

# Conservation Management Options & Recommended Prescriptions for Brittas Dunes and associated habitats, Brittas Bay, County Wicklow



Report to Wicklow County Council

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## 1.0 PURPOSE AND CONTEXT OF THIS REPORT

This document aims to provide conservation management guidance for actions identified as of conservation value. These actions aim to complement and contribute to the Site-specific Conservation Management Objectives (SSCO)<sup>1</sup> for qualifying interests of the Buckroney-Brittias Dunes and Fen Special Area of Conservation (SAC)<sup>2</sup>, and other important species at Buckroney-Brittias Dunes, Brittias Bay, County Wicklow.

The report reviews the existing status of features and the management issues that are current. It proposes a set of objectives and outlines key management actions and prescriptions which can be delivered in the short term to establish a new approach to the management of the site to enhance its conservation status while maintaining its value as an amenity area.

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<sup>1</sup> Buckroney-Brittias Dunes and Fen SAC Site Specific Conservation Objectives  
[https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO000729.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000729.pdf)

<sup>2</sup> Buckroney-Brittias Dunes and Fen SAC Site Synopsis <https://www.npws.ie/protected-sites/sac/000729>

## 2.0 BACKGROUND & INFORMATION

### 2.1 Site location, boundary & ownership

Located along Co. Wicklow's coast, Buckroney-Brittias Dunes (hereafter Brittias Bay or Brittias Dunes) is part of a larger coastal dune complex which extends to nearly 10 km of Coastline centred around Brittias Bay. This plan refers to the sections of the site managed by Wicklow County Council which extend to approximately 35 ha and forms much of the northern part of the larger Buckroney -Brittias Dunes and Fen SAC

The site is split into two main areas and along with adjacent non-designated site features such as car parks and amenity areas, is managed by Wicklow County Council.

A map detailing the indicative site boundary is given in Appendix I. This is the boundary of the dune and beach areas and excludes the south car park.

### 2.2 Site Importance & context

Brittias Dunes is part of a complex of coastal habitats located about 10 km south of Wicklow town. It is one of two main sand dune systems (along with the more southerly Buckroney Dunes) connected on the coast by the rocky headland of Mizen Head. The site is part of the Buckroney -Brittias Dunes and Fen SAC (site code 000729). The site boundary as indicated in Appendix 1.

This site is important as an extensive sand dune system with well-developed plant communities. Several coastal habitats listed on the E.U. Habitats Directive, including two priority habitats - fixed dune and decalcified dune heath - are present. The area contains two legally protected plants, as well as a number of other rare or scarce plant species. The site provides habitat for some rare and localised invertebrate species and supports a range of breeding and non-breeding "Birds of Conservation Concern in Ireland"<sup>3</sup>. A rich flora and fauna have persisted on this site despite extensive amenity use and adjacent farming. However, future land use practices will need to be managed to ensure the continued survival of this unique mosaic of coastal habitats.

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<sup>3</sup> Colhoun , K. and Cummins, S. 2013. Birds of Conservation Concern in Ireland 2014-2019. **Irish Birds** 9 (523-544) <https://www.birdwatchireland.ie/LinkClick.aspx?fileticket=WpxRLyul9cA%3d&tabid=178>

## 3.0 SITE INFORMATION, FEATURES & ATTRIBUTES

### 3.1 Review of special site interest and site condition

#### 3.1.1. SAC qualifying interest

The site includes the following habitats listed on Annex I of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)\*
- [2150] Decalcified Dune Heath\*
- [2190] Humid Dune Slacks

Embryonic dune development occurs at the southern part of Brittas. Typical species are couch grasses (*Elymus* sp.), Sand Sedge and Sea Sandwort. The main dune ridges are dominated by Marram *Ammophila arenaria*, with herbaceous species such Sea Spurge *Euphorbia paralias*, Sea-holly *Eryngium maritimum* and Common Restarrow *Ononis repens* occurring throughout. The main dune ridges are well developed, reaching heights of 10 m at Brittas. The northern end of the Brittas system has fine examples of parabolic dunes.

Stable fixed dunes are well developed at Brittas. Marram is less frequent in these areas and is replaced by Red Fescue *Festuca rubra* as the most common grass species. A rich flora occurs, especially in the more open areas. Common species include Pyramidal Orchid *Anacamptis pyramidalis*, Common Milkwort *Polygala vulgaris*, Wild Pansy *Viola tricolor* subsp. *curtisii*, Carline Thistle *Carlina vulgaris*, Biting Stonecrop *Sedum acre*, Wild Thyme *Thymus praecox* and Common Bird's-foot-trefoil *Lotus corniculatus*. The mature areas of fixed dune also contain Burnet Rose *Rosa pimpinellifolia*, Bracken *Pteridium aquilinum*, Wood Sage *Teucrium scordonia* and Common Sorrel *Rumex acetosa*. Mosses such as *Tortula ruralis* subsp. *ruraliformis*, *Rhytidiodelphus triquetris*, and *Homalothecium lutescens* are frequent, along with lichens *Cladonia* spp., *Peltigera canina*.

This is one of the few Irish east coast sites to possess good examples of wet dune slacks (it also formerly held dunes with Creeping Willow *Salix repens*). These areas of the dunes have a rich and varied flora, including species such as Creeping Willow, Water Mint *Mentha aquatica*, Silverweed *Potentilla anserina*, Meadowsweet *Filipendula ulmaria* and Meadow Thistle *Cirsium dissectum*. The slacks are notably rich in rushes and sedges. Of particular interest is the presence of Sharp Rush *Juncus acutus*, a scarce species in eastern Ireland and one that is indicative of a saline influence.

The site is also notable for the presence, at the back of the dunes, of areas of decalcified dune heath, a rare habitat type, and one which is listed with priority status in the E.U. Habitats Directive. Heath species present include Heather *Calluna vulgaris*, Bell Heather *Erica cinerea* and Gorse *Ulex europaeus*.

The designated site as a whole contains two rare plant species protected under the Flora (Protection) Order, 1999<sup>4</sup>: Wild Asparagus *Asparagus officinalis* subsp. *prostratus*, in its most northerly Irish station, and Meadow Saxifrage *Saxifraga granulata*. The presence of both species within the Brittas dunes has not been confirmed recently. Other rare species which may occur within

<sup>4</sup> <http://www.irishstatutebook.ie/eli/2015/si/356/made/en/print>

the site include Green-flowered Helleborine *Epipactis phyllanthes*, Bird's-foot *Ornithopus perpusillus* and Spring Vetch *Vicia lathyroides*. All of these are Red Data Book species<sup>5</sup>.

### 3.1.2 Other Biodiversity Interest

#### Birds

The site is predominantly dune grassland of various types, open sandy shore or patchy scrub and as such birds typical of these habitats can be found. Disturbance from high visitor numbers probably significantly restricts the use of the beach by ground nesting birds which would likely otherwise be found (e.g. Ringed Plover) and the high level of usage of the dune areas by people and dogs may well have an impact on nesting birds<sup>6</sup>,<sup>7</sup>

While a comprehensive search of bird records for the site has not been undertaken, at least four site visits between 2011 and 2018, at various seasons, recorded over 30 species using the dune areas and inshore waters of the bay (A. Lauder, *pers obs*). These included the species in table 1 which are listed in Birds of Conservation Concern in Ireland.

**Table 1 BoCCI species recorded at Brittas Bay and dunes (A. Lauder, *pers obs*)**

Species	BoCCI status	Status on site
Black-headed Gull	Red	Non-breeding & winter, shoreline & bay
Common Scoter	Red	Non-breeding & winter, bay
Grey Wagtail	Red	None-breeding, shore, damp areas
Herring Gull	Red	Non-breeding & winter, shoreline & bay
Meadow Pipit	Red	Common breeder – dune grasslands
Redshank	Red	Non-breeding & winter, bay
Common Gull	Amber	Non-breeding & winter, shoreline & bay
Common Tern	Amber	Non-breeding, bay
Gannet	Amber	Non-breeding, bay
Great Black-backed Gull	Amber	Non-breeding & winter, shoreline & bay
Great Spotted Woodpecker	Amber	Non-breeding, trees/scrub on site edges
Greenfinch	Amber	Prob. Breeder, in scrub
Guillemot	Amber	Non-breeding & winter, bay
House Martin	Amber	Summer, non-breeder, foraging over site
House Sparrow	Amber	Likely breeding locally at site edge buildings
Kestrel	Amber	Summer, non-breeder, foraging over site
Kittiwake	Amber	Non-breeding, bay
Lesser Black-backed Gull	Amber	Non-breeding, shoreline & bay
Linnet	Amber	Breeding, scrub
Mediterranean Gull	Amber	Occasional, non-breeding & winter, shoreline & bay
Red Kite	Amber	Non-breeder, foraging over site
Red-throated Diver	Amber	Non-breeding & winter, bay
Robin	Amber	Prob breeder, scrub
Sand Martin	Amber	Prob. Breeder, exposed sand banks

<sup>5</sup> [https://www.npws.ie/sites/default/files/publications/pdf/Curtis\\_1988\\_PlantsRedBook.pdf](https://www.npws.ie/sites/default/files/publications/pdf/Curtis_1988_PlantsRedBook.pdf)

<sup>6</sup> Banks, P. and Bryant, J. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters*

<sup>7</sup> Lauder, A. & Riley, M. 2017. Managing the Impact of Dogs and Dog Walkers on Biodiversity North Bull Island Nature Reserve, Dublin. Unpublished report to Dublin City Council.

Sandwich Tern	Amber	Non-breeding, bay
Shag	Amber	Non-breeding, bay
Skylark	Amber	Breeding, dune grassland
Starling	Amber	Likely breeding locally on site edge buildings
Stonechat	Amber	Breeding, tall grassland and scrub
Swallow	Amber	Summer, non-breeder, foraging over site
Swift	Amber	Summer, non-breeder, foraging over site
Black-throated Diver	Amber	Occasional, non-breeding & winter, bay
Cormorant	Amber	Non-breeding & winter, bay
Oystercatcher	Amber	Non-breeding & winter, shoreline & bay

A wide range of other bird species use the area for breeding, wintering or for passage. The site has potential to increase its value to birds through appropriate management.

### **Mammals**

There are records of Otter, Badger and Irish Hare from within the 10km square with Otter having records on the site in the river mouth to the northern end of the site. Other common mammal species are likely to be present and the sheltering dune ridge and high invertebrate abundance will likely provide feeding opportunities for bat species.

### **Herpetofauna**

Common Frog *Rana temporaria* has been observed on site (per NBDC) and Common Lizard *Zootoca vivipara* is likely though the nearest known record is c. 5km away.

### **Invertebrates**

There are a range of common butterfly species which occur e.g. Orange Tip *Anthocharis cardamines*, Peacock *Inachis io* and Small Copper *Lycaena phlaeas*. Two scarcer species which likely breed on the site are Grayling *Hipparchia semele* and Small Blue *Cupida minimus*. These are both localised and declining species and good indicators of floristic diversity of coastal grasslands<sup>8</sup>. The butterfly diversity of the site is likely to be relatively high and an attractive feature for visitors. Management of the stable dune areas for their botanical interest would be of benefit for this group

Given the relative scarcity of high quality sand dune systems it is likely that the site supports a range of other localised or scarcer invertebrate species and this taxon would benefit from more intensive survey as the site may well be important for some species and potentially subsequent management.

#### **3.1.3 Amenity interest and other site functions**

The dune system and beach is subject to high amenity usage from visitors and several areas adjacent to the site have been developed as caravan parks, car parks and golf courses. The importance of the bay for recreational use is high and it forms one of the most frequented beaches on the east coast, away from Dublin. Visitor numbers are not accurately known but estimates from the peak season at well in excess of 1000 per day and likely off-peak numbers of 50-100/day place the total at well in excess of 100,000 visits per annum (K. Scanlon *pers comm*) it is recognised as having national significance for tourism as a bathing water<sup>9</sup> and has attained Blue flag beach status.

The management of the site to achieve favourable conservation condition while maintaining its amenity value will be a key consideration.

<sup>8</sup> EEA Technical report No 11/2013 The European Grassland Butterfly Indicator: 1990–2011

<https://www.eea.europa.eu/publications/the-european...butterfly-indicator.../download>

<sup>9</sup> [http://swanireland.ie/download/resources/the\\_economics\\_of\\_water/Faile-Ireland-Water-Quality-Status-Report.pdf](http://swanireland.ie/download/resources/the_economics_of_water/Faile-Ireland-Water-Quality-Status-Report.pdf)

## 4.0 EVALUATION OF SITE FEATURES, ATTRIBUTES AND MANAGEMENT ISSUES

This site is important as an extensive sand dune system with well-developed plant communities. Several coastal habitats listed on the E.U. Habitats Directive, including two priority habitats - fixed dune and decalcified dune heath - are present. The area contains two legally protected plants, as well as a number of other rare or scarce plant species. The site provides habitat for some scarce and local species of invertebrate and supports a typical bird community for the habitat including a number of breeding and wintering birds which are red and amber listed BoCCI species.

A rich flora and fauna has persisted on this site despite extensive amenity use and adjacent farming. However, future land use practices will need to be managed to ensure the continued survival of this unique mosaic of coastal habitats.

Table 2 below sets out the key features of the site with regard to nature conservation and gives a summary of the specific attributes, levels of importance, targets identified in existing plans or strategies and the main factors identified as influencing condition or management of the respective feature.

Potential actions also identify opportunities for visitor engagement or awareness raising which in turn may have a positive impact on site, or wider, conservation.

The features addressed in this section are those identified as qualifying interests of the SAC, protected species or those of intrinsic importance identified in Section 3.

### 4.1 Key features, opportunities & constraints

*Table 2 Features, attributes and constraints*

Feature	Importance EU = EU Dir 1=Annex. *=EU priority RDB =red data book Red/amber = BoCCI category N=nationally scarce or declining	Attributes	Current status	Main/potential influencing factors (constraints and opportunities)	Target condition or potential action (condition target or action identified in existing plan or strategy)
Embryonic Dunes (2110)	EU1	Area	Unfavourable	<ul style="list-style-type: none"><li>Small habitat area – probably now absent – presence not found in SDM project - vulnerable to recreational impacts</li></ul>	Re-survey of site to identify presence/extent
Shifting Dunes along the shoreline with <i>Ammophila arenaria</i> (2120)	EU1	Extent, structure and Function Future prospects	Extent may be favourable. Structure and Function and Future Prospects Unfavourable	<ul style="list-style-type: none"><li>Recreation pressure</li><li>natural coastal erosion</li></ul>	Mapping of areas and identification of problem recreation pressure sites

Feature	Importance EU = EU Dir 1=Annex. *=EU priority RDB =red data book Red/amber = BoCCI category N=nationally scarce or declining	Attributes	Current status	Main/potential influencing factors (constraints and opportunities)	Target condition or potential action (condition target or action identified in existing plan or strategy)
					Measures to reduce paths/scars would benefit
Fixed dune (2130)	EU1*	Extent, structure and Function Future prospects	Extent. Structure and Function and Future Prospects Unfavourable	<ul style="list-style-type: none"> <li>Maturation/succession of dunes (lack of grazing)</li> <li>Invasive scrub/tall herb encroachment</li> </ul>	Restoration of favourable status through targeted grazing/mowing regime and reduced recreational impacts
Atlantic decalcified fixed dunes (2150)	EU1*	Extent structure and Function Future prospects	Unfavourable as habitat loss observed	<ul style="list-style-type: none"> <li>Recreation pressure</li> </ul>	Maintenance of habitat extent through management of recreational pressure
Rare Plants	Flora Protection order & RDB	Presence and extent	unknown	<ul style="list-style-type: none"> <li>Invasive scrub</li> <li>Inappropriate dune management</li> <li>Recreation pressure</li> </ul>	Re-survey & determine appropriate management actions
Breeding birds (high priority species)	BoCCI RED and AMBER species breeding in dune habitat	Presence of Meadow Pipit, Skylark, Stonechat	Information gap	<ul style="list-style-type: none"> <li>Population size unknown</li> </ul>	Survey or casual records of value, not high priority
Protected Mammals	EU2	Presence of Otter, Irish Hare	Information gap	<ul style="list-style-type: none"> <li>Abundance/presence unknown</li> </ul>	Survey or casual records of value, not priority
<i>Herpetofauna</i> Common Frog Common Lizard	N N	Presence of Common Frog/Common Lizard	Information gap	<ul style="list-style-type: none"> <li>Abundance/presence unknown</li> </ul>	Survey or casual records of value, not priority

Feature	Importance EU = EU Dir 1=Annex. *=EU priority RDB =red data book Red/amber = BoCCI category N=nationally scarce or declining	Attributes	Current status	Main/potential influencing factors (constraints and opportunities)	Target condition or potential action (condition target or action identified in existing plan or strategy)
<i>Invertebrates</i> Small Blue	N	Presence & abundance	Information gap	<ul style="list-style-type: none"> <li>• Abundance/presence unknown</li> </ul>	Survey or casual records of value, not priority

## 5.0 MANAGEMENT OBJECTIVES, RATIONALE & RECOMMENDED ACTIONS

### 5.1 Overall rationale

Biodiversity is outlined as a priority in the Wicklow County Heritage Plan<sup>10</sup> and delivered through the county Biodiversity Action Plan<sup>11</sup> (BAP). The BAP sets four objectives based around the premise of addressing key issues:

- *We are aware of many aspects of biodiversity and its potential value for us however we often know fairly little about what we actually have in our local areas, what its value may be (for example as indicator species) and what we need to do to ensure its conservation;*
- *Biodiversity is important not only on its own merits but also because it performs many functions that provide our basic needs and enhance our quality of life. Yet it seems that this beneficial role of biodiversity is often not widely appreciated or understood;*
- *Over the years we have had a damaging effect on biodiversity, and this continues to the present day. There is a need to take positive action to put right historic and current impacts as well as ensuring that we don't impact on biodiversity in the future;*
- *Many people, communities and organisations are already working for biodiversity, others want to do something but are unsure how best to make a difference.*

Taking account of these issues, the objectives for the Wicklow BAP are:

1. *To better understand the biodiversity of Wicklow.*
2. *To raise awareness of biodiversity in Wicklow, its value and the issues facing it.*
3. *To conserve and enhance habitats and species in Wicklow, taking account of national and local priorities.*
4. *To foster active participation to help biodiversity in Wicklow, encouraging a partnership approach to help our species and habitats.*

The SAC as a whole has agreed **Site-Specific Conservation Objectives (SSCO)**<sup>12</sup> and these outline the objectives which seek to enhance the conservation status of the site and its qualifying features. These focus on the suite of qualifying features and their attributes which require attention but **do not identify management mechanisms to achieve this**.

Regarding the site in the context of its designated site and its local heritage value; Brittas Bay dunes form part of a **high priority area** as a key part of a **SAC** and there is therefore a clear **requirement to maintain or restore** the site to favourable condition and its qualifying interest features to favourable conservation status – currently the site remains in unfavourable condition (Objective 3).

There are opportunities through conservation action at Brittas dunes to **engage the public** in biodiversity awareness and conservation (objective 2 & 3)

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<sup>10</sup> [http://www.countywicklowheritage.org/page/county\\_wicklow\\_heritage\\_plan?path=0p4p64p](http://www.countywicklowheritage.org/page/county_wicklow_heritage_plan?path=0p4p64p)

<sup>11</sup> [http://www.countywicklowheritage.org/page/county\\_wicklow\\_biodiversity\\_action\\_plan?path=0p4p64p](http://www.countywicklowheritage.org/page/county_wicklow_biodiversity_action_plan?path=0p4p64p)

<sup>12</sup> [https://www.npws.ie/sites/default/files/protected-sites/conservation\\_objectives/CO000729.pdf](https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000729.pdf)

There is a need, given the high priority nature of the habitat, to **better understand its plant and animal community** and the processes that act upon these species, through survey and research (Objective 1 and 3)

The importance of the dunes in providing a range of **ecosystem services** is clear. The stability of the dune structure and a wildlife community in good condition will provide a range of services including:

- Protection of hinterland from storms and seawater incursion
- Provision of shelter by high dune ridge for property, land and livestock
- Source of windblown sand and other soil components to the benefit of nearby farmland
- Natural grassland communities with high invertebrate abundance providing contribution to natural crop and plant pollination
- Aesthetic value of sand dune and shoreline landscape and associated wildlife for pleasure
- Provision of a grazing opportunity through conservation management
- Conservation management potentially contributes to local economy through specialist contractors
- Personal and community value - linkages to personal stories of members of the community and visitors
- Recreational and amenity value for the community and visitors
- Potential educational resource for primary, secondary and tertiary education

The importance of the site as a resource both in terms of its biodiversity value but also as a resource for the community and economy is clear from the ecosystem services identified above.

The following sections propose management objectives and actions which aim to enhance the conservation management for the features of importance within the SAC, to facilitate complementary management for other features of conservation importance where this is compatible with management for the SAC qualifying interest and to ensure management of the site for its amenity value is balanced with that of its conservation importance while enhancing its value in all respects to the community.

## 5.2 Advisory management objectives

### **Management Objective 1      Manage the site to maintain, enhance or restore the SAC qualifying interests and associated wildlife**

#### **Rationale**

The site is of high priority as a SAC with a range of qualifying features and at least 2 European priority habitats present. The condition of at least some attributes of all qualifying features at the site were identified by both Ryle *et al* (2009) Coastal Monitoring Project (CMP) and Delany *et al* (2013) (Sand Dune Monitoring project (SDM) as unfavourable. These aspects therefore require remedial action to improve the status of these features or their attributes.

The reasons for condition failure are provided in the extracts from CMP, below as these provide a convenient means of presentation but similar failures were noted by SDM which was carried out more recently.

Note that the habitat extent provided in the extracts below refers to the whole SAC (and in most cases was revised slightly in the 2013 report) not only the area at Brittas dunes.

#### **Status of Embryonic Dunes (Annex I habitat 2110)**

Area (ha)	Overall	Extent	Structure and function	Future prospects
0.647	<u>Amber</u>	Amber	Amber	Amber

**Comment:** Rated U1 due to scarcity of habitat and recreational impacts and erosion.

These appear to now be absent and the SDM project did not locate it.

#### **Status of Shifting Dunes along the shoreline with *Ammophila arenaria* (Annex I habitat 2120)**

Area (ha)	Overall	Extent	Structure and function	Future prospects
3.316	<u>Amber</u>	Green	Amber	Amber

**Comment:** Extent rated as FV. However Structure and Functions and Future prospects rated U1 due to ongoing natural erosion and recreational pressure

Recreation pressure obvious and notable. Mapping of areas for targeted action and determination of a suite of approaches will be required in short term

#### **Status of Fixed dune (Annex I priority habitat 2130)**

Area (ha)	Overall	Extent	Structure and function	Future prospects
44.94	<u>Amber</u>	Green	Amber	Amber

**Comment:** Structure and Functions and Future Prospects rated as U1 due to maturing sand dune system and considerable pressure from recreational users.

Recreation pressure obvious and notable. Mapping of areas for targeted action and determination of a suite of approaches will be required in short term

#### **Status of Atlantic decalcified fixed dunes (Calluno-Ulicetea) (Annex I Priority habitat 2150)**

Area (ha)	Overall	Extent	Structure and function	Future prospects
0.79	<u>Amber</u>	Amber	Green	Green

**Comment:** Extent rated U1 due to loss of habitat through development and impacts from recreational users of the beach.

Mapping of areas for targeted action and determination of a suite of approaches will be required in short term

#### **Status of Humid dune slack (Annex I H2190)**

Area (ha)	Overall	Extent	Structure and function	Future prospects
0.674	<u>Amber</u>	Green	Green	Amber

**Comment:** Future Prospects are rated as U1 owing to a documented lowering of the water table.

Investigation of local, extent and level of impact and investigation of potential solutions is short term priority.

A very significant aspect of failure is pressure from recreation and this is noted both by SDM and CMP. An extract from the CMP explains the impacts effectively:

*Recreational activities come in a variety of forms and were common at many of the sites that were surveyed. The main activities affecting sand dunes are trampling and general overuse of the dune system through social gathering, walking, golf courses, and camping & caravans. Pedestrian damage, littering, horse-riding, motor vehicles including quad bikes can compact the soil, lead to the creation of tracks and undermine the vegetation integrity, which accelerates the damage to dune systems and can accelerate erosion. Owing to the population density on the East coast some of these activities were*

*more pronounced, such as at the more popular and easily accessible beaches such as North Bull Island or Brittas Bay. Lower population densities on the west coast, however, or the relative isolation of site or its agricultural management, means that some sites are less intensively impacted by recreational use.*

This extract identifies access paths and **recreational activities** as being very significant in affecting dune structure and functioning. Targeted approaches to reducing these impacts will be required and should focus on reducing the number of pathways, **restoring** existing pathways and recreational use areas **back to functional dune habitat** and providing awareness raising and alternative recreational areas for use. In addition to this there are likely to be long-term, low level effects on vegetation communities from recreational detritus including; dog, horse and human faecal matter and urine causing soil enrichment; food waste; compaction pressure from unauthorised day or overnight camping; the use of stoves, barbeques and fires damaging vegetation cover; littering/dumping and introduction of garden waste.

A key element in driving **behavioural change** at the site will be to establish regular, planned, biodiversity focussed public events, re-brand and re-interpret the site and establish a **presence of personnel** through staffing and/or volunteering.

One of the main threats to the site is the continued expansion of **non-native plant species** shading or outcompeting native species or otherwise changing the environmental conditions at the site all of which will affect habitat structure and function. The largest challenge to tackle is the widespread and often dense presence of Sea Buckthorn and to address this, two approaches will be required in future; firstly, preventing further spread by cutting/pulling or treating new established plants away from the main stands and secondly, removal and subsequent follow up removal of existing stands and re-growth. This is a major and intrusive management task and while methods of **Sea buckthorn removal** are well known<sup>13</sup>, they usually require high levels of repeated intervention, major habitat disruption and in public areas, in some cases, the need for significant consultation and communications work. New Zealand Flax and other garden species have also become established and will need tackling in a similar manner. An important aspect into the future is the need to work with neighbouring property owners to prevent the spread of such species from gardens.

An additional significant continued risk to fixed dune habitat is the gradual encroachment of tall grass and other tall vegetation, reducing species richness through succession, competition and shading. The site if left ungrazed will succeed to scrub in the medium term and plant diversity priority habitat extent and habitat condition will decline. Conservation grazing is widely regarded as an effective tool in managing succession and is effective for sand dune habitat conservation and botanical diversity (e.g. Tahmasebi Kohyani, 2008). In this case the availability of suitable stock for the right periods is unknown and testing the site conditions and arrangements for introducing grazing would be of benefit before a more widespread roll out across the site. A small pilot area, 1-3 ha may be appropriate to test effects and enable effects to be monitored on an iterative basis.

## Objective 1 - Recommended actions

### 1.1 Reducing visitor access tracks and pathways

<sup>13</sup> <https://www.asharrison.com.au/wp-content/uploads/2017/05/sea-buckthorn-in-uk.pdf>

To reduce dune and dune crest erosion to a sustainable level by targeted closure and restoration of excess path network and recreational over-use areas by signage, awareness, exclusion and habitat rehabilitation

#### **1.2 Rehabilitation of main bare ground/blow out/erosion areas**

To reduce the extent of bare ground by stabilising sand by fencing and marram planting

#### **1.3 Sward management on fixed dunes**

Re-introduction of grazing and selective mowing at key sites to reduce tall grass/scrub dominance of grey dunes

#### **1.4 Invasive species control and removal**

To remove invasive species (mainly Sea Buckthorn) from the site and begin to restore native dune vegetation

## **Management Objective 2 Enhanced information, awareness and engagement to reduce recreational pressure on sensitive habitats**

### **Rationale**

The importance of the site to the local community as a recreational and amenity area, both socially and economically is high. The site receives a very high visitor footfall and visitor/recreation pressure is recognised (see objective 1) as a major contributor to the conservation status of the site being overall unfavourable.

There is, therefore, a requirement to manage the visitor impacts on the site. The main impacts on the dune system arise in 2 main ways; the footfall and recreational activity eroding pathways and broad bare sand recreational areas either within the dune system or at the dune front/beach interface which may then lead to further sea or wind erosion risk and; the impact on vegetation communities from a range of recreational detritus including; dog and human faecal matter and urine causing enrichment, food waste, compaction pressure from unauthorised day or overnight camping, the use of stoves, barbeques and fires, littering/dumping, introduction of garden waste from nearby property.

There is a clear opportunity identified for enhanced recreational value of the site through better interpretation and communication of the biodiversity value of the site to visitors. Establishing the site as a well-known high biodiversity area will require prominent and clear interpretation and potentially branding of the site in an appropriate way. Changing the perception of the site from simply a beach with a convenient rough grass area behind in which “anything goes” to a beach with a sensitive wildlife area that needs care and respect will take a long time, but similar approaches have been adopted at other challenging sites with some success. Maintaining a “clean” high quality appearance to amenity areas such as car parks, toilets, signs, paths and buildings is critical in this along with appropriate branding. Serious consideration of a refreshed approach to the status of the site as a Community or local nature reserve, including its branding, management, facilities provision and people engagement would provide a platform which would be likely, over time to address many of the issues identified. The mission should be to deliver the primary aim of nature protection while

integrating sustainable recreation and education, both of which will assist in delivering enhanced nature protection through people engagement and awareness raising.

The recommendations below include suggest key actions which if all implemented could help to address a number of issues which include conflict between wildlife interest and people.

<b>Recommended actions</b>
<b>2.1 Re-branding of the site</b>  A unified identity and clear mission based on nature protection, sensitive access and education
<b>2.2 Enhanced signage and interpretation</b>  An interpretation plan should be an immediate action and a clear web presence once the site is re-established
<b>2.3 Visitor facilities</b>  Provision of a refreshed set of visitor facilities on existing amenity areas - including an education centre. Provides a clear focal point for the site that visitors recognise as being focussed on nature.
<b>2.4 Events programme</b>  Enhanced awareness of site importance to engender community and regular visitor support through events e.g. guided walks, beach cleans etc.
<b>2.5 Formal education programme</b>  delivery of outdoor learning to schools within 1 hour's drive
<b>2.6 Site steering group</b>  or similar body that includes engagement with key stakeholders and potential delivery partners in future management actions – enabling issues to be raised and tackled in a cooperative manner for best resolution.
<b>2.7 Volunteer development</b>  Provide opportunities for engagement with volunteers in practical management and in site monitoring to create a network of site “champions”

## **Management Objective 3      Enhance biodiversity and management information to ensure better understanding of priorities, impacts and progress**

### **Rationale**

The site is a SAC designated for its listed habitats but also supports a range of other wildlife including some protected mammals, a range of protected and red and amber listed birds of conservation concern. The diverse habitats of the dune system are likely to support a range of potentially scarce or rare invertebrates and at least one butterfly which occurs, the Small Blue, has a scarce and localised national distribution.

The presence of some listed rare plants has not been confirmed for some years and there appears to be an information gap in terms of wider wildlife interest. Though a detailed search of the National Biodiversity Data Centre dataset may provide some qualitative information, the site would benefit from a range of surveys and more frequent ad hoc data collection. A means of collation to establish more information on the biodiversity of the site for interpretive purposes, promotion and protection would be of value.

Collection of biodiversity records through formal survey or through bespoke events can be a useful means of community and volunteer engagement. These would be valuable in establishing a group of site “champions” with specialist knowledge and interest in the site.

In the absence of formal “nature reserve” style management structure and the lack of a full management plan, this document may be used (but will then require screening for appropriate assessment). Management recording should be established to ensure key actions are recorded in detail in order to track progress and examine effectiveness of management in future. Not least this will also establish an effective way to achieve a consenting system for NPWS

### **Recommended actions**

#### **3.1 Establish a management planning and recording system**

To ensure all management works undertaken are approved by NPWS (as statutory lead for SAC protection), establish a clear annual/periodic work plan and annual reporting which enables consenting and monitoring of works undertaken effectively. This should include mapping of works carried out.

#### **3.2 Biodiversity Survey and monitoring**

Complete a survey and monitoring plan for biodiversity interest and to monitor the effects of management works. This may utilise both volunteer and professional survey assistance where appropriate.

#### **3.3 Collation and Review of Biodiversity Information**

Carry out a further data search of NBDC and other data sources to establish a more comprehensive database of biodiversity records and review the level of interest and management implications of these taxa and species

### **3.4 Biodiversity Events Programme**

Development of an annual programme of public participation events on key biodiversity including a Heritage Week event to increase the awareness of the importance of the site. This could include local or national recorders events or BioBlitz style events for example.

## **Additional Management recommendations**

Establishment of core personnel & responsibilities:

Required roles for management of the site could include:

- Volunteer co-ordination
- Management works co-ordination
- Events planning and running
- Communications and interpretive planning and management
- Biodiversity monitoring co-ordination
- Establishment and operation of a steering group or stakeholder liaison group

Consideration of resourcing of the plan into the future will depend upon the level of intervention selected from the actions identified and the detailed prescriptions.

## 6.0 RECOMMENDED MANAGEMENT PRESCRIPTIONS

To address or contribute to the delivery of recommended actions one or more detailed prescriptions have been prepared for the highest priority works recommended for the first 3 years of action.

Costs are indicative estimates and for initial set up only – running costs are not described unless specified.

### **PRESCRIPTION 1**

#### **Dune Restoration and Erosion Prevention**

##### **Purpose**

To reduce extent of damage to and restore the condition of the specific Annex 1 habitats which have unfavourable conservation status; *Embryonic Dunes*, *Shifting Dunes* and *Fixed Dune* and the Annex 1 priority habitat Atlantic decalcified fixed dunes

Relevant to: Objective 1 (actions 1.1, 1.2), objective 2 (2.1, 2.7), Objective 3 (3.1)

##### **Target condition**

Long term: Favourable conservation status re-established, overall, for all relevant habitats (unless impacted by natural processes)

Short term: Restoration plan established by end 2019, works commenced by 2021

##### **Recommended approach**

The approach in this case should focus on the short term or immediate need to test and evaluate approaches which will inform longer term solutions at the site:

- a) Restoration plan produced - path realignment/selected path closure, signage of main paths to beach, path infrastructure to provide improved, easier, path routes to beach, erosion “scar” restoration prioritised.
- b) Trial erosion scar and path restoration – enclosure, sand thatching and marram planting at selected sites by 2020

##### **Description/Specification/diagrams/illustrations**

###### **a) Restoration Planning**

The scope of this plan does not identify the detailed areas requiring restoration and the siting and options selection and site-by-site application required on the ground to ensure success. A restoration plan should be produced by competent ecologists and access/recreation specialists in order to provide a programme of costed works with detailed methodologies appropriate to individual sites. The three key elements of the plan would be

- Survey and mapping all priority areas of damage including path networks

- Evaluate and plan revised access network
- Produce restoration programme including detailed mapping (by GPS) and prioritisation of identified restoration areas

### b) Trial erosion scar and path restoration

Establishment of one trial restoration exclosure area by 2020, taking in one area of scar or blow out and a series of paths. A recommended area is mapped below in figure 1.

Works would require fencing off an erosion scar and area of paths and trialling both planting of marram across all bare ground and trial of a section of dune thatching in one area. The work would additionally require associated interpretation to inform visitors. A modest program of monitoring of bare ground extent and fixed-point photography would be required to assess effectiveness.

- Approx. **400metres fencing** at or close to stock proof standard – prevention and discouragement of people access to whole area
- Approx 0.15 Ha. **Dune thatching** (using old Christmas trees or similar woody material) for one main erosion scar (northern area) and c. 50% of pathways – this should follow typical methods such as those summarised in case studies by “RISC-KIT”<sup>14</sup>
- **Marram planting** (or other appropriate species) over c. 0.25 Ha. of scar and pathways within the zone
- **Interpretive signage** on fencing – temporary panels/signage – secure against wind/weather effects for at least 2 years (or replaceable)
- **Monitoring** including fixed point photography at trial start and monitoring 6 monthly intervals thereafter for 3 years.

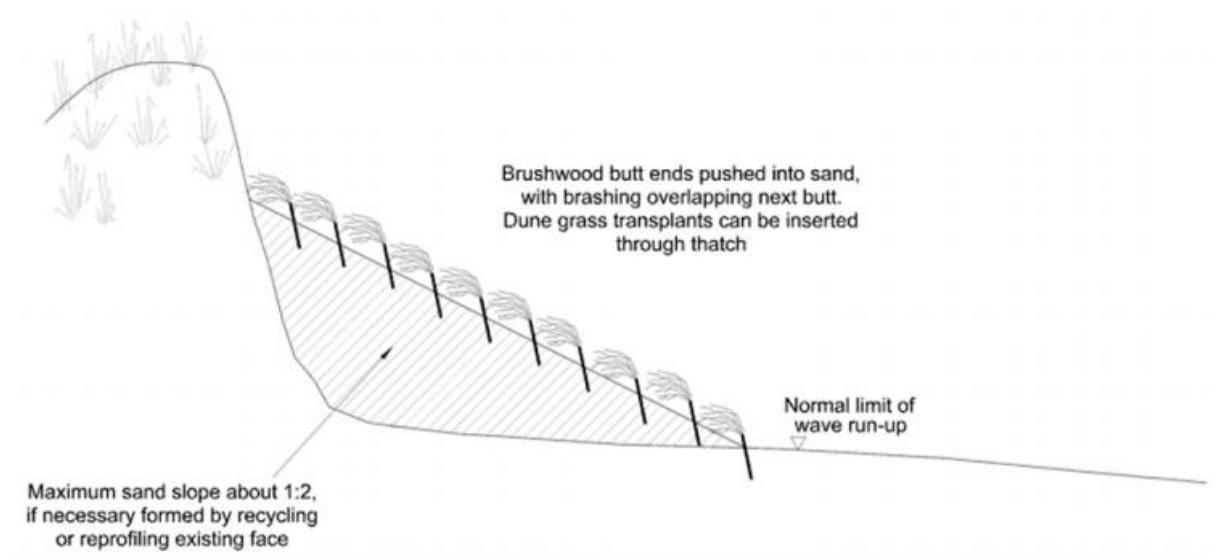


Figure 1 Dune thatching diagram

<sup>14</sup> <https://www.coastal-management.eu/dune-thatching>

## Estimated resources required and approximate cost

### a) Restoration Plan

Element	No.	Total cost
Path network planning (man/days)	5 days	2,500
Restoration plan production	4 days	2,000
Consultant ecologist - erosion/damage survey	5 days	2,500
<b>TOTAL</b>		<b>€ 7,000</b>

### b) Trial erosion scar and path restoration

Element	No.	Total cost
<b>Fencing</b>	400metres	4,000
<b>Dune thatching</b> (assume volunteer time, professional coordination, materials free + transport costs)	0.15 Ha	1500
<b>Marram planting</b> (purchase of materials and use of volunteer time for planting and professional time for co-ordination)	0.25ha/4 person/days	1,000
<b>Interpretive signage</b>	4 small panels & fixings	800
<b>Monitoring</b> (internal staff or volunteer time)		0
<b>TOTAL</b>		<b>€7,300</b>

## Additional notes/considerations

Costs outlined above include use of volunteers and no costs are assigned to volunteers but professional co-ordination/management of the tasks and work parties may be required.

Consider Christmas tree recycling as source of material for dune thatching – c. 500 small Christmas trees would likely provide enough thatch material. Preparation of the material would be required.

## Maps:



Figure 2 Indicative area for trial dune restoration

## PRESCRIPTION 2

# Dune sward management

### Purpose

To restore the condition of the specific Annex 1 priority habitat *Fixed Dunes*, which has unfavourable conservation status caused by a lack of grazing or other complimentary vegetation control;

Relevant to: Objective 1 (actions 1.3, 1.4), objective 2 (2.3, 2.7), Objective 3 (3.1, 3.2, 3.3)

### Target condition

Long term: Favourable conservation status re-established for Annex 1 priority habitat *Fixed Dunes*

Short term: sward management pilot area established by end 2020

### Recommended approach

The approach in this case should focus on the short term or immediate need to test and evaluate approaches which will inform longer term solutions and wider roll out at the site:

- a) The identification of an area of fixed dunes and the re-establishment of a conservation grazing regime using a combination of suitable livestock with suitable fenced enclosure.
- b) The establishment of two mowing plots to compare against grazing
- c) Carry out basic monitoring to inform management

### Description/Specification/diagrams/illustrations

#### a) Establishment of conservation grazing regime

Establishment of a fenced grazing area of c. 2 Ha, to restore sward height to enhance plant community diversity and restore favourable condition, determine effectiveness of grazing, test and resolve any issues relating to suitable livestock supply and livestock management.

Location of this area is indicated on Figure 3 below. This area may be adapted to suit exact conditions on the ground.

**Note:** Management of conservation grazing is an iterative and inexact process and requires the input of both professional habitat management advice and liaison with a cooperative grazing tenant. The specification below will require significant negotiation and adaptation subject to the grazing stock and grazier available.

- Fence specification - Approx. 650m length "typical" stock fence (1.4-1.6m height, "Rylock"-type stock netting with single top and bottom strands of plain wire and posts at 2 metre centres average – additional adaptations where required for stability in sandy substrate). Two gates placed at convenient access points. Strainer posts and adaptations for sandy soils at all changes of direction. Uneven ground may require additional patching or blockages at low points. *Potentially Graziers may be satisfied with a less permanent approach and the use of temporary electric fencing may be sufficient as an alternative which may reduce costs.*

- Livestock type, density and timing - Recommend livestock via a short licence or grazing let. Let on a less than annual basis. The proposed 2 ha unit may support 2 Livestock Units<sup>15</sup> (LSU) equivalents (say 2 cattle or 3 small breed cattle) for a full year subject to existing fodder available. A suitable grazing regime, taking the shorter grazing period into account and the initial need for higher numbers to “knock back” existing older vegetation, would be 5-6 LSU for an initial 1 month (Aug/Sep) with reduction to 3-4 LSU to April. A grazing break in May-July and then repeat with lower initial numbers from Aug (e.g. 3-4 LSU subject to sward assessment) in year 2.

Livestock should be introduced carefully in initial phase and close surveillance of numbers and impact kept and then adjusted on an iterative basis.

**b) Establishment of trial mowing plots**

Identification of two mowing plots totalling approximately 0.5ha in roughly equal sizes within the rank sward-dominated fixed dune habitat compartments to test response to mowing of vegetation in order to determine comparison in relation to grazing. Plots should be plotted on site using GPS and marked on site during mowing (markers can be removed thereafter).

Mowing should be carried out by strimmer (or bar mower or similar where access allows) in both areas in the period Sep 1- October 15. Sward cut back to c. 5-10 cm on average and cut material removed from site.

Indicative locations are indicated on Figure 2 below. These are identified se potentially of use for comparison to grazed areas and to provide ready access for mowing machinery/personnel.

**c) Monitoring of grazing and mowing trials**

Prior to mowing and the introduction of grazing, a baseline monitoring regime should be established and should consist of recording habitat/plant community characteristics representative of each management area.

- 2x2m quadrat placed at 4 random/representative locations within each management unit
- % species cover or Domin<sup>16</sup> scale and complete species list should be recorded (to allow comparison to SDM information)
- Survey timing – May- July (ideally June)
- Mean vegetation height recorded within each management unit – 30 measurements at random locations across the whole of the plot.
- Fixed point photography – establish 1 or more fixed points and take an image of the management area on the survey day

The data recorded by the monitoring will require analysis at a future point but should form the basis of reporting to both NPWS and to a stakeholder management group.

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<sup>15</sup> The livestock unit, abbreviated as LSU (or sometimes as LU), is a reference unit which facilitates the aggregation of livestock from various species and age as per convention, via the use of specific coefficients established initially on the basis of the nutritional or feed requirement of each type of animal – see: [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Livestock\\_unit\\_\(LSU\)](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Livestock_unit_(LSU))

<sup>16</sup> Domin scale as described by e.g. NVC users Handbook [http://jncc.defra.gov.uk/pdf/pub06\\_NVCusershandbook2006.pdf](http://jncc.defra.gov.uk/pdf/pub06_NVCusershandbook2006.pdf)

## Estimated resources required and approximate cost

### a) Grazing trials

This will require c. 650m of fencing installed by e.g. a fencing contractor. Grazing animals will require a source of water. The grazing let set up may require significant staff time in negotiation and a small legal cost to set up.

Element	No.	Total cost
Fencing including gate	c. 650m	€7500
water supply (1 trough and bowser – maintenance by grazing tenant)		€1000
Fence line interpretive/informative signage	2 panels & cost of installation	€300
<b>TOTAL</b>		<b>€8800</b>

### b) Establishment of trial mowing plots

Contractor or in-house staff time required out carry out mowing. Cost based on approximate daily rate for contractor including mowing and collection and removal of cuttings. This will be dependent upon access and terrain – priced on basis of cutting and collection by hand.

Element	No.	Total cost
Contract mowing – 0.5 ha	5 man/days	€1,250
<b>TOTAL</b>		<b>€ 1,250</b>

### c) Monitoring of grazing and mowing trials

Ecologist to carry out set up, initial survey and write up – c. 1.5 days set up and survey and 1 day write up. Skilled volunteer may reduce this cost.

Element	No.	Total cost
Ecologist botanical survey	2.5	€1,000
<b>TOTAL</b>		<b>€1,000</b>

MAPS:



Figure 3 Indicative areas for dune sward management

## **PRESCRIPTION 3**

### **Invasive species removal and control**

#### **Purpose**

To restore the condition of the specific Annex 1 priority habitat *Fixed Dunes*, which has unfavourable conservation status due to Sea Buckthorn and other invasive species encroachment

Relevant to: Objective 1 (actions 1.4), objective 2 (2.7), Objective 3 (3.1 and 3.2)

#### **Target condition**

Short term – costed and designed invasives removal plan in place to ensure targeted action has been identified

Long term – eradication of Sea Buckthorn from the site. This is not considered in full within the scope of this report but would be dependent upon the findings of the report described above.

#### **Recommended Management Actions**

Note that on initial investigation there may be in excess of 1.5Ha of mature scrub and further isolated pockets and younger encroaching low scrub. The approach required to eradicate this will likely include significant heavy machinery operations and major habitat disruption which will require substantial planning and consenting in collaboration with NPWS and others.

Similar works for comparable sites has extended to capital project costs in excess of €50,000<sup>17</sup> and may require multi-year interventions thereafter to treat re-growth.

Other invasive species including New Zealand Flax are also troublesome to remove and eradicate and may add to the costs further.

In this plan it is recommended to carry out the planning aspects in order to provide the correct approaches both ecologically and in terms of cost

##### **a) Project plan**

The scale of the issue of Sea Buckthorn encroachment is known to be large but its full extent and distribution across the site has not been fully mapped. In addition, there are known to be other non-native Invasive species on site and the threat and extent from these should also be considered. In order to address the problem in full a plan involving 2 main elements should be produced:

- Survey and mapping of Sea Buckthorn and other invasives to define scale and scope
- Assessment of impact and future risk and methodological options for treatment/removal

This will require ecologist time to survey, map and investigate management options subject to the scale of the problem encountered.

#### **Estimated resources required and approximate cost**

##### **a) Project plan**

<sup>17</sup> <https://www.nationaltrust.org.uk/portstewart-strand/features/dune-conservation-at-portstewart-strand>

Costs for project planning below are based on professional ecologist survey, GIS mapping, report production and consultation – elements of this may be reduced.

Element	No.	Total cost
Invasive species survey and mapping	3 days	1,200
Assessment, options appraisal, report production, consultation	8 days	4,000
<b>TOTAL</b>		<b>€3200</b>

## ***PRESCRIPTION 4***

### **Events and Awareness Programme**

#### **Purpose**

Establishment of a programme of events and community engagement to enhance awareness of the biodiversity value of the site and involve community in the site's future. Enhanced interpretation of biodiversity of the site and of management interventions will assist in developing awareness of the importance among a wider audience.

This would act as a first step in re-branding the site as of high nature importance and encouraging more sympathetic behaviour from users.

#### **Target condition**

Short term – events programme established and run, interpretive plan produced

Long term – behavioural change and enhanced condition of site due to interaction of awareness with enhanced site management.

#### **Recommended Management Actions**

##### **a) Establish community engagement approach through consultation and formation of stakeholder group**

Consultation with all neighbours and relevant other stakeholders (NPWS, conservation groups, Garda Síochána etc) in setting up a liaison or advisory group which will address management issues and advise on approaches. Meetings on at least an annual basis.

##### **b) Establish events programme – guided walks, exploration events etc**

An events programme run by a combination of partner groups and professional contractors to deliver well publicised and well attended biodiversity focussed events

An example events programme which could deliver enhanced awareness among key groups is illustrated in appendix 5

##### **c) Production of an Interpretive Plan**

A plan produced which reviews interpretive and signage needs for the site in detail and makes recommendation on:

- Directional/instructive signage style and locations
- Interpretive themes and signage design – taking account of need for minimal maintenance, robustness and cost
- Site Branding design

This element should only proceed after a period of events and awareness raising in order to utilise information gained from these activities to inform the interpretive process

### **Estimated resources required and approximate cost**

Key resource to achieve this will be staff time to co-ordinate the running of events and to act as facilitator of a stakeholder group. The role with that responsibility is not identified but costing based on a nominal €300/day are included.

a) Establish community engagement approach through consultation and formation of stakeholder group

<b>Element</b>	<b>No.</b>	<b>Total cost</b>
Stakeholder group formation/consultation	10d	€3000
Stakeholder meetings – meeting costs (meeting rooms, catering etc)	2	500
<b>TOTAL</b>		<b>€ 3,500</b>

b) Establish events programme – guided walks, exploration events etc

<b>Element</b>	<b>No.</b>	<b>Total cost</b>
Events resources– flags, banners etc. Budget for external operators to run events	10d	€5,000
<b>TOTAL</b>		<b>€ 5,000</b>

c) Production of an interpretive plan

<b>Element</b>	<b>No.</b>	<b>Total cost</b>
Plan production & interpretive design		€10,000
<b>TOTAL</b>		<b>€ 10,000</b>

## 7.0 ADDITIONAL SUPPORT REQUIREMENTS AND CONSIDERATIONS

The following aspects are considered potentially important in delivering enhanced management of the site:

- The delivery of the prescribed activities for this site will require a central role within Wicklow County Council to lead, or the outsourcing of a lead for management delivery.
- Delivery on the ground in part at least, may be feasible within the role of the technical and engineering outdoor staff team which operate over the site predominantly in the summer months. Subject to resources and work programme constraints. This would include the liaison, event planning, contract management of practical works and other activities, funding development and budgetary control.
- Typically, for a programme of this nature to be delivered in a nature reserve-style context, there are normally part-time or full-time staff that lead on equivalent these activities. It would be important for successful delivery of the management works identified to identify or recruit key personnel in this regard.
- The eventual role of the community in managing this site could include a reserve management group to lead on and carry out works on the site. This may replace much of the role of council staff and may enable more diverse funding arrangements for site management to be put in place.

## 8.0 INDICATIVE WORK SCHEDULE

The schedule below suggest a work programme which would allow the achievement of all elements within 3 years and with budget distribution approximately evenly across the 3 year programme.

*Table 3 Indicative work programme with costs*

Prescription	Task	Element	Year 1	Year 2	Year 3
1. Dune Restoration and Erosion Prevention	a) Restoration Plan	Path network planning (man/days)	2,500		
		Restoration plan production	2,000		
		Consultant ecologist - erosion/damage survey	2,500		
	b) Trial erosion scar and path restoration	Fencing		4,000	
		Dune thatching (assume volunteer time, professional coordination, materials free + transport costs)		1,500	
		Marram planting (purchase of materials and use of volunteer time for planting and professional time for co-ordination)		1,000	
		Interpretive signage		800	
		Monitoring (internal staff or volunteer time)		-	
	a) Grazing trials	Fencing including gate		7,500	
		water supply (1 trough and bowser – maintenance by grazing tenant)		1,000	
		Fence line interpretive/informative signage		300	
		Contract mowing – 0.5 ha		1,250	
2. Dune sward management	c) Monitoring of grazing and mowing trials	Ecologist botanical survey	1,000		

Prescription	Task	Element	Year 1	Year 2	Year 3
3. Invasive species removal and control	a) Project plan	Invasive species survey and mapping	1,200		
		Assessment, options appraisal, report production, consultation		4,000	
Events and Awareness Programme	a) Establish community engagement approach through consultation and formation of stakeholder group	Stakeholder group formation/consultation	3,000		
		Stakeholder meetings – meeting costs (meeting rooms, catering etc)	500		
	b) Establish events programme – guided walks, exploration events etc	Events resources– flags, banners etc. Budget for external operators to run events	2,000	1,000	1,000
	c) Production of an interpretive plan	Plan production & interpretive design			10,000
			14,700	22,350	11,000

# Appendices

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## Appendix 1 Site Management Boundary



## Appendix 2 SAC Site Synopsis



## SITE SYNOPSIS

### Site Name: Buckroney-Brittias Dunes and Fen SAC

#### Site Code: 000729

Buckroney-Brittias Dunes and Fen is a complex of coastal habitats located about 10 km south of Wicklow town. It comprises two main sand dune systems, Brittias Bay and Buckroney Dunes, connected on the coast by the rocky headland of Mizen Head. The dunes have cut off the outflow of a small river at Mizen Head and a fen, Buckroney Fen, has developed. A further small sand dune system occurs south of Pennycomequick Bridge.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [1210] Annual Vegetation of Drift Lines
- [1220] Perennial Vegetation of Stony Banks
- [1410] Mediterranean Salt Meadows
- [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
- [7230] Alkaline Fens

Along much of the higher parts of the beach at this site, typical annual strandline vegetation occurs. Species such as Sea Rocket (*Cakile maritima*), Prickly Saltwort (*Salsola kali*) and Spear-leaved Orache (*Atriplex prostrata*) are frequent in this zone, with the scarcer Yellow Horned-poppy (*Glaucium flavum*) present in places.

A shingle ridge occurs along the Buckroney dune system. The amount of exposed shingle is low, but it is likely that shingle underlies much of the sandy areas also. The vegetation on the shingle is similar in composition to that which occurs as part of the drift line and embryonic dune habitats. Sea Sandwort (*Honkenya peploides*) is characteristic, and other species include Sand Couch (*Elymus farctus*), Sand Sedge (*Carex arenaria*), Sea Rocket and Yellow Horned-Poppy.

An area of saline vegetation which conforms to 'Mediterranean salt meadows' occurs in the Buckroney dune system south of the inlet stream to the fen, and possibly in small areas elsewhere within the site. It is typically dominated by rushes (*Juncus* spp.), and of note is the presence of Sharp Rush (*J. acutus*). Sea Club-rush (*Scirpus*

*maritimus*) also occurs. The area is inundated by the tide only occasionally via the narrow inlet leading to Buckroney Fen.

Embryonic dune development occurs at the southern part of Brittas and more widely at Buckroney and Pennycomequick. Typical species are couch grasses (*Elymus* sp.), Sand Sedge and Sea Sandwort. The main dune ridges are dominated by Marram (*Ammophila arenaria*), with herbaceous species such Sea Spurge (*Euphorbia paralias*), Sea-holly (*Eryngium maritimum*) and Common Restharrow (*Ononis repens*) occurring throughout. The main dune ridges are well developed, reaching heights of 10 m at Brittas. The northern end of the Brittas system has fine examples of parabolic dunes.

Stable fixed dunes are well developed at Brittas and Buckroney. Marram is less frequent in these areas and is replaced by Red Fescue (*Festuca rubra*) as the most common grass species. A rich flora occurs, especially in the more open areas.

Common species include Pyramidal Orchid (*Anacamptis pyramidalis*), Common Milkwort (*Polygala vulgaris*), Wild Pansy (*Viola tricolor* subsp. *curtisii*), Carline Thistle (*Carlina vulgaris*), Biting Stonecrop (*Sedum acre*), Wild Thyme (*Thymus praecox*) and Common Bird's-foot-trefoil (*Lotus corniculatus*). The mature areas of fixed dune also contain Burnet Rose (*Rosa pimpinellifolia*), Bracken (*Pteridium aquilinum*), Wood Sage (*Teucrium scordonia*) and Common Sorrel (*Rumex acetosa*). Mosses such as *Tortula ruralis* subsp. *ruraliformis*, *Rhytidadelphus triquetris*, and *Homalothecium lutescens* are frequent, along with lichens (*Cladonia* spp., *Peltigera canina*).

This is one of the few Irish east coast sites to possess good examples of wet dune slacks and dunes with Creeping Willow (*Salix repens*). These areas of the dunes have a rich and varied flora, including species such as Creeping Willow, Water Mint (*Mentha aquatica*), Silverweed (*Potentilla anserina*), Meadowsweet (*Filipendula ulmaria*) and Meadow Thistle (*Cirsium dissectum*). The slacks are notably rich in rushes and sedges. Of particular interest is the presence of Sharp Rush (*Juncus acutus*), a scarce species in eastern Ireland and one that is indicative of a saline influence.

The site is also notable for the presence, at the back of the dunes, of areas of decalcified dune heath, a rare habitat type, and one which is listed with priority status in the E.U. Habitats Directive. Heath species present include Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and Gorse (*Ulex europaeus*).

Buckroney Fen lies west of Mizen Head. It is backed to the west by a dense swamp of Common Reed (*Phragmites australis*). The fen is dominated by Tussock Sedge (*Carex paniculata*), with Water Mint, Purple Loosestrife (*Lythrum salicaria*), Marsh Pennywort (*Hydrocotyle vulgaris*), Greater Bird's-foot-trefoil (*Lotus uliginosus*), Water Horsetail (*Equisetum fluviatile*), small sedges (*Carex* spp.) and other flowering plants. An extensive stand of Blunt-flowered Rush (*Juncus subnodulosus*) is of note. Throughout this area the rare Marsh Fern (*Thelypteris palustris*) is frequent. There are also extensive areas of Rusty Willow (*Salix cinerea* subsp. *oleifolia*) scrub.

This site contains two rare plant species protected under the Flora (Protection) Order, 1999: Wild Asparagus (*Asparagus officinalis* subsp. *prostratus*), in its most northerly

Irish station, and Meadow Saxifrage (*Saxifraga granulata*). Other rare species which occur within the site include Green-flowered Helleborine (*Epipactis phyllanthes*), Bird's-foot (*Ornithopus perpusillus*) and Spring Vetch (*Vicia lathyroides*). All of these are Red Data Book species. The rare sedge hybrid *Carex riparia* x *C. vesicaria* (*Carex* x *csomadensis*) is only known from Mizen Head.

The invertebrate fauna of Buckroney fen has been investigated and some notable species have been recorded, including the beetle *Eurynebria complanata* and the following flies: *Machimus cowini*, *Anasimyia lunulata*, *Parhelophilus consimilis* and *Lejogaster splendia*.

Little Tern, a species listed on Annex I of the E.U. Birds Directive, has bred or attempted to breed at Buckroney strand in recent years. In 1992 between 7 and 10 pairs were present and in 1993 up to 8 pairs. Teal are regular in winter (119), as are Curlew (46), Lapwing (515) and Snipe (87). All figures are average peaks for 1994/95 - 1995/96.

The dune systems and beaches are subject to high amenity usage from day-trippers and several areas around the site have been developed as caravan parks, car parks and golf courses. The marginal areas of the fen have been reclaimed, especially at the south end, though these areas still flood in winter and attract waterfowl.

This site is important as an extensive sand dune/fen system with well developed plant communities. Several coastal habitats listed on the E.U. Habitats Directive, including two priority habitats - fixed dune and decalcified dune heath - are present. The area contains two legally protected plants, as well as a number of other rare or scarce plant species. The site provides habitat for some rare species of invertebrate and for the vulnerable Little Tern. A rich flora and fauna has persisted on this site despite extensive amenity use and adjacent farming. However, future land use practices will need to be managed to ensure the continued survival of this unique mosaic of coastal habitats.

### Appendix 3 Evaluation matrix

#### DRAFT GENERAL EVALUATION MATRIX (PER BIOGEOGRAPHIC REGION) FOR ASSESSING THE CONSERVATION STATUS OF A HABITAT TYPE (as used in Ryle et al, 2009)

Parameter	Conservation status			
	Favourable ('green')	Unfavourable - Inadequate ('amber')	Unfavourable - Bad ('red')	Unknown (insufficient information to make an assessment)
Range	Stable (loss and expansion in balance) AND not smaller than the 'favourable reference range'	Small decrease, less than 6% in reporting period (6 years) OR Stable/Small increase but still below 'favourable reference range'	Considerable decrease, more than 6% in a reporting period (6 years)	No or insufficient reliable information available
Area covered by habitat type within range	Stable (loss and expansion in balance) or increasing AND not smaller than the 'favourable reference area' AND without significant changes in distribution pattern within range	Stable or small decrease in surface area less than 6% in reporting period (6 years) OR With some losses in distribution pattern within range OR Stable/Small increase but still below 'favourable reference area'	Considerable decrease in surface area more than 6% in reporting period (6 years) OR With major changes in distribution pattern within range	No or insufficient reliable information available
Conservation status of the typical species	All typical species in favourable conservation status	Majority of the typical species in favourable conservation status.	Majority of the typical species in unfavourable conservation status.	No or insufficient reliable information available
Specific structures and functions	Structures and functions in good condition in all area and no significant deterioration in NATURA 2000 sites.	Up to 25 % of the area is unfavourable as regards its specific structures and functions, e.g. by discontinuation of former management, or is under pressure from significant adverse influences, e.g. critical loads of pollution exceeded.	More than 25% of the area is unfavourable as regards its specific structures and functions, e.g. by discontinuation of former management, or is under pressure from significant adverse influences, e.g. critical loads of pollution exceeded.	No or insufficient reliable information available
Future prospects	The habitat is not under significant impact from threats. Excellent / good prospects for its future: long-term viability assured.	The habitat is under moderate impact from threats, slowly declining. Poor prospects for its future: long-term viability not assured.	The habitat is under severe impact from threats, rapidly declining. Bad prospects for its future: long-term viability not assured.	No or insufficient reliable information available
Overall assessment of CS	All 'green' OR four 'green' and one 'unknown'	Any combination of 'green' and 'amber' but no 'red' and any one 'unknown'	One or more 'red' with any combination of 'green' and 'amber' and more than one 'unknown'	Three or more 'unknown'

Reference: EU Doc. SWG 04-03/03-rev.3 (Annex E)

## Appendix 4 Generic habitat assessment approach as noted by Delany *et al* (2013)

### as noted by Delany *et al* (2013)

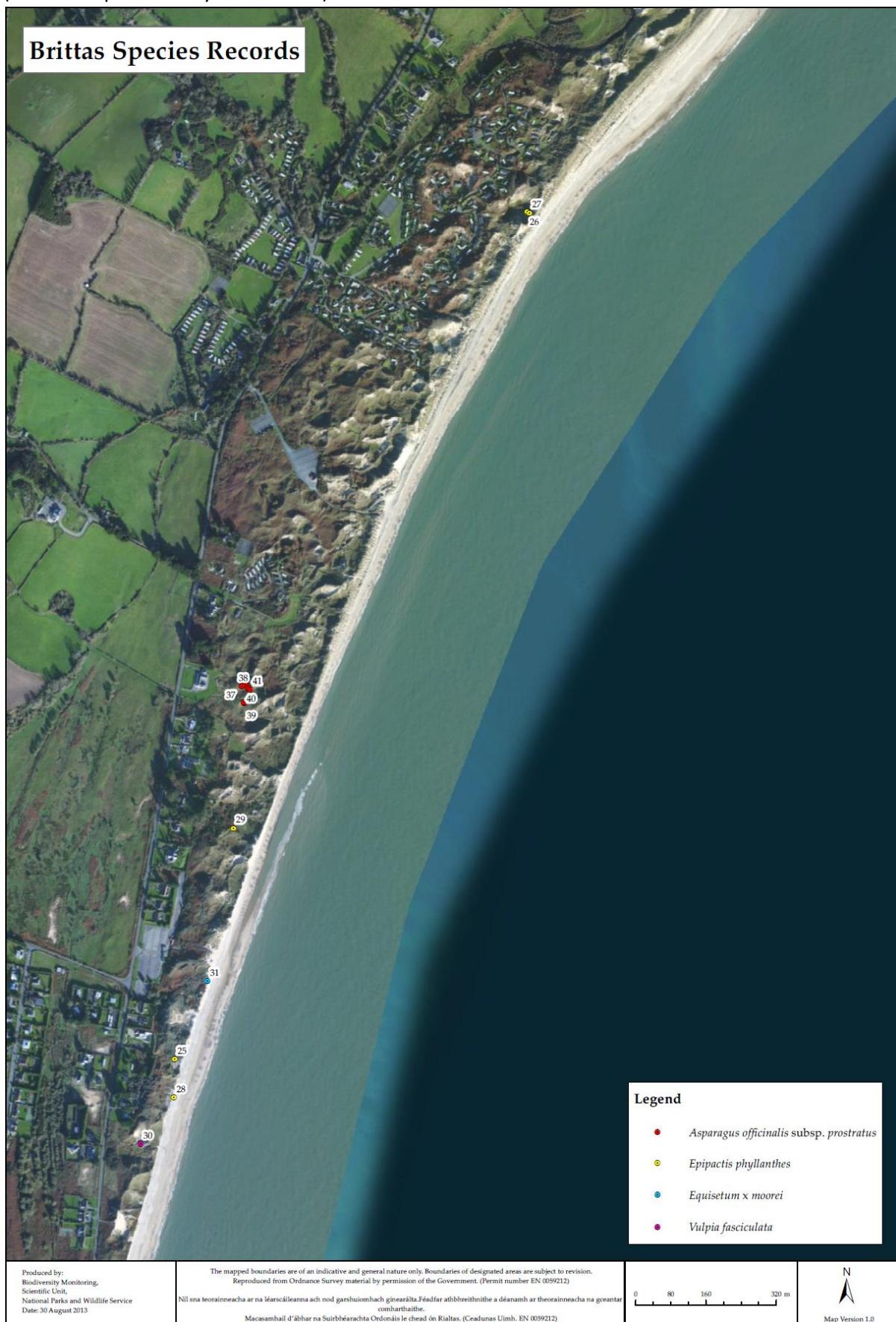
Table 1.1: Summary matrix of the parameters and conditions required to assess the conservation status of habitats. Modified from Evans and Arvela (2011).

Parameter	Green	Amber	Red
Range	Stable/increasing	>0% - <1% decline/year	≥1% decline in range/year over specified period
Area	Stable/increasing	>0% - <1% decline/year	≥1% decline in area/year over specified period
Structure and Functions	Habitat structure in good condition and functioning normally; typical species present	Any combination other than those described under green or red	>25% of habitat has structure, function or species composition in unfavourable condition
Future Prospects	Excellent, no significant impact from threats expected. Long-term viability assured	Between green and red	Bad, severe impact from threats expected; habitat expected to decline or disappear
Overall assessment of conservation status	All green	One or more amber but no red	One or more red

## Appendix 5 Example biodiversity/community events program (Apr – Jul)

When	Event & focus	Location	Target audience	Leader	Charge?
Mid-April	<p>Spring Bird migration</p> <p>Guided walk of 1 -2 hours locating first migrant bird arrivals – expecting to see Swallow, Sand Martin, Chiffchaff, Blackcap, willow warbler, wheatear, Sandwich Tern etc</p> <p>Agree routes and paths with leader to ensure messaging on access and erosion is clear</p>	North Beach car park start – walk, beach to river mouth and return. Explore good paths into dune areas from car park	Community and regular visitors	BirdWatch Ireland	Donation to BWI?
May bank holiday	<p>Beach clean and BBQ</p> <p>Mobilise volunteers to carry out extensive rubbish clear up on beach and dunes – recording marine plastic pollution information and “thanks you” barbecue</p> <p>High profile event to other beach users about litter</p>	South Beach CP	Volunteers for future involvement and high-profile activity in view of beach users	Coastwatch?	Donation
June Bank Holiday	<p>Dogs at the beach</p> <p>Promotional information day – through survey of dog walkers – on dog fouling. Survey can gain information on dog walking locations and behaviour and promotional message of caring for the beach and dunes relayed to large bank holiday audience.</p> <p>Potential to involve Dogs Trust through their campaigns team</p>	All car parks	Dog walkers, wider site users	Dogs Trust?	N/A
June	<p>Blooming Dune</p> <p>Community botany discovery walk through dune areas.</p> <p>Messaging around conservation work plans, care in using agreed pathways only and community upskilling in recognising plants and community engagement in providing eyes and ears on the ground</p>	North Beach Car park & dune areas	Community and regular visitors – incidental visitors present	NPWS/botanist	?
July	<p>Beach clean and BBQ</p> <p>Mobilise volunteers to carry out extensive rubbish clear up on beach and dunes – recording marine plastic pollution information and “thanks you” barbecue</p> <p>High profile event to other beach users about litter</p>	North Beach Car park	Volunteers for future involvement and high-profile activity in view of beach users	?	Donation

Appendix 6 Rare plant locations  
(from Rare plant survey NPWS 2013)



## Appendix 7 rare plant records

(courtesy NPWS)

Taxon Latin Name	Sample Date	Sample Spatial Reference	Sample Location	Sample Recorders	Obs Abundances (LC)	Sample Comment	Obs (Occurrence) Comment
<i>Epipactis phyllanthes</i>	03/08/2009	T3045082226	Brittas Bay	Faith Wilson	Present Count of Plant	Curtis, T.G.F. & Wilson, F. (2010) Irish Naturalists' Journal 31 (2) p.145	Found in three dune slacks in and around grid ref T3045082226
<i>Epipactis phyllanthes</i>	06/11/2009	T3125284152	Brittas Bay	Tom Curtis;Faith Wilson	Present Count of Plant	Curtis, T.G.F. & Wilson, F. (2010) Irish Naturalists' Journal 31 (2) p.145	Refound. Not seen here since the 1950s.
<i>Epipactis phyllanthes</i>	16/07/2013	T3125784150	Brittas Bay, Co. Wicklow	Wyse Jackson, M.B.	3 Plants		
<i>Epipactis phyllanthes</i>	03/08/2009	T3044882139	Brittas Bay, Co. Wicklow	Faith Wilson	3 plants	Wilson, F. pers. comm. E-mail 17 July 2013	Near the seaward side of a dune slack to the south of the southern car park with lots of Hippophae at rear
<i>Epipactis phyllanthes</i>	03/08/2009	T3058382751	Brittas Bay, Co. Wicklow	Faith Wilson	5 plants	Wilson, F. pers. comm. E-mail 17 July 2013	Dune slack to the north of the southern car park access point
<i>Vulpia fasciculata</i>	03/08/2009	T3037282034	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Equisetum x moorei</i>	03/08/2009	T3052482404	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3064683080	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	Population beneath large Monterey Cypress and extending south along small ridge. Approximately 50 plants recorded in the population, 2 in fruit, which were over the fence in the small dune hollow to the east
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3061783074	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3061683068	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3061983068	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3060983078	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3060583076	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3060283074	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3060883035	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3060783037	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	
<i>Asparagus officinalis</i> subsp. <i>prostratus</i>	03/08/2009	T3062183066	Brittas Bay, Co. Wicklow	Faith Wilson	Present	Wilson, F. pers. comm. E-mail 17 July 2013	

