# A SUMMARY OF THE NATIONAL SURVEY OF IRISH SAND DUNES.

## INTRODUCTION

The Coastal Monitoring Project (CMP) was carried out on behalf of the National Parks and Wildlife Service (NPWS). The project represents the first comprehensive survey and assessment of sand dune systems and their habitats in Ireland. The original inventory of Irish sand dune systems (Curtis, 1991) listed a total of 168 sandy sites for the Republic of Ireland. The CMP updated this inventory to 181 sites (plus an additional 15 sub-sites). Over the course of three field seasons (2004-2006), almost all of these sites were visited, mapped and assessed. Four sites were not visited owing to access problems, but they were assessed and mapped where possible using available information, including aerial photographs. The project was specifically developed and designed to meet Ireland's obligation to report on the conservation status of Annex I sand dune habitats, under Article 17 of the EU Habitats Directive. It also provides important baseline data that can be used for monitoring sites in the future. The following habitats were assessed:

1210 – Annual vegetation of driftlines
1220 – Perennial vegetation of stony banks
2110 – Embryonic shifting dunes
2120 – Shifting dunes along the shoreline with *Ammophila arenaria*
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* ssp. *argentea* (Salicion arenariea)
2190 – Humid dune slacks
21A0 – Machairs

The main report[1] is divided into four sections: Introduction, Methods, Results & Discussion, Conclusions & Recommendations. A series of Appendices include examples of the fieldsheets used for each habitat and summary tables of the results. County summaries, individual site reports and habitat maps are held separately (and can be made available on request). There is also a GIS project for each individual site surveyed. All of the site monitoring data collected is held in a MS Access Database.

This document provides a brief summary of the survey and the principal findings. The conclusions are those of the survey team and no attempt is made to interpret or analyse the results. It should not be inferred that the conclusions of the survey team represent those of NPWS. It should be pointed out that in order to conduct the national assessments under Article 17 of the EU Habitats Directive other information sources were used in addition to this survey. Therefore, the results of the conservation assessments in the CMP do not necessarily comply with the final assessments for all habitats submitted to the European Commission. Readers are advised to examine the full report before using the information.

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

## METHODS

The overall condition of each habitat was determined following a methodology that was adapted from the Joint Nature Conservancy Council – Common Standards Monitoring (CSM) guidance documents. The specific attributes that determine the conservation status of a habitat at a site are (a) Habitat extent (area), (b) Structure and Functions and (c) Future Prospects. Habitat area was based on survey work using GPS, examination of aerial photographs and the production of detailed GIS maps. Structure and Functions was determined from monitoring stops that were carried out in all habitats and at most sites. Targets were set for a series of attributes for each habitat and monitoring stops were assessed on a pass/fail basis. Future Prospects were based on apparent impacts/threats to the site or a particular habitat that are likely to occur in the future. Each of these attributes was assigned either a 'Favourable', 'Unfavourable-Inadequate' or 'Unfavourable-Bad' rating. The Overall Conservation Status was derived using the least favourable attribute. Each habitat was assessed at each individual site and the data was combined to rate the habitat at a national level.

## RESULTS & DISCUSSION

Summary data from the 181 sites (and 15 sub-sites) surveyed are presented and analysed. The following table summarises the national conservation status assessments assigned for each habitat by the CMP. In most cases these comply with the final assessments submitted to the European Commission for Irish dune habitats, with the exception of decalcified fixed dune with *Empetrum nigrum* (2140) and Atlantic decalcified fixed dunes (2150), which were both rated as *unfavourable-bad* in the Article 17 report.

### National Overview of Conservation Assessments

| **Habitat Names** | Range | Area | Structure and Functions | Future Prospects | **Overall** |
|---|---|---|---|---|---|
| Decalcified fixed dunes with *Empetrum nigrum* (2140) | | | | | |
| Annual vegetation of driftlines (1210) | | | | | |
| Perennial vegetation of stony banks (1220) | | | | | |
| Embryonic shifting dunes (2110) | | | | | |
| Shifting dunes along the shoreline with *Ammophila arenaria* (2120) | | | | | |
| Fixed coastal dunes with herbaceous vegetation (2130) | | | | | |
| Atlantic decalcified fixed dunes (2150) | | | | | |
| Dunes with *Salix repens* ssp. *argentea* (2170) | | | | | |
| Humid dune slacks (2190) | | | | | |
| Machairs (21A0) | | | | | |

From the habitat maps produced the total dune resource remaining was estimated to cover over 10,850ha. The main findings in relation to each habitat can be summarised as follows:

**Annual vegetation of driftlines (1210)** was recorded from a total of 71 sites and occupied an area of 52.16ha. There has been an estimated loss of 0.6% or 0.31ha of the total habitat area since 1996, primarily due to natural erosion, pedestrian traffic and the construction of sea-defences, which alter the movement of and deposition of organic debris. Where present, the habitat structure and functions were assessed as *favourable*. A total of 46 of the 71 sites (or 65%) were in *favourable* conservation status. This accounts for 66% of the total habitat area. The remainder of the habitat was rated as *unfavourable-inadequate*. In terms of the national overview, the habitat was rated as *unfavourable-inadequate*.

**Perennial vegetation of stony banks (1220)** was only recorded from sand dune systems associated with the current survey. This habitat is far more widespread in its overall distribution and the results should be treated accordingly. 49% of the habitat area associated with sand dunes was rated as *favourable* while 51% was *unfavourable-inadequate*. A single site in Donegal (Mountcharles) was rated *unfavourable-bad* and accounts for less than 1% of the total area of the habitat. This poor result was largely due to dumping of rubble at the site. The overall conservation status for the habitat was *unfavourable-inadequate*, which is largely due to the increasing number of man-made structures – coastal protection works that are being installed. These are likely to impact on the natural mobility of the substrate in the future.

**Embryonic shifting dunes (2110)** were estimated to occupy 171.5ha and were recorded from 118 sites. Although embryonic dunes are susceptible to removal by storms or high tides, the loss of habitat was estimated to be 4.8ha or 2.72% of the habitat area over the past 10 years. 91% of the habitat is considered to be funtioning naturally. The overall conservation assessment for the habitat was *unfavourable-inadequate*.

**Shifting dunes along the shoreline with *Ammophila arenaria* (2120)** were recorded from a total of 141 sites and covered approximately 405.65ha. The overall conservation assessment for the habitat in terms of the national resource was *unfavourable-bad*, as only 19% of sites (27) or 131.08ha were considered to be in a *favourable* status, while 38% of sites or 20% (76.63ha) of the total habitat area was *unfavourable-bad*. Extent was rated as *unfavourable-bad*, as there has been an estimated loss of 89.2ha of habitat, which represents a decrease of 18% since 1996. This figure is misleading, and does not portray the habitat dynamic, nor the fact that accretion was noted at a number of sites such as Bull Island, Cahore Point North, Kilmuckridge, Fermoyle sub-site and Dooey. The future prospects were considered *unfavourable-bad*, owing to the ongoing threats from natural erosion and recreational pressures. Therefore, the overall conservation assessment was *unfavourable-bad*.

**Fixed coastal dunes with herbaceous vegetation (grey dunes) (2130)** were estimated to cover 7293ha. This priority habitat occupies the largest area of all Annex I sand dune habitats in Ireland. It is widespread and was recorded at 152 sites. In general, the habitat was found to be in poor condition with little in *favourable* overall

conservation status – only 20% of both the overall area of the habitat and of sites. It was estimated that there has been a loss of 232.6ha or 3.2% over the past 10 years, largely due to undergrazing, agricultural management and the development of land for various purposes such as housing and recreation. Less than 20% of sites were rated as *favourable*. Therefore the overall conservation assessment was *unfavourable-bad*.

**Decalcified fixed dunes with *Empetrum nigrum* (2140)** were recorded from 4 sites in Donegal. It was estimated that this priority habitat covers 2.85ha, which is significantly lower than the 245.01ha reported in the NATURA 2000 database. The reason for this discrepancy is partly owing to misidentification of the habitat in earlier surveys (e.g. *Empetrum* was present, but was not growing on sand), its occurrence within complex mosaics of vegetation and more accurate mapping. The overall conservation assessment for this habitat was *unfavourable-inadequate*. Issues relating to habitat characteristics and demarcation - in terms of other similar "heath"-like habitats were not resolved during the current project and will require additional research. Despite these difficulties, 3 sites (or 99% of the total habitat area) were rated as *favourable*, while the last, small site accounts for 1% *unfavourable-inadequate* overall conservation assessment in terms of area. Future work is needed to clearly define, describe and develop a management strategy for this habitat in Ireland.

**Atlantic decalcified fixed dunes (Calluno-Ulicetea) (2150)** were confirmed at 7 of the 11 sites that have been designated for this habitat – one on the East coast and the remainder in Mayo and Donegal. The current area of this priority habitat was estimated at 77.81ha, with some losses reported from Brittas Bay since 1996. Based on floristic criteria and project-determined constraints, its presence was not confirmed at Magherabeg, Kilpatrick, Ballyteige Burrow and Inchydoney. More research is needed to clearly define the characteristics of this habitat in Ireland. However, in the absence of well-defined criteria and targets, structure and functions, future prospects and overall conservation assessments have provisionally been rated as *unfavourable-inadequate*.

**Dunes with *Salix repens* ssp. *argentea* (Salicion arenariea) (2170)** were recorded from a total of 17 sites in 5 counties. The extent of the habitat is currently 118ha. There has been an approximate loss of 0.5ha since 1996. It should be noted that there is an inherent difficulty in characterising the habitat, particularly as it often occurs in an intimate mosaic with both humid dune slacks and fixed dunes. The primary impacts/threats are largely associated with agricultural management. Although a reasonable level of grazing is required to ensure a healthy habitat, both undergrazing and overgrazing were noted. Other impacts include the location of supplemental feeders in these areas. Owing to the level of regular occurrence of these impacts, the overall conservation assessment for the habitat was *unfavourable-inadequate*.

**Humid dune slacks (2190)** were recorded from 64 sites (211.5ha). It was estimated that there has been a relatively small loss of area (0.5ha), which corresponds to a loss of 0.23% over a 10-year period. The overall conservation status of dune slacks recorded throughout Ireland was *unfavourable-bad*. This is largely due to a number of impacts including grazing pressures, recreational activities and water abstraction in particular. Although it was outside the project capabilities to quantify the lowering of the water-table, its occurrence was noted at a number of sites, notably around existing

golf links and also in areas where the development of land for housing can alter the local hydrological regime e.g. Brittas Bay.

**Machairs (21A0)** were estimated to occupy 2752.6ha. This priority habitat was recorded from 59 sites in counties Galway, Mayo, Sligo and Donegal. Like fixed dunes, machair represents a generally stable grassland habitat where agricultural or amenity management may dominate large areas of habitat. Since 1996, there has been an estimated loss of 66.4ha or 2.35% of the total habitat, primarily due to restructuring of land holdings and agricultural improvement, overgrazing and general recreation. 10% of sites or 6% (156.76ha) of the total habitat area was considered of *favourable* conservation status. 62% (1704.38ha) of the total area of the habitat was rated as *unfavourable-inadequate*, while 32% (891.60ha) was in worse condition and was rated as *unfavourable-bad*. The overall conservation assessment, however, for the habitat was *unfavourable-bad*, owing to the failure of the structure and functions attribute at 33.6% of sites. This is indicative of the considerable changes in farming practices which has seen many machair commonages being fenced (stripped), resulting in greater concentration of livestock in confined areas, overgrazing, supplementary feeding and poaching of the land.

**Pressures and threats**

The main activities and pressures affecting each individual habitat and dune systems in general are identified and their impacts are assessed. Some of the main activities recorded include agriculture (including grazing and cultivation), recreation (including golf courses, caravan parks and pedestrian traffic), sand extraction and water abstraction. The urgent need to develop appropriate grazing strategies for dune systems is highlighted by the fact that both overgrazing and undergrazing are identified as threats to the conservation status of dune habitats. The restructuring of agricultural holdings is identified as a particular problem associated with machair systems. Erosion was recorded to be affecting a number of sites. However, where this was deemed to be part of a natural process it was not assessed as negative. It is, however, likely to increase in the future if the predicted sea level rise associated with climate change occurs. The current data can be used to monitor any change. The on-going pressures of recreation, agriculture, water abstraction and coastal stabilisation are likely to continue to threaten the future prospects of dune habitats at a large number of sites.

**Summary**

All sand dune habitats recorded in Ireland are failing to achieve a favourable conservation status in terms of the overall national resource. The condition of the sand dune habitats is far from encouraging, as 6 out of the 10 sand dune habitats were assessed as *unfavourable-inadequate*, while the remaining 4 were *unfavourable-bad*, including two of the Annex I priority habitats (fixed dunes and machair). Two other priority habitats (dunes with *Empetrum nigrum* and decalcified fixed dunes) were assessed as *unfavourable-inadequate* in the current survey, although more work is needed to accurately determine the current and potential status of these habitats in Ireland. The conclusion to be drawn from the results of this survey is clear. The management regimes that are in place for various sand dune systems and their various habitats, in terms of maintaining or improving their ecological condition, as required

under the EU Habitats Directive, are largely unsatisfactory. Structured management plans need to be developed and implemented in order to achieve favourable conservation status for dune habitats in the future.

## CONCLUSIONS & RECOMMENDATIONS

This section presents a critical assessment of the adapted methodology that was used in this survey. The usefulness of each attribute and target used to assess the conservation status is discussed and recommendations for future survey work are made. There is a discussion of the problems encountered during the survey, including dealing with habitats that are poorly defined, are difficult to map, or are found within complex vegetation mosaics.

The report concludes with a comprehensive list of references and a series of Appendices containing details of the CSM protocol, as well as the attributes and targets used in the CMP, examples of the fieldsheets used to survey each habitat and summary tables for all the sites where each habitat was recorded.

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