



# Managing the Impact of Dogs and Dog Walkers on Biodiversity

North Bull Island Nature Reserve, Dublin

May 2017

## Draft Report

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## Field Investigations and Data

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by EcoNorth Ltd. for inaccuracies in the data supplied by any other party.

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## Non-Technical Summary

1. This project aimed to investigate and analyse the issues and opportunities around the management of dog walking at Bull Island Nature Reserve.
2. The documented high level of dog walking off-lead is infringing byelaws there is a range of evidence to indicate negative impacts on designated site and other important wildlife features.
3. Wildlife stakeholders recognise the issue and urge change to the level and approach to management to see wildlife populations protected and enhanced
4. Dog walker awareness of the status of the site and their potential impact on wildlife is relatively low. There is an opportunity to raise better awareness to assist with improving dog walker behaviour
5. Patterns of site usage by dog walkers provide an opportunity to balance provision of areas of amenity value and zoned areas of non-access to protect the most sensitive wildlife interest
6. Recommendations in the report are:
  - a. **Creation of a new reserve development plan** - re-branding the site, provision of enhanced visitor facilities, establishing clear management prescriptions and creation of a nature reserve steering group
  - b. **Establishment of zones of controlled public access** on the nature reserve in areas of high sensitivity/critical importance for wildlife;
  - c. **Establishment of enhanced wildlife viewing with interpretation** through events, staffing, signage and media including wildlife viewpoints, a regular wildlife events programme enhanced site personnel presence, development of opportunities for cameras within no access zones to view sensitive wildlife (e.g. seals), development of a volunteer network
  - d. **Provision of dog and dog walker specific facilities** and rules in low impact areas and related guidance including a zoned approach to *dogs on leads* rules, increased staffing resource for dog wardening, dog walker liaison volunteers, provision of safe, off-lead, exercise area
  - e. **Enhanced guidance, enforcement & policing** including Increase staffing resource for visitor engagement, enhanced warning and advisory signage to assist with enforcement, a staff base and specialised equipment provision and a volunteer programme established
7. Monitoring activities are recommended to ensure management can adapt and change subject to identified need or emerging issues
8. Scale of resource needs to achieve the recommended actions are outlined.



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## 1. Introduction

This report was commissioned by Dublin City Council as part of a wider project to look at the impacts of and management options for, recreation, in particular dog walking, on the wildlife at North Bull Island, Dublin.

The overall aim of the project is to determine a recommended approach to management of the island which maintains dog walking in combination with other recreational activities but provides effective management to enable the protection and enhancement of the wildlife value of the site, in particular the use of the site by Common and Grey Seals and the numbers and distribution of other designated wildlife features such as the assemblage of wintering waterbirds.

### 1.1 Background

North Bull Island is frequented by many recreational users on a daily basis. There are two golf courses located on the island and the dunes and beaches are visited by a range of users including walkers with dogs. The site is also used for training activities by the Irish Army & FCA, Irish Whale and Dolphin Group (beached whales practice/exercises) and also for water safety training. The high nature conservation value of the site also attracts nature-lovers including bird-watchers. Several nature conservation groups such as Birdwatch Ireland, Irish Wildlife Trust and Dublin Naturalist's Field Club regularly run field-trips to the island.

Disturbance to wildlife is perceived as an issue on the island, in particular disturbance to important bird species and to breeding seals is regularly reported to or noted by Dublin City Council or NPWS staff. While the exact nature and level of impact from disturbance is unknown there is a requirement to ensure that recreational impacts do not compromise the site's special wildlife interest.

A key issue on the site is in relation to high frequency of unleashed dogs on the site, despite bye-laws prohibiting this, and instances of disturbance to wildlife. A study carried out by DCC in 2015 (Jenkinson, 2015) found that there is a lack of clarity on North Bull Island about the actual impacts of dogs on wildlife and that partnership working should be an important aspect of managing dogs on the site. It is also considered likely (Jenkinson, 2015) that there are visitors with dogs on North Bull Island which have been excluded from other designated sites, given this along with increased housing in the area (Jenkinson, 2015) there has been an increase in visitor numbers (with dogs) on the site.

Off-the-lead walking, in addition to traffic free sites, are important elements for people walking dogs (Jenkinson, 2015) and these options should be considered in management on North Bull Island.



## 1.2 Aims

To identify a range of options and measures to address the real and perceived impacts of dogs and dog walkers upon the wildlife interest at Bull Island Nature Reserve

## 1.3 Objectives

There are four key objectives of this study relating to current and predicted management measures. These are;

1. To review current issues and measures
2. Co-design of targeted measures through stakeholder engagement targeted to:
  - a. Raise awareness of key issues, areas and vulnerable species
  - b. Jointly design/agree measures & codes of behaviours
  - c. Gain support/buy in to behavioural measures with the aim of instigating a self-policing model
3. Produce a draft medium term costed monitoring plan
4. Review funding information for implementation

This report sets out the results of work against these objectives and provides a set of recommended options in light of the findings of this work. Work under aim 2 will likely be ongoing and this study has taken the initial steps in raising issues and determining potential approaches with stakeholders.

## 1.4 Designations and Conservation Objectives

The over-arching framework for the conservation of wild birds within Ireland and across Europe is provided by Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Birds Directive). Together with the EU Habitats Directive (Council Directive 92/43/EEC), these legislative measures provide for wild bird protection via a network of protected sites across Europe known as Natura 2000 sites, of which the overriding conservation objective is the maintenance (or restoration) of 'favourable conservation status' of habitats and species.

North Bull Island is part of the Natura 2000 network as both a Special Protection Area (SPA) and Special Area of Conservation (SAC) for its undisturbed sequence of coastal habitats, including a Priority habitat (fixed grey dunes). The site also includes a RAMSAR wetland. It is a National Nature Reserve and was the first national bird sanctuary in 1931.

The site designated as North Bull Island Special Protection Area covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. Table 1 outlines the rationale for the designation of North Bull Island SPA.



North Bull Island is part of the North Dublin Bay SAC. Table 2 outlines the key features for designation. This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of nine habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a number of rare and scarce plants including some which are legally protected.

**Table 1. Rationale for Designation of SPA**

Designation – North Bull Island SPA	Rationale/qualifying interest
Habitats - Habitats listed in Annex I for the EU Habitats Directive	<ul style="list-style-type: none"><li>• 1140 – Intertidal mud and sandflats</li><li>• 1210 – Annual vegetation of drift-lines</li><li>• 1310 – Salicornia flats</li><li>• 1330 – Atlantic salt meadows</li><li>• 1410 – Mediterranean salt meadows</li><li>• 2110 – Embryonic shifting dunes</li><li>• 2120 – Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</li><li>• 2130 – Fixed coastal dunes with herbaceous vegetation (grey dunes) (priority habitat)</li><li>• 2170 – Dunes with <i>Salix repens</i> ssp. <i>argentea</i> <i>Salicion arenaria</i></li><li>• 2190 – Humid dune slack</li></ul>
Plants - Species listed in Annex II of the EU Habitats Directive	<ul style="list-style-type: none"><li>• Petalwort <i>Petalophyllum ralfsii</i></li></ul>
Birds - Birds listed in Annex I of the EU Birds Directive	<ul style="list-style-type: none"><li>• Several Annex I bird species use the site.</li><li>• SPA of international importance to wildfowl as it regularly supports &gt; 20,000 waders and wildfowl during winter.</li></ul>



	<ul style="list-style-type: none"><li>• SPA supports internationally important numbers of Light bellied Brent Geese <i>Branta bernicla hrota</i> Bar-tailed Godwit <i>Limosa lapponica</i> (internationally important numbers)</li><li>• and nationally important numbers of several other bird species.</li></ul>
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**Table 2. Rationale for the Designation of Dublin Bay SAC**

<p>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</p> <p>(* = priority; numbers in brackets are Natura 2000 codes):</p>	<ul style="list-style-type: none"><li>• [1140] Tidal Mudflats and Sandflats</li><li>• [1210] Annual Vegetation of Drift Lines</li><li>• [1310] Salicornia Mud</li><li>• [1330] Atlantic Salt Meadows</li><li>• [1410] Mediterranean Salt Meadows</li><li>• [2110] Embryonic Shifting Dunes</li><li>• [2120] Marram Dunes (White Dunes)</li><li>• [2130] Fixed Dunes (Grey Dunes)*</li><li>• [2190] Humid Dune Slacks</li><li>• [1395] Petalwort <i>Petalophyllum ralfsii</i></li></ul>
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The conservation objectives for the SPA site relate predominantly to protecting the bird populations on the island. The following factors may affect the conservation condition of waterbird populations on the site;

- Habitat modification: activities that modify discreet areas or the overall habitat(s) within the SPA in terms of how one or more of the listed species use the site (e.g. as a feeding resource) could result in the displacement of these species from areas within the SPA and/or a reduction in their numbers
- Disturbance: anthropogenic disturbance that occurs in or near the site and is either singular or cumulative in nature could result in the displacement of one or more of





the listed waterbird species from areas within the SPA, and/or a reduction in their numbers

- Ex-situ factors: several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas ecologically connected to it. The reliance on these habitats will vary from species to species and from site to site. Significant habitat change or increased levels of disturbance within these areas could result in the displacement of one or more of the listed waterbird species from areas within the SPA, and/or a reduction in their numbers

There are two conservation objectives for this site, full details are outlined in Conservation Objectives Supporting Document Version 1 (National Parks & Wildlife Service, October 2014).

Conservation Objective 1 - To maintain the favourable conservation condition of the non-breeding waterbird Special Conservation Interest species listed for North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA

Conservation Objective 2 - To maintain the favourable conservation condition of the wetland habitat at North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise these areas

The conservation objectives of North Dublin Bay SAC are outlined below;

- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide
- To restore the favourable conservation condition of Annual vegetation of drift lines
- To restore the favourable conservation condition of Salicornia and other annuals colonizing mud and sand
- To maintain the favourable conservation condition of Atlantic salt meadows *GlaucoPuccinellietalia maritima*
- To maintain the favourable conservation condition of Mediterranean salt meadows *Juncetalia maritima*
- To restore the favourable conservation condition of Embryonic shifting dunes
- To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes')
- To restore the favourable conservation condition of Humid dune slacks
- To maintain the favourable conservation condition of Petalwort

North Bull Island is a World Biosphere Reserve, an internationally important designation by UNESCO and is one of only two such reserves in Ireland. The Dublin Bay Biosphere contains three zones 1) Areas of high natural value 2) Public and private green spaces and 3) Transition zones which includes residential and commercial premises. The main objective



of this designation and the biosphere reserve concept is to reconcile the multiple uses in this small area ([www.unesco.org](http://www.unesco.org)).

North Bull Island is also a Ramsar site (<http://irishwetlands.ie/> site no. 406 North Bull Island) on account of it being a wetland of international importance and by regularly supporting >10,000 wildfowl or >20,000 waders.

North Bull Island is one of only three National Special Amenity Areas in Ireland, all of which lie in Dublin. Its status as an amenity area is in part for its recreational value and part for scenic beauty. This order however does not supercede European legislation and as such management for its amenity value must be compatible with management to ensure it meets favourable conservation status under its designations as an SAC and SPA.

Effectively managing the site for the benefit of wildlife will directly ensure that the conservation objectives of the site are met. In developing management regimes for recreational activity, bird populations on the island will be protected where less disturbance will allow birds to maintain natural foraging and resting patterns. Management of recreational activity will also allow habitats to develop naturally, in particular, the sensitive wetland and mudflat habitats on the island. To ensure that conservation objectives are met, enforcement of byelaws and rules is required necessary in addition to the use of interpretative signage. Using this approach should ensure that the multiple uses objective of the biosphere is also maintained.

There are bye-laws in place for the island which includes the Control of Dogs Bye-laws which was put in place by Dublin City Council in 1998 and prohibits unleashed dogs on the island

[http://www.dublincity.ie/sites/default/files/content/RecreationandCulture/AnimalWelfare/Documents/Control\\_of\\_Dogs\\_Bye\\_Laws%201994.pdf](http://www.dublincity.ie/sites/default/files/content/RecreationandCulture/AnimalWelfare/Documents/Control_of_Dogs_Bye_Laws%201994.pdf)

## 1.5 Key Species

The island is designated for the large populations of water birds which utilise the site to forage and roost. Key bird species present on site either in passing or as residents include the following species (BoCCI red and amber species are indicated and Annex 1 species are given an \*):

Table 2: Primary bird interest at North Bull Island

Birds (*Annex 1)					
Curlew	Redshank	Bar-tailed Godwit*	Light-bellied Brent Goose	Shelduck	Teal
Dunlin	Pintail	Black-tailed Godwit	Little Tern*	Short-eared Owl*	
Golden Plover*	Shoveler	Grey Plover	Oystercatcher	Skylark	
Meadow Pipit	Wigeon	Knot	Ruff*	Stonechat	



There are a number of specially protected mammals (i.e. those given protection under European legislation or specific protections in Irish law) which use the site regularly (or use adjacent waters) which may be impacted by recreational activity. These species are listed below:

Table 3 specially Protected mammals present at North Bull Island

Protected Mammals
Grey Seal
Common Seal
Harbour Porpoise
Irish Hare
Bat species
Badger

Waterbirds which utilise intertidal mud and sand to forage such as, redshank, knot and sanderling are at risk of direct disturbance from chasing or active unleashed dogs in close proximity. Those such as skylark and meadow pipit are ground nesting birds that will nest in the dune slacks in tall grasses and reed buntings may be found within the scrub habitats in the dune slacks. These may be susceptible to direct attack on nests, young or adults.

Little terns were once present on the site, nesting at the northern tip of the island up until the 1990's with a peak of 88 breeding pairs in 1987. The last breeding was a single pair recorded in 1992. The decline is attributed to a number of factors such as disturbance, predation from magpies and foxes, possible change to the substrate or all of these.

The Bull Island colony at its peak was highly significant supporting perhaps 30-50% of Ireland's Little Terns in any given year (Mitchell et al, 2004; Hutchinson, 1989). The loss of this colony Little Terns are highly restricted in Ireland and the main colonies now exist to the north and south of Dublin in Louth and Wicklow respectively.

There are two species of seal on the island, Grey Seal and Common (Harbour) Seal. Both species breed at the northern tip of the island. Grey seals pup in autumn when females may haul out on to the beaches at the northern end of the island, usually between late October to the end of November. Females will tend to stay on land for up to three weeks nursing pups and pups will be on land for up to four weeks until they are physically able to enter the water.

Common Seals are present with pups in the summer months.

Both seal species are present on and around the island throughout the year using haul out areas for loafing/resting and the channels and offshore areas for feeding.



Irish hare once populated the island but a recent survey carried out in 2016 found that hare are most probably no longer present (Naulty, 2016). The last records of Irish hare on the island are from 2015 when two individuals were identified at St. Anne's golf course (Naulty, 2016).

## **2. Methods**

### **2.1 Desk Study**

A desk study was carried out to collate information available on designated status of the Island the wildlife interest of the site and the existing management regime. The National Parks and Wildlife Service (NPWS) online portals were accessed to ascertain the conservation objectives of the designated sites. An online literature review was carried out in conjunction with the desk study. The aim of this literature review was to source details of other sites with similar issues and to review the works carried out on those sites to combat negative impacts on wildlife.

In addition, reference material from a range of publications related to recreational disturbance on wildlife was accessed along with a range of unpublished project reports and similar material of relevance the site and the issues involved.

### **2.2 Stakeholder consultation**

Consultations were carried out with key relevant bodies – National Parks and Wildlife Service (NPWS), Dogs Trust, BirdWatch Ireland (BWI) and Irish Seal Sanctuary in November/December 2016. The purpose of the consultations was clearly outlined at each event so attendees were clear on aims and the issues of recreational activity (in particular dog walking) on wildlife on the Island was discussed. Meetings were held with these relevant bodies separately so that bias was not incorporated into talks.

### **2.3 Dog walker consultation**

A questionnaire compiled in conjunction with staff from Dogs Trust was used to carry out a survey of dog walkers present on Bull Island. Dog walkers were approached and interviewed in order to complete the questionnaire.

The questionnaire was developed from Dogs Trust's experience of similar studies elsewhere and included an indicative mapping element to compile a representative indication of the extent of dog walker distribution/preferred usage of the site.

Interviews were carried out by EcoEireann staff and staff and volunteers from Dogs Trust on Saturday 5<sup>th</sup> and Wednesday 9<sup>th</sup> November 2016 during the morning and early afternoon.



## 2.4 Dog walking behaviour observations

In addition to the questionnaire survey, visits were carried out on 5 dates for a total of 14 hours to observe and record dog walker behaviour at key access points to the island. The aim being to document the general level of key behaviours with regard to interactions with wildlife/dogs/people and compliance with bye-laws. While this was not comprehensive it was used to provide a general indication of the scale of key behaviours.

Behaviour was observed by recording all dogs visible in an area at 30 minute intervals and recording whether dogs were on or off lead and the number of key behaviours or incidents in the previous 30 minutes (e.g. apparently disturbing birds/apparent negative interactions with other people/apparent negative interactions with other dogs)

The dates this was carried out are given in table 4 below

**Table 4 Timetable of dog walking behaviour observations**

Date	Day	Start time	End time	Total obs time (hrs)	Location
17/09/2016	Sat	0800h	1030h	2.5	South car park
17/10/2016	Mon	1015h	1215h	2	Causeway (looking N)
05/11/2016	Sat	1100h	1400h	3	Central beach access
07/12/2016	Wed	1430h	1600h	1.5	South beach access
13/12/2016	Tue	0930h	1230h	3	Central beach access
13/12/2016	Tue	1245h	1445h	2	Wooden bridge looking north

## 2.5 Wildlife data

Information on wildlife for the purposes of this study is taken from existing management plans and other published material with additional comment provided by consultees. No survey was undertaken in relation to this study.

## 3. Apparent Impacts of Unrestrained Dogs at North Bull Island

There are a range of effects and related impacts of the presence of people with dogs (both on the lead and unrestrained) at the island and these are acknowledged by and outlined in the site management plan (DCC 2009). Section 7.4.6 of the site management plan provides good summary of the impacts of dogs and is reproduced at Annex 1. The impacts are largely negative with regards to wildlife. And the main areas of concern are illustrated in table 5 below. Examples of impacts include:



breeding seals disturbed leading to the abandonment of pups or increased energetic demands.

Birds at disturbance risk during feeding and roosting

Disturbance or taking of ground nesting birds or their nests.

Disturbance causing elevated energy use is particularly detrimental in winter and during migration periods when energetic demands are highest

This latter aspect of increased energetic demands on birds is difficult to show conclusively but has been demonstrated in a number of studies worldwide in waterbirds. It is well accepted that these energetic demands are likely to have knock on over winter or migratory survival and can affect breeding success or productivity (e.g. Madsen 1995, Drent *et al*, 2003).

**Table 5 Potential for Dog and Wildlife interactions**

<b>Wildlife Interest</b>	<b>Likely impact of dogs</b>	<b>Main area of concern</b>	<b>Main time of concern</b>
Grey Seal	Abandonment of pups	Northern tip of the island where breeding is strongest	Late autumn / early winter
Common Seal	Abandonment of pups	Northern tip of the island where breeding is strongest	June to August
Foraging birds	Putting birds to flight, wasting energy	On mud flats and salt marshes	Over winter
Roosting birds	Putting birds to flight, wasting energy	Areas uncovered at high tide	All year round
Nesting bird	Disturbance to nesting	Dune slacks / scrub	March to August

## 4. Review of Existing Literature

There are several sites around the world which have researched how dogs may impact wildlife. From these sites, lessons may be learned as to best practice techniques for managing dogs on sensitive sites. Three of these studies are outlined below.



#### **4.1 Solent SPAs, Portsmouth, UK**

The Solent supports in up to 90,000 waders of differing species many of which will travel thousands of kilometres to over-winter at the Solent. These birds travel to forage and roost on the intertidal habitats such as mudflats, saltmarsh and shingle. It has been recognised on these SPAs, the impact of recreational disturbance on the birds.

Through partnership working between the city council, neighbouring local authorities along the Solent, the Partnership for Urban South Hampshire, Natural England and other stakeholders, research has been carried out (the Solent Disturbance and Mitigation Project (SDMP)), to assess whether the Solent SPAs suffer from mortality in the bird population due to disturbance caused by recreation.

Results from the research indicated that an increase in housing along the coastline will incur an increase in recreational disturbance to the SPAs resulting in an increase in mortality of the birds in the areas. A mitigation report was published (Liley & Tyldesley (2013)) indicating an overall aim to *enhance the existing recreation experience and provide opportunities such that access and nature conservation interests are not in conflict*.

Mitigation options for the Solent SPAs include: careful location of development, influencing which sites people visit, where people go within sites and how they visit and includes providing adequate and clear interpretation signs, enforcement, education and on-site access management.

#### **4.2 Metro Parks, Oregon, USA (Hennings 2016)**

Research has found that dogs can have physical and temporal displacement of wildlife and the Parks organisation have aimed to locate walking trails in less sensitive habitat to ensure that human activity is as non-disruptive as possible. Part of that strategy has been to allow public access, while limiting certain activities such as bringing dogs into natural areas.

The evidence that dogs negatively impact wildlife is overwhelming. Research demonstrates that people with dogs both on and off the lead are much more detrimental to wildlife than people without dogs.

Metro Parks have seen that dogs cause wildlife to be more alert, which reduces feeding, sleeping, grooming and breeding activities and wastes vital energy stores that may mean life or death when resources are low, such as during winter or reproduction.

#### **4.3 Thanet Coast Project, Kent, UK**

The Thanet Coast Project has seasonal restrictions for dogs on beaches and an overarching measure that dogs must be kept under control at all times on all sites. Particularly pertinent is the prohibition of dogs on saltmarshes and mudflats around the





coast but where these habitats exist, dogs are allowed on other sections (such as cliffs, beaches) as long as they are leashed.

Downloadable and printable leaflets and guides, available on the project website assist in raising awareness of these restrictions in addition to there being a strong outlet on social media (Facebook and Twitter). Volunteer wardens ensure that bye-laws are adhered to and dog walking events demonstrate that there is no animosity towards dog walking and helps promote better understanding of how and why dogs are required to be managed on their coast.

#### **4.4 Banks and Bryant, 2007 – Sydney, Australia**

Results of this study demonstrate that even dogs restrained on leads can disturb birds sufficiently to induce displacement on local bird fauna. It also outlines that where dog walking was frequent, wildlife does not become habituated to continued disturbance.

The results of the study show that there is a dramatic reduction in bird diversity and abundance in response to dog walking which has immediate implications for other recreational activities such as bird watching and ecotourism where visitor satisfaction shows a strong relationship to numbers of species seen. It also found that it is possible that the particular sensitivity of ground dwelling birds to dog walking may lead to a cascade of potential behavioural changes in birds with implications for their local conservation. The results of the study support the long-term prohibition of dog walking from sensitive conservation areas.

#### **4.5 Lessons Learned**

The case studies summarised in Sections 4.1 to 4.3 are located in USA, UK and Australia and all with similar findings where dogs are seen as a detrimental disturbance to wildlife. There were no case examples found for interactions with seals but given disturbance has an energetic and stress cost this is likely to be negative, albeit the significance of the impact is unknown.

Complete prohibition of dogs from sites is a recurrent theme to help protect wildlife, however, in the Thanet Coast study, dogs are permitted on leads at certain times of the year and dog walkers are encouraged to visit through dog walking events that promote dog management in relation to wildlife. Public awareness is a tool used by Thanet Coast in addition to volunteer wardening to assist in promoting and enforcing bye-laws.

Sites of alternative natural greenspace (SANG) is another form of mitigation to protect wildlife on site (Jenkinson, 2015). At Thames Basin Heaths SPA Natural England have recognised this as an appropriate form of mitigation.

These approaches may be of relevance in finding potential management tools at North Bull Island. Dublin City Council has already implemented some measures such as awareness events and dog specific areas at e.g. St. Anne's Park and while the impact has





not been measured, this proactive management approach in a less sensitive greenspace should provide a benchmark for any approaches taken on the significantly more sensitive site at Bull Island.

## 5. Review of Existing Measures

Current disturbance management at the site is in the form of wardening and signage. Byelaws are in force on the island (Bye-Laws For The Control Of Dogs Under The Local Government Act, 1994.) which require dogs to be kept on a lead on the site. A small number of prosecutions have been made where owners did not abide by this bye-law.

There is a management plan for the island which was completed in 2009. This plan outlines the key management factors required on the island, include those to protect wildlife including increased wardening of the site to managed unleashed dogs and reviewing the interpretation modes to express management decisions to the public.

The key objectives of the management plan relate to management of the habitats on site, management and eradication of invasive species on the island, manage the impacts of recreational activity on the site and looks at the potential to reintroduce little terns to the island.

Where management is linked to protecting wildlife the following recommendations are in place;

- Liaise with public on the issues regarding dogs off leashes
- Monitor the impacts of bait digging on key species and develop a code of conduct for the activity
- Develop a code of conduct for recreational activities
- Review the interpretation and public awareness on the island

Vehicle movements have been limited on Dollymount Strand which, to the date of the management plan, has had apparently successful impacts on protecting wildlife through reducing disturbance.

Where recreational disturbance has been anecdotally recognised as being detrimental for wildlife on the island, there is little research to prove this. Where research exists, recommendations are outlined in the plan based on the findings such as zoning areas for dog walking and possibly prohibiting all activities on the northern tip of the island and increasing public awareness through social media on the impacts of unleashed dogs on wildlife. Despite the lack of empirical evidence of impacts of recreational disturbance on wildlife that is available for the site itself, there is ample evidence arising from studies



elsewhere which show that this is a proven factor effecting wildlife populations of a range of types and in a range of ways.

Currently the main control measures in place on Bull Island to manage recreation and other activities on the island which may impact upon the nature conservation interest are;

- Bye-laws
- Wardening/staffing presence for byelaw enforcement and advisory
- Informal zonation through signage
- Advisory signage
- Information provision, education and awareness

These current measures are reviewed below:

### **Bye-laws**

Byelaws have been in place for many years and have been enforced at a number of levels through that time. Currently, the very high level of off-lead dog walking in the region of 90%+ of all dogs are off lead for at least some of the time (evidenced by observations in this study, by questionnaire respondents and by anecdotal evidence from staff and stakeholders) illustrates that compliance with the byelaws is at a very low level.

Reasons for low compliance levels may relate to a number of key factors:

Low enforcement rate: staff acknowledge that there is a low enforcement rate and that this is primarily due to the high level of effort required to achieve a positive enforcement outcome and the very large number of cases that would exist if enforcement was given due priority. There is also a clear argument which could be used in defence of an infringement that enforcement is arbitrary when otherwise large numbers of people are non-compliant and little has been done to combat this.

Copy response: with high numbers of other dogs off-lead there is a group mentality prevailing and presumed immunity from enforcement by “safety in numbers”.

Poor signage: the questionnaire responses indicate that awareness or quality of signage in relation to this issue is perceived as low.

Reckless disregard: at some level there is disregard for rules around this issue. Questionnaire respondents show a high level of awareness of rules but a low level of compliance which indicates a willingness to break the bye-laws.

Lack of awareness of real impact: disregard for the rules may emanate from a low level of awareness of the impact of dogs on wildlife. This is borne out by a mismatch between the high levels of awareness of the site's status and protections but low levels of compliance with byelaws and control of dogs engaging in chasing/disturbing behaviour of birds.



**Figure 1 A threshold sign, the largest on the site – despite showing wear and tear there is a clear instruction regarding rules on dog walking**

### **Wardening/staffing presence**

Current provision of staffing for enforcement is very low. One staff member has management oversight of the island and a low level allocation of wardening time but has no powers to enforce bye-laws with regard to dogs, similarly lifeguards in summer months perform some aspects of these duties but are limited in zone of influence. Dog wardens are required in order to carry out enforcement proper but their presence on the island has been described by stakeholders during informal discussions as “very low level” or “rare” and “occasional”.

### **Informal zonation through signage**

Signage is present which indicates that saltmarsh/lagoon areas are out-of-bounds to all access. These areas are critical to the conservation interest of the site and are sensitive to disturbance by people and dogs for waterbirds in particular. While access levels appear to be low in these areas from both the behavioural observations and the questionnaire survey, even low levels of access could be significant and may be impacting on the birds present through sub lethal effects such as energetic demands of disturbance evasion. No other zonation is used on the site and access for people and dogs throughout is permitted, and under current compliance and enforcement levels this effectively includes allowing dogs off-lead unchecked.

### **Advisory signage**



Signage informing visitors of the byelaws and reminding people of rules about dogs on leads is present on site at key points (e.g. see figure 1). Much of this signage is of variable visibility and in some cases old.

There is a clear lack of awareness of signage among a large portion of the dog walking public. This may be due to familiarity with the site and may in part be response to avoid indicating an awareness of rules, though this is not consistent with general levels of awareness indicated and an openness in the responses.

There is an indication in questionnaire responses that there could be more clarity from the signage about the rules around dog walking.

### **Information provision, education and awareness**

There is a generally high level of awareness of the status of the site and its general level of protection amongst the public, evidenced by questionnaire responses.

There is provision of education to visiting school groups on a regular basis, many of these local. This may in part be responsible for the good levels of general awareness about the protection of the site.

Away from education work and some events, signage on the island is limited to advisory signage and there is little to increase awareness among visitors of the wildlife of the island. The visitor centre itself is, by necessity, closed when not manned and is off the beaten track of many casual walkers and thus has a currently limited impact on information provision.

While the site as a whole is a nature reserve it has the general feel more of an amenity area. The ethos of nature reserves to place nature conservation as the primary management aim with compatible activities alongside it, is not readily apparent from the set up or infrastructure on the site albeit there are signs stating this but recognition of those is low among the sampled dog walker population at least.

## **6. Stakeholder Engagement**

### **6.1 Stakeholder Consultation**

Along with multiple designations, Bull Island Nature Reserve also supports a range of competing, benign or complimentary user groups. As a nature reserve with many designations, the primary consideration in managing the island is for its nature conservation features of importance and there is a statutory duty on its managers to, as well as a public benefit from, ensuring that the conservation interest is maintained and where possible enhanced. It is recognised that alongside the nature conservation



importance there is also some level of socio-cultural value from the recreation and public usage elements of the site. These may play an important role in the exposure of city dwellers to nature, to public health and well-being and as a contributor to overall quality of life. While combining dog-walking with nature conservation objectives can be problematic in some situations, there is often little direct evidence for cause and effect level impacts on wildlife. This is mainly due to a lack of information in most cases (caused by either a complete lack of or difficulty in recording appropriate information in combination with impacts likely to be predominantly sub-lethal, long-term or indirect) and thus management decisions must often be drawn from limited evidence available which is often provided simply by strong inferences drawn from known or typical ecological responses. These may in many cases be supported by records of instances of apparent conflict but not in all cases.

Stakeholders from key user groups and expert bodies relating to relevant wildlife and dog-walking were engaged to investigate impacts, perceptions and potential solutions. These stakeholders were selected in discussion with Dublin City Council staff.

Table 6 Stakeholder consultees

Stakeholder	Reason for selection	Consultation type
Irish Seal Sanctuary	Seal expertise and regular observers/reporters of disturbance incidents	Interview/meeting
Dogs Trust	Dog welfare organisations with large membership and in depth understanding of issues surrounding dog-friendly areas and responsible dog ownership	Interview/meetings
Dog walkers	Key user group involved in this issue	Questionnaire survey
Birdwatch Ireland	IWeBS waterbird counts coordinator & lead partner in Dublin Bay Birds project which looks at distribution of waterbirds in Dublin Bay	Interview/meeting
NPWS	Statutory responsibility for nature conservation designations	Interview/meeting



### 6.1.1 Consultee Response 1

#### IRISH SEAL SANCTUARY

A meeting/interview and discussion was held with Brendan Price of the ISS and seal observer and local resident, Sean O'Laoire on 5<sup>th</sup> December 2016.

The purpose of the meeting was to seek the views and experiences of ISS in relation specifically to seals and dog walking and to seek their input and suggestions in determining measures which would enable any issues to be managed.

#### **Discussion area 1: Do you think there is a significant impact of dog-walking upon seals and if so in what way do you think they are being impacted?**

Main points:

- There are variable numbers of seals both Common (Harbour) Seals and Grey Seals. Numbers regularly around 35 animals and these are mostly Greys – no breakdown in numbers was provided.
- There was a recognition that there is a lack of data on the seal usage of the island and more information would assist in conservation for the species present. Information such as site usage, individual identification to local at population turnover and post-mortem on any dead seals encountered.
- There are vulnerabilities at most times of year and these exist at all tidal states though pupping months are of even more concern (in general June for Common Seal and October for Grey Seals) but there is a long period through which that vulnerability can last. In general Grey seals are more vulnerable to disturbance from dog-walkers or direct attack from dogs as their ability to escape is much lower (with dependent young) than the slightly more mobile Common Seals. Both however can be susceptible and escape to the water while possible is still significant disturbance.
- Expressed opinion that effect is most likely sub-lethal and regular harassment from dogs may affect; breeding productivity (through stress), survival (through increased energetic demand), probably a few cases of direct attacks and overall population size/site usage (through disturbance causing exclusion).
- Generally high numbers of dogs are walked off lead (estimated to be 95%+)
- Dogs are able to reach seals before owners are aware
- Some (a few) dogs appear to be encouraged to “go after” seals and have seen incidents of sticks thrown at seals to encourage dogs to chase
- Dog-walkers have been challenged and in many cases have been reasonable and reacted positively to being advised and dog walkers have suggested they could have a role in finding a solution
- Currently no resources to police bye-laws, provide advice or monitor.





- ISS will continue to take a strong line on the need for Bull Island to be a no dogs area as the best solution to resolve the problem

## Discussion area 2: What is your current perception/evidence for these issues?

### Main species of concern

- Grey Seals as there have been recorded incidents of deaths suspected to be result of encounters with dogs
- Also disturbance to Common Seals
- Both species should be able to use the site, a traditional haul out, as a safe, disturbance free area, at all times

### Main areas of concern

The most significant concern was the northern tip of the island and the sand banks lying offshore (red shading) from that (see sketch map of areas indicated below)



### Main times of concern

Daylight hours when dog walkers are mostly present – all tidal states bring some level of vulnerability with higher tidal states bringing seals and dogs in closer proximity more regularly when seals have hauled out closer to main beach line where most dog walkers are.



### **Discussion area 3: What Measures would you see as priority?**

**Zoning?** High importance – seals and dogs don't mix. ISS continues to propose that Bull Island should be a strict dog-free zone.

**Signage?** Useful but not a replacement for a strongly enforced no-go zone (which should ideally be the whole island) through wardening

**Events & campaigns?** Yes, good to raise awareness, including media to show the value of wildlife to Dublin.

**Information giving?** Yes – needs multiple media efforts. Needs to be friendly but demonstrating the strong need for better awareness and zones. Better behaviours are not a replacement for no dogs.

**Enforcement/Policing?** Yes vital, but only worthwhile in conjunction with a dog-free zone – ideally the whole island

#### **Others?**

- Emphasis on need for no dogs mixing with important seal areas. Input through a biosphere monitoring committee would be valuable.
- Working with local residents and groups e.g. Sutton dinghy club, to help monitor seals, police incidents and raise community awareness
- A viewing point from Sutton mainland could be useful for this

### **Discussion area 4: What role could ISS play in helping the council with these issues?**

- ISS hold a strong line that there should be no dogs on Bull Island and that would be the most effective way to prevent impacts on seals
- The onus of proof of any new solutions is on DCC
- Volunteer presence from ISS may be able to contribute but would need professional guidance and support – proper resourcing
- Formalised reporting procedures for incidents would help with future monitoring and ISS volunteers would welcome opportunity to help devise and contribute to monitoring in future

#### **Additional comments:**

staffing resource in future to police the island should be increased and this will need to be very significant.

Commitment to future monitoring at a suitable level is required and should be in conjunction with key stakeholders to agree a way forward





**Dog Walkers/unrestrained dogs regularly encounter seals at the north end of the island and scare them from onshore loafing areas into water (pic: S. O'Laoire)**

#### **6.1.2 Consultee response 2**

### **NATIONAL PARKS & WILDLIFE SERVICE**

A meeting/interview and discussion was held with Ciaran Foley (District Conservation Officer) and Niall Harmey (Conservation Ranger) of the National Parks & Wildlife Service (NPWS) of the Department of Arts, Heritage, Regional Rural and Gaeltacht Affairs on 2<sup>nd</sup> December 2016.

The purpose of the meeting was to seek the views and experience of NPWS in relation to wildlife issues and dog walking and to seek their input and suggestions in determining measures which would enable any issues to be managed.

### **Discussion area 1: What is your current perception/evidence for issues in relation to the impacts of dog walking on wildlife?**

#### **Main species of concern**

Seals – Grey and Common Seals – NPWS perceive a c.30% reduction in peak numbers in the past 5 years. The main impacts felt to be through disturbance on their energetics during harsh weather in particular. Both species susceptible but likely highest impacts on Grey Seals during autumn/winter when pups are present. Common seals more readily escape and peak time in summer but still some level of disturbance. Any level of disturbance at haul outs is undesirable.

Waterbirds – all waterbird species receive some level of disturbance and this is unquantified. Key issues revolve around disturbance at high tide roosts – likely to be of greatest significance during colder months and pre-migratory periods when energetic demands are highest. Waterbirds are key features of the qualifying interest of the SPA.



Absence of breeding Little Terns has been long standing but presence of high levels of dog walking (walking generally?) at northern end of island may be in part preventing re-colonisation

Ground nesting birds in grassland and beach areas during breeding season – There is a strong perceived reduction in ground nesters such as Ringed Plover, Skylark and Meadow Pipit. These species while not part of the formal bird qualifying interest of SPA are noted in the SPA citation as supporting interest features and are included as priorities within the management plan for the site, they are also Birds of Conservation Concern in Ireland (BoCCI species) and are of significant biodiversity interest within Dublin area. Dogs off leads within the dune areas are of particular concern in affecting nests by disturbance or direct attacks on nesting birds and chicks.

### **Main periods of concern**

Seals – all year but mainly winter (October-Dec) and June/July during pupping periods for the two species present.

Waterbirds – All year but main concerns during Oct-May which is the winter and pre-migratory period when energetics may be affected by disturbance

Breeding Little Terns – would require disturbance free area during April – August

Ground nesting birds – April – Aug would cover main period of sensitivity

### **Main areas of concern**

The main areas of concern are indicated on the sketch map below:





Notably, dog walkers accessing the saltmarsh areas in the lagoon sections regularly have dogs off lead and disturb waders on the saltmarsh edges and upper mudflats and Brent Geese and other species on saltmarsh and saltmarsh pools. These areas are of highest importance for the SPA interest and action is needed to eliminate this disturbance.

**What action have NPWS taken to address any issues so far?**

Regular liaison with DCC staff at Bull island to encourage and promote the application of byelaws. NPWS recognise the difficult job involved in DCC achieving effective controls due to the large visitor numbers present and the culture of off lead dog walking and other non-compliant activities but would welcome greater efforts to ensure positive long term conservation management of the site to achieve the designated site objectives.

**What future measures would you see as a priority?**

**Zoning?** Yes high importance in principal but only as good as the enforcement that is carried out

**Signage?** Only a part of the enforcement of zoning and improving behaviour needs more than this to be effective. Useful but not a replacement for a strongly enforced no-go zone through wardening

**Events & campaigns?** Can play a useful role in conjunction with proper policing

**Information giving?** As above

**Enforcement/Policing?** Highest priority but high level of resource required. NPWS see a need for a well-resourced, more robust approach to improving site behaviour and would be very necessary if zoning was applied.

**Other factors?** Need for overall approach to take account of all forms of recreation – there are likely to be in-combination effects from other forms of recreation; Kite surfing, water craft, walking (without dogs) etc.

### **6.1.3 Consultee response 3**

#### **BIRDWATCH IRELAND**

A meeting was held with Olivia Crowe (Head of Conservation) and Niall Tierney (Dublin Bay Birds Project Officer) on 8<sup>th</sup> December 2016.

The consultation meeting focussed on BirdWatch Ireland's views on current issues & measures to manage the island for its main bird interest and to explore the knowledge gained from the Dublin Bay Birds Project relating to the primary sensitive areas and where these may be affected by dog walking or other activities. In addition BWI's views of



measures which could assist where there are known or perceived issues of conflict with bird interest were discussed.

## **Discussion Area 1: What is your current perception/evidence for issues?**

### **Main species of concern?**

Wintering waterbirds in daylight hours but notably presence of waterbirds is year round. Also there is evidence to suggest that there is usage at night (N. Tierney & O. Crowe *pers obs.*), although this has not been quantified and is less relevant to dog walking.

Ground nesting passerines and long term loss of Little Tern and reduced breeding Ringed Plover

### **Main areas of concern?**

Northern tip – former significance for Little Tern, breeding ringed plover and occasional but often disturbed wader roost

Lagoon area is highest sensitivity and high concentrations of birds at high tide roost do get disturbed by dogs allowed to roam, and walkers who venture around to the west side of the island from the beach.

Dune areas for ground nesting passerines both north and south of the visitor centre

The sketch map below indicates main areas of priority interest.

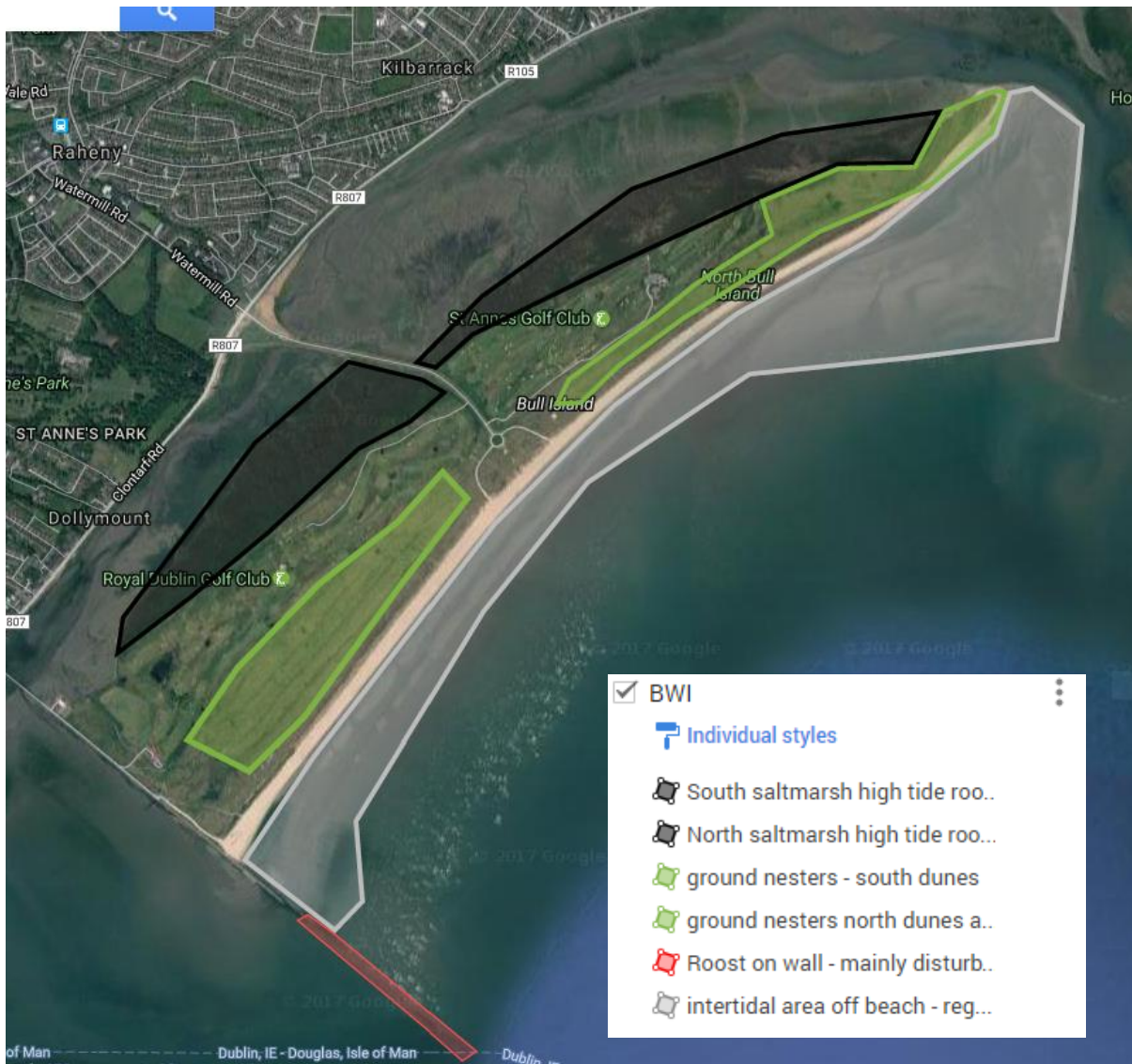
The lagoon and saltmarsh area being noted as particularly high value and the roost at the end of the north bull wall being noted as self-limiting by way of access being difficult and therefore rare at that point.

### **Main times of concern?**

Year round waterbird presence, but especially during the mid-winter period when numbers are at their highest

Breeding season disturbance of dunes and land area at peak in spring/summer of concern for passerines & Little Tern.





## Discussion area 2: Do you think Dog walking is of concern to bird interest and what measures to address this would you see as priority?

**Zoning?** - highest priority is lagoon area and lagoon saltmarsh – no access should be allowed at any time (with or without dogs but roaming dogs cause much disturbance). Restricted access at north end would provide an opportunity for re-established safe wader roost there and potential for re-establishment of Little Tern colony. Dune areas zoned in Spring/summer would enable better breeding of Skylark and Meadow Pipit

**Signage?** yes but only part of the solution – zoning required and would need policing as well as signage



**Events & campaigns?** Recognise amenity value of the site and the opportunity public access to the reserve has for creating greater awareness and understanding – one part of the solution along with zoning etc.

**Information giving?** As above – Information giving is part of an overall approach to better management of the island

**Enforcement/Policing?** Critical to delivery of non-access zones and needs to be in conjunction with policing and management of all other recreation activities on the island – care not to remove dog walking and see it replaced with something else – in combination effects can be an issue

### **Discussion area 3: What way would BWI like to engage in management in future?**

**Advisory?** provision of information from DBBP would be possible. Would consider a role in a management forum or committee

**Volunteers?** Volunteers already contribute through bird counts. May be a source volunteers for use in multiple ways on the island but careful liaison needed

**Research & data gathering?** Dublin Bay Birds Project may already contribute significantly but need for more targeted information for better management. The DBBP could be expanded where necessary to gather detailed and specific information that would better inform impacts and the success of any future management. Would welcome discussion.

**Information & publicity** – own magazine/web/social media would reach regular birdwatching audience

Would be interested in exploring opportunities to work together on events to raise awareness

**Any additional comments or recommended action?** Would welcome an approach which considers all activities on the island to ensure that impacts on wildlife are minimised, and that there is reduced potential for conflicts. Note issues around kite surfing and care need in managing this. An integrated approach to managing activities would be welcome.



## 6.2 Dog walkers – questionnaire survey

### 6.2.1 General approach

The questionnaire survey of dog walkers was carried out on Saturday 5th and Wednesday 9th November 2016 during the morning and up to mid-afternoon.

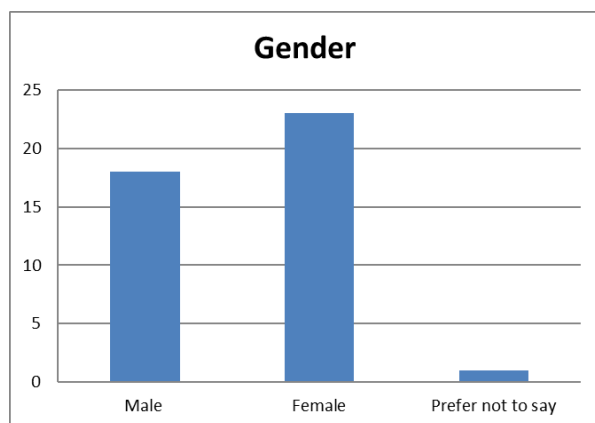
This formed the primary means of gaining insight into the general attitudes and behaviour of dog walkers.

The general approach was to interview as many dog walkers as were willing during the time available. In total 42 full or partial responses were recorded. While this is a modest sample it was still able to provide a set of effective responses in most cases, particularly where the effects or choices were clearest.

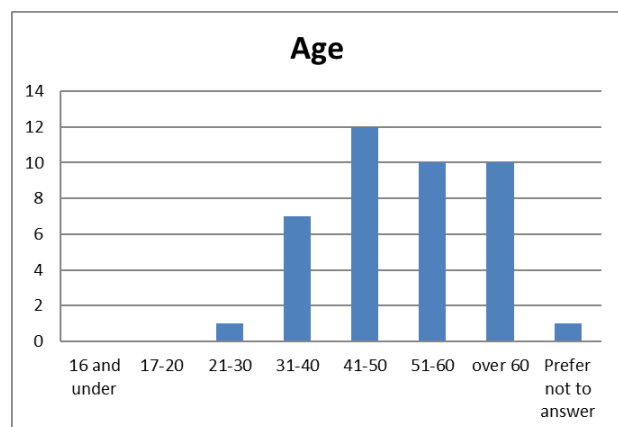
The questionnaire included a mapping question and this was generally filled in by the interviewer based on direct guidance from the interviewee or alternatively directly drawn on by the interviewee. Examples of responses are included at Annex 2.

### 6.2.2 Profile of the population sampled and limitations of the survey

Due to timing of questionnaires there may be some limitations on the information gleaned from the survey but there appeared to be a good cross section of the dog walking public interviewed and within the adult age range age and gender profiles were well represented other than for those under 30 – there was no sense of younger walkers present ignoring or avoiding the interviews, there were simply fewer present overall and very few with dogs.



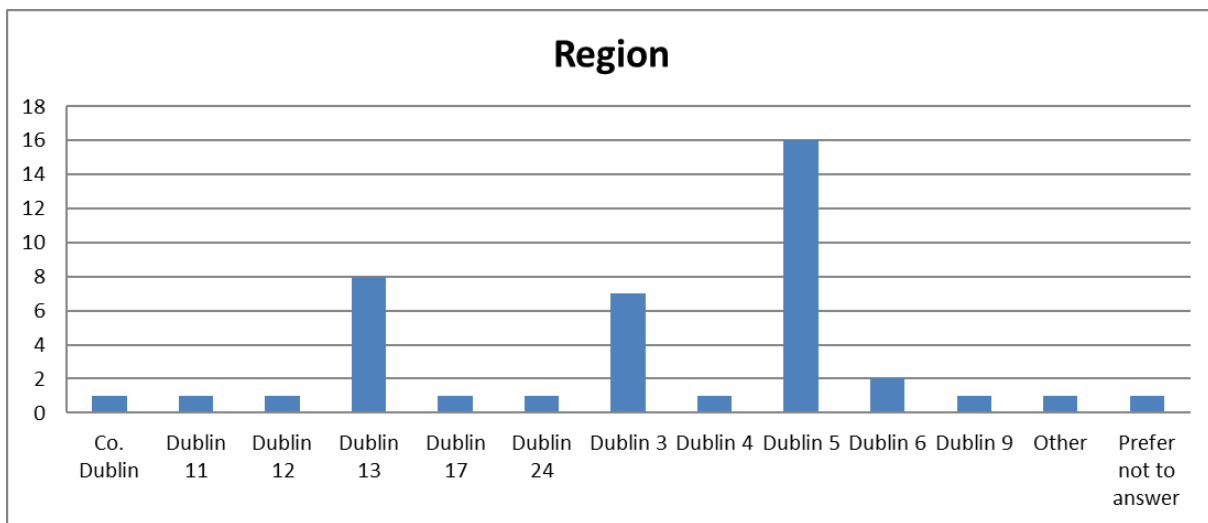
Response chart 1



Response chart 2

The respondents also came predominantly from the local area. As might be expected of most popular dog walking sites, the main users come from within walking or short drive distance. Only one respondent came from outside County Dublin and one did not state a location.





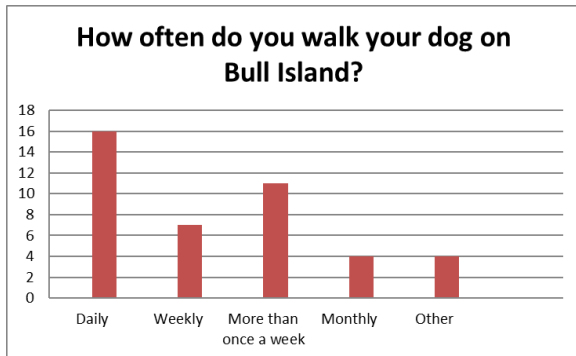
**Response chart 3**

The central beach area was chosen for the location of surveys as this was perceived to be the point which was likely to encounter the highest numbers of dog walkers and which encountered walkers entering at both this central access point and those walking up from the south. Being close to the dune areas it was also able to capture respondents who had walked in the dune areas. There may be some influence in the profile of the respondents of this location in that those who walk the lagoon areas or solely walk in the dunes would be under represented.

### **6.2.3 Results**

#### **Frequency and timing of visits**

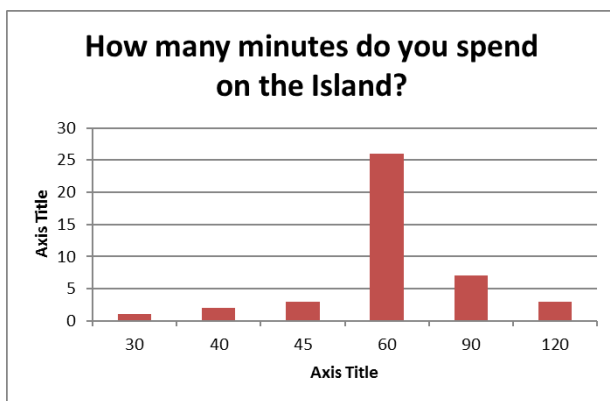
The questions in this subject area were designed to identify the timing and duration of visits. There is obvious potential bias in the responses from the fact that only those present were able to be interviewed and that the interview times were within a relatively short daytime period, albeit a mid-week and weekend day were chosen in order to provide a less biased sample than a single day visit



**Response chart 4**

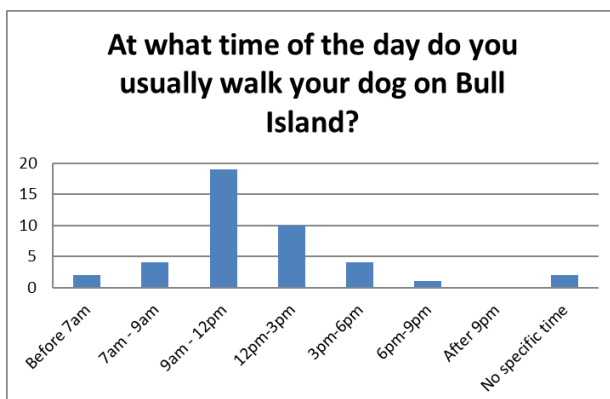
Most respondents were very regular users with more than 60% near daily visitors.

This means that any changes in behaviour that may be desirable would be targeted to a user group which is familiar with the site and with whom developing positive relationships will be important.



**Response chart 5**

Most dog walkers appear to spend around an hour on the island. Which would match with a walk which may take in a 3-5 kilometres walk of shore or dunes.

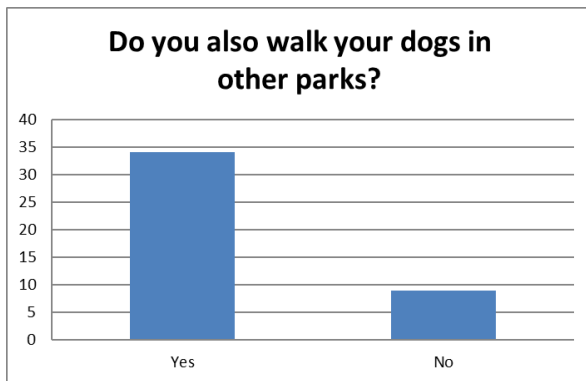


**Response chart 6**

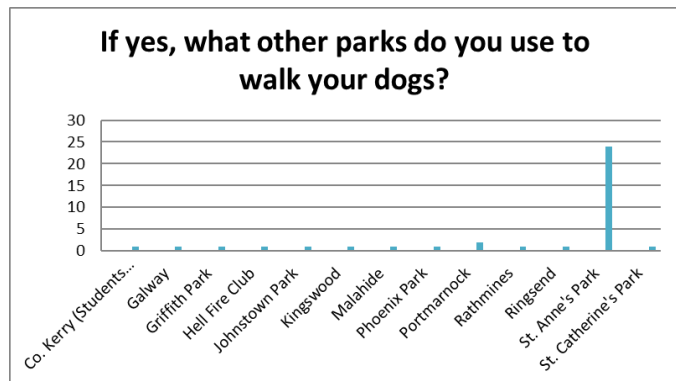
The timing of visits may be biased by the period of questionnaire survey undertaken with the period covering morning and early afternoon most covered, however a range of other times were specified which stretched through much of the day from early morning into evening. This would have implications on the techniques considered for use in addressing any undesirable behaviours

### Preferred locations for dog walking

The questions here were aimed at locating the primary areas of usage and any other areas away from Bull Island.



Response chart 7



Response chart 8

Despite a high proportion of people appearing to visit Bull island every day, 80% of respondents also use other parks and of most commonly the nearby St. Anne's Park.

Behaviour in one location may influenced by the rules and behaviours at other sites. While it may be likely that different sites are used for different modes of dog walking or in different weathers, seasons or for different reasons, considering all parks in the area in terms of management options is an important consideration

A key question in the survey asked respondents to map or indicate to the interviewer where their normal dog walking route was. This was intended to examine the main areas frequented by dog walkers and where conflicts with wildlife interest may lie. Examples of completed maps by dog walkers is provided at Annex 2

Figure 2 below indicates the level of composite usage of each general area by the respondents. This is classifies into "high" (meaning >70% respondents use this area), "moderate" (25-70% of respondents using these areas) and "low" (up to 25%) and given approximate boundaries of maximum extent of use. Those areas unshaded are where no indication of use was given but DO NOT indicate no use by dog walkers but rather may be a result of the survey sample, the recording method or may have no usage level. This latter point may be informed by observations by site staff in future.



**Figure 2 – Generalised intensity of dog usage of North Bull Island derived from dog walker route responses**

The area of heaviest use was the causeway and roads at the central access and along the beach areas adjacent to that. Moderate usage was indicated at the southern end of the beach and both main dune areas while low level usage was indicated for the northern tip and the northern saltmarsh area

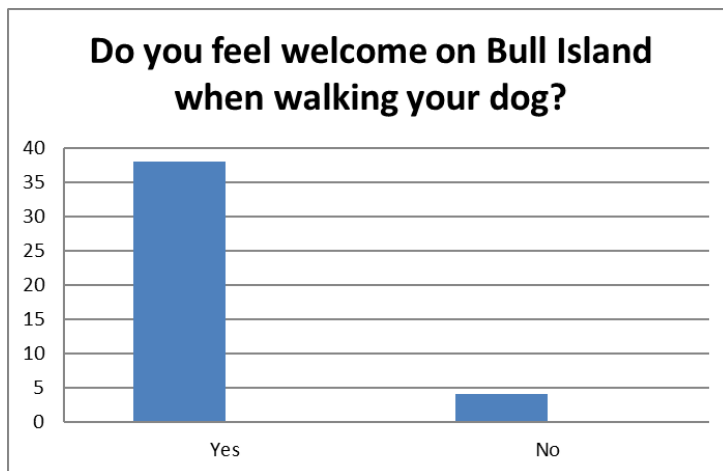
While there was moderate use of the dune areas it was indicated as heaviest in the south.

The sample of respondents was taken for the central beach access which may skew results towards the beach area. But this pattern of usage is consistent with the expectations of DCC staff, stakeholders and authors.

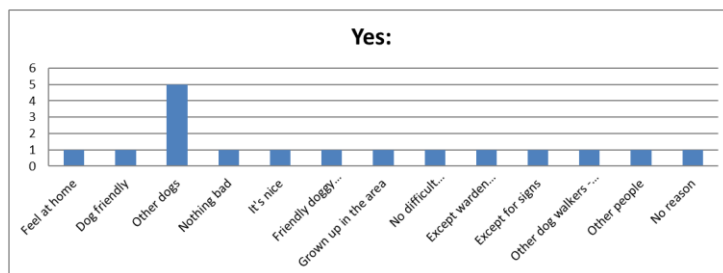
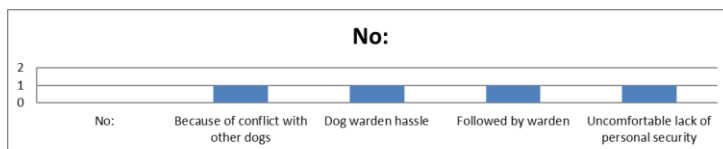
The tidal state may play a role in the exact distribution of dog walkers on the beach.



## Dog walker perceptions



Response chart 9



Response chart 10

## Dogs on and off leads

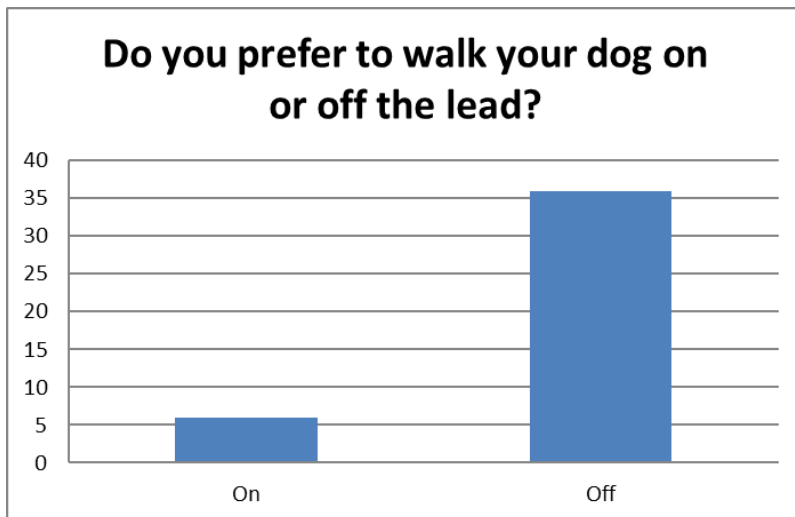
The site bye-laws prohibit walking dogs off the lead. A significant area of concern for stakeholders and Dublin City Council staff is the perceived high proportion of dogs which are exercised off lead and which has led to significant concerns over conservation management of the site for key species of interest.

The following questions were targeted at identifying dog walker preferences with regard to use of leads and comparing this to perceived and observed levels of usage, to attitudes and compliance with regard to byelaws.

People feel welcome at Bull Island for a wide range of reasons mainly because of the presence of other dogs and dog walkers.

Those who don't feel welcome or those who felt welcome but expressed additional comments were few and the main reasons given centred around having had interaction with dog warden staff and one case each a lack of personal security or conflict with other dogs.

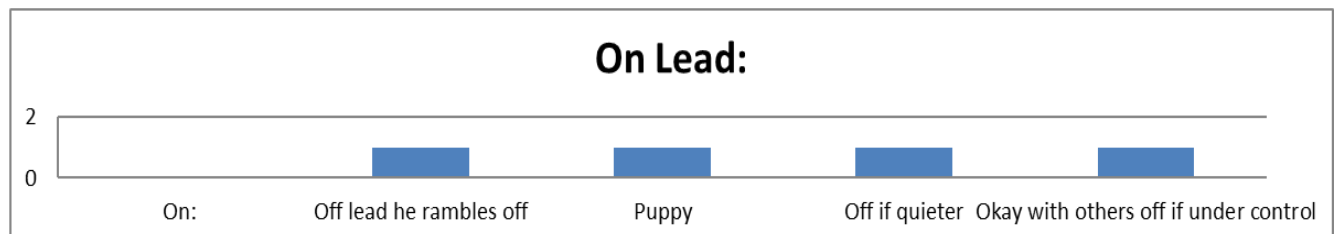
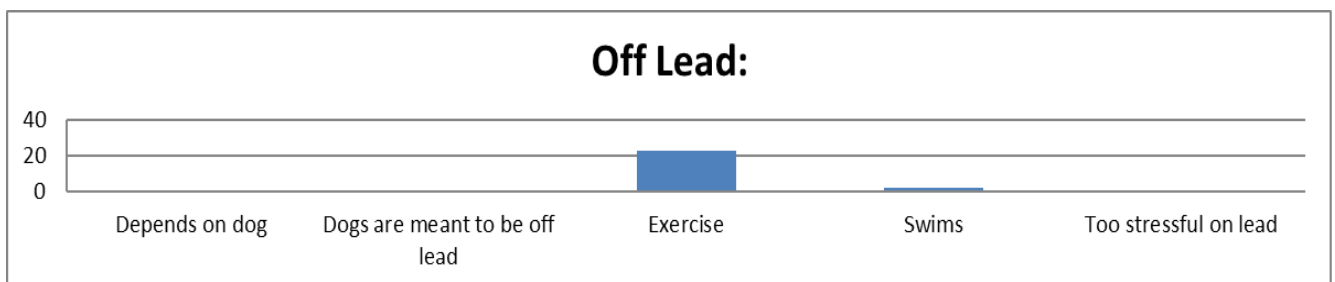
If dog walking is to be maintained on the site a welcoming atmosphere is important and an approach to enforcement utilised which takes account of that and of the diverse management aims of the site would be needed



Response chart 11

There is a clear preference among dog walkers to walk their dog off the lead. Only 14% of respondents indicated a preference for walking their dog on the lead and among the reasons discussed some respondents indicated they would walk their dog off lead when there are fewer other dogs around so the figure of 86% who prefer off lead walking is conservative.

The perception among Dublin City Council staff is that >90% of dogs are seen off lead.



Response chart 12

The question below was designed to look at the consistency of response on preference of off-lead walking

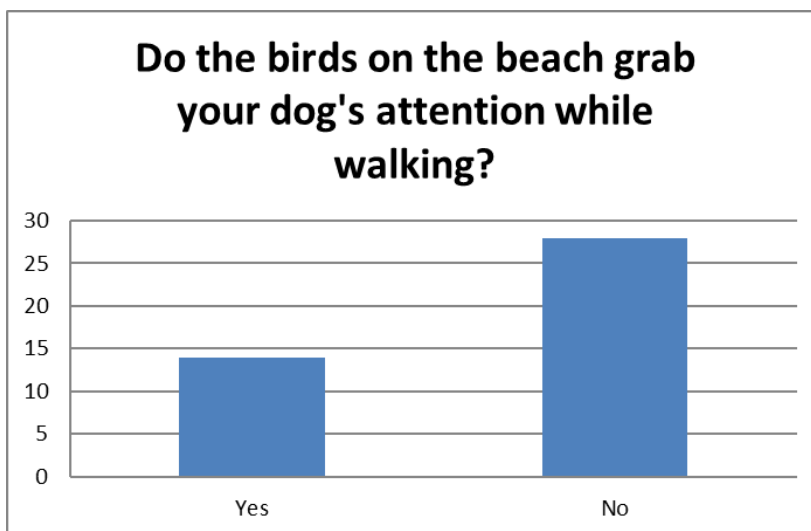


Only one respondent considered that they walked their dog off lead “rarely” – all others (97.7%) walked their dogs off lead at least some of the time with more than 50% walking their dogs off lead “all the time”

Response chart 13

### Dog & wildlife interactions

The three questions below explored whether dogs were allowed to actively chase wildlife and whether this was focussed on birds or included other animals.

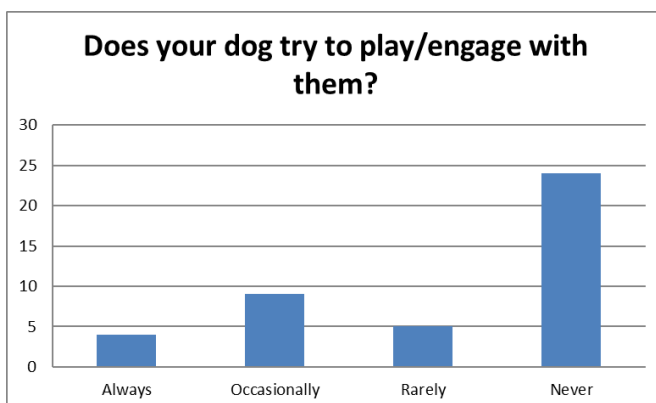


Owners believe that only 33% of dogs are attracted by “birds on the beach”

While 42% would express at least some level of chasing or interaction on at least a rare frequency, only 33% (consistent with the figure above) show regular interest in interacting with wildlife.

In discussion with respondents this was thought to usually be chasing birds

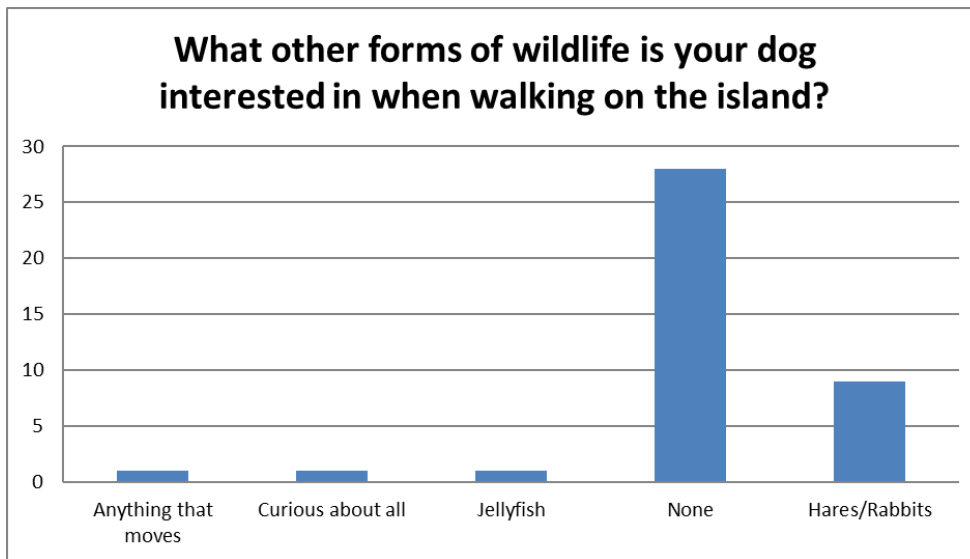
Response chart 14



In questioning about species other than birds that attracted dogs most indicated birds were the only interest while in other forms mentioned seals were absent but hares were mentioned by 9 respondents

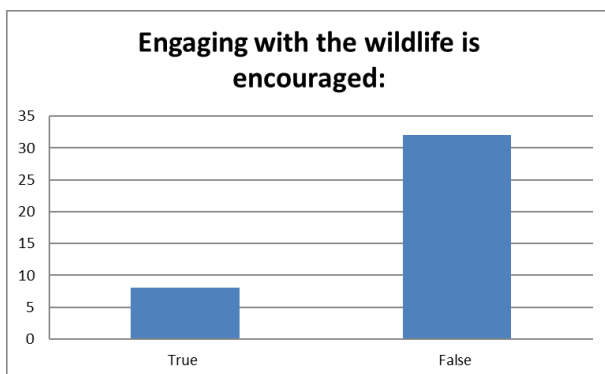
Response chart 15



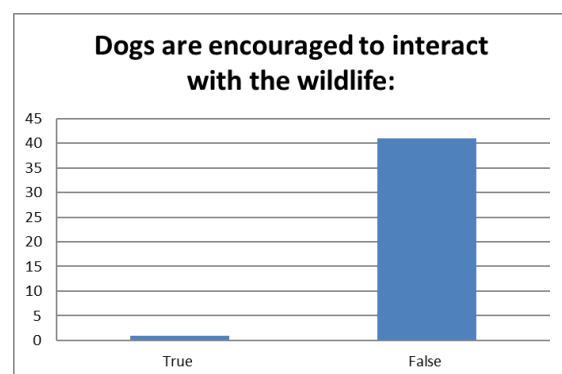


**Response chart 16**

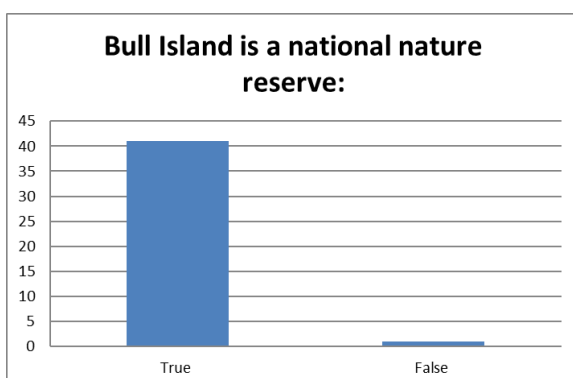
There is awareness from those questioned that engagement or interaction with the wildlife is not encouraged but from previous questions there is a recognition that owners allow or in some cases enable this to occur.



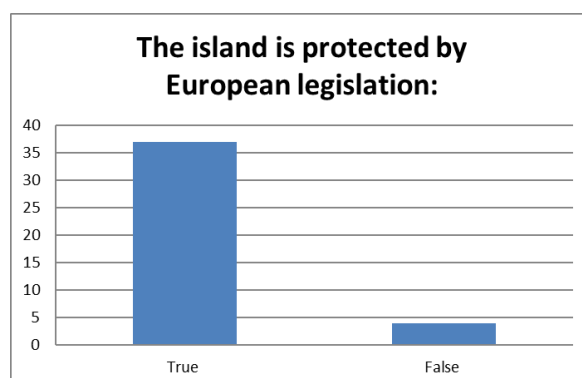
**Response chart 18**



**Response chart 17**



**Response chart 19**

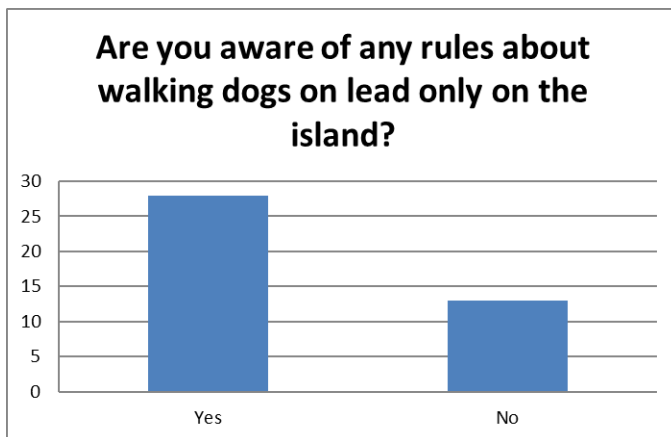


**Response chart 20**

There is strong awareness that the site is a nature reserve and that interaction with wildlife is sensitive.



### Awareness of rules regarding dog walking

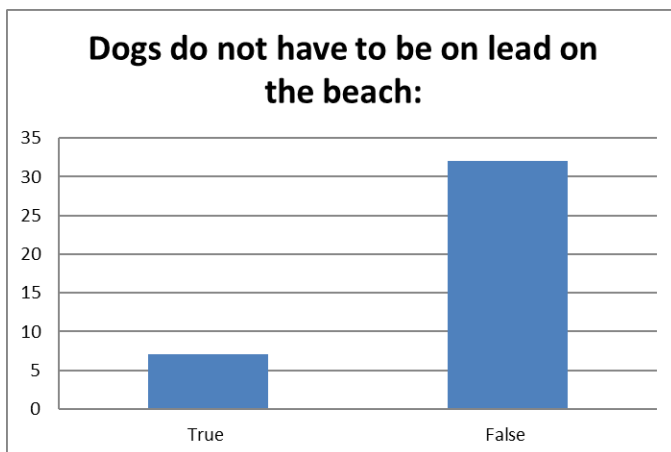


Response chart 21

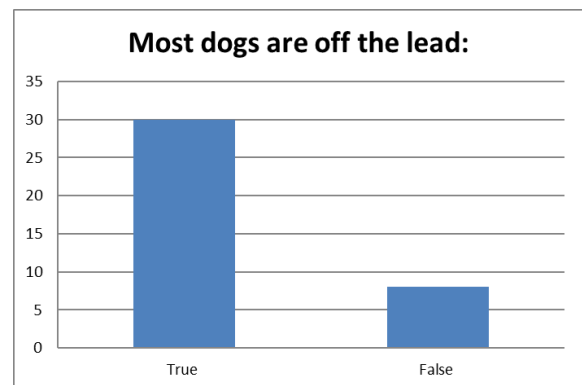
There is a moderate to high level of awareness of rules around dogs on the site.

While 33% of respondents claimed to be unaware of rules around walking dogs on the lead, 76% recognised that the rule extended to the beach area.

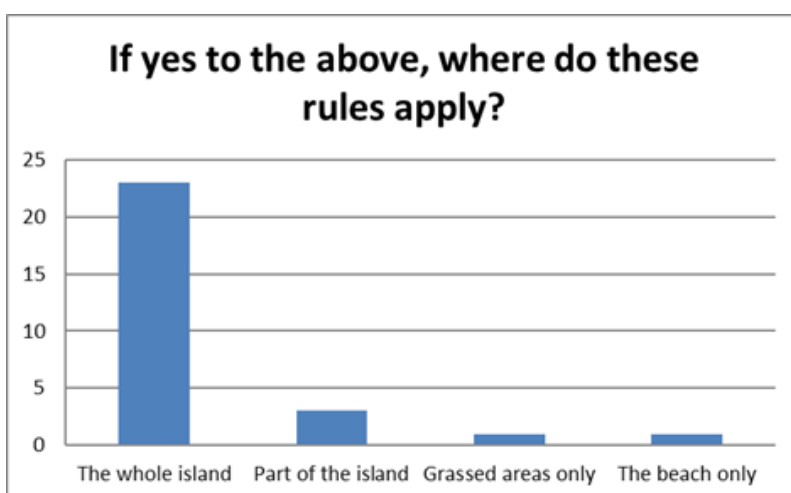
Despite clearly visible presence of dogs off the lead during interviews only 78% of people admitted that most dogs are off the lead



Response chart 22



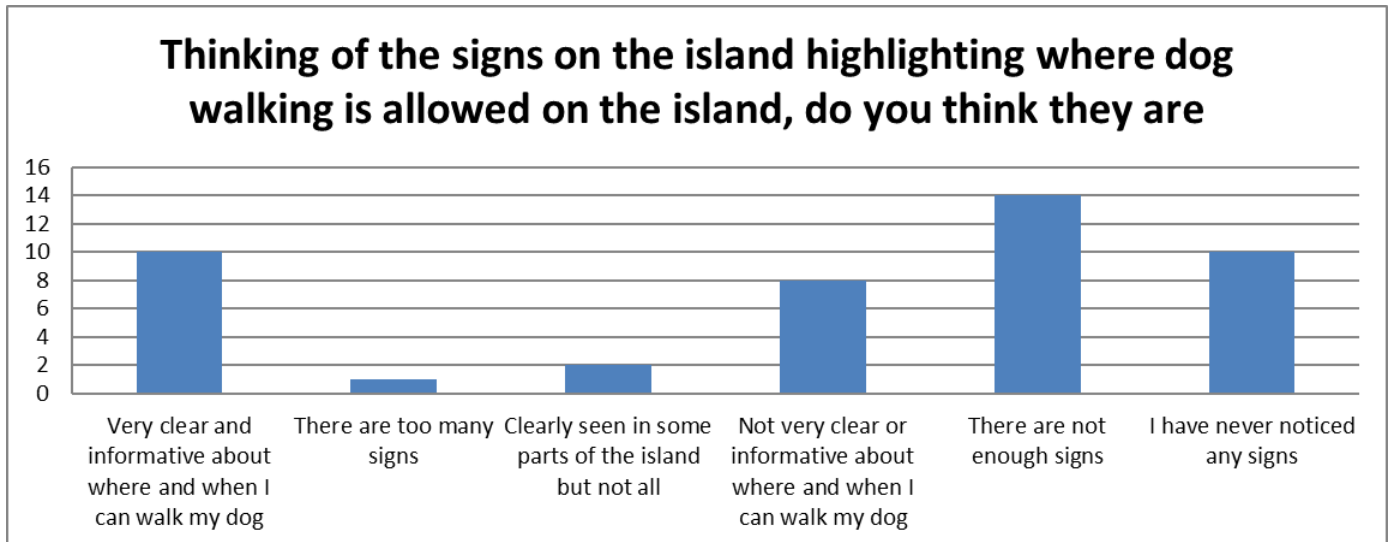
Response chart 23



Response chart 24

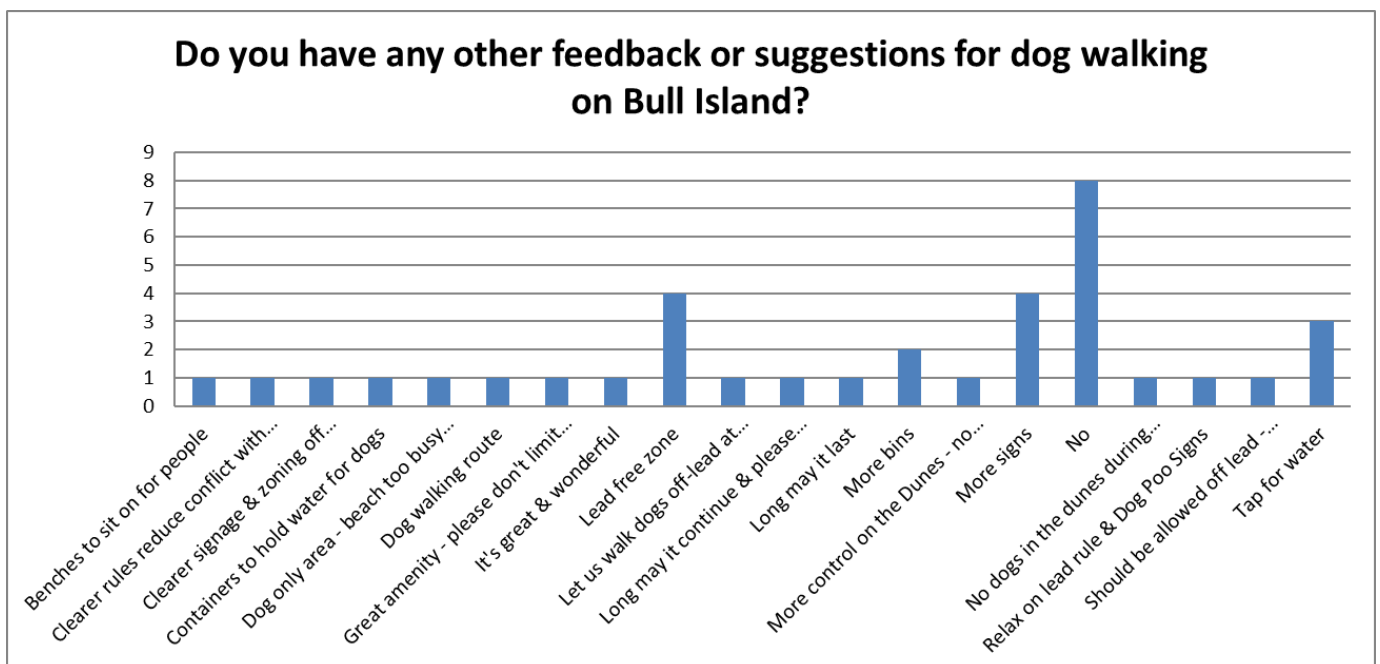


The question below asked whether the information signage provision regarding the rules around dog walking on the island was adequate. There were a range of views but 52% of respondents felt the information was not adequate in some way and 24% were completely unaware of signage relating to dog walking.



Response chart 25

Thinking about what dog walkers might see as useful for their purposes respondents were asked for suggestions. Thirty four chose to do so (81%) and of those there was a strong tendency to ask for more clarity on where they could walk freely or suggested providing an off-lead zone.

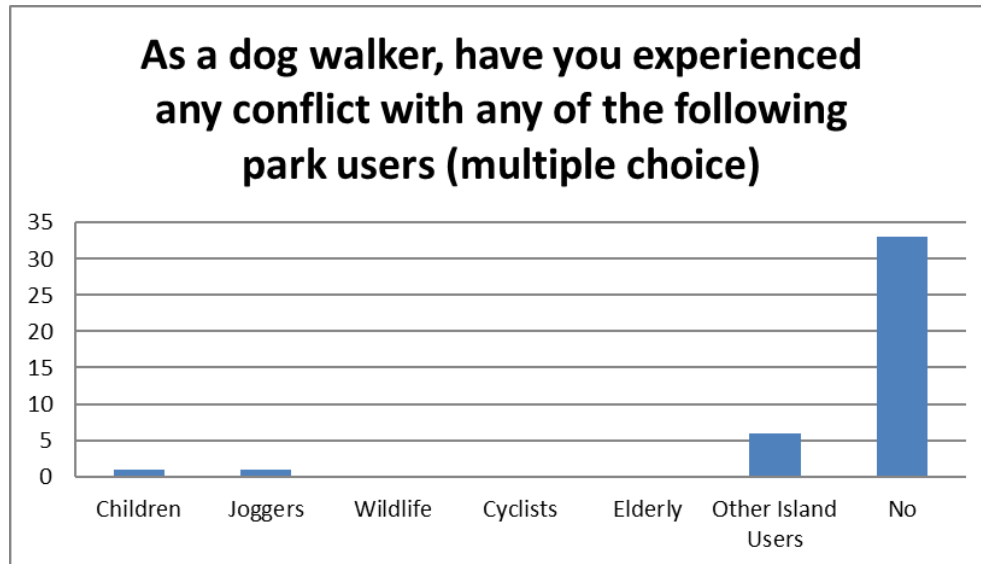


Response chart 26



## Conflicts with other users

This question was focussed on exploring whether dog walkers recognised any conflicts with other island users or with wildlife.



Dog walkers appear to rarely perceive or experience any conflicts with other users.

None admitted to experiencing wildlife conflicts though earlier in the survey were able to moderate levels of interaction with wildlife – presumably not seeing this as a conflict

Response chart 27

## 6.2 Dog walking behaviour observations

The table at Annex 3 shows data collected from observations from key access points in order to gain insights into the behaviour of dogs and dog walkers. The methods used were simple counts and recording of perceived incidents of relevance (bird disturbance/-ve dog:dog interaction/-ve dog:people interactions)

Summary data are presented in table 7 below

**Table 7 Dog behavioural observations – summary data**

Date	Day	Start time	End time	Total obs time (h)	Location	Bye-law compliance			Negative interactions			
						total dogs recorded	off lead	off lead %	no. bird disturbance incidents	ratio of dogs per incident	dog:dog	dog:people
17/09/2016	Sat	0800h	1030h	2.5	South car park	25	24	96.0	2	12.5	0	0
17/10/2016	Mon	1015h	1215h	2	Causeway (looking N)	3	3	100.0	4	0.75	0	0
05/11/2016	Sat	1100h	1400h	3	Central beach access	90	83	92.2	5	18	3	0
07/12/2016	Wed	1430h	1600h	1.5	South beach access	18	17	94.4	1	18	0	0
13/12/2016	Tue	0930h	1230h	3	Central beach access	35	33	94.3	2	17.5	2	0
13/12/2016	Tue	1245h	1445h	2	Wooden bridge looking north	3	3	100.0	6	0.5	0	0
<b>Combined</b>						<b>174</b>	<b>163</b>	<b>93.7</b>	<b>20</b>	<b>8.7</b>	<b>5</b>	<b>0</b>



The primary control measure taken to control dog walking on the island is a bye-law permitting access to people with dogs only when dogs are kept on a lead.

A large amount of observational data and opinion from stakeholders has indicated that this bye-law was widely flouted and that off-leash walking of dogs was the norm. This is borne out further by the limited set of recorded observations summarised in table 7 above.

The rate recorded above of an average of 93.7% of dogs off-lead is consistent with stakeholder perceptions. It is clear then that compliance with the byelaw in this regard is negligible.

Variation in the % of dogs on the lead at different access points was apparent but given the small sample size no clear inferences can be made.

Signage on the island details the byelaws and additionally there is signage indicating areas where no access is permitted, namely in the lagoon/saltmarsh areas. Survey observations over 4 hours in total in this area indicate a significantly lower overall number of dog walkers than present in the beach areas but a much higher rate of disturbance incidents per dog. This is in part due to higher numbers/greater concentrations of birds present in the lagoon/saltmarsh area than on the beach and also the relatively less tolerant species present such as wildfowl and waders as opposed to predominantly low density of gulls and many fewer waders in the beach areas.

Bird disturbance incidents in the beach areas were largely dogs observed chasing or incidentally disturbing and displacing flocks of open strand waders like Sanderling and Oystercatcher or gulls (mainly black headed and herring gull) on the beach or in the shallow water off the beach. Displacement distance and behaviour varied greatly but was not recorded.

The primary factor limiting access to small numbers at the lagoons may in fact be the less attractive, marshy terrain for walking on rather than the signage but the relative impact of any dog accessing the area site is higher due to the high concentration of sensitive waterbirds present.

Accurate Tidal state was not recorded on the days of observation and further data on this could describe in more detail the relative impacts. Birds present on the saltmarsh at high tide roost are closer to areas where dogs are walked (generally on the upper saltmarsh with dogs making forays out to the saltmarsh edge). Recording more data on this aspect was not feasible in this study but could be considered for future monitoring purposes.

Very low number of negative incidents between dogs, and no incidents between dogs and people, were recorded. This in part may be influenced by observational distance affecting observer perception but also the likelihood that regular dog walkers and their dogs may be accustomed to the presence of dogs in the same area and may avoid conflicts.



## 7. Potential Control Measures

It is clear that there are specific challenges of managing dog walking at North Bull Island in relation to wildlife. To achieve reduced wildlife impacts and to maintain a significant level of amenity/recreational value for dog walkers, additional measures to those identified in the existing site management plan will be required. These should however be set around a holistic approach to the management of the site rather than simply targeting one issue. The range of general measures which could be considered include:

- **Additional effort on bye-law enforcement:** Current informal advisory effort is limited by low staff resource and formal bye-law enforcement is infrequent and hampered both by poor resourcing and by lack of availability of appropriate staff. The use of increased enforcement should be considered as part of the mix of control measures possible but is unlikely to be successful in isolation as the relative scale of penalty is low and staff resource required to achieve adequate coverage is high.
- **Additional effort on awareness raising:** a number of methods for raising awareness are already in operation but these are not effective in influencing compliant or appropriate behaviours from dog walkers. Significant new measures could include:
  - Targeted awareness events
  - Handouts & leaflets
  - Targeted signage
  - One to one informal advisory discussions on site
  - Enhanced web-based information

These are unlikely to be effective in isolation due to the need for a more robust approach to persistent or serious offences and for an even-handed approach to provision for all forms of legitimate recreation.

- **Limiting access spatially (and temporally) to the most sensitive wildlife areas for all visitors (not just dog walkers):** By identifying the most sensitive areas for access, it may be possible to zone the site and focus resources in a targeted way towards enforcement, awareness raising and protection of those zones. This has the added effect of creating a strong message around the nature reserve status of the site and thus potentially increasing awareness and compliance overall.

Limiting access may require physical barriers (fencing), policing of boundaries (staff or volunteers) and signage in order to establish non-access areas. This may additionally require changes to existing bye-laws.

Zones are unlikely to be successful in isolation and a strong effort to raise awareness of their sensitivity would be required alongside policing to engender a sense of care among visitors. Providing an opportunity for viewing of e.g. seals from observation points may assist in establishing permanent non-access zones.



Care over the choice of terminology for these zones will be required to ensure there is strong regard for their purpose

Protecting certain areas from unleashed dogs and general access disturbance should not only protect vulnerable seals and birds but could also contribute to the success of reintroducing Irish hare and re-establishment of Little Tern to the island should these be considerations for the island in the future.

- **Creating enhanced access opportunities in least sensitive areas to provide an opportunity for holistic management of dog walking:** there may be opportunities in the least sensitive parts of the island to allow permissive zones or less strict adherence to on lead dog walking or tolerance of off lead walking, where the likely impacts on wildlife are very low and where aspects such as public safety can be managed appropriately.
- **Creating an enhanced understanding of the management aims for the site:** There is scope to increase awareness of the bye-laws and to educate users of the impacts that access to sensitive areas and allowing dogs off lead can have on wildlife on the island.

## 8. Analysis & Discussion

### Is there a problem?

The clear opinion of stakeholders and managers of the nature reserve is that a problem exists where dog walking conflicts with the nature conservation interest of the site. There is additionally a problem identified among dog walkers whereby they have low awareness of their potential impacts on wildlife and the rules on dog walking on the site are unclear.

### What is the nature of the problem?

The amounts to a range of issues impacting on different features of the site in different ways and these can be primarily identified as:

- Disturbance impacts (unquantified) on wintering and migrant waterbirds through increased energetic demands and/or direct exclusion of birds from habitats or areas by the scaring presence of walkers/dog walkers
- Disturbance, through direct impacts (such as damage to nests or chicks) or exclusion through repeated scaring, of ground nesting birds during the breeding season (March – August); these include Skylark, Meadow Pipit, Ringed Plover and Little Tern
- Disturbance and direct impacts on Grey and Common Seals at the northern tip of the island year-round. There are heightened concerns during pupping periods in approximately May-July (Common Seals) and September-November (Grey Seals).





The impacts may be energetic through exclusion from loafing or pupping areas or direct impact through attack, though evidence for this is poor

- Disturbance and direct impacts on mammals and reptiles in the dune areas – notably Irish Hare which may now be extinct on the island.
- The identified need to balance off the site's amenity value for dog walking against its importance for nature conservation is effectively unmanaged at present through lack of enforcement and low level application of existing low intervention management approaches.

### **Are current controls effective? If not why not?**

The existing control measures are ineffective. Section 8 reviews the current control measures and indicates issues such as poo signage, low levels of enforcement, disregard for bye-laws and lack of awareness of impacts as being primary reasons for ineffectiveness.

What do stakeholders want to see?

Dog walkers wish to see clearer guidance and from their behaviour and their responses to questions they also wish to see a lead-free zone.

ISS wish to see seals left undisturbed ideally by exclusion of dogs from the island to create a level of certainty in managing the issue

NPWS wish to see the site conservation objectives addressed including long term security for the waterbird populations, undisturbed seal sites and progress with the restoration of breeding bird communities and enhanced conditions for Irish Hare. NPWS would like to also see other user groups considered in any plans for management.

Birdwatch Ireland wish to see key bird areas of the site left undisturbed for wintering waterbirds and significant management of breeding bird populations. They also wish to see a holistic approach to managing disturbance on the site which takes account of other user groups.

### **What measures do the existing plans propose?**

The existing management plan for the site proposes the following measures to alleviate the impacts of dogs:

Enforcement of current legislation – this is currently not enforced at a significant level.

Increased awareness of the bye-law – awareness of the bye-law regarding dogs on leads is relatively high but there is widespread non-compliance.



Increased public awareness though the website has still not been achieved and the issue of dog control and the bye-laws are difficult to find on the website and there is no mention in the "Guide to" section.

This study is the first to consider the impact of dogs on the island specifically and to consider any potential for management measures to address impacts including the possibility of the use of zonation.

#### RECOMMENDATIONS

Experience of dog control policies by site managers in Britain on sites of nature conservation interest (Taylor *et al.* 2005) indicates that regulations and bye-laws remain the one of the most effective methods to control disturbance by dogs.

- It is recommended that current legislation related to dog control (restricting dogs to being 'on leash') at North Bull Island is enforced. There is anecdotal evidence that dogs 'off leash' at North Bull Island disturb wildlife. There is plenty of evidence from other sites that dog disturbance can have a significant negative impact on factors like reproductive potential and breeding success of birds, and feeding by waders (See Appendix IV, [Section 7.4.6](#)).

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- As part of this policy, there should be renewed effort to increase awareness of this bye-law amongst the public. Some access points already have signs indicating that dogs must be on a leash at all times. The posting of regulations and fines for having your dog 'off leash' on the signs around North Bull Island should be considered to help enforcement.
- Public awareness should also be increased by the use of the internet (DCC web page) and via signs, leaflets and information at the Interpretative Centre. There is currently no information about restrictions to dogs on the DCC web page about North Bull Island. DCC staff indicate that there is considerable mis-information about the management of North Bull Island and the 'rights' of its users, many of which think they have the 'right' to allow dogs to roam.
- The potential for prohibiting dogs (including dog walkers and other walkers) from the northern tip of the island should be explored. This area is the most isolated spot on the island and is the most suitable spot on the island to prevent all access to reduce disturbance. This would significantly reduce dog disturbance to the Seal colony and may also help breeding success of Ringed Plovers, Skylark and Meadow Pipit that breed in this area. Some of this area was fenced off in the past to prevent disturbance to the Little Tern breeding colony.

#### What is likely to be the most effective approach to managing dog walking in future?

The current level of management provision of the island is effectively allowing open access to all parts of the nature reserve at all times of day and year unless restricted by tidal state and this includes off-lead dog walking. This unregulated access is creating real or potential impacts on the designated site features and interests of the nature reserve. This situation has arisen due to the scale of non-compliance with bye-laws among visitors which, at least in part, is due to a lack of resources required to apply existing identified management requirements in an effective manner. In addition, the existing management approach may be contributing to the lack of compliance by not engendering awareness of a clear and

defined set of rules, enabling non-compliance to go unchecked and thus setting precedents and focussing on a wider set of functions than the primary interest of the site as a nature reserve.

Addressing this will require a number of approaches:



The re-establishment or “refreshment” of the site as a clearly defined nature reserve with a clear set of management policies and practices for the future. This would provide an overarching general approach which involves many more detailed approaches.

The establishment of clear management policies which give primacy to nature conservation interests and which seek to integrate other activities on the island around those policies in a sustainable, low-impact manner.

Management resources which are commensurate with the delivery of clearly defined nature conservation prescriptions and targets some of which include the sustainable integration of recreation including dog walking.

The sustainable integration of dog walking as a legitimate form of recreation by the spatial management of dogs including the provision of areas of non-access and areas of increased tolerance of off lead walking. The latter may include dog-walker specific zones or exercise areas.

The development of a more extensive staff resource that also utilises volunteers and that engages actively with all of the recreational users of the site will be needed to be

#### **What would the expected outcomes be?**

Any new management implemented should be targeted at achieving the following outcomes in order to fulfil the management objectives identified within the existing management plan and the needs of both nature conservation management of the site and the integration of sustainable levels of dog walking:

**Creation of low disturbance areas throughout the lagoon and at the north tip of the island all year round** - this would create a refuge zone for waterbirds and seals at all times. This would be likely to increase both the residence time and peak numbers of birds using the site by providing a spatial refuge to retreat to from areas which become temporarily disturbed elsewhere. This is likely to also function as a refuge zone for wider parts of the Dublin Bay area where there are currently no formal refuge zones.

**Creation of favourable conditions for ground nesting birds in significant areas of the dune and beach habitats** – there are significant parts of the dunes and beaches which if undisturbed by people and dogs would provide an opportunity for ground nesting species to nest more successfully and in some cases to potentially re-establish their numbers. At least part of this approach could be combined with the zoning of a refuge at the northern end of the island to create a non-access zone also encompassing the waterbird and seal interests and potentially of importance for Irish Hare.

**Enhanced facilities for dog walkers** – reducing the overall area of access through the provision of clearer guidance and enhanced bye-law enforcement or bye-law changes will potentially negatively impact on the perceived amenity value of the area for dog walking. In order to provide balanced management provision, an off-lead zone or a zone of tolerance for off-lead dog walking could be a means of managing dog walking



restrictions. Such an area could be placed on a site of low sensitivity and feature additional resources of value to dog walkers such as drinking water provision, environmental enrichment features and seating for owners.

## **9. Recommendations**

The recommended actions provided here follow the step wise process flowing from the earlier sections of consideration of the interest, issues and statutory requirements on the site, the views of key stakeholders, review of the current management regime and the potential options identified for future management and the expected outcomes.

An estimate of the level of resource required for implementation of the recommended actions and the monitoring requirements is provided in section 12.

### **9.1 Nature reserve re-development – refreshed approach to reinforcing, re-branding and re-launching the Island as a Nature Reserve**

A refreshed approach to the status of the site as a nature reserve including its branding, management, facilities provision, people engagement and legal provision would provide a platform for the re-launch of the nature reserve which would 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 suggested key actions which if all implemented could help to address a number of issue which include conflict between wildlife interest and dog walking.

#### **Action 1: Creation of a new reserve development plan focussing on;**

- i. Re-branding the site with a unified identity and clear mission based on nature protection, sensitive access and education
- ii. Provision of a unified and coherent set of signage and interpretation approaches which are clearer and more impactful than that currently existing, including increased web presence and enhanced people engagement.
- iii. Provision of a centralised visitor hub and facilities to provide a clear focal point for the site that visitors recognise as being focussed on nature.
- iv. A clear set of management objectives, prescriptions and a work programme that are designed and adequately resourced to show the site to deliver better value for conservation management



- v. Create a nature reserve steering group 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.

## 9.2 Zonation of activity

### Action 2: Establishment of zones of controlled public access on the nature reserve in areas of high sensitivity/critical importance for wildlife;

In order to effect more secure conditions for priority wildlife while at the same time provide clearer guidance for dog walkers and for access generally while considering the potential ability to police and enforce any new rules, the following zones are recommended for establishment, subject to a review in conjunction with other recreation activity provision and in light of detailed, ground truthing of practicalities of the zones indicated;

- i. **No access zone (all year)** for all visitors throughout the island side of lagoon area and northern tip of the island (see figure 3)

This would likely require a hard boundary within the dune system out to the beach, would require abutting the golf course fence line and a novel approach to marking on the beach itself. An observation point at the northward beach boundary or some other means of observing both people and wildlife activity, as well as suitable signage and interpretation to back this up, would likely be required.

Boundary and signage solutions on the lagoon side are also a challenge but require to be ideally difficult to penetrate with clear signage and interpretation

The exact siting of this infrastructure requires detailed planning on the ground

- ii. A **strict on-lead zone** in dune area south from the no access zone and including the beach as far as the main access (see Figure 3) this enables control of dogs close or in approach to the non-access zone to prevent inadvertent straying and enables close control of dogs during the breeding within the dune areas. While people access can be a disturbing factor in such habitats it is likely to be less impactful than the predation perception reaction birds are likely to have with dogs. It will also prevent chasing of hares all year. This will only be of value if there are high rates of compliance and thus close policing will be required. In addition, monitoring of the bird populations to look for positive effects should be carried out with regular review of the prescription thereafter.





- ### 9.3 Signage, interpretation and raising awareness of wildlife



**Action 3: Establishment of enhanced wildlife viewing with interpretation through events, staffing, signage and media where appropriate**

- i. See Action 1 (iii) above
- ii. Wildlife viewpoint at or around northern boundary of access zone to enable viewing of seals and birds – careful consideration of location and manpower resource
- iii. Establishment of a regular wildlife events programme – e.g. talks, outreach to community groups, guided walks – to establish high rate of visitor and community engagement with wildlife
- iv. Enhanced on site personnel presence; volunteers out on site daily for information provision, monitoring and low tech site maintenance – to help instil the concept of watchful eyes on the ground and promote the importance of the site
- v. Development of opportunities for cameras within no access zones to view sensitive wildlife (e.g. seals) – footage provision to visitor locations throughout city & promotional campaign
- vi. Develop volunteer network – a core group of volunteers would be an added significant resource which could help to engender greater local ownership of the site and peer group influence over community visitors. In particular dog walking volunteer wardens could help to influence the dog walking community by example or by leading events.

A key consideration in the provision of signage and interpretation will be the style, branding and approach of the material provided. A discussion of and suggested approach to, signage and interpretation is provided in section 11.

## **9.4 Dog specific facilities and rules**

**Action 4: Provision and promotion of dog and dog walker specific facilities and rules in low impact areas and related guidance**

- i. Provide a zoned approach to *dogs on leads* rules – determine most effective zones (see figure 3), amend bye-laws to accommodate new rules if necessary
- ii. Increased staffing resource for dog wardening – a planned/scheduled approach and daily/near daily presence in initial period, varying effort subject to effectiveness through monitoring
- iii. Consider use of dog walker liaison volunteers in conjunction with key partners e.g. Dogs Trust, to act as peer leaders and monitors





- iv. Consider provision of safe, off-lead, exercise area at a site of low impact to focus main off lead activity away from wildlife sensitive to disturbance (see figure 3) – this would require specific identification, consideration and provision.

## **9.5 Enhanced guidance, enforcement & policing**

### **Action 5: Build greater resourcing of operation and infrastructure for policing and enforcing bye-laws, site rules and guidance**

- i. Increase staffing resource for engagement with visitors to the island including dog warden presence as part of increased engagement and enforcement (see Action 4ii)– this should be in combination with zonation (Recommendation 2)
- ii. Enhanced and strategically located warning and advisory signage to assist in enforcement
- iii. Staff base and equipment provision commensurate with need
- iv. Volunteer programme established and suitably resourced (see Action 3vi)

## **10. Signage and Interpretation approaches**

This section is informed by discussions with stakeholders and in particular, discussions held with Dublin City Council staff at points throughout the duration of the project and informal discussions incidental to presence on site for e.g. questionnaire surveys. These discussions have provided guidance on generally acceptable approaches which have been modulated in light of the recommendations provided above.

In determining a successful approach to signage and interpretation additional work will be required which is beyond the scope of this study. This includes; brand development, detailed interpretive planning, signage design and specification.

### **10.1 What is the overall aim in the provision of signage?**

There are two main aims in the provision of signage and interpretation:

1. To provide clear instruction on the access rules, zones and orientation around the site
2. To enhance awareness of the site's importance among visitors and provide guidance on how to visit the site responsibly

To achieve these the signage should form an integral part of the branding of the site as a nature reserve.



## 10.2 What general approach is needed?

The recommendations in section 10 include reference to a general approach which focuses around re-branding and re-launching the site under a refreshed nature reserve “banner”. A key component of this refreshed approach is signage and interpretation as one of the most visible ways of re-branding. Relative to the provision of major new visitor facilities, signage is relatively low cost and is a basic provision for any operation to help in managing and ultimately reducing undesirable patterns of behaviour.

The key elements of nature reserve branding promoted through signage which should be used are:

**Threshold signs** – at one or more main points of entry to the site that convey to visitors that they have arrived and that once they have crossed that line that they are within the nature reserve.

Threshold signs would include the name of the site, be situated at strategic locations and make a strong first impression. They need to be impactful, well maintained, fitting within their environment rather than overpowering it and sensitive to the landscape.

A site motif or logo may be a useful feature and can be repeated on other signage and on e.g. staff and volunteer clothing, to maintain awareness of the nature reserve throughout the site.

**Directional & guidance signs** - signs or markers that fulfil various functions such as providing simple orientation, waymarking or the provision of key information such as warnings, information on access points or key rules.

These would include signs that display key bye-law information, marks access zones and site boundaries where appropriate and provide other guidance and warnings. These may include seasonal signs that convey information about taking appropriate care with regard to e.g. fire risk

These signs are highly variable in size and specification but should contain common design elements that ensure the brand is recognisable and thus their legitimacy as guidance or warning is consistent.

**Interpretation** – signs which convey information in relation to the value of the site in order to achieve increased awareness or knowledge. A site like Bull Island with a range of challenges in terms of anti-social behaviour may be best placed to use alternative approaches. These could include:

- Utilising robust simple signage to convey means of accessing non-fixed forms of interpretation such as web based “soft copy” information which can be accessed



in advance of visiting or on site, via mobile technology. This material should also maintain brand motifs and values throughout.

- Use of staff volunteers, events and activities to provide the main source of interpretation rather than rely on physical infrastructure. This could include community volunteering as site guides. Training and appropriately equipping staff and volunteers would be important in ensuring high levels of brand coherence.
- Development of a bespoke site guide on mobile app. This material should also maintain brand motifs and values throughout.

These aspects would form key elements of an **interpretive plan** for the site which would be essential in determining the detail of the most effective approach and would take account of available resources.

### 10.3 What type of signage should be used for guidance and warning?

Signage which takes the approach of providing eye catching and issue appropriate warning and guidance can be used.



In the case of access and in relation to dogs signage which provides an engaging theme and which utilises potential partnerships would be valuable. The Dogs Trust logo, for example, is eye catching, highly recognisable and brings a high level of authority and respect consistent with the Dogs Trust Brand. A partnership agreement with Dogs Trust in developing an approach to dog access and responsible dog ownership

**Figure 4 Dogs Trust Logo would be a valuable addition to signage relevant to dog walking** – use of the logo would require specific agreements in place with Dogs Trust

consistent with their own campaigns would be of high benefit. An opportunity to use their logo and their co-operation on designing messaging would be of significant assistance in engaging with dog owners who visit the island.

A blanket “strong warning” approach can become fatiguing to visitors and can create an unwelcoming or restrictive atmosphere even where it is not required. Signage relevant to the audience would be targeted, taking an approach of increasing warning levels (including the strength of message and the frequency of signage) in relation to location and proximity of important issues. This would be an opportunity to provide a welcoming atmosphere and engendering support and also make stronger messages stand out more when required.

Figures 5 & 6 below show two approaches to dog signage – figure 5 provides a humorous, simple message but no explanation, perhaps where the message is less critical and Figure 6 provides a sense of seriousness along with a strong explanation via simple symbols.



**Figure 5** Advisory signage which appeals to dog owners in a playful way where issues are less critical



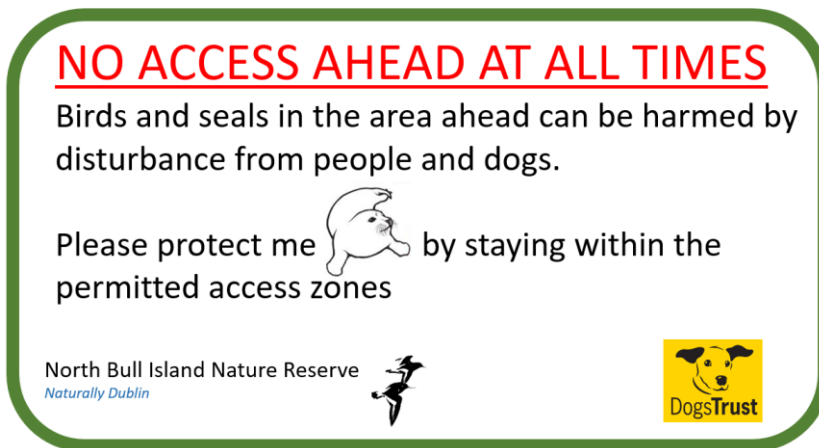
**Figure 6** Strong advisory signage conveying serious information in a concise way

Both of these approaches could be used effectively at North Bull Island in order to achieve effective zonation where required or improved behaviour during key periods. Zonation signs may include wording such as in figures 7 & 8 below:



Development of a site logo (example mock up shown) may have value in bringing new brand identity and use of the Dogs Trust logo would require specific agreements in place with Dogs Trust

**Figure 7** An example sign which could be used on approach from an off lead zone to an on-lead zone



**Figure 8 Signage with messaging on approach to a no access boundary**

These signs attempt to appeal emotively to all visitors and where necessary target dog walkers where a behavioural change is required. Use of the Dogs Trust logo, wildlife image and the site logo and a strapline maintain strong visual messaging around the key issues. The signs would be simple and easily replaceable depending on materials chosen.

## 10.4 What type of signage should be used for interpretation and awareness?

Signage used for interpretation is highly diverse and the choice of approach is subject to a wide range of factors such as audience, location, weather, risk, subject matter and the aim of the messaging.

North Bull Island has a range of factors which make static interpretive signage a challenge to maintain, in particular high exposure to weather conditions and proven high risk of damage from vandalism and defacing.



**Figure 9 Interpretation panel example**

Static interpretation examples like this are of limited value where simple strong messages are needed and where risk of damage is high. They are high initial cost and have high maintenance requirements and depending on their design can be unattractive in certain landscapes



In addition, the usefulness of static interpretive signage is highly limited when dealing with dog walking issues and particularly so in this case, with a high proportion of this visitor type being local and relatively fast moving with an exercise purpose they are unlikely to utilise the interpretation provided.

It is the authors' recommendation to avoid the use of static interpretation and use alternative approaches:

- Use of volunteer and staff as on site information providers
- Web based materials – at least a website and downloadable site guide
- Consider the development of a site mobile app – use of geo location has strong potential to help in creating a strong draw for new visitors to the site. A site app could also provide a reporting tool.

These alternative approaches can avoid high maintenance costs and are potentially more fitting for the open landscape of the site where signage clutter can be unhelpful.

## **10.5 where are the key locations for signage?**

Signage locations should be determined through careful interpretive planning but with the following basic requirements:

Threshold signage at main entrance points

Clear zonation signage at frequent locations – within line of sight of each other on zone boundaries particularly where historical desire lines reach a zone boundary.

Advanced warning signage in prior to zone boundaries

Clear advisory signs at main access points relating main rules of “do” and “don’t”.

Additional opportunities to address the dog walker audience by providing dog waste bins and water points and signage in association with those could help target that audience for key messages.

## **10.6 Scale of cost for signage and interpretation**

The cost of signage is difficult to estimate at an early, pre-design, stage. The cost of signage includes high levels of variance which are subject to several factors including cost of materials, installation, transport and detailed location issues and the need for significant design costs. As such the cost estimates provided here are only broadly indicative.

The exact need for specific numbers of signage may also vary subject to terrain, advice from staff, and solutions for complexities of intertidal areas.

**Table 8 Outline estimated costs of new signage North Bull Island**





	Approx. No. signs	Ave. cost per sign (incl. inst.)	total	Comments
Threshold signs (main)	3	8000	24000	
Threshold signs (secondary)	6	3000	18000	bye-law info etc.
Zonation boundary signs	20	500	10000	
Zonation intertidal signs	4	1500	6000	
Zonation advisory signs	20	250	5000	
Directional signage (posts)	20	200	4000	
Dog advisory	10	500	5000	
Viewpoint platform & signage	1	100000	100000	
			<b>172000</b>	

Costs are approximates based on reasonable signage numbers as estimated by eye based on likely locations identified on maps and from the signage project experience of the authors without recourse to seeking detailed costs from manufacturers.

These cost estimates do not include removal of old signage.

There would be significant challenges associated with boundary signage in exposed intertidal areas – this cost may be borne through increased staffing rather than physical signage.

The cost of viewpoint construction is unknown and a nominal figure of €100,000 is suggested. The solution for this may be low specification and much lower or higher specification and much higher cost subject to ground conditions. The use of low specification infrastructure and manpower may be an effective alternative.

## 11. Monitoring Requirements

The implementation of a significant proportion of the recommendations listed is likely to have a material impact on the management issues discussed in this report and potentially a range of other related management issues. For example, increased wardening presence through volunteers may address issues such as anti-social behaviour and illegal bait digging while disturbance from other recreation in the sensitive northern area of the island would be managed by zonation.

In all cases, it is prudent to ensure that the application of increased and adapted resources or management approaches are well applied and are having the desired effect. To achieve this, a proportion of any additional resource allocation should go towards monitoring of the effects of management and the response of the receiving environment or subject in order to inform decision making in future





The recommended monitoring programme should include, but is not limited to, the following key aspects:

## **12.1 Wildlife response to new measures**

### **12.1.1 Wintering and migratory waterbirds**

- a) Building on IWeBS, the Dublin Bay Birds Project, low tide counts and casual recording a programme which includes the monitoring of the following parameters should be established:
- b) Sectoral counts at high and low tides of all waterbirds in the lagoon, island and associated areas - at least 1 count per month to co-ordinate with other Dublin Bay wide counts
- c) Mapping/species composition & counting of key high tide roost sites
- d) Interrogation of the DBBP to examine nocturnal site usage by waterbirds

### **12.1.2 Breeding birds**

- a) Establish a CBC or transect style monitoring regime for breeding birds in dune, scrub, beach and saltmarsh habitats to include territory plotting of priority species – 3 visits 1xApril/2xMay
- b) Respond to tern usage of the site by targeted monitoring if appropriate

### **12.1.3 Seals**

- a) Establish an agreed monitoring regime for year-round seal counts with NPWS and ISS including agreed method and frequency of counts – e.g. consider use of remote imagery
- b) Establish formal incident reporting and carcass post-mortem protocols in conjunction with NPWS and ISS

### **12.1.4 Hares**

- a) Annual assessment of hare numbers and distribution using a transect methodology

### **12.1.5 Other taxa**

- a) Follow monitoring plans identified in management plan or as identified by any new management committee which may be required to inform the impact of dogs

### **12.1.6 Habitat**



- a) Establish a baseline survey of access and recreation derived erosion e.g. desire line tracks and monitor periodically

## **12.2 User groups & stakeholders**

### **12.2.1 Dog walkers**

- a) Establish a survey regime for regular monitoring of behavioural observations of dog walkers – 3-5 observation sites, 1-3 times per month, representative days and times.
- b) Questionnaire re-survey of dog walkers annually

### **12.2.2 Visitors**

- a) Survey of visitors using counters and/or visual survey to establish annual estimates of total numbers, distribution and usage across the site
- b) Design visitor questionnaire survey to test levels of awareness, types of use of the site, origins, residence time and other relevant parameters to inform management.
- c) Record numbers and distribution of group use of the site, event attendance and engagement in any social media relevant to the site.

### **12.2.3 Recreation activities**

- a) Create a baseline assessment of site usage levels and distribution of other recreation types e.g. kite surfers

### **12.2.4 Stakeholders**

- a) Carry out a review of stakeholder opinion in relation to site management on a mutually agreed basis with a stakeholder liaison group or through other forums

The estimated cost of annual monitoring to enable responses to be measured and to contribute to other aspects of monitoring to benefit site management is included in table 9.

#### **Table 9 Estimated costs of monitoring**



## Managing dog walking impacts at Bull Island – March 2017

	man days per annum			Other	TOTAL
	Staff	Vol	partner	costs	est. cost
<b>12.1 Wildlife response to new measures</b>					
<b>12.1.1 Wintering and migratory waterbirds</b>					
a) Building on IWeBS, the Dublin Bay Birds Project, low tide counts and casual recording a programme which includes the monitoring of the following parameters should be established:					
b) Sectoral counts at high and low tides of all waterbirds in the lagoon, island and associated areas - at least 1 count per month to co-ordinate with other Dublin Bay wide counts	6		36		2400
c) Mapping/species composition & counting of key high tide roost sites		10			500
d) Interrogation of the DBBP to examine nocturnal site usage by waterbirds	1		2		300
<b>12.1.2 Breeding birds</b>					
a) Establish a CBC or transect style monitoring regime for breeding birds in dune, scrub, beach and saltmarsh habitats to include territory plotting of priority species – 3 visits 1xApril/2xMay	1	3			400
b) Respond to tern usage of the site by targeted monitoring if appropriate					0
<b>12.1.3 Seals</b>					
a) Establish an agreed monitoring regime for year round seal counts with NPWS and ISS including agreed method and frequency of counts – e.g. consider use of remote imagery	2	25	10		2000
b) Establish formal incident reporting and carcass post-mortem protocols in conjunction with NPWS and ISS	1	2	2		400
<b>12.1.4 Hares</b>					
a) Annual assessment of hare numbers and distribution using a transect methodology	2	2			600
<b>12.1.5 Other taxa</b>					
a) Follow monitoring plans identified in management plan or as identified by any new management committee which may be required to inform the impact of dogs	2	2			600
<b>12.1.6 Habitat</b>					
Establish a baseline survey of access and recreation derived erosion e.g. desire line tracks and monitor periodically	2				500
<b>12.1 User groups &amp; stakeholders</b>					
<b>12.2.1 Dog walkers</b>					
a) Establish a survey regime for regular monitoring of behavioural observations of dog walkers – 3-5 observation sites, 1-3 times per month, representative days and times.	1	2.5			375
b) Questionnaire re-survey of dog walkers annually	1		2		300
<b>12.2.2 Visitors</b>					
a) Survey of visitors using counters and/or visual survey to establish annual estimates of total numbers, distribution and usage across the site*	2	5		2000	2750
b) Design visitor questionnaire survey to test levels of awareness, types of use of the site, origins, residence time and other relevant parameters in order to inform management.	2	5			750
c) Record numbers and distribution of group use of the site, event attendance and engagement in social media.	1	5			500
<b>12.2.3 Recreation activities</b>					
a) Create a baseline assessment of site usage levels and distribution of other recreation types e.g. kite surfers	3	20	5		1875
<b>12.2.4 Stakeholders</b>					
a) Carry out a review of stakeholder opinion in relation to site management on a mutually agreed basis with a stakeholder liaison group or through other forums	4		3		1075
*annualised sum		Total			<b>15325</b>



## 12. Resource needs & Potential Funding Options

The potential benefits for the management of North Bull Island the implementation of the recommendations from this study are significant. To deliver the recommendations and additionally achieve the full benefits of these, significant new resources may be required.

The resource implications of the recommendations are shown in Table 10 below.

**Table 10 Scale & nature of resource requirements for implementation of recommendations**

Action summary	Cost type	Scale of cost (H:>1m, M: 100K-1m, L:<100K)	annual/capital	Potential funding sources to consider?
<b>Recommendation 1 - Nature reserve re-development – refreshed approach to reinforcing, re-branding and re-launching the Island as a Nature Reserve</b>				
Planning & re-branding	design & plan production	L	C	Internal
Signage and interpretation	infrastructure	M	C	Tourism, EU Life/Interreg
Visitor hub and facilities	infrastructure	H	C	Tourism
Management planning	plan production	L	A	Internal, EU Life/Interreg
Management committee	facilitation	L	A	Internal
<b>Recommendation 2 - Zonation of activity</b>				
controlled access zones	signage etc	M	C	Tourism, EU Life/Interreg
	legal costs	L	C	Internal
	planning & media	L	A	Internal
<b>Recommendation 3 -Signage, interpretation and raising awareness of wildlife</b>				
Wildlife viewpoint	infrastructure	M	C	Tourism
Establishment of a regular wildlife events programme	staff & training	L	A	Tourism, EU Life/Interreg
Enhanced on site wardening	staff & training	M	A	Internal
Development of opportunities for cameras	infrastructure	M	C/A	Tourism, EU Life/Interreg
Develop volunteer network	staff & training	L	A	Internal
<b>Recommendation 4 -Dog specific facilities and rules</b>				
zoned for dogs on leads	infrastructure	see recommendationn 2 above		
dog wardening	staff	L	A	Internal
dog walker liaison volunteers	staff & training	L	A	Internal
off-lead, exercise area	infrastructure	L	C	Internal
Enhanced guidance, enforcement & policing				
<b>Recommendation 5 - Enhanced guidance, enforcement &amp; policing</b>				
staffing resource for wardening	staff & training	See recommendation 3 above		
warning and advisory signage	infrastructure	See all above		
Staff base and equipment	infrastructure	L	C	Tourism, EU Life/Interreg
Volunteer warden programme	staff & training	L	A	Internal
<b>Estimated costs of annual monitoring (see table 9)</b>				
Monitoring Costs	staff & training	L	A	Internal



The implementation of costs related directly to the addressing of dog walking issues is a smaller sub set of the cost estimates provided here but the effectiveness of implementation of those measures is likely to be low unless an overall holistic approach to reserve re-development is undertaken

Funding sources are given in outline terms only in this report. The most apparent sources of significant funding for the large capital aspects of infrastructure work are funding areas centred on tourism. The significant impact of major new development at the reserve to showcase the site's wildlife and potentially that of further afield is a potentially large tourism draw but would require specific separate justification and is not within the scope of this report other than to mention it as having the potential to drive reserve re-branding/re-launch.

For works related to annual/revenue costs there is unlikely to be easy sources of external funding but some of this may be sourced through effective running of commercial aspects of new facilities should that be an option.

For the costs of implementing significant new management such as the establishment of zonation and associated required works there may be significant value in considering EU funding through programmes such as LIFE or INTERREG whereby funding for management for elements biodiversity recovery could be sourced provided the strategic value of such programmes was high.



## 13. References

- Banks, P. and Bryant, J. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters*
- Drent, R. Both, C., Green, M., Madsen, J., Piersma, T. 2003. Pay offs and penalties' of competing migratory schedules. *Oikos* 103:274-292
- Hennings, L. 2016. The impacts of dogs on wildlife and water quality: A literature review Metro Parks and Nature
- Hutchinson, C. D. 1989. Birds in Ireland T&AD Poyser, Calton
- Jenkinson, S. 2015. Managing Dublin's Walkers with Dogs. Preliminary Assessment Report for Dublin City Council. Access and Countryside Management.
- Liley, D. & Tyldesley, D. (2013). Solent Disturbance and Mitigation Project: Phase III. Towards an Avoidance and Mitigation Strategy. Unpublished report. Footprint Ecology/David Tyldesley & Associates
- Madsen, J., 1995, Impacts of disturbance on migratory waterfowl. *Ibis* 137 (suppl.): 67-74
- McCorry, M and Ryle, T. 2009. A Management Plan for North Bull Island. Dublin City Council.
- Mitchell, P. I., Newton S.F., Ratcliffe, N. & Dunn, T.E. 2004 Seabird Populations of Britain & Ireland. T&AD Poyser, London
- Naulty, F. 2016. North Bull Island Hare Survey 2016. UCD School of Biology and Environmental Sciences.
- Paths for All. 1996. Signage Guidance for Outdoor Access - A Guide to Good Practice



## ANNEX 1 Extract from Management plan

### 7.4.5 Impacts of dogs on wildlife

Taylor *et al.* (2005) points out that it is very important to distinguish between an effect and an impact. An effect is something we can observe, like the movement of a bird in response to a dog. An impact implies that 'dog disturbance' is affecting factors such as survival, body condition and reproductive potential, which all would be of primary conservation concern.

Generally, disturbance increases when greater numbers of people visit the site (Beale & Monaghan 2004). A straightforward comparison could be made between the site (Sandymount Strand) studied by Phalan and Nairn (2007) and North Bull Island. It could be presumed that the level of disturbance on the intertidal area along the path between Sandymount seafront and the Poolbeg Peninsula (where Phalan and Nairn's study was carried out) is higher overall compared to Dollymount Strand, although disturbance at Dollymount Strand would be much greater at certain times of the year. The level of disturbance along the saltmarsh and intertidal flats is also likely to be lower relative to the rest of North Bull Island, as these habitats are not as popular for





recreation and dog walking (although staff at North Bull Island have noted that dog walkers are increasingly using the paths along the saltmarsh with their dogs off leash to avoid confrontation with the staff).

Disturbance of waterbirds using intertidal habitats by dogs, walkers and other activities along the mainland shoreline (Clontarf- Howth Road) may not as significant as disturbance in other parts of the site. Phalan and Nairn (2007) found that birds on the intertidal area were largely habituated to walkers and dogs using paths close to the Sandymount Strand. This study pointed out that habitation to people, dogs and vehicles by waterbirds has been noted at other sites in Ireland but that not all bird species may habituate to disturbance.

A recent study in South Dublin Bay (Phalan & Nairn 2007) examined disturbance to waterbirds in South Dublin Bay. People and unrestrained dogs walking on the beach were the greatest cause of disturbance. However, this study also found that birds were largely habituated to walkers and dogs using paths close to the beach. This study pointed out that birds can compensate to some degree by moving, but that sustained and widespread disturbance has a significant impact on their foraging success, energetic costs, use of feeding and roosting sites and may ultimately result in population declines.

English Nature (now Natural England) has recently produced a comprehensive research report about the impact of dogs on nature conservation (Taylor *et al.* 2005). This report reviewed an extensive amount of scientific literature and anecdotal information about the impacts of dogs on wildlife from around the world, including studies on breeding birds, waders and studies on coastal habitats. Some of the points made in this review are presented below.

- Birds generally perceive dogs as predators.
- A walker with a dog has a larger 'sphere of influence' on wildlife than a walker with no dog.
- The pattern of disturbance varies between bird species and at different times in their life cycle.
- All the breeding birds affected were ground-nesting species.
- Studies on breeding birds (particularly ground nesting species) have shown that disturbance by dogs exposes eggs or young to greater risk of opportunistic predation, especially from crow species.
- Breeding success has been shown to improve significantly on habitats like beaches when dogs are managed.
- Dogs can have a greater effect on wintering birds, than walkers or, for some species, joggers.
- Different species seem to be more tolerant of approach than others, with distances at which a disturbance reaction occurs differing widely.



- For one species this response distance is half that of the birds in the breeding season.
- There is no clear impact identified at the population level but there are a number of suggestions that birds have vacated sites when disturbance became too great. Generally these do not separate out dogs as a factor, although they are present on many sites.
- A reaction to dogs has an energy cost, which is particularly important in winter if resource acquisition is limited, or if winter conditions are particularly severe. Compensatory feeding is found in some species, for example, at night.
- Whether dogs impact on bird species or not will depend on the habitat involved (because of their effect on patterns of human behaviour), the numbers of dogs, frequency of disturbance, the sensitivity of the species and bird condition.
- Although mammals may be disturbed by dogs, there is no evidence that these are affected at population levels. (Behavioural effects on a number of species of deer are documented).

Pienkowski (1984) found that the breeding success of Ringed Plover at Lindisfarne was highly correlated to levels of human disturbance that included dog walkers. A second population model of Ringed Plover reproduction found that if human disturbance including dog-walkers was removed from an NNR, then the reproductive potential of this species could increase by 85% (Liley 1999 cited in Taylor *et al.* 2005). Some interesting anecdotal information in Taylor *et al.* (2005) included that fact that when paths across some upland moors were closed during the Foot and Mouth crisis in Britain in 2001, breeding success of Golden Plover, Curlew and Dunlin increased. This was interpreted as a response to the reduced level of disturbance in habitat used for breeding by these bird species.

Fouling by dogs is common within the dunes although it may be obscured by tall vegetation. It is unsightly, offensive and poses a health hazard, especially to young children. It has also been noted that localised fouling by dogs can result in eutrophication of the sand and can result in a change in the vegetation composition. Taylor *et al.* (2005) presented research that indicated that nutrient levels were elevated along paths in sand dunes, at one site commonly used by dogs. Some plant species like Wild Thyme preferred this nutrient-enriched zone along these paths. Some paths became species-poor and dominated by Perennial Rye-grass due to a combination of nutrient enrichment and trampling. However, most dune systems in Ireland are subjected to grazing with associated nutrient inputs from livestock (so some level of eutrophication is 'normal').

#### ATTITUDES TO DOGS AND DOG WALKERS

The presence of dogs in areas of countryside with public access can detract from people's enjoyment (Taylor *et al.* 2005). A variety of reasons (including their tendency to disturb wildlife) are reported but dog mess is the most frequently cited. Its presence is an all-too-evident indicator of an irresponsible approach to dog ownership, and many dog owners are in denial of any responsibility. A national survey in Britain found that non-dog owning visitors to nature reserves appeared to be more than twice as likely to try to avoid contact with dogs as welcomed them. First-time dog owners do not appear to receive education about the potential effects of dogs on



wildlife and social pressure does not seem to be effective. A national survey in Britain found that that many visitors to nature conservation sites will take action to avoid encountering dogs.

### MANAGEMENT OF DOGS IN NATURE RESERVES

Many countries around the world manage dogs in nature reserves in different ways (Taylor *et al.* (2005). In the US national parks, dogs must be kept on a 6 foot leash and the superintendent of each park can designate areas where dogs are banned. All dog faeces must also be removed. Similar rules apply in New Zealand. Australia provides free-running areas in some parks where dogs are allowed off-leash but must also be under 'effective control'. Dogs may be banned from other sections or access may be restricted using a permit system. Some nature reserves offer 'time-sharing arrangements' where dogs must not be present at certain times of the day.

Taylor *et al.* (2005) stated that:

- Dog management policies vary in effectiveness but wardens/guided walks, steering (moving dogs away from restricted areas) and regulation (bans on dogs in certain areas) appear to work best.
- Multi-faceted policies are more effective than one or no policies.
- Leaflets tended not to be very effective as method to increase awareness.
- Working with dog walkers can assist in meeting objectives.

## ANNEX 2 Extract from Management plan

Two typical examples of map responses provided by dog walkers during questionnaire survey/interviews are shown below. In these examples the walkers indicated that in one case they walked mostly in the dune areas to the southern section of the island visiting the beach at usually two points to enable their dog to go for a swim. In the other example the walker accessed via the main central access and walked north to and around, the northern point of the island. The red marker lines were added later over the respondent or interviewer pen marks, to allow highlighting of the marks for ease of mapping later.

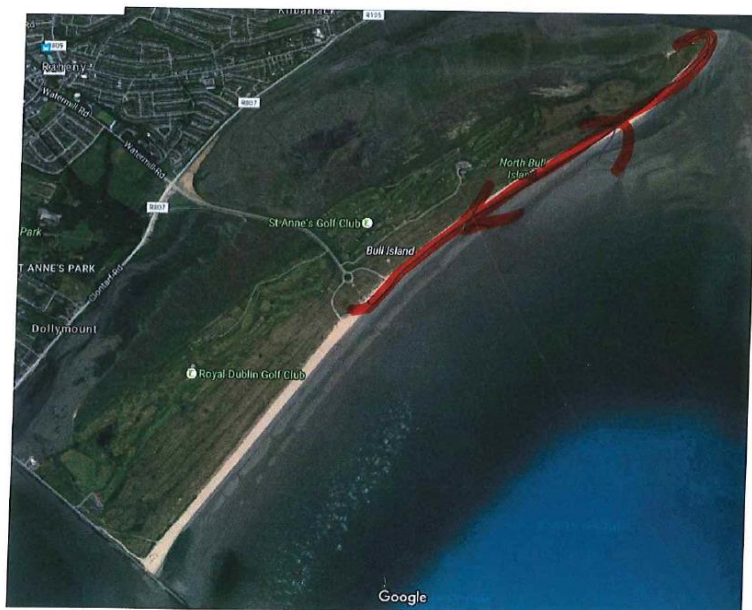




3. On the attached map please draw a line to indicate your most preferred walking route. Draw a line or shade on aerial pic below



3. On the attached map please draw a line to indicate your most preferred walking route. Draw a line or shade on aerial pic below





## ANNEX 3 Behavioural observations data

Dog walker behaviour observations											
				dogs seen at time			interactions noted in prev 30 minutes				
Date	day of week	time of Observation	location	total dogs	dogs on lead	dogs off lead	bird disturbance	dog negative	people negative	% dogs on lead	% off lead
17/09/2016	Sat	08:00	South car park	5	0	5				0.0	100.0
17/09/2016	Sat	08:30	South car park	8	1	7	0	0	0	12.5	87.5
17/09/2016	Sat	09:00	South car park	4	0	4	0	0	0	0.0	100.0
17/09/2016	Sat	09:30	South car park	4	0	4	0	0	0	0.0	100.0
17/09/2016	Sat	10:00	South car park	3	0	3	0	0	0	0.0	100.0
17/09/2016	Sat	10:30	South car park	1	0	1	0	0	0	0.0	100.0
17/10/2016	Mon	10:15	Causeway (looking N)	0	0	0					
17/10/2016	Mon	10:45	Causeway (looking N)	1	0	1	1	0	0	0.0	100.0
17/10/2016	Mon	11:15	Causeway (looking N)	1	0	1	0	0	0	0.0	100.0
17/10/2016	Mon	11:45	Causeway (looking N)	0	0	0	0	0	0		
17/10/2016	Mon	12:15	Causeway (looking N)	1	0	1	1	0	0	0.0	100.0
05/11/2016	Sat	11:00	Central beach access	8	0	8				0.0	100.0
05/11/2016	Sat	11:30	Central beach access	14	1	13	1	1	0	7.1	92.9
05/11/2016	Sat	12:00	Central beach access	10	1	9	0	0	0	10.0	90.0
05/11/2016	Sat	12:30	Central beach access	18	1	17	1	0	0	5.6	94.4
05/11/2016	Sat	13:00	Central beach access	11	2	9	0	1	0	18.2	81.8
05/11/2016	Sat	13:30	Central beach access	14	1	13	2	0	0	7.1	92.9
05/11/2016	Sat	14:00	Central beach access	15	1	14	1	1	0	6.7	93.3
07/12/2016	Wed	14:30	South beach access	5	1	4				20.0	80.0
07/12/2016	Wed	15:00	South beach access	6	0	6	1	0	0	0.0	100.0
07/12/2016	Wed	15:30	South beach access	4	0	4	0	1	0	0.0	100.0
07/12/2016	Wed	16:00	South beach access	3	0	3	0	0	0	0.0	100.0
13/12/2016	Tue	09:30	Central beach access	4	0	4				0.0	100.0
13/12/2016	Tue	10:00	Central beach access	6	0	6	1	1	0	0.0	100.0
13/12/2016	Tue	10:30	Central beach access	5	0	5	0	1	0	0.0	100.0
13/12/2016	Tue	11:00	Central beach access	6	1	5	0	0	0	16.7	83.3
13/12/2016	Tue	11:30	Central beach access	7	1	6	1	0	0	14.3	85.7
13/12/2016	Tue	12:00	Central beach access	3	0	3	0	0	0	0.0	100.0
13/12/2016	Tue	12:30	Central beach access	4	0	4	0	0	0	0.0	100.0
13/12/2016	Tue	12:45	Wooden bridge looking north	1	0	1				0.0	100.0
13/12/2016	Tue	13:15	Wooden bridge looking north	1	0	1	3	0	0	0.0	100.0
13/12/2016	Tue	13:45	Wooden bridge looking north	0	0	0	2	0	0		
13/12/2016	Tue	14:15	Wooden bridge looking north	0	0	0	0	0	0		
13/12/2016	Tue	14:45	Wooden bridge looking north	1	0	1	1	0	0	0.0	100.0
			Totals	174	11	163	16	6	0	6.3	93.7
			Disturbance incidents per dog				0.1 or 1 in 10 dogs				
			Dog incidents per dog				0.05 or 1 in 20 dogs				