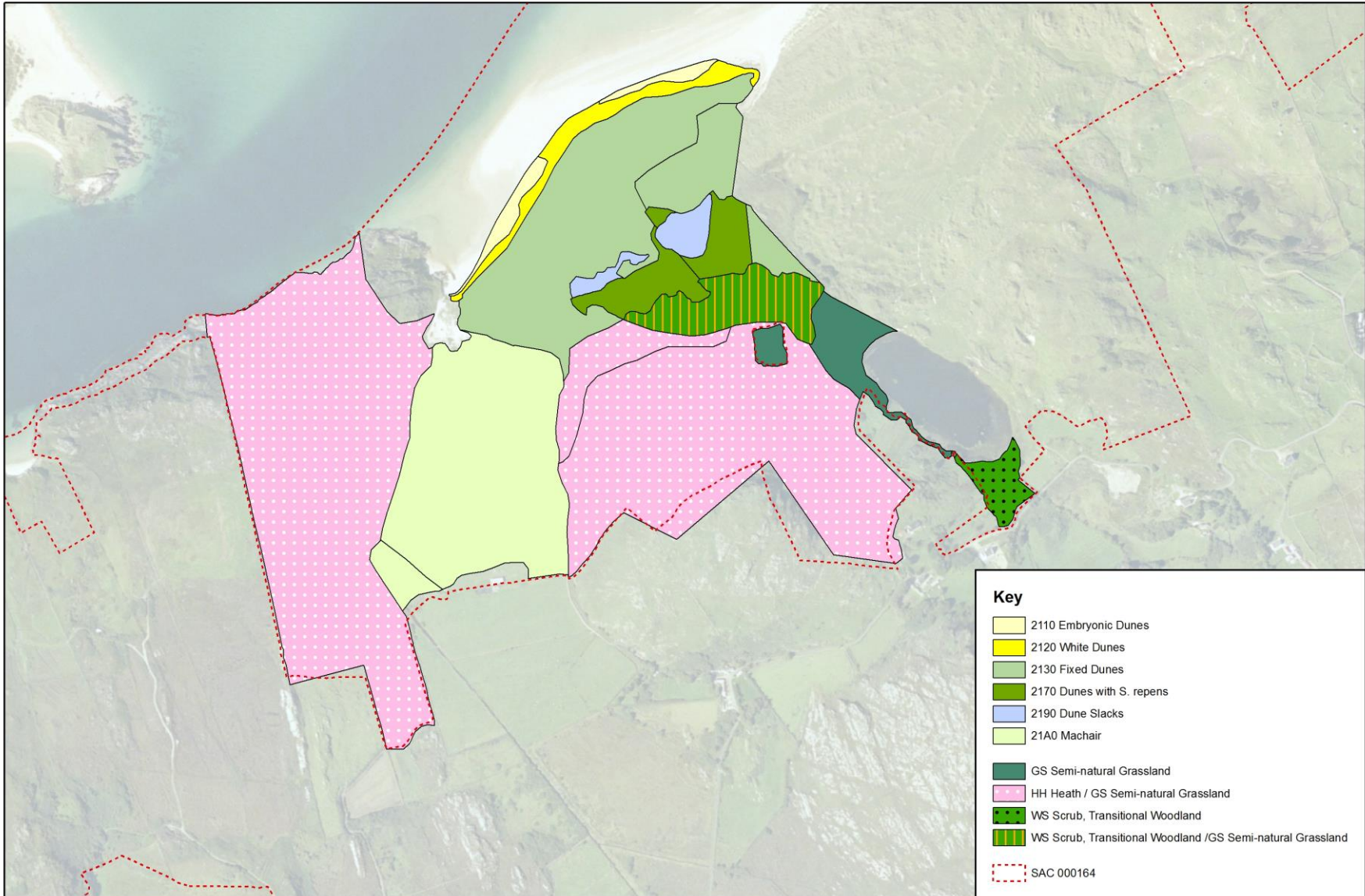
Lough Nagreany,  
Co. Donegal  
- Revised Baseline Habitat Map -

SDM code: 169  
Date of  
map production: 15-04-2014

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Níl sna teorainneacha ar na maircáil sin ach mod gairneoireachta. Fíleáil a bhaineann le sainbhailíní a bhaineann le teorainneacha na gceantar comhthráise. Maircáil sin d'áiríonn na Sarbhailíní Odrónáis le chead na Rialtas (Ceadaíonn Uimh. EN 0009214)







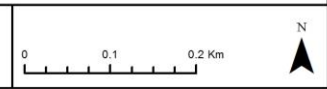
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 Department of  
 Arts, Heritage and the Gaeltacht

Monitoring survey of Annex I  
 sand dune habitats in Ireland  
 2011-2012

Lough Nagreany,  
 Co. Donegal  
 - Updated SDM Map -

SDM code: 169  
 Date of  
 map production: 15-04-2014

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## Appendix III – Doaghmore site report and habitat map from the Coastal Monitoring Project (Ryle *et al.*, 2009)

### DOAGHMORE

#### SITE DETAILS

**CMP06 site name:** Doaghmore                      **CMP06 site code:** 170                      **CMP Map No.:** 167

**County:** Donegal                      **Discovery map:** 2                      **Grid Reference:** C 145 425

**6 inch Map No.:** Dg 8 & 17

**Aerial photographs (2000 series):** O 0041 D; O 0060 A&B

**NPWS Site Name:** Lough Nagreany Dunes

**NPWS designation:**    **pNHA:** 000164                      **cSAC:** 000164

**Ranger Area:** Donegal

**MPSU Plan:** Draft II (2006)

**Report Author:** Anne Murray

#### SITE DESCRIPTION

Doaghmore sand dune system is part of Lough Nagreany Dunes cSAC which is located in north Donegal, on the north-western side of the Fanad Peninsula. The cSAC is approximately 30 km north of Milford. This coastal site comprises a relatively intact complex of sand dune habitats.

The dune system is noted as interesting in the conservation plan,

*‘ ...as it shows a fine gradation from fixed dunes to machair and to dune heath and includes several priority habitats listed on Annex I of the EU Habitats Directive. ‘*

The sand dune element of the site can be divided into two sub-systems and these are treated as three separate sites within this project. Lough Nagreany (site code 169) and Doaghmore (site code 170) comprise the sub-system in the southern part of the cSAC and Gortnatraw (site code 171), which is a smaller very mobile system at the northern end of the cSAC. The cSAC displays a diverse range of relatively undisturbed sandy habitats and is designated for three Annex I priority habitats – Fixed dunes, Atlantic decalcified fixed dunes (Calluno-Ulicetea) and Decalcified fixed dunes with *Empetrum nigrum*. Other Annex I sand dune habitats for which it is designated are, Dunes with *Salix repens* and Embryonic shifting dunes. Sand dune habitats present but not selected for the cSAC are Machair, Dune slack and Mobile dunes.

The cSAC is also designated for the rare aquatic plant – *Najas flexilis* (slender naiad) which is found at Lough Nagreany. This plant is listed in Annex II of the Habitats Directive. The site provides good

feeding habitat for cough (*Pyrrhocorax pyrrhocorax*), a species listed in Annex I of the EU Birds Directive, which breed locally. Lapwing (*Vanellus vanellus*), also breed within the site.

The dominant farming activity in this area is grazing. Recreational use of the beaches within the site is limited by their relative inaccessibility. Lough Nagreany and Gortnatraw Lough are used for trout fishing.

The sand dune habitats recorded at Doaghmore during this survey include, the priority habitat – Fixed dunes as well as Dunes with *Salix repens*, Dune slack and Mobile dunes. The sand dunes at Doaghmore are separated from the adjacent site of Lough Nagreany dunes by a channel that runs out onto the beach from the lough. Doaghmore dunes lie to the north of this channel extending as far the foot of Crocknalarhin Hill (Gortnatraw). The dunes comprise a mosaic of fixed dunes, dune slack and dunes with *Salix repens* fronted by mobile dunes. The dune system slopes south-eastward to lower ground towards Lough Nagreany. The total sand dune area at Doaghmore is 30.461ha (Table 170A).

### Fixed Dunes (H2130)

The fixed dune habitat comprises 26.306ha (Table 170A) and consists of tall fixed dune ridges interspersed with dune slack hollows with *Salix repens* (creeping willow) on slopes. The dunes are striped and managed for agriculture. Cattle are the main grazers along with rabbits and sheep to a lesser extent. Supplementary feeding is evident in some fields.

**Table 170A** Areas of EU Annex I habitats mapped at Doaghmore

EU Code	EU Habitat	Area (ha)
H2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i>	0.832
H2130	Fixed coastal dunes with herbaceous vegetation	26.306
H2170	Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (Salicion arenaria)	2.560
H2190	Humid Dune Slacks	0.763
	<b>Total Sand dune</b>	<b>30.461</b>

The typical fixed dune species recorded include *Carex arenaria* (sand sedge), *Carex flacca* (glaucous sedge), *Cerastium fontanum* (common mouse-ear), *Campanula rotundifolia* (harebell), *Festuca rubra* (red fescue), *Euphrasia officinalis* agg. (eyebright), *Galium verum* (lady's bedstraw), *Hypochaeris radicata* (cat's ear), *Lotus corniculatus* (common bird's-foot-trefoil), *Luzula campestris* (field wood-rush), *Plantago lanceolata* (ribwort plantain), *Taraxacum* agg. (dandelion), *Thymus polytrichus* (wild thyme), *Trifolium repens* (white clover), *Veronica chamaedrys* (Germander speedwell) and the mosses *Rhytidiadelphus triquetrus* and *Rhytidiadelphus squarrosus*.

Other species present in the fixed dune are *Ammophila arenaria* (marram grass), *Cynosorus cristatus* (crested dog's-tail), *Daucus carota* (wild carrot), *Holcus lanatus* (Yorkshire fog), *Leontodon saxatilis* (lesser hawkbit) and *Rosa pimpinellifolia* (burnet rose).

The negative indicator species *Senecio jacobaea* (common ragwort) is occasional throughout the fixed dunes. Bracken (*Pteridium aquilinum*) and scrub is also invading the fixed dunes from the slopes of Crocknalarhin Hill.

### **Dune Slacks (H2190)**

Six dune slacks occur at Doaghmore and comprise 0.763ha of the total sand dune habitat (Table 170A). Most of the dune slacks are wet with the exception of one which is dry and maturing. The dune slacks occur in a mosaic with fixed dunes and dunes with *Salix repens*. The slacks are well grazed by cattle and this keeps the sward short and helps to maintain the diversity of species and openness of the slack. There is some poaching but it is not significant.

The typical species that occur in the slack include *Carex arenaria* (sand sedge), *Carex nigra* (common sedge), *Hydrocotyle vulgaris* (marsh pennywort), *Juncus articulatus* (jointed rush), *Mentha aquatica* (water mint), *Potentilla anserina* (silverweed), *Prunella vulgaris* (selfheal), *Salix repens* (creeping willow) and the moss *Calliergonella cuspidata*.

Other species include *Anacamptis pyramidalis* (pyramidal orchid), *Agrostis stolonifera* (creeping bent), *Carex flacca* (glaucous sedge), *Cynosorus cristatus* (crested dog's-tail), *Epilobium palustre* (marsh willowherb), *Euphrasia officinalis* agg. (eyebright), *Festuca rubra* (red fescue), *Filipendula ulmaria* (meadowsweet), *Holcus lanatus* (Yorkshire fog), *Lotus corniculatus* (common bird's-foot trefoil), *Pinguicula vulgaris* (common butterwort), *Ranunculus bulbosus* (bulbous buttercup), *Trifolium repens* (white clover), *Trifolium pratense* (red clover) and the moss *Rhytidiadelphus triquetrus*.

No negative indicator species were recorded in the dune slack.

### **Dunes with *Salix repens* (H2170)**

The EU Annex I habitat - Dunes with *Salix repens* is considered a dune slack type community and is typical of older drier slacks. It often occurs in a mosaic with fixed dunes and dune slack where it develops on the drier slopes of the dune slack as is the case at Doaghmore.

There is some difficulty in discerning boundaries between the habitats, as they all occur close together. Although, it was possible to map some discrete areas of dunes with *Salix repens* totalling 2.56 ha, the overall area may be greater.

The typical species of the dunes with *Salix repens* at Doaghmore include: *Carex arenaria* (sand sedge), *Carex flacca* (glaucous sedge), *Festuca rubra* (red fescue), *Galium verum* (lady's bedstraw), *Lotus corniculatus* (common bird's-foot trefoil) and *Salix repens* (creeping willow) along with other typical species of fixed dune including: *Campanula rotundifolia* (harebell), *Cerastium fontanum* (common mouse-ear), *Euphrasia officinalis* agg. (eyebright), *Galium verum* (lady's bedstraw), *Linum catharticum* (fairy flax), *Luzula campestris* (field wood-rush), *Plantago lanceolata* (ribwort plantain), *Trifolium repens* (white clover), *Hypnum cupressiforme*, *Rhytidiadelphus triquetrus*, *R. squarrosus*, and *Peltigera* spp. The diversity of plant species is good and the habitat appears to be functioning fairly well under the current conditions.

Other species present include: *Ammophila arenaria* (marram grass), *Viola canina* (heath dog-violet) and the moss *Scleropodium purum*.

### **Mobile Dunes (H2120)**

The total mobile dune area is 0.832ha (Table 170A). The mobile dunes extend the length of the strand at Doaghmore and are fronted by a sandy beach. The impacts on this habitat are few due to the remoteness of the site. The main activity that threatens the mobile dunes is sand removal which is ongoing in the southern part of Doaghmore Strand.

The typical species *Ammophila arenaria* (marram grass) and *Leymus arenarius* (lyme-grass) dominate with *Elytrigia juncea* (sand couch) also present.

The negative indicator species *Senecio jacobaea* (common ragwort) occurs in the mobile dunes but is not common.

### **IMPACTS**

Similar to the adjacent site Lough Nagreany, farming is the main land-use of the sand dune system at Doaghmore and the impacting activities associated with farming are given in Table 170B.

The sand dune system is fenced (code 150). With the exception of the mobile dunes that lie outside of the fenced fields. The fixed dunes are grazed by cattle, sheep and rabbits (code 140). Overall the impact of grazing has been positive throughout the sand dune system, resulting in high species diversity and preventing rank vegetation and scrub from becoming dominant.

However, *Pteridium aquilinum* (bracken) is invading (code 954) the north and eastern edges of the dunes from the higher slopes of Crocknalarhin at Gortnatraw. Agricultural weeds occur occasionally throughout the dunes. Stock feeding is evident in the fixed dunes (code 171).



**Table 170B** Intensity and impact of various activities on sand dune habitats at Doaghmore

EU Habitat Code <sup>1</sup>	Activity Code <sup>2</sup>	Intensity <sup>3</sup>	Impact <sup>4</sup>	Area affected/ha	Location of Activity <sup>5</sup>
H2130	140	A	+1	20	Inside
H2190	140	A	+1	0.5	Inside
H2170	140	A	+1	1	Inside
H2130	150	A	-1	25	Inside
H2190	150	A	-1	0.7	Inside
H2170	150	A	-1	2.5	Inside
H2130	171	C	-1	20	Inside
H2120	302	A	-2	0.8	Outside
H2130	720	B	-1	5	Inside
H2120	900	B	0	Unknown	Inside
H2130	954	C	-1	1	Inside

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

<sup>2</sup> Description of activity codes are found in Appendix 3

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

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

<sup>5</sup> 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 dune slack and dunes with *Salix repens* are lightly grazed (code 140) and the positive impacts of grazing could be detected in the high diversity of plant species and the lack of scrub invasion.

The mobile dunes lie outside of the striped fields and so they are largely unaffected by agricultural activities. They are mainly impacted by natural erosion (code 900) and this is not considered unfavourable. The dunes appear to be in dynamic balance with erosion occurring in the northern section of Doaghmore Strand and accretion in southern section which lies within the adjacent site Lough Nagreany (site code 169). Sand extraction (code 302) in southern section of Doaghmore Strand within the site of Lough Nagreany is impacting on the mobile dunes of Doaghmore as both sites lie within the one coastal cell. This activity will exacerbate natural erosion and reduce the available sediment for the dunes.

## 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 ASI and the NATURA 2000 survey and the most recent MPSU plan (2006).

The method of assessment of conservation status differed in the NATURA 2000 survey and so only broad comparisons between the conservation status of the two surveys was possible. The NATURA 2000 assessment encompasses the entire cSAC and does not distinguish between the three sites of this project. The conservation status of the Annex I sand dune habitats at Doaghmore are given in Table 170C.

### Fixed Dunes (H2130)

The extent of fixed dunes is rated as *favourable* (Table 170C). The fixed dune area is intact and are well vegetated with a low bare sand cover. The fixed dunes are free of development.

The structure and functions parameter is rated as *favourable*. Four monitoring stops were placed in the fixed dunes (one of these was located in the more rank semi-fixed area) and all the stops passed (Table 170D). The fixed dune is tightly grazed and contains a uniform short sward with a high diversity of typical species. The structure of the dunes is intact and it is functioning naturally. The negative indicator species *Senecio jacobaea* (common ragwort) and *Pteridium aquilinum* (bracken) occur throughout the fixed dunes but are not common.

**Table 170C** Conservation status of Annex I sand dune habitats at Doaghmore

Habitat <sup>1</sup>	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system <sup>2</sup>
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
Fixed Dunes (H2130)	Extent/ Structure and functions/ Future prospects			Favourable	Favourable-maintained
Dune Slack (H2190)	Extent/ Structure and functions/ Future prospects			Favourable	Favourable-maintained
Dunes with <i>Salix repens</i> (H2170)	Extent/ Structure and functions/ Future prospects			Favourable	Favourable-maintained
Mobile Dunes (H2120)	Extent/ Structure and functions	Future prospects		Unfavourable - Inadequate	Unfavourable-unchanged

<sup>1</sup> EU Codes as per Interpretation Manual

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

**Table 170D** Pass/Fail results of monitoring stops for Annex I sand dune habitats at Doaghmore

Habitat	Monitoring stops		Conservation status
	Pass	Fail	
Fixed Dunes (H2130)	4	0	Favourable
Dune Slack (H2190)	2	0	Favourable
Dunes with <i>Salix repens</i> (H2170)	3	0	Favourable
Mobile Dunes (H2120)	3	0	Favourable

The future prospects for the fixed dunes are considered *favourable*. Doaghmore is managed in a similar way to the adjacent area of dunes of Lough Nagreany. The fixed dunes are not commonage. The MPSU plan states the following in relation to non-commonage land of this cSAC:

*For non-commonage land, NPWS will seek to ensure that sustainable grazing levels are maintained/established via REPS and NPWS farm plans, using similar methodology applied to commonage areas.*

Currently, the fixed dunes appear to be under an appropriate grazing regime and this should be maintained. However, stock feeding should be curtailed, if possible.

The conservation status of the fixed dunes at the entire cSAC is described as *good conservation* in the NATURA 2000 survey. Currently, the overall EU conservation status of fixed dune is *favourable* (Table 170C).

The Irish conservation status is rated as *favourable-maintained*.

### **Dune Slack (H2190)**

Six areas of wet dune slack occur in mosaic with the fixed dunes and dunes with *Salix repens* at Doaghmore. The MPSU map does not delineate dune slack but instead dune slack and dunes with *Salix repens* are incorporated into one theme. In addition, the area where dune slack was recorded during this survey is not assigned to the dune slack/dunes with *Salix repens* theme on the MPSU map. Therefore, the conservation assessment is based on best scientific judgement. The extent is rated as *favourable* as there is no apparent decline in the area of dune slack.

The structure and functions parameter is rated as *favourable*. Two monitoring stops were placed in this habitat and both passed (Table 170D). The slacks are lightly grazed by cattle and contain a good diversity of typical species. The habitat is intact and functioning well. There is some light poaching in the wetter slacks but it is not considered significant.

The future prospects for the dune slacks are considered *favourable*. There are no apparent threats and the current grazing regime appears appropriate for the habitat.

The conservation status of the dune slack is not assessed in the NATURA 2000 survey as the site is not listed for this habitat. Currently, the overall EU conservation status of dune slack is *favourable* (Table 170C), as the slack areas contains a good diversity of species and are not currently under threat from agricultural activities.

The Irish conservation status is rated as *favourable-maintained*.

### **Dunes with *Salix repens* (H2170)**

The extent of the dunes with *Salix repens* is inexact as it occurs in a mosaic with dune slack and fixed dunes. The extent is rated as *favourable* as there is no apparent decline in the area of dunes with *Salix repens* (Table 170C). This is based on best scientific judgement as some of the areas of dunes with *Salix repens* found during this survey were not indicated on any of the previous maps available for this site.

The structure and functions parameter is rated as *favourable*. Three monitoring stops were placed in the dunes with *Salix repens* and all of these passed (Table 170D). However, it is important to note that monitoring stops for this habitat are on a trial basis as further studies are required for the development of targets for this habitat (See main report). The structure of this habitat is intact and there is a good diversity of typical species with a fair cover of forbs. The presence of negative indicator species is very occasional.

The future prospects for this habitat are considered *favourable*. There are no apparent threats and the current grazing regime seems appropriate for the habitat.

The conservation status of this habitat is described as *good* in the NATURA 2000 survey. The current overall EU conservation status of dunes with *Salix repens* at Doaghmore is *favourable* (Table 170C). It should be noted that further study of this habitat in Ireland is required in order to assess it fully.

The Irish conservation status is rated as *favourable-maintained*.

### **Mobile Dunes (H2120)**

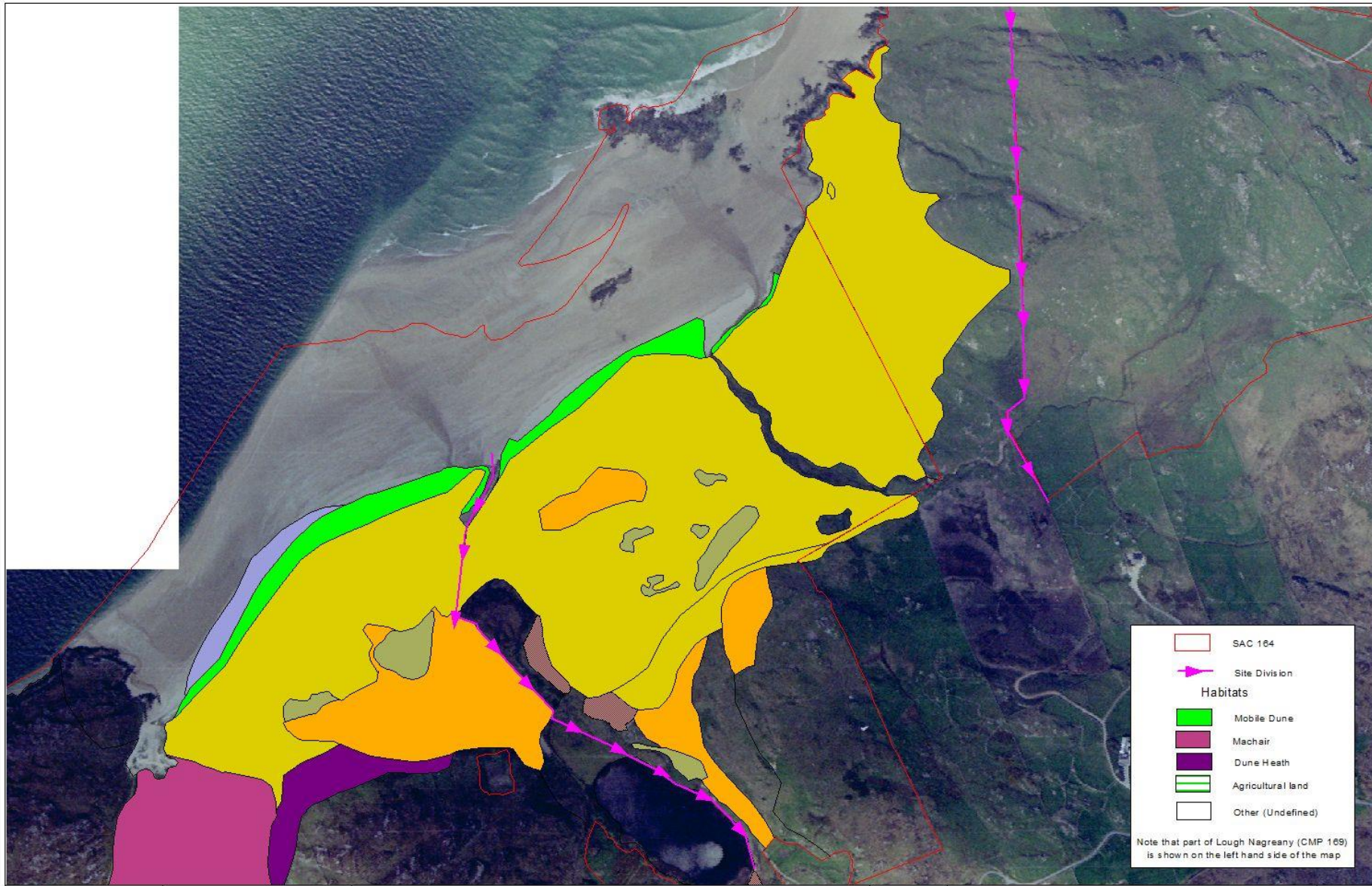
The extent of the mobile dunes is rated as *favourable* at Doaghmore (Table 170C). The mobile dunes are impacted by natural erosion along the northern section of Doaghmore Strand but are accreting in the southern section which lies within the adjacent site of Lough Nagreany.

The structure and functions parameter is rated as *favourable*. Three monitoring stops were placed in the mobile dunes and these passed (Table 170D). Although the dunes are undergoing some erosion they contain very healthy, flowering *Ammophila arenaria* (marram grass) and *Leymus arenarius* (lyme-grass). There are no negative indicator species in this habitat.

The future prospects of this habitat are considered *unfavourable-inadequate*. The mobile dunes are under on-going threat from sand extraction in the southern part of the Doaghmore Strand in the adjacent site of Lough Nagreany. If this is not stopped it will impact on the sediment budget of this coastal cell which includes both sites, and impact the mobile dunes of Doaghmore.

Currently, the overall EU conservation status of mobile dunes at Doaghmore is *unfavourable-inadequate* (Table 170C). This rating is attributable to sand extraction occurring outside but adjacent to the site.

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



	SAC 164
	Site Division
<b>Habitats</b>	
	Mobile Dune
	Machair
	Dune Heath
	Agricultural land
	Other (Undefined)

Note that part of Lough Nagreany (CMP 169) is shown on the left hand side of the map

<p>Coimisiún, Oidhreacht agus Iosláir Áite Environment, Heritage and Local Government National Parks and Wildlife Service</p>	<p><b>Coastal Monitoring Project 2004-2006</b></p>	<p><b>Dooaghmore</b></p>	<p>CMP code: 170</p>	<p>0 80 160 240 320 400 Meters</p>	<p>Date of production: 25/11/2008 Map version: 1</p>	<p>Original Drawing Size: 297 x 420 (A3) Scale 1:8240</p>	
		<p><b>Lough Nagreany Dunes (SAC 164)</b></p>	<p><small>This habitat map was created with a combination of fieldwork, GPS and interpretation of aerial photos. Boundaries of designated areas are subject to revision. Produced from Ordnance Survey, maps by permission of the Government (Permit number 8963)</small></p>				