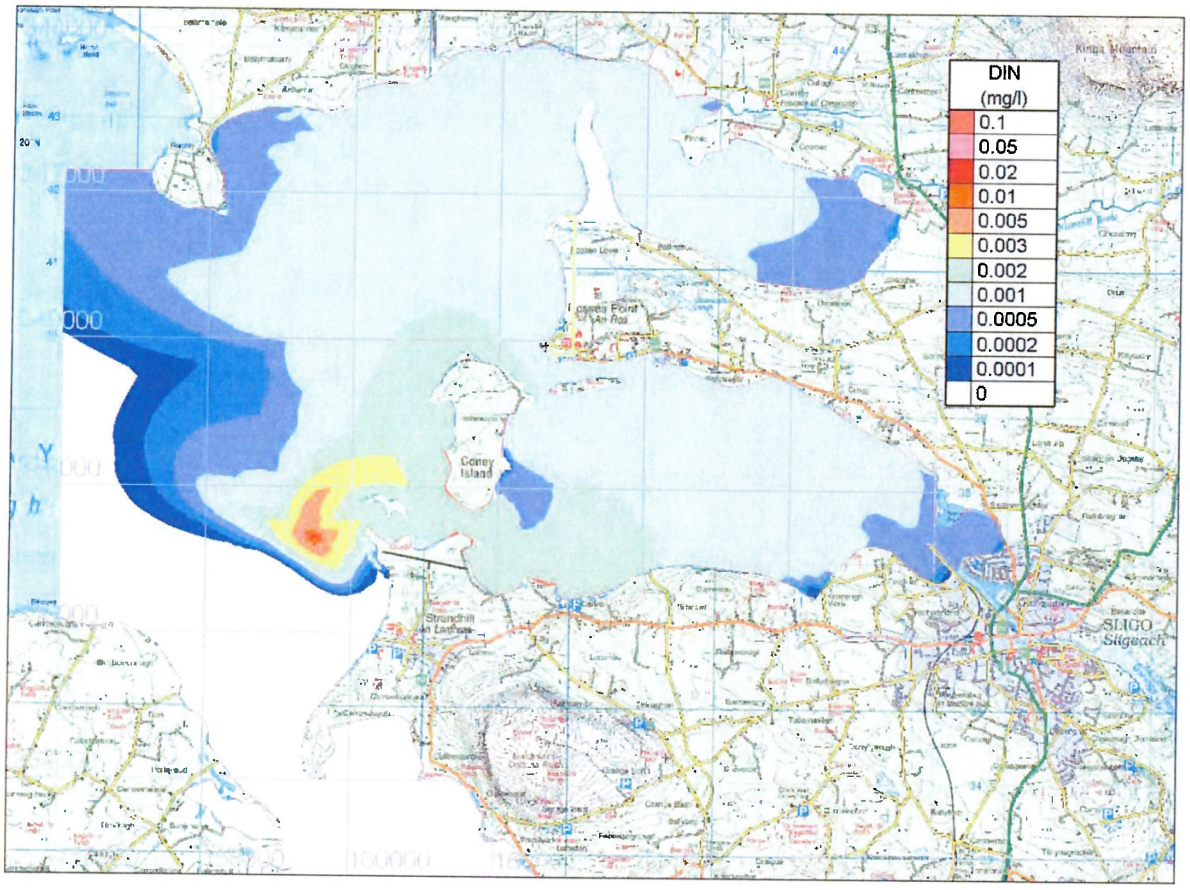


Figure 4.14: Maximum DIN concentrations for outfall option 2 and treated effluent of 40mg/l DIN as N

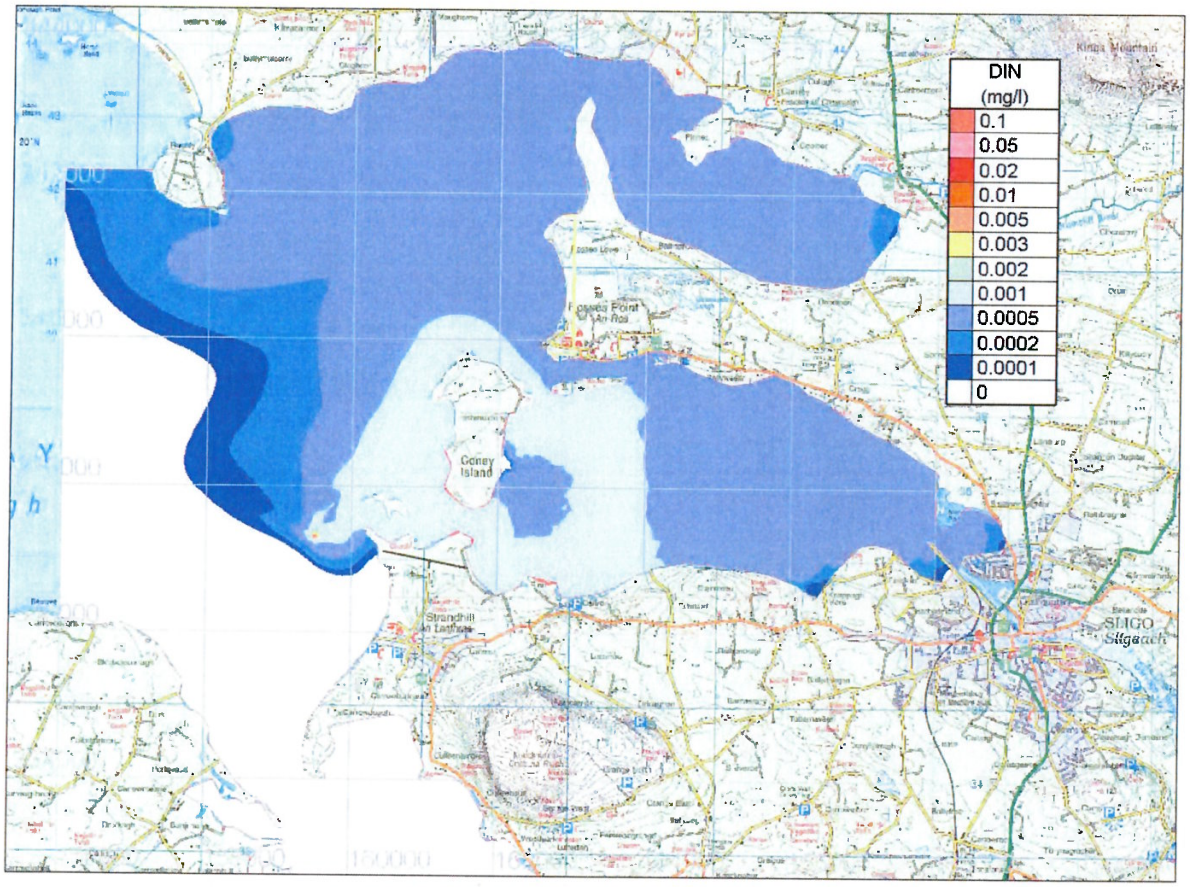


Figure 4.15: Tidal averaged DIN concentrations for outfall option 2 and treated effluent of 40mg/l DIN as N

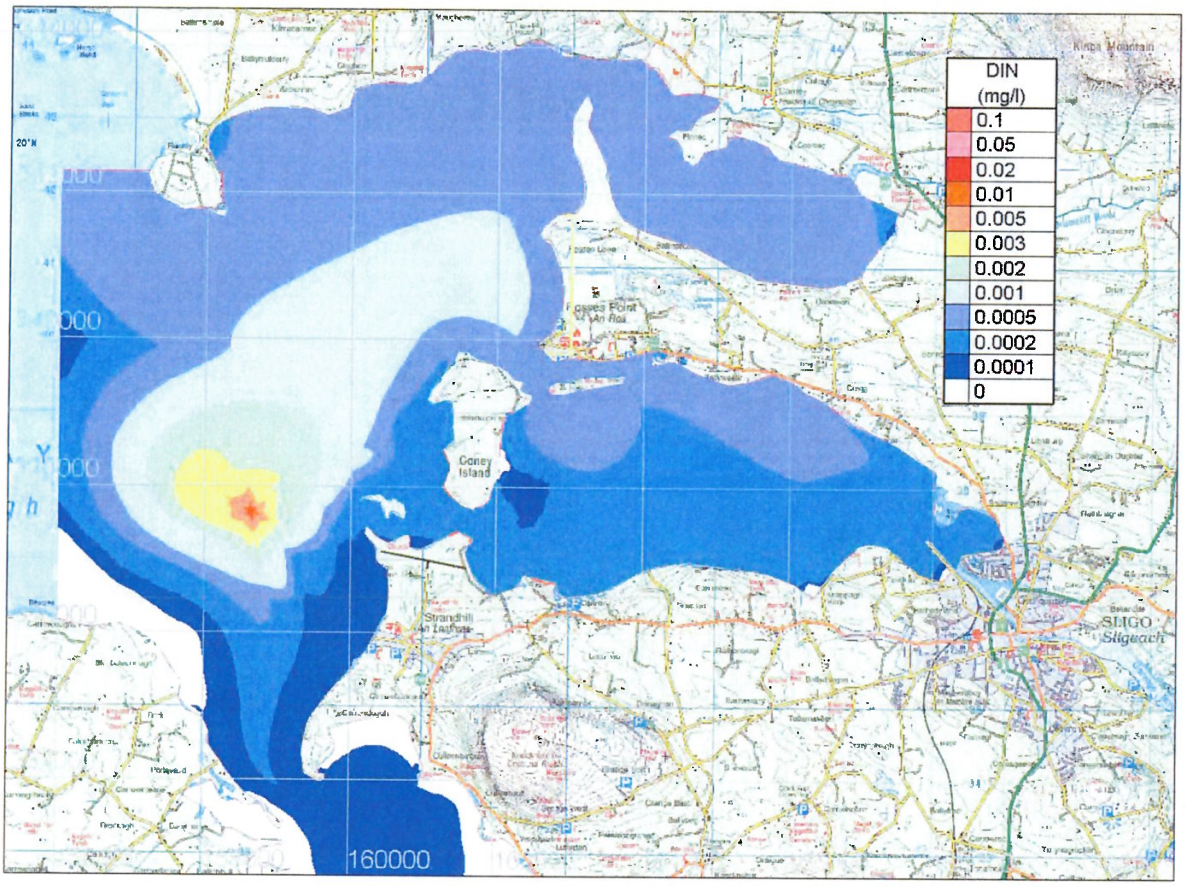


Figure 4.16: Maximum DIN concentrations for outfall option 3 and treated effluent of 50mg/l DIN as N

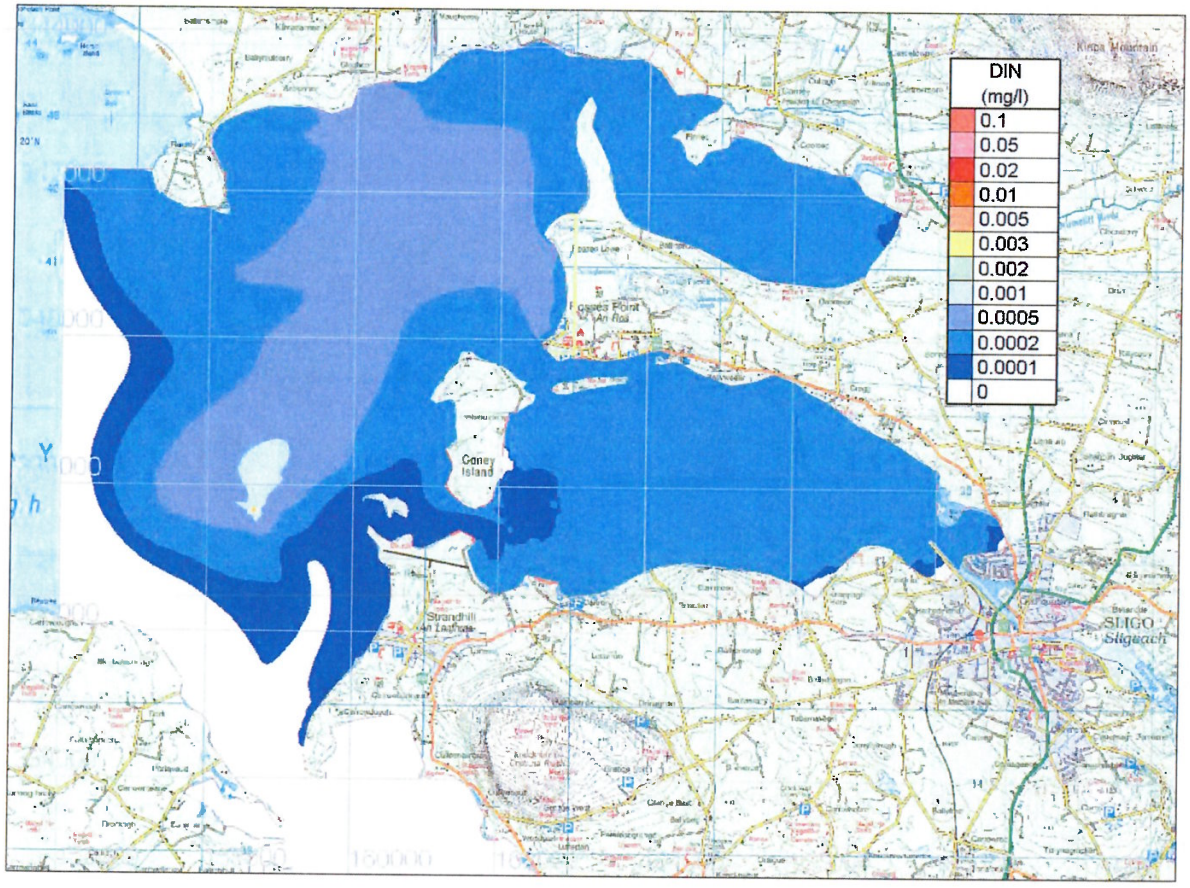


Figure 4.17: Tidal averaged DIN concentrations for outfall option 3 and treated effluent of 50mg/l DIN as N

5. Conclusion

The hydrodynamic dispersion simulations for the three outfall sites show that in respect to DIN the impact is minimal and easily falls well within the surface water regulations for "Good" status waters relating to DIN. The simulations show that even for the shallower nearshore outfall option 1, specific nitrogen removal will not be required with a normal secondary treated effluent standard of 40 DIN suitable. The impact to Ballysadare Bay, Sligo Harbour and Drumcliff Bay is shown to be negligible and will not affect the status of these bays in respect to DIN concentration and nutrient enrichment.

The total coliform simulations show high concentrations in the immediate vicinity of the outfalls for secondary treated effluent. However, such concentrations are shown to dramatically reduce with distance from the outfall. Secondary treated effluent from any of the outfall options will result in a moderate impact to the shellfish waters of Sligo Harbour and minor impact to the Blue flag bathing area at Rosses Point. Given the sensitivity of these waters as shellfish and Blue Flag bathing waters such a water quality impact by potential bacterial contamination is not considered tolerable. The treatment option of UV disinfection with a

Log4 reduction at outfall option 1 is shown to achieve the desired standard of imperceptible impact within the shellfish and bathing areas.

The recommendation is for a secondary treated effluent discharging at outfall option 1 with disinfection to significantly reduce bacteriological levels. Specific nitrogen removal in the treatment process will not be required. Other water quality parameters such as BOD and suspended solids will result in a negligible increase in ambient concentrations in the receiving waters.

Summerstrand / Druncliffe Bay SAC Conservation Objectives August 2013

placed in the northern section failed and none of the seven in the southern part of Strandhill failed.

Table 133C Conservation status of Annex I sand dune habitats at Strandhill

Habitat[1]	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
Fixed Dunes (H2130)		Extent, Structure & Functions, Future prospects		Unfavourable-inadequate	**Unfavourable-declining**
Dunes with *Salix repens* (H2190)	Structure& Functions	Extent, Future prospects		Unfavourable-inadequate	**Unfavourable-declining**
Dune Slack (H2170)		Extent, Structure & Functions, Future prospects		Unfavourable-inadequate*	**Unfavourable-declining**
Mobile Dunes (H2120)		Extent, Structure & Functions, Future prospects		Unfavourable-inadequate	**Unfavourable-declining**
Embryonic Dunes (H2110)	Extent, Structure & Functions, Future prospects			Favourable	**Favourable-maintained**
Perennial vegetation of stony banks (H1220)	Extent, Structure & Functions	Future prospects		Unfavourable-inadequate	**Unfavourable-unchanged**
Annual vegetation of strandlines (H1210)	Extent, Structure & Functions, Future prospects			Favourable	**Favourable-maintained**

[1]EU Codes as per Interpretation Manual
[2]Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)
*This rating is based on best scientific judgement see text

Table 133D Pass/Fail results of moni torings topsfor Annex I sand dune habitats at Strandhill

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Fixed Dunes (H2130)	12	2	**Unfavourable-inadequate**
Dunes with *Salix repens* (H2190)	4	0	**Favourable**
Dune Slack (H2170)	0	1	**Unfavourable-inadequate**
Mobile Dunes (H2120)	5	1	**Unfavourable-inadequate**
Embryonic Dunes (H2110)	4	0	**Favourable**
Perennial vegetation of stonybanks (H1220)	3	0	**Favourable**
Annual vegetation of strandlines (H1210)	3	0	**Favourable**

The two monitoring stops that did not pass, failed to reach the target for the attributes of typical species, sward height and flowering and fruiting. This is mainly on account of undergrazing.

The Conservation Plan for cSAC Cumeen Drumcliff (the northern part of Strandhill) contains a strategy for the management of the coniferous plantation located on the fixed dunes. It states:

Following harvesting (which will be outside of the time frame of this conservation plan), the dune area should not be re-planted.

This strategy, if implemented will facilitate the restoration of this habitat. This Conservation Plan also states that the dunes will remain without active management unless monitoring indicates that a grazing regime is required. The results of the monitoring program as part of this project would indicate that a sustainable grazing regime should be implemented. The control of human induced erosion in the southern part of Strandhill is addressed in the Conservation Plan for the cSAC Ballysadare Bay. It states that if erosion becomes a problem, action will be taken entailing the use of boardwalks and limiting human access to the dunes. The issue of undergrazing in the south is not addressed in the Conservation Plan for cSAC Ballysadare Bay. Until the issues of undergrazing (in both the north and south of Strandhill) and human induced erosion are actively managed, the future prospects are considered *unfavourable-inadequate* (Table 133C).

Human Induced Erosion *

Northern part of Strandhill is wrong

None of the fixed dune areas of the cSAC 627 Cumeen Drumcliff (the northern part of Strandhill) are considered particularly good examples of this habitat type in NATURA 2000. The fixed dunes are given a rating of *average or reduced* conservation status. The fixed dunes in the southern part of the site (cSAC of Ballysadare Bay) are given a rating of *good* conservation status in NATURA 2000. Currently, the overall EU conservation status of the entire fixed dune habitat is *unfavourable – inadequate* (Table 133C). This is mainly due to undergrazing and human induced erosion.

Under the Irish scheme, the conservation status for fixed dune at this site is *unfavourable – declining*.

Dunes with *Salix repens* (2170)

The extent of the dunes with *Salix repens* is rated as *unfavourable–inadequate* (Table 133C). This is based on best scientific judgement as there is no previous information available on this habitat at Strandhill. It is largely confined to the north of the site. This habitat occurs in a mosaic with fixed dunes and dune plantation. It is likely that the presence of the plantation has affected the extent of this habitat.

The structure and functions parameter is rated as *favourable*. Four monitoring stops were placed in the dunes with *Salix repens* and all of these passed (Table 133D). However, it is important to note that these are trial monitoring stops for this habitat. Further studies are required for the development of targets for this habitat (See main report). The main threat to the structure and functions of this habitat is from undergrazing, but otherwise this habitat appears to be functioning well with a high diversity of species present.

The future prospects for this habitat are considered *unfavourable-inadequate.* Dunes with *Salix repens* are not described or designated in the Conservation Plan (MPSU, 2000) for Strandhill. At present, there are no conservation management strategies for this habitat. The most urgent action needed is the introduction of grazing at a sustainable level for this habitat. This part of the site is also under on-going threats from development.

The conservation status of this habitat was not assessed in the NATURA 2000 survey. The current overall EU conservation status of dunes with *Salix repens* at Strandhill is *unfavourable-inadequate* (Table 133C). 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 *unfavourable-declining*.

Dune Slack (H2190)

The extent is rated as *unfavourable-inadequate* as there is an apparent decline in the number of dune slacks since the ASI survey. This may be due to the presence of the plantation, which may be impacting on the local hydrology. The remaining dune slack is heavily trampled and suffering erosion in places. An estimated loss of dune slack area of 1ha is given based on the ASI survey. It is unclear if dune slack habitat was present in the plantation area before its development.

One monitoring stop was placed in dune slack and failed due to the lack of typical species and excessive bare ground cover (Table 133D). However, given the low number of pioneer slacks encountered during this survey and the lack of information on monitoring of this type of slack, the targets for each attribute are not fully developed. Therefore, the structure and functions parameter is rated as *unfavourable-inadequate* in preference to *unfavourable–bad*.

The future prospects for this site are considered *unfavourable-inadequate* on the basis that there are no strategies outlined in the Conservation Plan (2000) for this habitat. Currently, the viability of this habitat is threatened by the presence of the golf course, which may be impacting on the local hydrology. Also, the plans to expand the golf course include the development of this habitat as part of the new golf course. If the golf course extends into this area it will result in the total loss of this habitat at Strandhill.

The conservation status of this habitat was described as *average or reduced* in the NATURA form. The current overall EU conservation status of dune slack at Strandhill is *unfavourable-inadequate* (Table 133C).

Under the Irish scheme, the conservation status for fixed dune at this site is *unfavourable – declining*.

Mobile Dunes (H2120)

The mobile habitat at Strandhill appears highly susceptible to natural erosion and it is almost absent from the northern section of the site where the fixed dunes are fronted by a steep eroding ridge. The NATURA 2000 form noted that there were good areas of mobile dunes running the length of the spit in the south of Strandhill. The total area of this habitat appears to have declined since the NATURA survey. Natural erosion is compounded by human disturbance in the southern part of the site, mainly due to trampling. Therefore, extent is considered *unfavourable-inadequate.*

Six monitoring stops were placed in the mobile dunes and one of these failed (Table 133D). The stop that failed contained a large amount of unhealthy *Ammophila arenaria* (Marram grass). Therefore, the structure and functions parameter is given a conservation status rating of *unfavourable-inadequate.* The area of mobile habitat at the tip of the spit is in good condition and is freshly accreting.

The mobile dunes are affected by natural and human induced erosion. The plans to control human induced erosion are discussed in the Conservation Plan (cSAC Ballysadare Bay) in relation to the protection of the fixed dunes and these plans could also include the other sand dune habitats. However, there is currently no active management in place. Until the issue of human induced erosion is actively managed at the site, the future prospects are considered *unfavourable-inadequate.*

The mobile dunes are rated as *good* in the overall conservation status assessment in the NATURA 2000 form. The mobile dunes are currently regarded as *unfavourable-inadequate* under the overall EU conservation status and *unfavourable-declining* under the Irish conservation status system (Table 133C). This unfavourable rating is due to some loss of extent caused by negative impacts from human pressures.

Embryonic Dunes (H2110)

The extent of the embryonic habitat is rated as *favourable* (Table 133C). This is based on best scientific judgement. The embryonic dunes occur along the seaward edge of the spit and at the tip and are absent along the eroding northern part of Strandhill.

There appears to be no current impact on the extent. This is one of the few developed embryonic habitats found along the west coast.

The structure and functions parameter is rated as *favourable*. Four monitoring stops were placed in the embryonic habitat and all of these passed. Where embryonic habitat occurs, it is dominated by healthy typical embryonic species *Elytrigia juncea* (Sand couch) with no negative indicator species present. Overall this habitat appears to be functioning well.

The future prospects of the embryonic habitat are considered *favourable*, as despite the potential threat from recreational pressures at this site these do not appear to impact this habitat. This may be related to the location of the embryonic dunes further south of the main informal access point at Shelly Valley.

The conservation status is rated as *good* in the NATURA 2000 notes. The present overall EU conservation status for embryonic dunes is considered *favourable*.

The overall Irish conservation status is *favourable-maintained* (133C).

Perennial vegetation of stony banks (H1220)

Shingle beaches were noted previously at Strandhill in the Conservation Plans for the site, most notably at Culleenamore Strand. There is no apparent decline in the extent of this habitat and therefore it is rated as *favourable*. Given the lack of detailed information on this habitat at Strandhill, the assessment is based on best scientific judgement.

Three monitoring stops were placed in this habitat and these passed. Based on an overall visual assessment of this habitat and presence/absence of typical species, the conservation status of the structure and functions is rated as *favourable*.

Future prospects are considered *unfavourable-inadequate*. This is attributed to recreational activities, mainly trampling from walkers and horseriding along the edge of the inner bay at Culleenamore. This impact is very difficult to quantify. However the succulent nature of many shingle plant species makes them very susceptible to

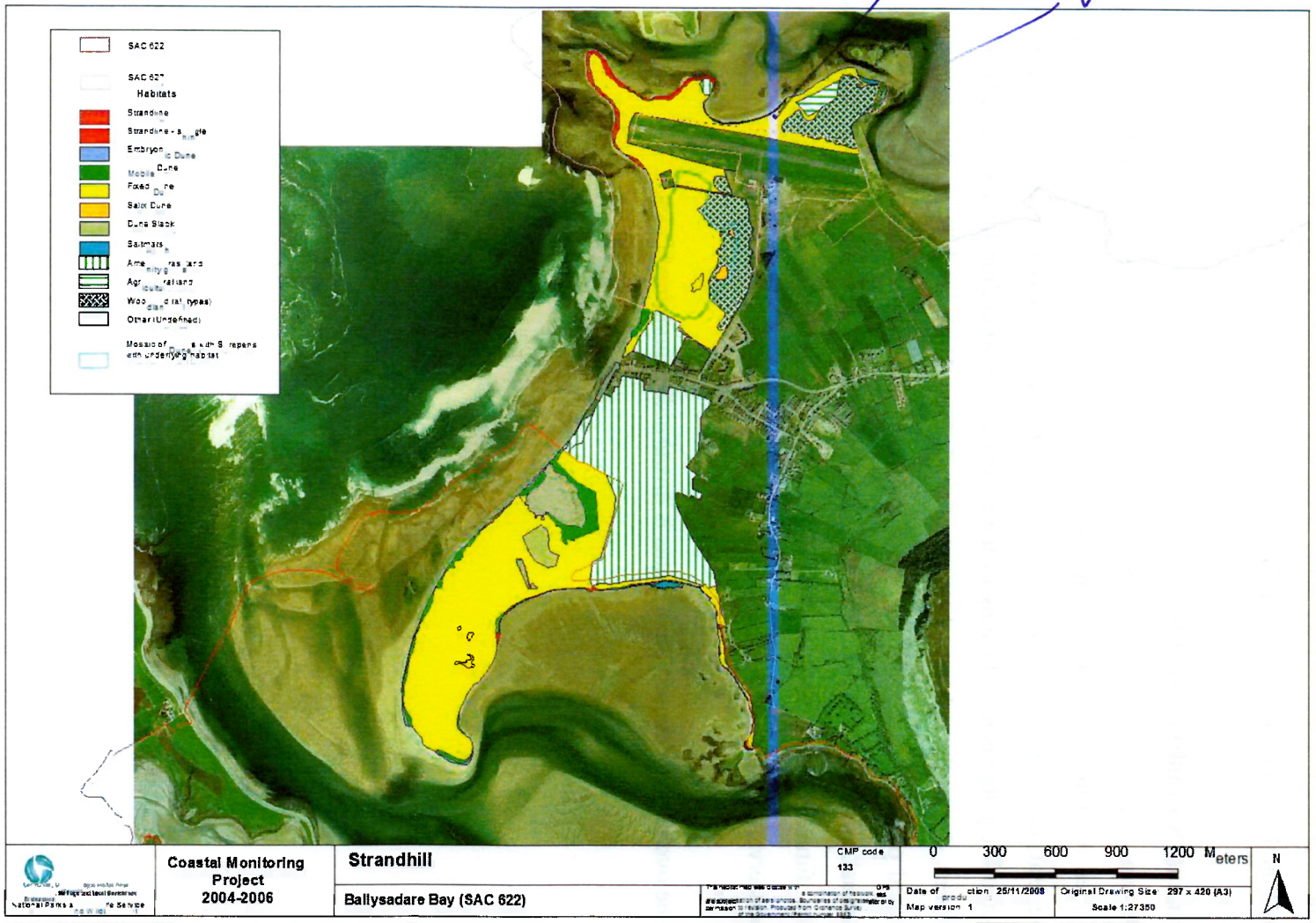
trampling. Trampling also compacts the cobble habitat restricting the germination of some seeds. If the plans to control human induced erosion are implemented perhaps the management of pedestrian traffic along the beach could also take into consideration the impacts on the shingle vegetation. Until this is addressed future prospects of this habitat are rated as *unfavourable-inadequate.*

The overall EU conservation status is currently regarded as *unfavourable-inadequate* and the Irish conservation status is *unfavourable-unchanged* (Table 133C).

Annual Strandline (H1210)

Annual vegetation of strandlines is confined to a narrow strip at Killaspug Point. Given the limited area of this habitat and the overlap of this habitat with Perennial vegetation of stony banks, the conservation status assessment is partly based on scientific judgement. Changes in the extent of the strandline habitat are difficult to assess, due to the ephemeral nature of the habitat. However it is rated as *favourable* based on the presence of tidal litter and strandline habitat that supports the typical annual species. The three monitoring stops passed and there is no apparent threat to the future of this habitat. Therefore, all three parameters and the overall EU conservation status of this habitat is rated as *favourable* (Table 133C).

The overall Irish conservation status is *favourable-maintained* (133C).


Fixed Dunes
woodland.
SAC 622
SAC 627
Habitats
Strandline
Embryonic Dune
Mobile Dune
Fixed Dune
Salix Dune
Dune Slack
Saltmarsh
Amenity grassland
Agricultural land
Woodland (all types)
Other (Undefined)
Mosaic of Semi-natural habitats with underlying habitat
Coastal Monitoring Project 2004-2006
Strandhill
Ballysadare Bay (SAC 622)
CMP code 133
0 300 600 900 1200 Meters
Date of production 25/11/2008
Map version 1
Original Drawing Size 297 x 420 (A3)
Scale 1:2750
N

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

SITE DETAILS

CMP06 site name: **Coney Island** CMP06 site code: **134** CMP Map No.: **131**

County: **Sligo** Discovery map: **25** Grid Reference: **G 612 390**

6 inch Map No.: **Sl 7 & 8 & 13 & 14**

Aerial photographs (2000 series): **O 0951 A, B, C & D**

NPWS Site Name: **Cummeen Strand / Drumcliff Bay (Sligo Bay)**

NPWS designation: pNHA: **627** cSAC: **627** SPA: **4035**

Ranger Area**: Sligo**

MPSU Plan**: Draft II Consultation**

Report Author: **Anne Murray**

SITE DESCRIPTION

Coney Island sand dune system is part of a large coastal cSAC site that extends from Cullamore in the northwest to Killaspug in the southwest, Sligo town in the southeast and Drumcliff village in the northeast. The site is designated for the EU Annex I sand dune habitats – Fixed dunes, Mobile dunes and Embryonic dunes. Other habitats for which the site is designated are; Large shallow inlets and bays, Mudflats and sandflats not covered by seawater at low tide and Estuaries.

Six sand dune systems occur within the cSAC. For the purpose of this project the cSAC is divided into four main sites listed in the inventory of the sandy coasts of Ireland (Curtis, 1991). These are Strandhill (site 133), Coney Island (site 134), Rosses Point (site 135) and Yellow Strand (site 136). Two very small sand systems noted in the Consevation Plan (MPSU, 2000) are at Lisadell Strand and on Maguin's Island, these were not listed for this project.

Table 134A Areas of EU Annex I habitats mapped at Coney Island

EU Code	EU Habitat	Area (ha)
H1210	Annual vegetation of driftlines	0.021
H2110	Embryonic shifting dunes	0.672
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	0.455
H2130	Fixed coastal dunes with herbaceous vegetation	37.262*
H2190	Humid Dune Slacks	0.239
	Total sand dune	**38.649**

*21ha of fixed dune lies outside the cSAC

Coney Island is situated in Sligo Bay and lies at the mouth of Sligo Harbour alongside Oyster Island. The sand dunes of Coney Island cover the south and west of the island. They comprise tall fixed dune ridges along the southern edge which slope gently landward to lowlying dunes grading into wet agricultural fields. The eastern edge of the dunes is bordered by a narrow strip of saltmarsh. The more exposed western edge of the dunes are eroding, resulting in a steep sandy cliff which is fronted by a cobble beach (unvegetated).

EU Annex I sand dune habitats recorded during this survey at Coney Island are Fixed dunes (priority habitat), Dune slack, Mobile dunes, Embryonic dunes and Annual vegetation of driftlines. The total sand dune area is 38.649ha (Table 134A).

Fixed Dunes (H2130)

Fixed dunes are the main sand dune habitat (97% of the total area) at Coney Island covering 37.262ha (Table 134A). Approximately 21ha of the fixed dune area is fenced and lies outside of the cSAC north of the boundary, which is delineated on the ground by an old stone wall. The fixed dune is grazed by cattle, sheep and rabbits. The local rabbit population appears very high and rabbit burrows dominate the dune system. The dunes are overgrazed in the main with agricultural weeds abundant throughout.

The typical fixed dunes species recorded at Coney Island include *Carex arenaria* (Sand sedge), *Cerastium fontanum* (Common mouse-ear), *Euphrasia officinalis* agg (Eyebright), *Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Geranium molle* (Dove's-foot crane's-bill), *Hypochaeris radicata* (Cat's ear), *Linum catharticum* (Fairy flax), *Luzula campestris* (Field wood-rush), *Lotus corniculatus* (Common bird's-foot-trefoil), *Plantago lanceolata* (Ribwort plantain), *Poa pratensis* (Smooth meadow-grass), *Prunella vulgaris* (Selfheal), *Taraxacum* agg. (Dandelion), *Thymus polytrichus* (Wild thyme), *Trifolium repens* (White clover), *Veronica chamaedrys* (Germander speedwell) and the mosses - *Tortula ruraliformis*, *Rhytidiadelphus squarrosus* and *Rhytidiadelphus triquetrus*.

Other species present in the fixed dune include: *Agrostis stolonifera* (Creeping bent), *Ammophila arenaria* (Marram grass), *Bellis perennis* (Daisy), *Myosotis arvensis*

(Field forget-me-not), *Ranunculus bulbosus* (Bulbous buttercup) and *Rumex acetosella* (Sheep's sorrel).

The negative indicator species *Senecio jacobaea* (Common ragwort) and *Cirsium vulgare* (Spear thistle) are abundant throughout the fixed dunes.

Dune Slacks (H2190)

Three small areas of wet dune slack occur in the northern part of the fixed dunes comprising a total area of 0.239ha. These are heavily grazed and the negative indicator species *Cirsium vulgare* (Spear thistle) is common.

The typical dune slack species present are *Hydrocotyle vulgaris* (Marsh pennywort) *Galium palustre* (Marsh bedstraw), *Potentilla anserina* (Silverweed), *Prunella vulgaris* (Selfheal) and the moss - *Calliergonella cuspidata*.

Other species present include, *Agrostis stolonifera* (Creeping bent), *Anagallis tenella* (Bog pimpernel), *Carex flacca* (Glaucous sedge), *Cerastium fontanum* (Common mouse-ear), *Lotus corniculatus* (Common bird's-foot-trefoil), *Ranunculus repens* (Creeping buttercup) and *Trifolium repens* (White clover).

Mobile Dunes (H2120)

A narrow band of mobile dunes front the southwestern edge of the fixed dunes at Coney Island and comprise a total area of 0.455ha. These have formed from sand recycled from the eroding fixed dunes.

The mobile dunes are dominated by the typical species *Ammophila arenaria* (Marram grass) as well as some fixed dunes species including *Festuca rubra* (Red fescue), *Lotus corniculatus* (Common bird's-foot-trefoil) and *Taraxacum* agg. (Dandelion).

The negative indicator species *Senecio jacobaea* (Common ragwort) and *Cirsium vulgare* (Spear thistle) occur occasionally in the mobile habitat.

Embryonic Dunes (H2110)

Patches of embryonic dune occur along the south and western edge of the fixed dune habitat and the total area of 0.672ha. This is probably an overestimation as the habitat is significantly discontinuous along the frontline. The typical species *Elytrigia juncea* (Sand couch) dominates with no other species present.

Annual Strandline (H1210)

A very small area of annual strandline edges the southeast corner of the dunes and covers 0.021ha. The typical species present include *Atriplex* spp. (Orache spp.), *Cakile maritima* (Sea rocket) and *Honckenya peploides* (Sea sandwort). There are no negative indicator species present.

IMPACTS

The main activities impacting the sand dune system on Coney Island are listed in Table 134A. Grazing (code 140) is the main land-use activity on the dunes. Some parts of the fixed dune (mainly outside of the cSAC) are fenced into fields (code 150) and intensively managed. These fields contained a poor diversity of typical fixed dune species. Overgrazing by sheep, cattle and rabbits (code 142,143 and 146 respectively) has damaged the dunes and exacerbated natural erosion.

Table 134B Intensity and impact of various activities on sand dune habitats at Coney Island

EU Habitat Code[1]	Activity Code[2]	Intensity[3]	Impact[4]	Area affected/ha	Location of Activity[5]
H2130	103	C	-1	15	Inside
H2130	140	A	+2	21	Inside/Outside
H2130	142	A	-1	15	Inside/Outside
H2190	142	B	-1	0.2	Inside/Outside
H2130	143	A	-1	15	Inside/Outside
H2130	146	A	-1	15	Inside/Outside
H2130	150	A	-1	15	Inside
H2130	720	A	-1	15	Inside
H2130	900	B	0	Unknown	Inside
H2120	900	B	0	Unknown	Inside
H2130	954	A	-1	15	Inside

[1] EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[3] Intensity of the influence of an activity is rated as: A= high, B = medium, C = low influence and D = unknown.
[4] Impact is rated as: -2 = irreparable negative influence, -1 = repairable negative influence, 0 = neutral, +1 = natural positive influence and +2 = strongly managed positive influence
[5] Location of activity: Inside = activities recorded within and directly impacting the cSAC. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the cSAC

The predominance of agricultural weeds (code 954) in the sand dunes has reduced the diversity of typical species. Rabbit burrows have undermined the structure of the dunes and induced erosion.

Natural erosion (code 900) is impacting the more exposed western edge of the sand dune system.

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 survey and the NATURA 2000 survey.

The method of assessment of conservation status differed in the NATURA 2000 survey and the various sand dune systems within the cSAC are assessed together, whereas each system is treated individually in this survey. Therefore, only broad comparisons between the conservation status of the two surveys was possible. The conservation status of the Annex I sand dune habitats on Coney Island are given in Table 134C.

Fixed Dunes (H2130)

The extent of fixed dunes at Coney Island is *unfavourable-inadequate*. Part of the fixed dune area lies outside of the cSAC and has not been mapped in previous surveys. The decline in area is due to erosion induced by overgrazing and rabbit burrowing which has resulted in large areas of bare sand across the fixed dunes.

Table 134C Conservation status of Annex I sand dune habitats at Coney Island

Habitat[1]	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
Fixed Dunes (H2130)		Extent	Structure & Functions/ Future prospects	**Unfavourable-bad**	**Unfavourable-declining**
Dune Slack (H2190)	Extent/ Structure & Functions	Future prospects		**Unfavourable-inadequate**	**Unfavourable-declining**
Mobile Dunes (H2120)	Extent/ Structure & Functions	Future prospects		**Unfavourable-inadequate**	**Unfavourable-declining**

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

Table 134D Pass/Fail results of mo nitoring stopsfor Annex I sand dune habitats at ConeyIsland

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation stat us**
Fixed Dunes (H2130)	4	2	Unfavourable-bad
Dune Slack (H2190)	1	0	Favourable
Mobile Dunes (H2120)	2	0	Favourable

Six monitoring stops were placed in the fixed dunes (Table 134D). Two of the monitoring stops were placed in the fixed dune outside of the cSAC and four within the cSAC. Two of the monitoring stops within the cSAC failed due to the high cover of bare ground and negative indicator species (agricultural weeds). The structure of the fixed dunes is undermined due to the high number of rabbit burrows in the habitat. Therefore, the structure and functions is rated *unfavourable-bad.*

The future prospects are *unfavourable-bad.* The habitat is largely destroyed by rabbit burrows and the impacts of overgrazing. The problem of overgrazing is recognised in the conservation plan and is described as 'slightly above ideal'. Monitoring is recommended in order to ensure a suitable grazing regime for the dunes. However the threats of overgrazing and rabbit burrowing are on-going. A reduction of the rabbit population is urgently required to alleviate the pressures on this habitat.

The conservation status of fixed dunes in the NATURA 2000 survey is rated as *average or reduced conservation.* None of the fixed dune areas of the cSAC including those at Coney Island are considered to be particularly good examples of this habitat. Currently, the overall EU conservation status of this habitat is *unfavourable-bad* (Table 134C) and this is attributable to the on-going threats of overgrazing and rabbit burrowing.

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

Dune Slacks (H2190)

The extent of dune slack on Coney Island is rated as *favourable* as there is no indication that the area has declined in recent times. This is based on best scientific judgement as this area of dune slack is not indicated on any of the previous maps available for this site and it is not mentioned in the MPSU conservation plan.

The structure and functions parameter is rated as *favourable*. One monitoring stop was placed in the dune slack area and this passed (Table 134D). Although the dune slacks are not overgrazed, poaching by sheep is evident and agricultural weeds have invaded some of the slack areas. This is taken into consideration in the future prospects of the habitat.

The future prospects for the dune slack are considered *unfavourable-inadequate.* Although it is not apparent in the monitoring stop, an overview of the entire habitat indicates that the current agricultural management is inappropriate for the dune slack. This threatens the viability of this habitat.

Currently, the overall EU conservation status of dune slack is *unfavourable-inadequate* (Table 134C), as the slack area is currently under pressure from agricultural activities..

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

Mobile Dunes (H2120)

The extent of mobile dunes at Coney Island is rated as *favourable* (Table 134C). Even though the mobile dunes are limited in extent, they appear intact. There are few visitors due to inaccessibility of the island and so the main impact on the mobile dunes is natural erosion which is not considered unfavourable.

Two monitoring stops were placed in the mobile dunes and these passed (Table 134D). Therefore, the structure and functions is rated as *favourable.*

The future prospects of the mobile dunes are considered *unfavourable-inadequate.* The activities currently impacting the rest of the dune system are likely to have repercussions for the future of the mobile dunes especially the intensity of rabbit burrowing.

The conservation status of fixed dunes in the NATURA 2000 survey is rated as *average or reduced conservation.* Currently, the overall EU conservation status of this habitat is *unfavourable-inadequate*(Table 134C).

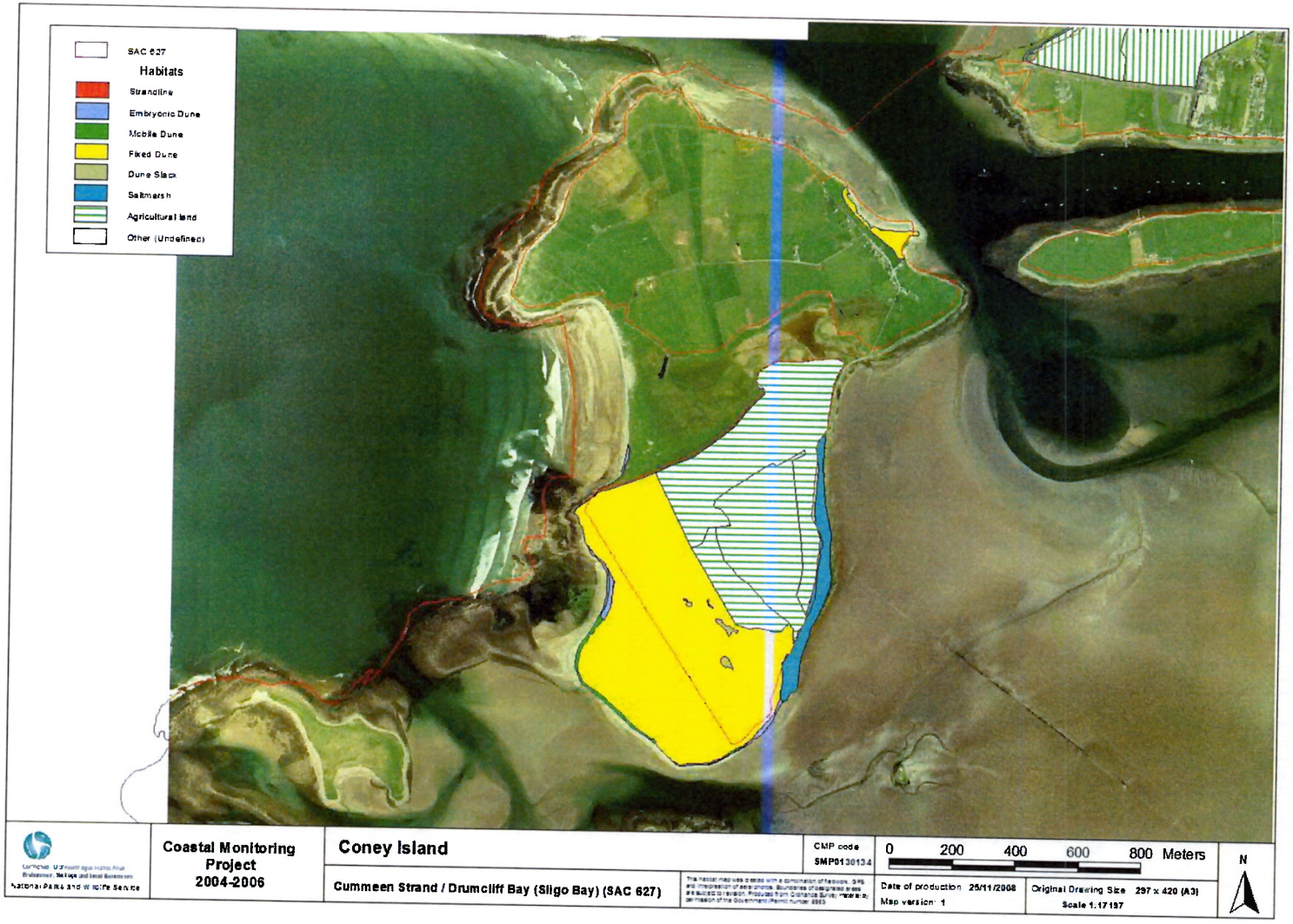
The Irish conservation status is rated as *unfavourable-declining*.

Embryonic Dunes (H2110)

The area of embryonic dunes is small and a conservation assessment is not required.

Annual Strandline (H1210)

The area of annual strandline is small and a conservation assessment is not required.


SAC 627
Habitats
Strandline
Embryonic Dune
Mobile Dune
Fixed Dune
Dune Slack
Saltmarsh
Agricultural land
Other (Undefined)
Coastal Monitoring Project 2004-2006
Coney Island
Cummeen Strand / Drumcliff Bay (Sligo Bay) (SAC 627)
CMP code SMP0130134
0 200 400 600 800 Meters
Date of production 25/11/2008
Map version: 1
Original Drawing Size 297 x 420 (A3)
Scale 1:17197
N

Appendix IV – Rosses Point site report and habitat map from the Coastal Monitoring Project (Ryle *et al.*, 2009)

SITE DETAILS
CMP06 site name: **Rosses Point** CMP06 site code: **135** CMP Map No.: **132**
County: **Sligo** Discovery map: **16** Grid Reference: **G 626 405**
6 inch Map No.: **Sl 8**
Aerial photographs (2000 series):**O 0847B;O 0848C;O 0895B,D;O 0896A,C; O 0951B**
NPWS Site Name: **Cummeen Strand / Drumcliff Bay (Sligo Bay)**
NPWS designation: pNHA: **627** cSAC: **627**
Blue Flag Beach: **Rosses Point**
Ranger Area: **Sligo**
MPSU Plan: **Draft II 2000**
Report Author: **Anne Murray**

SITE DESCRIPTION

Rosses Point sand dune system is part of a large coastal cSAC site that extends from Cullamore in the northwest to Killaspug in the southwest, Sligo town in the southeast and Drumcliff village in the northeast. The site is designated for the EU Annex I sand dune habitats – Fixed dunes and Embryonic dunes. Other habitats for which the site is designated are; Large shallow inlets and bays, Mudflats and sandflats not covered by seawater at low tide and Estuaries.

Six sand dune systems occur within the cSAC. For the purpose of this project the cSAC is divided into four main sites listed in the inventory of the sandy coasts of Ireland (Curtis, 1991). These are Strandhill (site 133), Coney Island (site 134), Rosses Point (site 135) and Yellow Strand (site 136). Two very small sand systems noted in the Consevation Plan (MPSU, 2000) are at Lisadell Strand and on Maguin's Island, these were not listed for this project.

Table 135A Areas of EU Annex I habitats mappedat Rosses Point

EU Code	EU Habitat	Area (ha)
H2130	Fixed coastal dunes with herbaceous vegetation	22.181
H2120	Mobile dunes	0.174
H2110	Embryonic shifting dunes	32.274*
	Total Sand dune	**54.629***

* This is an overestimation of the embryonic habitat and therefore of the total sand dune habitat (see text).

Rosses Point peninsula is located just north of Sligo Harbour. Most of the sand dune system has been modified by the presence of a golf course and is excluded from the site. The sand dune habitat within the cSAC comprises a narrow band of fixed dune that fringes the golf course and an area of embryonic dunes that extends the length of a sand spit on the northern edge of Rosses Point peninsula. This spit partially encloses Drumcliff Bay. Sandhills were noted on the early 1900s Ordnance Survey maps, along the north of the spit. These have since disappeared and have been replaced by hummocks of *Elytigia juncea* (Sand couch). An area of Meditteranean saltmarsh occurs in close association with the embryonic and fixed dunes along the southeastern edge of the spit.

The spit is noted as an important roosting area for waders including *Charadrius hiaticula* (Ringed Plover), *Calidris alba* (Sanderling) and *Calidris alpina* (Dunlin) and is partially included in Drumcliff Bay SPA 4013 and wildfowl sanctuary.

Marsh fritillary (*Eurodryas aurinia*), a butterfly species listed in Annex II of the E.U. Habitats Directive, has been recorded at Rosses Point.

EU Annex I sand dune habitats recorded during this survey at Rosses Point are Fixed dunes (priority habitat), Mobile dunes and Embryonic dunes. The total sand dune area is 55ha (Table 135A).

Fixed Dunes (H2130)

The priority habitat fixed dune comprises 22ha of the total sand dune habitat at Rosses Point (Table 135A). The golf course area is mapped as 93ha, however the boundary is not defined on the ground and a small area (approximately 1.5ha) to the south appears to lie within the cSAC boundary as indicated on the digital map **(CMP Map No. XX).** The area of fixed dune on the western edge of the golf course is undergoing natural erosion and this is compounded by recreational activities. Coastal protection in the form of rock armour, planting of *Phormium tenax* (New Zealand Flax), the installation of sand trapping fences and planting of *Elytrigia juncea* (Sand couch) have been carried out along this eroding edge. The success of these measures has been limited as the dunes are continuing to erode southwards towards Bomore Point. The area of fixed dune on the northern edge of the golf course is bound by an accreting sand spit and remains intact. However, there is no grazing and the fixed dunes are

rank, dominated by grasses *Arrhenatherum elatius* (False oat-grass) and *Festuca rubra* (Red fescue), with a thick carpet of moss underfoot.

The species diversity is low in the fixed dunes at Rosses Point. The typical species include: *Arrhenatherum elatius* (False oat-grass), *Anthyllis vulneraria* (Kidney vetch), *Daucus carota (*Wild carrot*), Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Hypochaeris radicata* (Cat's ear), *Lotus corniculatus* (Bird's foot trefoil), *Plantago lanceolata* (Ribwort plantain), *Taraxacum* agg. (Dandelion), *Trifolium repens* (White clover) and *Trifolium pratense* (Red clover) as well as the moss - *Rhytidiadelphus squarrosus.* Other species present are *Anacamptis pyramidalis* (Pyramidal orchid) and *Leucanthemum vulgare* (Oxeye daisy). Isolated *Acer pseudoplatanus* (Sycamore) trees are present on the northern part of the fixed dunes.

A limestone escarpment runs out to the coast (at Bomore Point) from fixed dunes at the southern part of the golf course (at the main access area to the dunes). This area is used as a viewing point for visitors with benches provided. As a result the area is heavily trampled and contains large amounts of bare sand and exposed rock. The lifeguard hut is also located here. This area is covered with a very thin layer of blowing sands that is colonised by species of dry grassland and heath including: *Aira praecox* (Early hair-grass), *Anthyllis vulneraria* (Kidney vetch), *Arrhenatherum elatius* (False oat-grass), *Bellis perennis* (Daisy), *Briza media* (Quaking-grass), *Carex arenaria* (Sand sedge), *Dactylis glomerata* (Cock's foot), *Danthonia decumbens* (Heath-grass), *Euphrasia officinalis* agg. (Eyebright), *Galium verum* (Lady's bedstraw), *Juniperus communis* (Common juniper), *Lotus corniculatus* (Bird's foot trefoil), *Salix cinerea* subsp. *cinerea* (Grey willow) and *Thymus polytrichus* (Wild thyme). This area is indicated on the digital map as a Juniper information point (See Main Report).

Mobile Dunes (H2120)

The total mobile dune comprises a very small area of 0.174 ha (Table 135A). The mobile dunes are confined to the beach between Bomore Point and Deadman's Point where it fronts the car park. The front slope of the mobile dunes is naturally eroding and heavily impacted by disturbance from recreational activities.

There are some small hummocks of *Ammophila arenaria* (Marram grass) on the spit at the northern section of the site at Rosses Point but these have not developed into a typical mobile zone.

The typical species *Ammophila arenaria* (Marram grass) dominates with other species present, including *Elytrigia juncea* (Sand couch) and *Eryngium maritimum* (Sea-Holly).

The negative indicator species *Cirsium arvense* (Creeping thistle) occurs in the mobile dunes but is not common.

Embryonic Dunes (H2110)

The mapped area of embryonic dunes at this site is 32ha. An area of 27ha of embryonic habitat is mapped on the spit at the northern part of the site. The tip of the spit is covered by freshly accreting sand and hummocks of the typical species - *Elytrigia juncea* (Sand couch). The western edge of the spit also comprises embryonic habitat. The neck of the spit is disturbed by natural forces of winter storms on the seaward edge, as a result *Ammophila arenaria* (Marram grass) dominated hummocks and fragmented patches of fixed dune species occur in mosaic with embryonic habitat. Saltmarsh occurs along the east and south of the spit and channels containing saltmarsh species traverse the lower part of the embryonic habitat. Overall the embryonic habitat is in good condition.

There is also a man-made ridge of sand, with the species - *Elytrigia juncea* (Sand Couch) forming an embryonic habitat on the western side of the golf course towards the headland of Rosses Point.

There are no negative indicator species in the embryonic dunes.

IMPACTS

The site has been impacted heavily by natural erosion and human activity. The impacts are listed in Table 135B. Rosses Point has well developed recreational infrastructure (code 530), with a large car park, public toilets and a lifeguard station behind the beach. There is also a scenic walking path with benches at Bomore Point

and Deadman's Point. Deadman's Point is stop no. 2 on "Yeat's Country Tour", a self guided driving tour published by Bord Failte.

There is easy access to the site and the recreational facilities of a Blue Flag beach along with the adjacent golf course (code 601) and caravan park (608), make it very popular. Impacts associated with recreational activities such as golfing (601), walking (code 622), picnicing, horse riding (code 622) and swimming are contributing to the overuse of the dune system in certain areas. This is evident at the access point near Bomore Point where trampling (code 720) and damage to vegetation is concentrated.

A car park and a shed (code 440), which holds equipment for the county council are also located on the fixed dunes at Bomore Point. These should be excluded from the cSAC, along with other sheds and buildings that have remained within the cSAC e.g. Sligo Yacht Club storehouse and clubhouse.

Table 135B Intensity and impact of various activities on sand dune habitats at Rosses Point

EU Habitat Code[1]	Activity Code[2]	Intensity[3]	Impact[4]	Area affected/ha	Location of Activity[5]
H2130	149	A	-1	20	Inside
H2130	421	C	-1	0.1	Inside
H2130	530	B	-1	4	Outside
H2130	601	A	-2	93	Outside
H2130	601	A	-1	1.5	Inside
H2130	608	B	-2	Unknown	Outside
H2130	622	C	-1	2	Inside
H2110	622	B	-1	Unknown	Inside
H2110	720	B	-1	Unknown	Inside
H2130	790	C	-1	0.4	Inside
H2130	871	B	-1	2	Inside
H2110	871	A	-1	2	Inside
H2130	600	C	-2	0.1	Inside
H2130	900	B	0	2	Inside
H2110	900	B	0	6	Inside

[1]EU Codes as per Interpretation Manual. Code 21BB is an additional code used to signify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[3] Intensity of the influence of an activity is rated as: A= high, B = medium, C = low influence and D = unknown.
[4] Impact is rated as: -2 = irreparable negative influence, -1 = repairable negative influence, 0 = neutral, +1 = natural positive influence and +2 = strongly managed positive influence
[5] Location of activity: Inside = activities recorded within and directly impacting the cSAC. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the cSAC.

The fixed dune is also impacted by undergrazing (code 149) due to the absence of grazers at this site. This has resulted in a poor quality fixed dune habitat dominated by rank grasses and poor species diversity. The introduction of a grazing regime for this

site would require consideration of the recreational activities of the site and the limited area of fixed dune. It may be best suited to one or two horses or ponies.

Littering and burning from beach parties is evident in the fixed dunes, this has been classed under the category 'other pollution or human activities' (code 790).

Natural erosion (code 900) is impacting both the embryonic and fixed dunes along the western side of the golf course and this is compounded by trampling (code 720) by visitors and also by horse riding (code 622). Protection works have been installed including hard coastal protection measures (code 871)) along the northwestern edge of the golf course.

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 survey, Golf survey (Gaynor and Browne) and NATURA 2000 survey.

The method of assessment of conservation status differed in the NATURA 2000 survey and the current survey, so direct comparisons between the conservation status of the two surveys were not possible.

Fixed Dunes (H2130)

The extent of fixed dunes is rated as *unfavourable-inadequate* (Table 135C). This is based on scientific judgement as there is no previous information on the extent of this habitat at Rosses Point. There is an estimation of 5ha for the entire cSAC (NATURA 2000). A large part of the fixed dune area is now excluded from the site as it is occupied by a golf course, however an area of fixed dune contained within the cSAC at the southern part of this site appears to have been modified by the golf course. The fixed dune next to Bomore Point is affected by trampling from visitors and the physical presence of a car park. Therefore, loss of extent of the fixed dune is due to both natural erosion and recreational activities.

Table 135C Conservation status of Annex I sand dune habitats at Rosses Point

Habitat[1]	EU Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	Unfavourable - Inadequate	Unfavourable - Bad		
Fixed Dunes (H2130)		Extent, Structure & functions, Future prospects		Unfavourable-inadequate	Unfavourable-declining
Mobile dunes (H2120)			Extent, Structure & functions, Future prospects	Unfavourable-bad	Partially destroyed
Embryonic Dunes (H2110)	Structure & functions	Extent, Future prospects		Unfavourable-inadequate	Unfavourable unchanged

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

The structure and functions parameter is rated as *unfavourable-inadequate*. This is based on best scientific judgement. Although the four monitoring stops placed in the fixed dunes passed (Table 135D), overall the functioning of the fixed dune is poor due impacts associated with the presence of the golf course. Other recreational activities are restricted to the remaining fixed dune outside of the golf course, thus concentrating recreational impacts on the fixed dune within the cSAC and reducing the possibility of grazing at the site. One attribute that failed at three of the stops is the sward height indicating the lack of grazers at the site. There are some tracks through the fixed dunes but these are currently having a minor impact on the habitat and are probably contributing to the diversity of species albeit poor.

The future prospects for this habitat are considered *unfavourable-inadequate.* The main threat to the future of the habitat is the natural retreat of the coastline on the western edge of the golf course and the management of protection works by the golf course and county council in relation to natural erosion. Rosses Point has a well developed recreational infrastructure resulting in high amenity use of the beach and dunes that is likely to continue to impact negatively on the dunes.

The conservation status of the fixed dune was described as *average or reduced* in the NATURA 2000 survey. The current overall EU conservation status of fixed dunes at Rosses Point is *unfavourable-inadequate* (Table 135C). This reflects the impact of undergrazing and the high amenity use of this site resulting in loss of extent and reduction in the quality of this habitat.

The overall Irish conservation status is *unfavourable-declining.*

Table 135D Pass/Fail results of monitoring stops for Annex I sand dune habitats at Rosses Point

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Fixed Dunes (H2130)	4	0	**Unfavourable-inadequate***

*This conservation status is based upon best scientific judgement (see text)

Mobile Dunes (H2120)

Given the limited area of this habitat the conservation status assessment is based on best scientific judgement. The parameters and overall EU conservation status of this habitat is rated as *unfavourable-bad*, as the area is very disturbed by recreational activities. The area is heavily trampled, as it is located at the main access to the site just below the car park and caravan park. Some dumping of rubble is also evident along the top ridge of the mobile dune.

The overall Irish conservation status is *partially-destroyed.*

Embryonic Dunes (H2110)

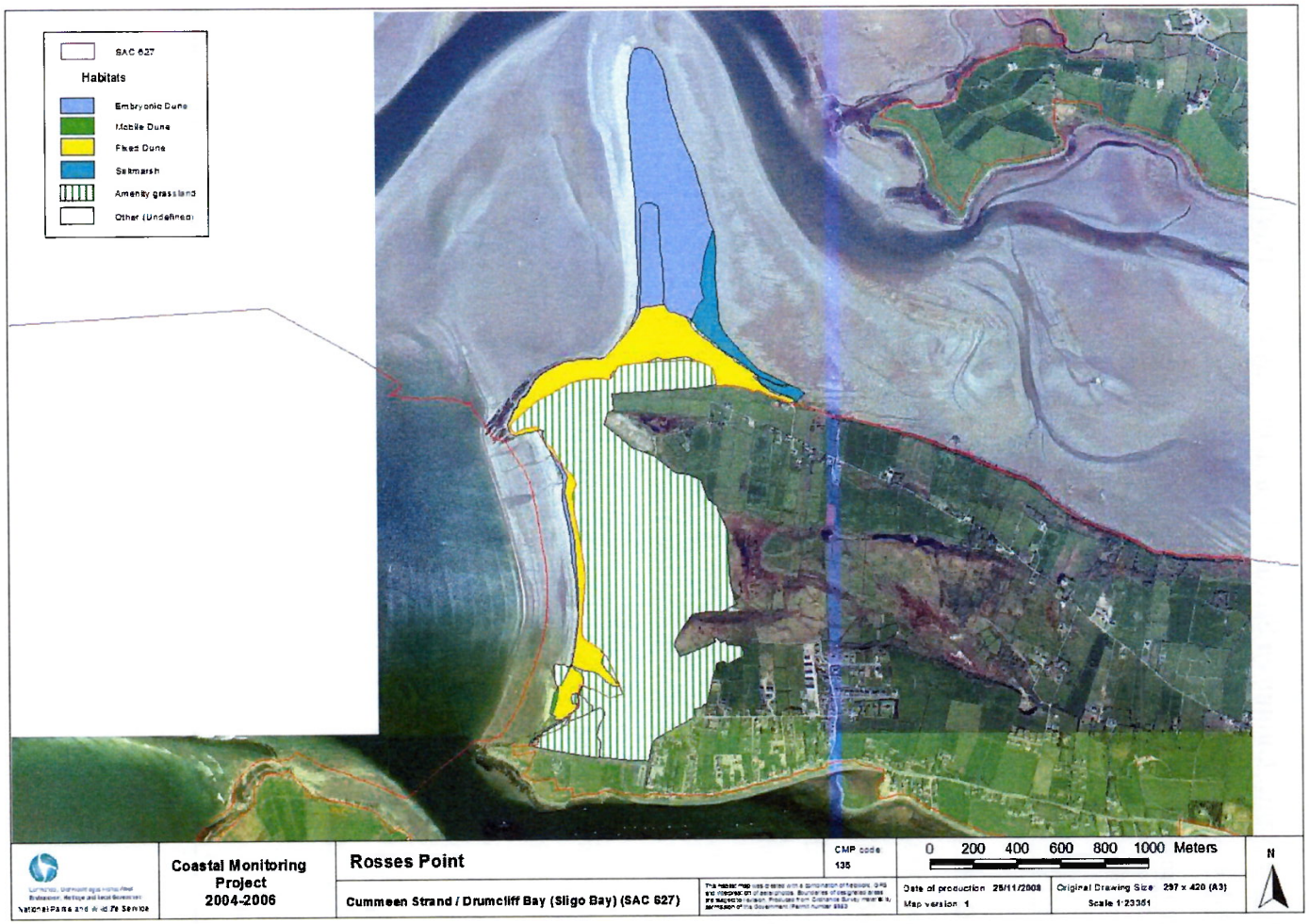
The extent of the embryonic habitat is rated as *unfavourable-inadequate.* This is based on best scientific judgement. An estimated area of less than 1ha is given in the NATURA 2000 survey. Natural erosion is occurring along the western edge of Rosses Point and this appears to be compounded by recreational activity mainly horse riding and the use of motorised vehicles in the northern part of the site (Table 135C).

The structure and functions parameter is rated as *favourable.* No monitoring stops were placed in the embryonic habitat, due to equipment failure on the day of survey. Where embryonic habitat occurs it is dominated by healthy typical embryonic species with no negative indicator species present.

The future prospects of the embryonic habitat are considered *unfavourable-inadequate*, as there is no active management prescribed in the conservation plan for this part of the cSAC. The impact of horse riding and motorised vehicles on this site (especially on the spit) should be examined and addressed. It is not possible to assess the extent or intensity of these impacts based on one site visit given the ephemeral nature. Therefore, the extent is given as 'unknown in Table 135B.

The conservation status is rated as *good* in the NATURA 2000 notes. The present overall EU conservation status for embryonic dunes is considered *unfavourable-inadequate*. This is attributable to the impacts of human activity at the site

The overall Irish conservation status is *unfavourable-unchanged.*


SAC 627
Habitats
Embryonic Dune
Mobile Dune
Fixed Dune
Saltmarsh
Amenity grassland
Other (Undefined)
Coastal Monitoring Project 2004-2006
Rosses Point
Cummeen Strand / Drumcliff Bay (Sligo Bay) (SAC 627)
CMP code 135
0 200 400 600 800 1000 Meters
Date of production 28/11/2008
Map version 1
Original Drawing Size 297 x 420 (A3)
Scale 1:23361
N

Appendix V – Yellow Strand report and habitat map from the Coastal Monitoring Project (Ryle *et al.*, 2009)

SITE DETAILS

CMP06 site name: **Yellow Strand** CMP06 site code: **136** CMP Map No.: **133**

County: **Sligo** Discovery map: **16** Grid Reference: **G 576 437**

6 inch Map No.: **Sl 7**

Aerial photographs (2000 series): **O 0846 A & C; O 0847 D; O 0848 C; O 0894 A; O 0895 B**

NPWS Site Name: **Cummeen Strand / Drumcliff Bay (Sligo Bay)**

NPWS designation: pNHA: **627** cSAC: **627**

Ranger Area**: Sligo**

MPSU Plan**: Draft II Consultation**

Report Author: **Anne Murray**

SITE DESCRIPTION

Yellow Strand sand dune system is part of a large coastal cSAC site that extends from Cullamore in the northwest to Killaspug in the southwest, Sligo town in the southeast and Drumcliff village in the northeast. The cSAC is designated for the EU Annex I sand dune habitats – Fixed dunes, Mobile dunes and Embryonic dunes. Other habitats for which the site is designated are; Large shallow inlets and bays, Mudflats and sandflats not covered by seawater at low tide and Estuaries.

Six sand dune systems occur within the cSAC. For the purpose of this project the cSAC is divided into four main sites listed in the inventory of the sandy coasts of Ireland (Curtis, 1991). These are Strandhill (site 133), Coney Island (site 134), Rosses Point (site 135) and Yellow Strand (site 136). Two very small sand systems noted in the Consevation Plan (MPSU, 2000) are at Lisadell Strand and on Maguin's Island, these were not listed for this project.

Table 136A Areas of EU Annex I habitats mapped at Yellow Strand

EU Code	EU Habitat	Area (ha)
H2110	Embryonic shifting dunes	0.837
H2120	Shifting dunes along the shoreline with *Ammophila arenaria*	0.491
H2130	Fixed coastal dunes with herbaceous vegetation	22.084
	Total sand dune	**23.412**

Yellow Strand dunes are located in townland of Ballintemple in the northwestern part of the cSAC. The sand dunes stretch from the old pier at Knocklane southeast to a small headland at Lackaneena. A road delineates the landward edge of the site. The higher (50-100m) peaty ground slopes from the road seaward to wet grassland and a sandy lowlying plain fronted by a narrow strip of dune ridges. The foredunes in the west have been breached by severe winter storms in the past and sand has blown inland some distance. The breach is now colonised by *Ammophila arenaria* (Marram grass). The sandy plain in the southeastern part of the site has been described as machair by Goodwillie (1972) and again by Eakin (1995). Similar to the rest of the site, the machair has been striped and altered by agricultural improvement. Interesting plant species noted by Eakin (1995) include *Spiranthes spiralis* (Autumn lady's tresses) and *Blackstonia perfoliata* (Yellow-wort), which occur at the very north of their range in Ireland.

The fields at Ballintemple are used by the Annex I bird species - Barnacle goose (*Branta leucopsis*) which occurs in internationally important numbers in the adjacent SPA of Drumcliff Bay. Ballintemple fields are locally known to have been the first fields in which the geese arrived each year and the last fields to be left.

Machair (H21A0)

Machair was noted at Yellow Strand in the ASI survey (Eakin 1995). It was described as dry calcareous grassland comprising of flat areas of rank vegetation interspersed with raised sandy hummocks of short grazed turf. The machair was agriculturally improved in places and supplementary feeding was also evident.

The short sward consisted of species including *Antennaria dioica* (Mountain everlasting), *Euphrasia officinalis* agg (Eyebright), *Linum catharticum* (Fairy flax), *Pilosella officinarum* (Mouse-ear-hawkweed) and *Thymus polytrichus* (Wild thyme). In the wetter machair areas other species included *Hydrocotyle vulgaris* (Marsh pennywort), *Mentha aquatica* (Water mint) and *Ranunculus flammula* (Lesser spearwort). Plant species of note also present in the machair were *Spiranthes spiralis* (Autumn lady's tresses) and *Blackstonia perfoliata* (Yellow-wort) as discussed above.

On the day of the site visit (during this survey) access was denied to the fields beyond the fenceline of the fixed dunes. Heavy rains hampered a visual assessment (from the fenceline) of the area denoted as machair on the ASI map. The machair fields appeared improved for the most part with grazing and supplementary feeding evident. The total area of machair is approximately 30-50ha (based on the ASI map). The habitat would require closer examination in order to establish the current condition of the habitat and to assign a conservation status to the habitat. It is mentioned in the conservation plan under the heading 'sand dunes (other than fixed dune)'. However, the cSAC is not designated for this habitat and therefore there is no conservation assessment of this habitat in the NATURA 2000 form.

Fixed Dunes (H2130)

A narrow strip of fixed dunes fronted by a steep cliff face edges Yellow Strand and comprises an area of 22.084ha. The foot of the eroding face is colonised by both *Ammophila arenaria* (Marram grass) and *Elytrigia juncea* (Sand couch). The frontline consists of an upper cobble beach and a lower sandy beach. The fixed dunes have been breached in the past due to winter storms and the breach is now revegetating. The fixed dunes are fenced and are grazed by cattle. Agricultural weeds dominate the vegetation which is relatively species poor.

The typical fixed dunes species recorded at Yellow Strand include *Agrostis capillaris* (Common bent), *Carex arenaria* (Sand sedge), *Cerastium fontanum* (Common mouse-ear), *Festuca rubra* (Red fescue), *Galium verum* (Lady's bedstraw), *Hypochaeris radicata* (Cat's ear), *Linum catharticum* (Fairy flax), *Luzula campestris* (Field wood-rush), *Lotus corniculatus* (Common bird's-foot-trefoil), *Plantago lanceolata* (Ribwort plantain), *Taraxacum* agg. (Dandelion), *Trifolium repens* (White clover), *Veronica chamaedrys* (Germander speedwell) and the moss -*Rhytidiadelphus triquetrus*.

Other species present in the fixed dune include: *Ammophila arenaria* (Marram grass), *Bellis perennis* (Daisy), *Carex nigra* (Common sedge), *Dactylis glomerata* (Cocksfoot), *Holcus lanatus* (Yorkshire fog) and *Ranunculus repens* (Creeping buttercup).

The negative indicator species *Cirsium arvense* (Creeping thistle), *Lolium perenne* (Perennial rye-grass) and *Senecio jacobaea* (Common ragwort) are abundant throughout the fixed dunes..

Mobile Dunes (H2120)

A small area of 0.491ha of mobile dunes has formed in the breach in the western part of the dunes and extends into the fixed dune area. The area is dominated by the typical species *Ammophila arenaria* (Marram grass) and is fronted by embryonic dunes.

Embryonic Dunes (H1220)

The embryonic dunes form a thin band edging the front eroding face of fixed dunes, widening to fill the breach at the western end of the strand. The total area of this habitat is 0.837ha and it is formed from recycled sand of the eroding fixed dunes.

The typical species Elytrigia juncea (Sand couch) dominates with *Ammophila arenaria* (Marram grass), *Festuca rubra* (Red fescue) and *Honckenya peploides* (Sea sandwort) also present.

The negative indicator species *Cirsium arvense* (Creeping thistle) occurs in the embryonic habitat but is rare.

IMPACTS

The main activities impacting the sand habitats at Yellow Strand are given in Table 136B. The dominant farming activity is grazing and most of the site is fenced into fields that run perpendicular to the coastline (code 150). The intensive agricultural management of the fields has led to overgrazing in places, mainly by cattle (code 143). Rabbit grazing (code 146) and burrowing is also evident. Agricultural improvement (code 103) and stock feeding (code 171) has resulted in a high cover of agricultural grasses and weeds. There is also an animal house and shelter (code 430) located on the fixed dunes. Natural erosion (code 900) is exacerbated by poaching and trampling of the dunes by livestock as well as rabbit burrowing.

Table 136B Intensity and impact of various activities on sand dune habitats at Yellow Strand

EU Habitat Code[1]	Activity Code[2]	Intens ity[3]	Impac t[4]	Area affected/ha	Location of Acti vity[5]
H2130	103	A	-1	15	Inside
H2130	143	A	-1	15	Inside
H2130	146	A	-1	15	Inside
H2130	150	A	-1	20	Inside
H2130	171	C	-1	1	Inside
H2130	430	B	-2	0.5	Inside
H2130	900	A	0	Unknown	Inside
H2120	900	A	0	Unknown	Inside
H2110	900	A	0	U nknown	Inside

[1] EU Codes as per Interpretation Manual. Code 21BB is an additional code used to s ignify the entire dune habitat.
[2] Description of activity codes are found in Appendix 3
[3] Intensity of the influence of an activity is rated as: A= high, B = medium, C = low influence and D = unknown.
[4] Impact is rated as: -2 = irreparable negative influence, -1 = repairable negative influence, 0 = neutral, +1 = natural positive influence and +2 = strongly managed positive influence
[5] Location of activity: Inside = activities recorded within and directly impacting the cSAC. Outside = activities recorded outside but adjacent to sand dune habitat that are impacting the cSAC.

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 survey, the NATURA 2000 survey and the most recent MPSU plan.

The method of assessment of conservation status differed in the NATURA 2000 survey as the various sand dune systems within the cSAC are assessed together, whereas each system is treated individually in this survey. Therefore, only broad comparisons between the conservation status of the two surveys were possible. The conservation status of the Annex I sand dune habitats on Yellow Strand are given in Table 136C.

Table 136C Conservation status of Annex I sand dune habitats at Yellow Strand

Habitat[1]	E U Conservation Status Assessment			Overall EU conservation status assessment	Proposed Irish conservation status system[2]
	Favourable	Unfavourable-Inadequate	Unfavourable - Bad		
Fixed Dunes (H21 30)		Extent	Structure & Functions/ Future prospects	Unfavourable-bad	**Partially destroyed**
Embryonic Dunes (H2110)	Extent/ Structure & Functions/ Future prospects			Favourable	**Favourable-maintained**

[1] EU Codes as per Interpretation Manual
[2] Ratings are Favourable (Enhanced, Maintained, Recovered, Declining), Unfavourable (Recovering, Unchanged, Declining) and Destroyed (Partially destroyed, Completely destroyed and Unknown)
*This assessment is based on best scientific judgement (see text)

Table 136D Pass/Fail results of monitoring stops for Annex I sand dune habitats at Yellow Strand

	Monitoring stops		
Habitat	**Pass**	**Fail**	**Conservation status**
Fixed Dunes (H2130)	1	3	Unfavourable-bad
Embryonic Dunes (H2110)	4	0	Favourable-

Fixed Dunes (H2130)

The extent of fixed dunes at Yellow Strand is *unfavourable-inadequate* (Table 136C). The decline in area is due to erosion induced by overgrazing, trampling and rabbit burrowing which has resulted in numerous areas of bare sand across the fixed dunes. The presence of animal housing has also reduced the extent of the dunes.

Four monitoring stops were placed in the fixed dunes and three of these failed. The monitoring stops failed to reach the targets for a number of different attributes including typical species, the cover of bare ground, sward height and negative indicator species (agricultural weeds). Therefore, the structure and functions is rated *unfavourable-bad* (136D).

The future prospects are *unfavourable-bad*. The habitat has been modified by agricultural improvement and the impacts of overgrazing. The management of the Yellow Strand dunes by grazing is one of the objectives stated in the conservation plan. However, it would appear that a suitable grazing regime and stocking density has yet to be established. Agricultural improvement of the dunes is another on-going threat at this site.

The conservation status of fixed dunes in the NATURA 2000 survey is rated as *average or reduced conservation*. None of the fixed dune areas of the cSAC including those at Yellow Strand are considered to be particularly good examples of this habitat. Currently, the overall EU conservation status of this habitat is *unfavourable-bad* (Table 136C) and this is attributable to the on-going threats of overgrazing and agricultural improvement.

The Irish conservation status is rated as *partially destroyed*.

Mobile Dunes (H2120)

Given the small area of mobile dune sat Yellow Strand, a conservation assessment is not required.

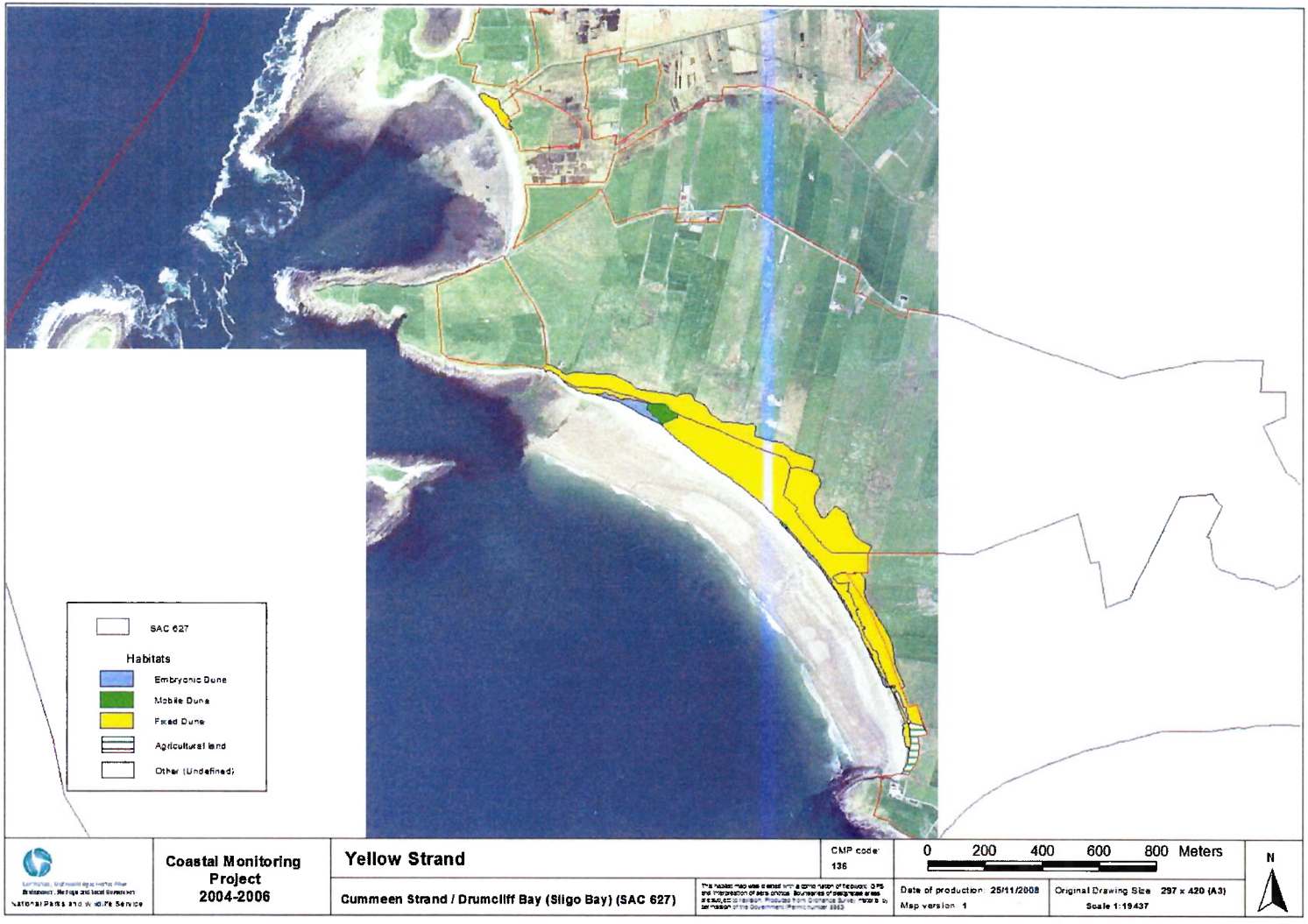
Embryonic Dunes (H2110)

The extent of the embryonic dunes is rated as *favourable*. There is a narrow band of embryonic fronting the eroding fixed dunes. Given the more exposed nature of the west coast to Atlantic Ocean, the embryonic habitat on the west/northwest coast of Ireland differs from the wider more accreting embryonic zones of the east coast. The embryonic dunes tend to occur as a narrow band on the slopes of actively eroding sand dune or machair habitat. These are undergoing natural erosion at Yellow Strand, a process that is not considered unfavourable in relation to extent of habitat. Most of the sand available for foredune development is coming from the eroding fixed dunes.

Structure and functions is rated as *favourable*. Four monitoring stops were placed in the embryonic dunes and all of these passed.

The future prospects of the embryonic dunes are considered *favourable*. There appear to be few threats to this habitat as it is fenced off from the agricultural activities of the rest of the site. Recreational use of the beach and dunes is low given the remoteness of the beach and the strong currents of the sea here.

Embryonic dunes are not mentioned in the NATURA 2000 form. The current overall EU conservation assessment is rated as *favourable* and the Irish conservation status is rated as *favourable- maintained*.


SAC 627
Habitats
Embryonic Dune
Mobile Dune
Fixed Dune
Agricultural land
Other (Undefined)
Coastal Monitoring Project 2004-2006
Yellow Strand
Gunmeen Strand / Drumcliff Bay (Sligo Bay) (SAC 627)
CMP code: 136
0 200 400 600 800 Meters
N
Date of production: 25/11/2008
Map version: 1
Original Drawing Size: 297 x 420 (A3)
Scale 1:19437