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# NATIONAL TOURISM MONITORING PROGRAMME 2021-2025

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## ANNUAL RESULTS FOR 2021

**for:**

**Fáilte Ireland**

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**by:**

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**October 2022**

## Document Control

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# 1 Introduction

## *National Tourism Monitoring Programme*

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level.

The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen in the map.



## *Progress to date*

To date, the Wild Atlantic Way Environmental Monitoring Programme has allowed us to sample and monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to development a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

## 2 The Monitoring Programme

### *Programme Purpose*

The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

In considering whether and how there may be room for improvement, it is also important to bear in mind that some of these sites are already regarded as being of the highest quality – indeed one such site, Keem Bay on Mayo was recently ranked as number 11 on the 2021 list of the World’s Top 50 beaches. Seen in this light, recommendations are often aimed at making better what is already very good.

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

### *Monitoring Programme Focus*

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

### *Methods & Surveys*

The Monitoring Programme was based on following types of surveys:

#### Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities as undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitor s and local amenity use.

### Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

### Other Surveys

Other Surveys were also carried out to identify the species presence of breeding birds, mammals and bats. Furthermore, on some sites particularly marine and wetland ones, winter bird surveys were also carried out.

### Site Assessment Surveys

Assessments were carried out on each site of the conditions of pathways and features, as well as and potential hazards that were noted.

Each survey concluded with Recommendations for interventions that could address visitor-related activities with a potential to give rise to environmental Effects.

## 3 Findings and Conclusions

### *Introduction*

As expected from such a wide range of locations and types, a correspondingly wide range of conditions were encountered.

From the outset, there are two clear findings, namely that some types of sites are more sensitive than others and also that where visitor-related issues arise and are identified, that these can be resolved.

These observations arise on the basis of the results of the previous 5-year visitor monitoring programme, as well as this year's wider monitoring programme.

### *Intrinsic Site Sensitivity*

Ecology, exposure and patterns of use mean that some types of sites will always be more likely to exhibit signs of visitor pressure. Sensitive site types include bogs, coastal sites and uplands. Examples of such sites from this monitoring programme include Doonloogan, Streedagh Beach and Bray Head

Sites that have well-established patterns of management, resilient built infrastructure and mature woody vegetation are intrinsically robust and able to accommodate existing and increasing visitor numbers with little effect. Examples of such sites from this monitoring programme include Acres Lake, Carlingford, Lough Key, Killykeen, Mount Congreve and Portumna.

### *Established Mitigation Strategies*

Over the course of the full monitoring programme, it has been established that a suite of existing techniques are demonstrably able to accommodate elevated levels of visitor pressure – even in the most sensitive locations and types of habitats. Examples of methods in previously assessed sites include:

- Rocky Shore and Cliff Environs – Mizen Head
- Lake and reedbed Environs – Acres Lake
- Dune and Beach Environs – Clonakilty
- Bog and wet woodland environs – Lough Key
- Upland and Heath environs – Slieve League

### *Guidelines*

Many of these examples of successful solutions are contained in the Visitor Management Guidelines for the Wild Atlantic Way (June 2020). These advise on all aspects of site location, design and management for visitors to show how impacts can be anticipated and avoided.

## Acres Lake Floating Boardwalk – Interesting Finds

### HIGH LEVELS OF BAT FORAGING ACTIVITY

Daubenton’s bat – often referred to as the water bat has a high abundance at the site. This species is a trawling species which scoops floating insects from the surface of the water with their hind legs, and acrobatically throw them into their mouth mid-flight. All species of bats are protected and rely on healthy invertebrate populations to thrive.

All bat species in Ireland are protected under the Irish Wildlife Act.

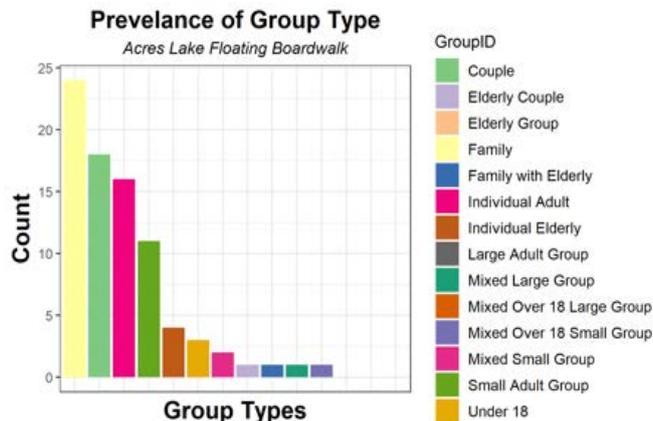


### KEY RECOMMENDATIONS

- Maintain the existing features and ensure there is no degradation of existing habitats particularly the reed beds and aquatic habitats.
- Lighting features should not be erected on site
- Carpark capacity an issue. Efforts should be made to explore options for increasing the capacity.
- Engaging interpretive material should be provided across the site to activate an interactive and educational experience.

### VISITOR NUMBERS AND DWELL TIME

- 222 people visited the site over 8 hours
- Average dwell time of 40 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Boardwalk means there were few activities undertaken on site.
- Netting activities were observed on site which can have detrimental effects if not controlled
- Most of the visitors to the site stayed for at least 40 minutes – given the nature of the site being a long straight walkway.
- Site signage is limited – missed opportunity for wildlife

### Highlights:

- High levels of bat foraging activity
- Strong breeding bird populations
- Important callow and reed bank areas
- Netting and capture of aquatic species may be an issue if unrestricted long term
- No wading species food provided – thus bread is fed to the local populations
- Long site dwell time of at least 40 minutes
- Site signage is limited – missed opportunity for wildlife



## 4 Acres Lake Floating Boardwalk

### 4.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Ireland's regional areas; The Wild Atlantic Way, Ireland's Hidden Heartlands, Ireland's Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

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- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
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These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 4.2 Methods & Surveys

The following surveys were undertaken at Acres Lake Floating Boardwalk:

### 4.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Acres Lake Floating Boardwalk was undertaken on the 10<sup>th</sup> of July 2021, with max temperatures reaching approximately 29.8° C, no rainfall and low levels of wind on the day<sup>1</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 4.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>1</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

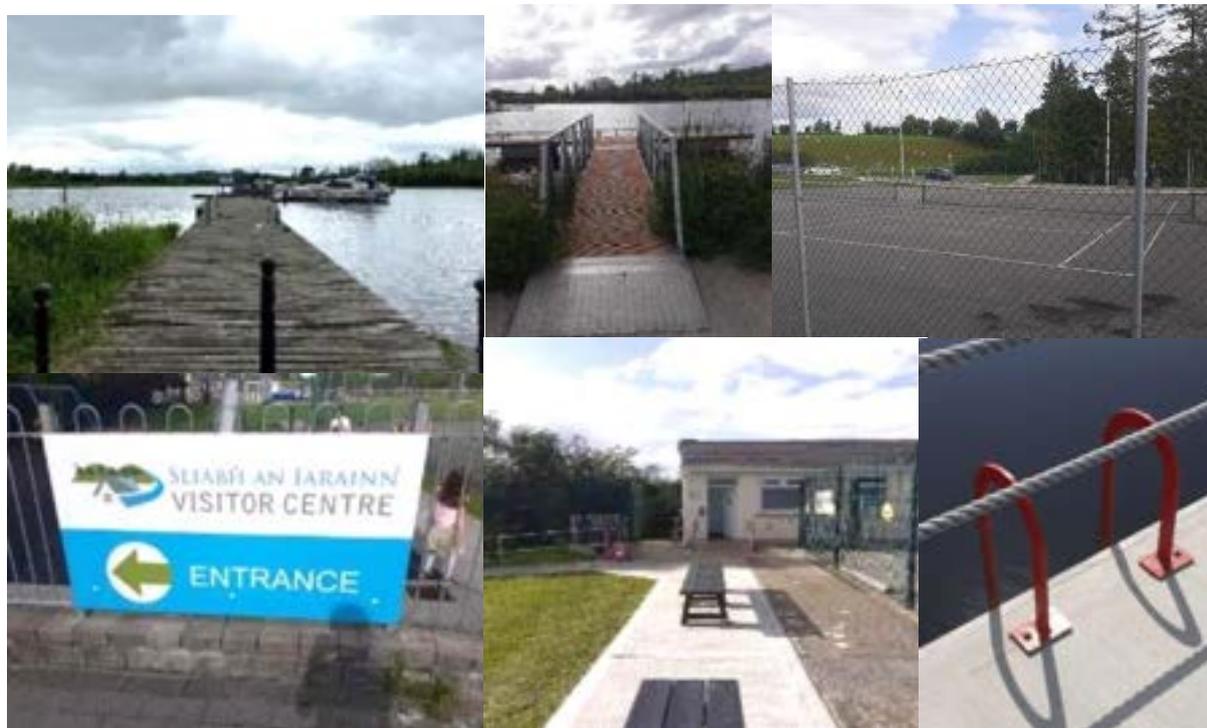
### 4.2.3 Other Surveys

Additional surveys were undertaken at Acres Lake Floating Board Walk to identify the species presence of breeding birds, mammals and bats. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 4.3 Site Description of Acres Lake Floating Board Walk

Acres Lake is home to Ireland's first floating boardwalk just outside Drumshanbo in Co. Leitrim. This boardwalk connects to a 6.5km linear walking and cycling trail along the Shannon Blueway from Acres Lake to Battlebridge Lock, near Leitrim Village. The lake itself is used for recreation and amenity and has a range of habitats present including riparian woodland patches and shallow reed beds. The site has an existing small-scale carpark with space for 15-20 cars and an existing jetty (Figure 4.1). The EPA water quality data for the Battle bridge station (downstream of the site) has a Q-value of 4.

The site is host to leisure facilities such as tennis courts, a visitor centre and an outdoor pool. There are a number of jetties and mooring features on the site.



**Figure 4.1 Montage of some of the features at Acres Lake Floating Boardwalk**

### 4.4 Pathways and Features Condition Results

#### 4.4.1 Pathway Condition

The path is perfectly maintained – the full site is a guarded boardwalk which is all hard infrastructure. The material and dimensions are consistent throughout (Figure 4.2 & Figure 4.3).





**Figure 4.4 Features recorded at Acres Lake**



**Figure 4.5 Features at Acres Lake Floating Boardwalk**

#### 4.4.3 Hazards

The hazards identified on site (Figure 4.6) relate to slippery surfaces which are accompanied throughout the site with signs alerting visitors to the potential for hazards such as slippery surfaces.



**Figure 4.6 Hazards recorded at Acres Lake**

#### 4.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 222 visitors<sup>2</sup> (which represent 82 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 40 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Dog walking (on lead)
Cycling
Playing in playground
Powered Movement Through Water (Boat, Jetski etc)
Fishing
Sitting
Kayaking
Picnicking
Swimming
Jogging
Exploring off trail
Feeding ducks
Flying drone
Running boat engine at Dock

<sup>2</sup> It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

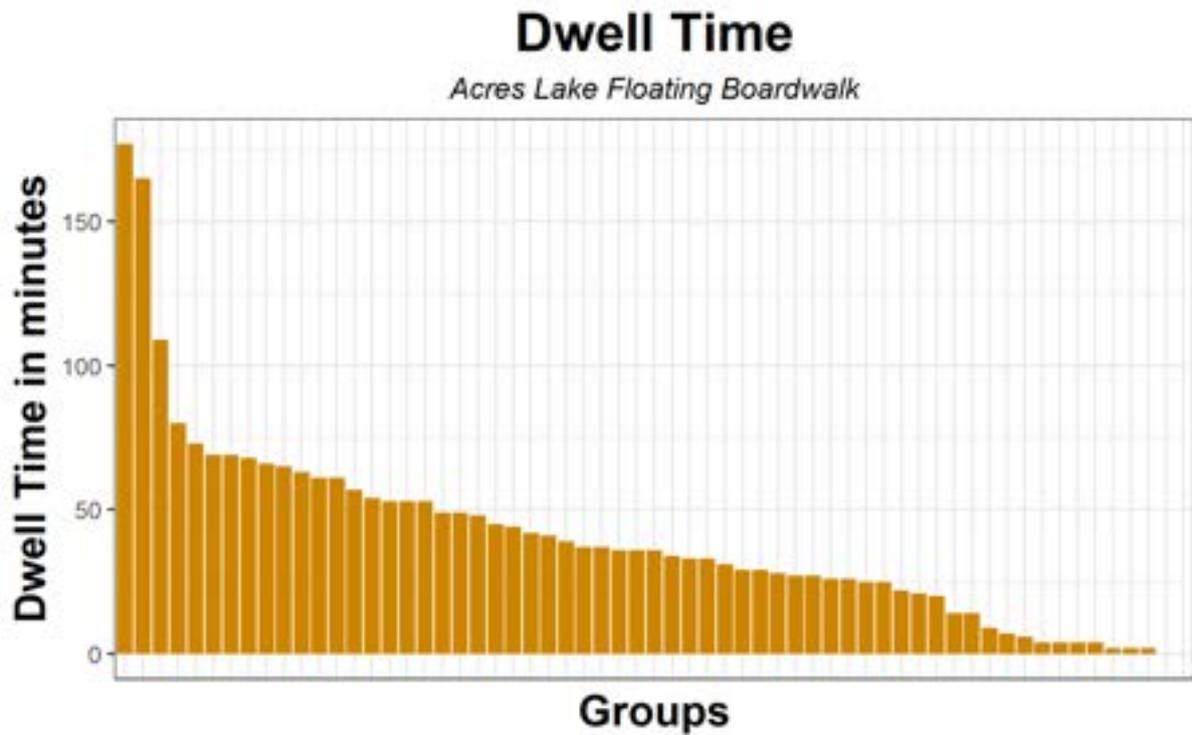


Figure 4.7 Duration of Time Spent at Acres Lake Floating Boardwalk

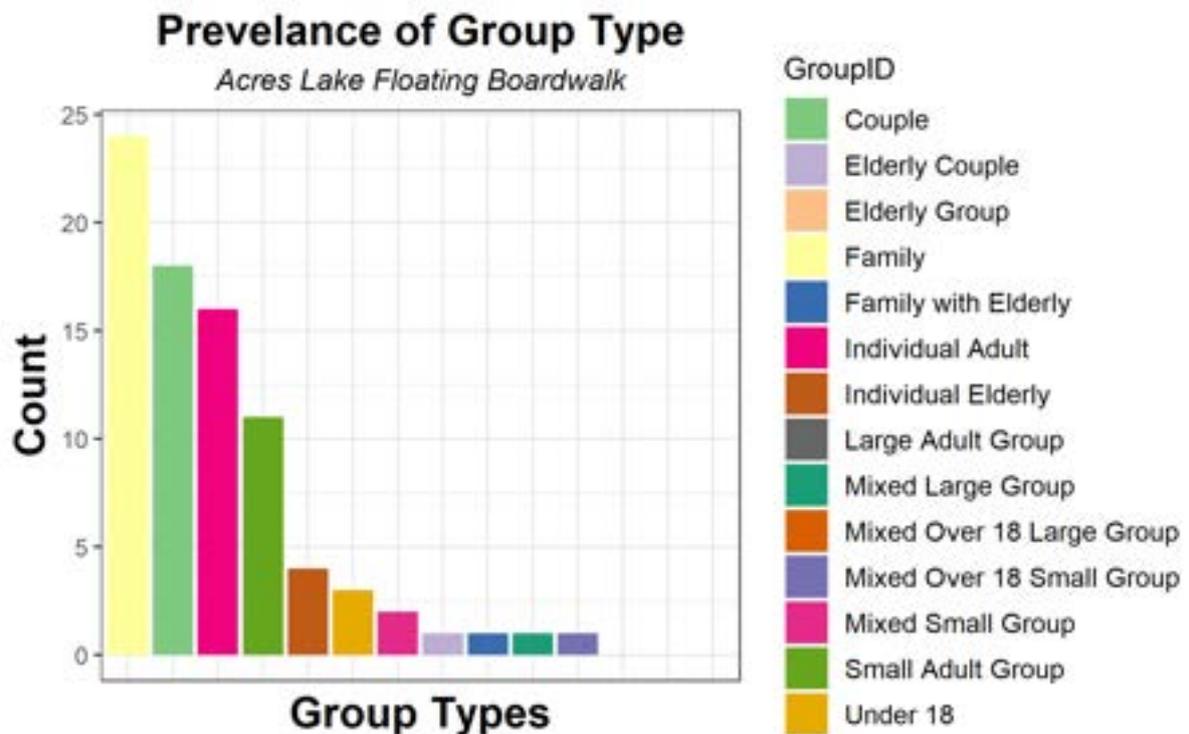
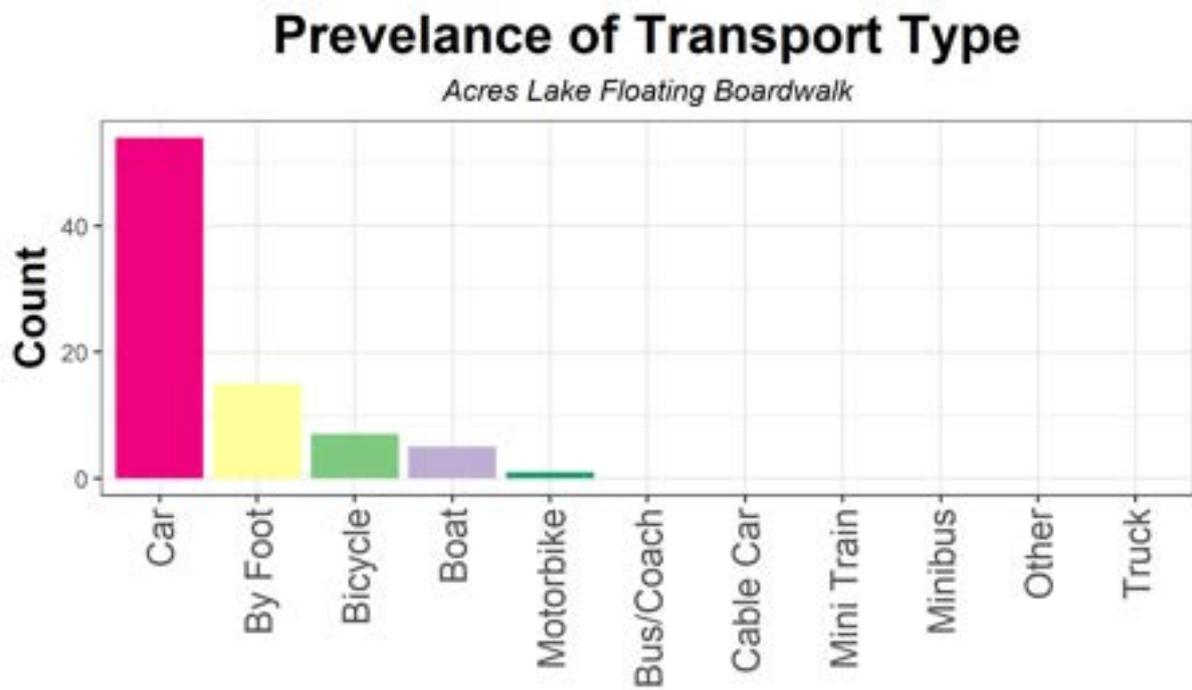
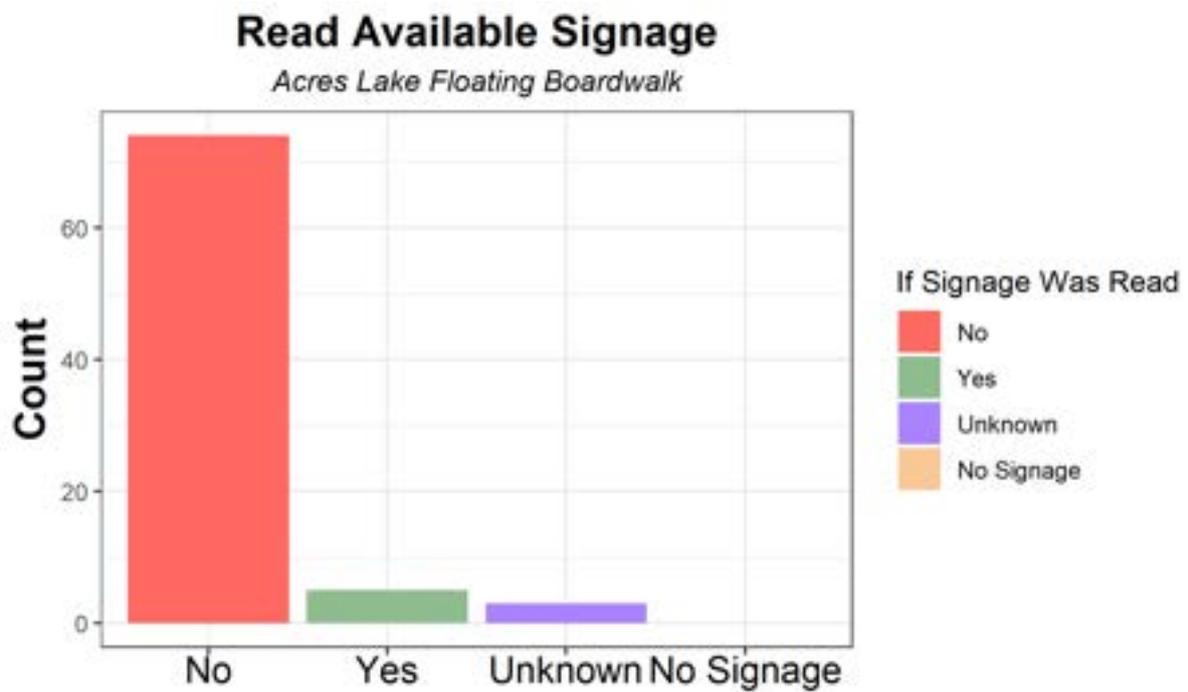


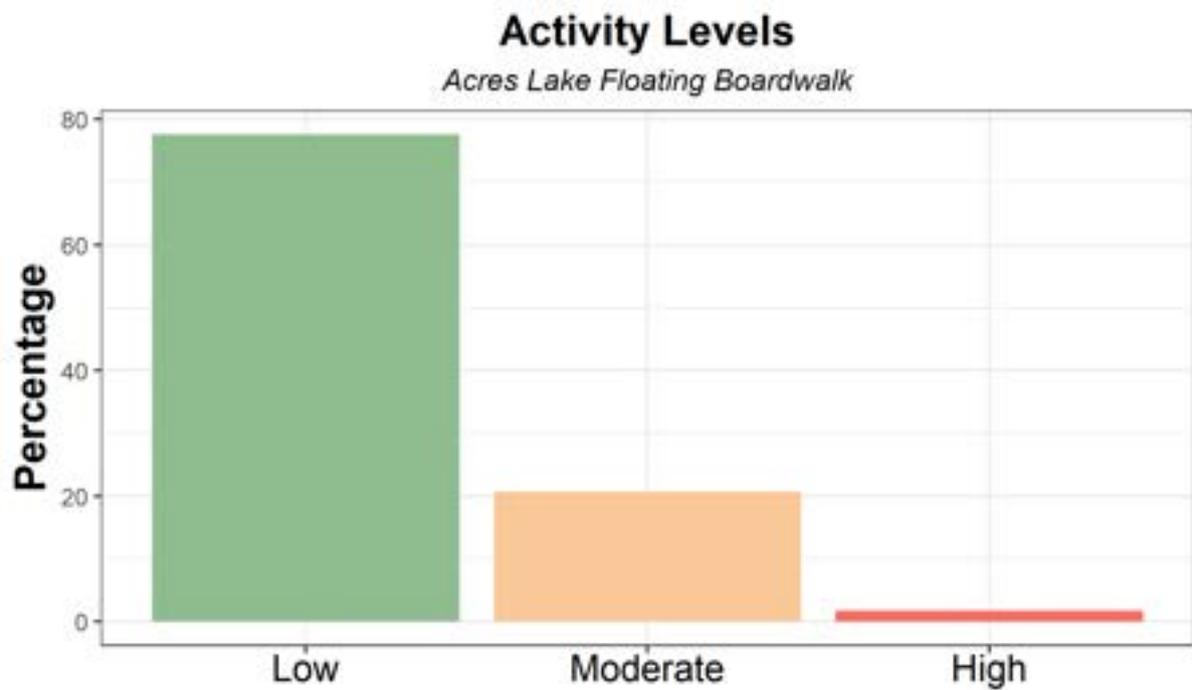
Figure 4.8 Groups of visitors that visited Acres Lake Floating Boardwalk



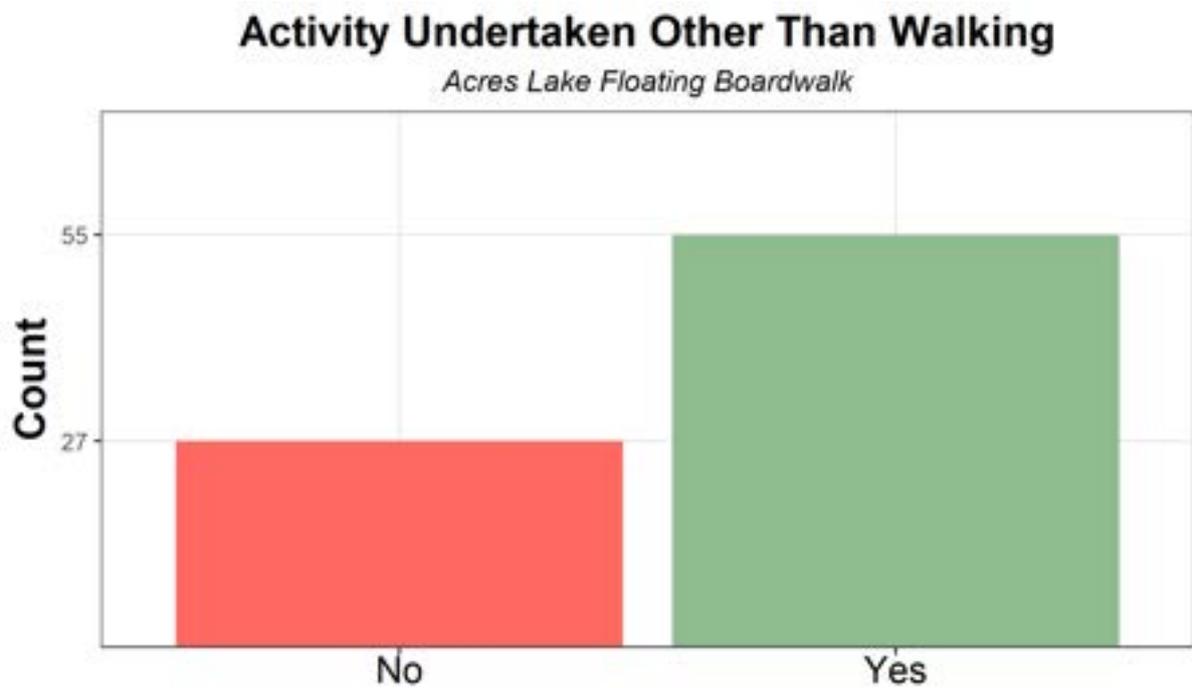
**Figure 4.9 Mode of transport used to visit Acres Lake Floating Boardwalk**



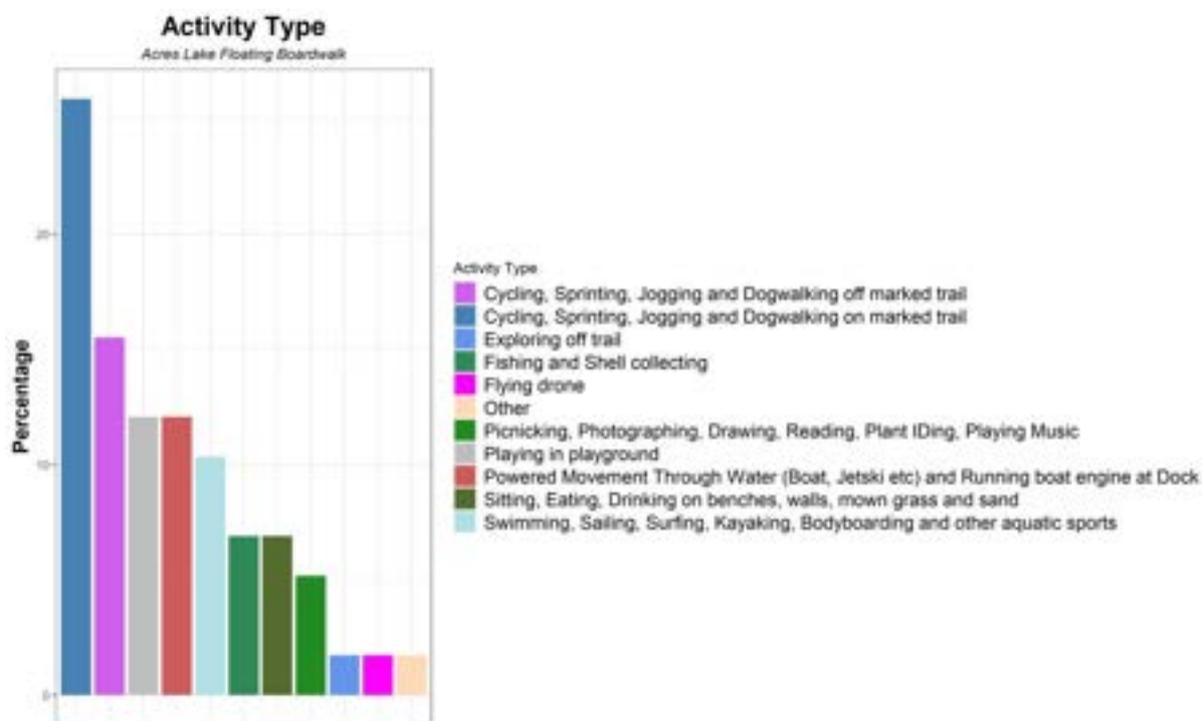
**Figure 4.10 Use of Interpretive Material at Acres Lake Floating Boardwalk**



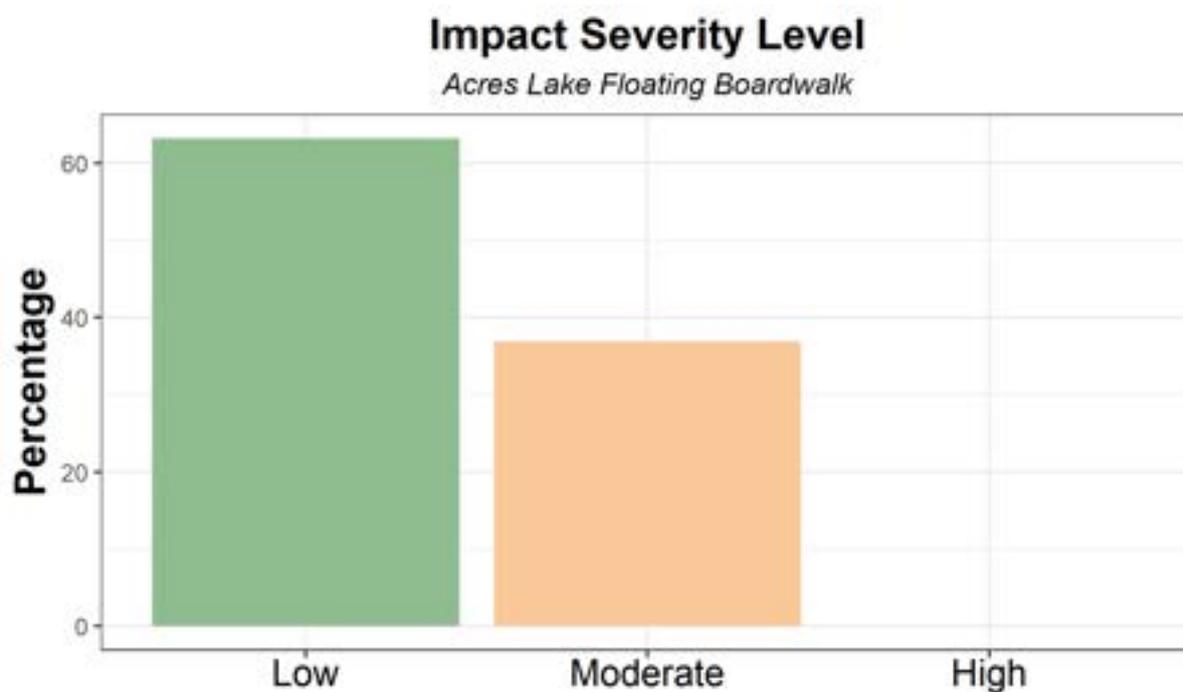
**Figure 4.11 Categories of Activity Levels Observed at Acres Lake Floating Boardwalk**



**Figure 4.12 Activities undertaken other than walking**

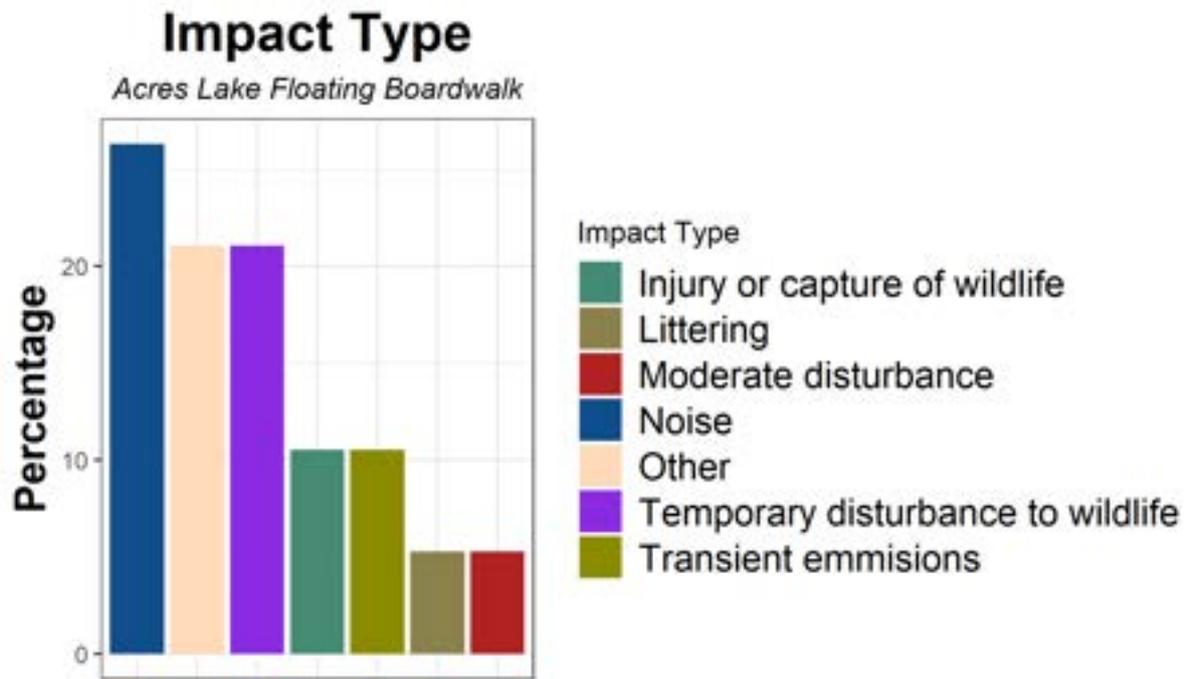


**Figure 4.13 Range of Visitor Activities Observed at Acres Lake Floating Boardwalk**

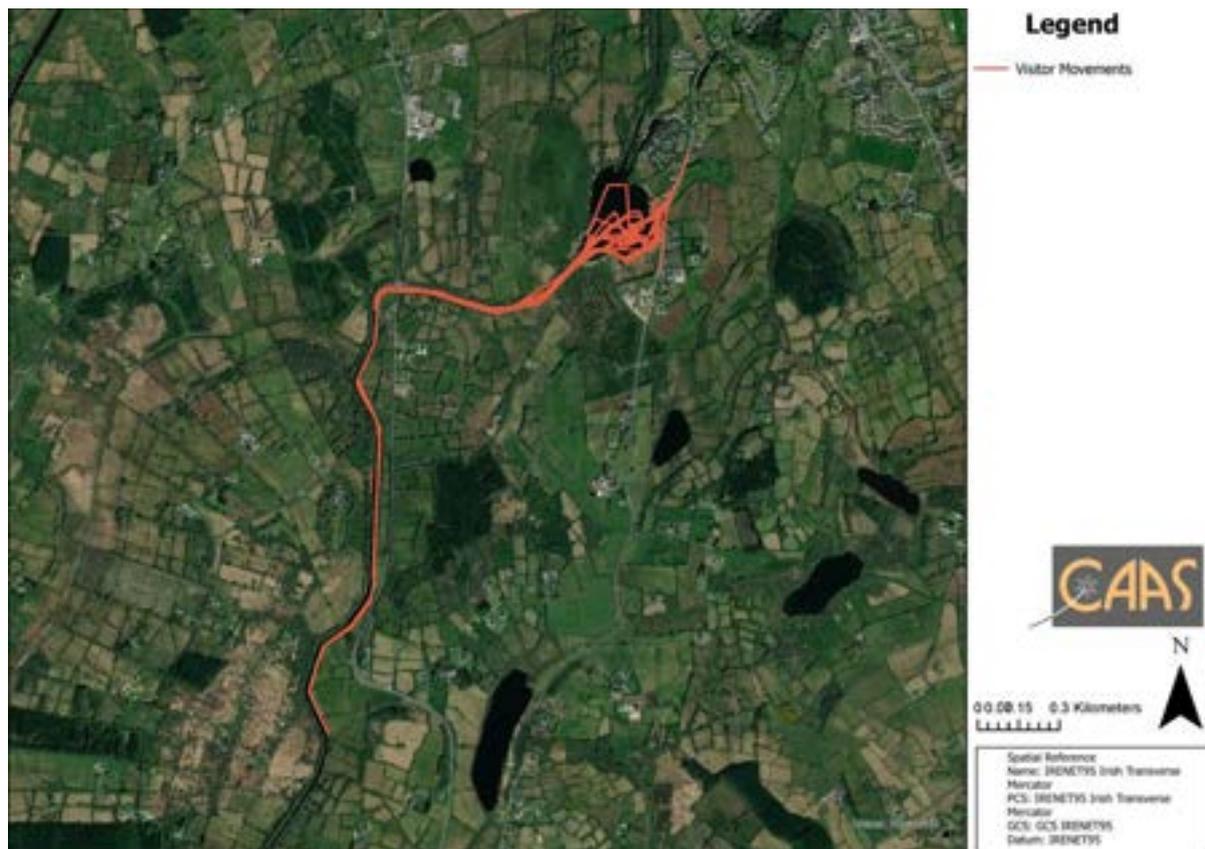


**Figure 4.14 Categories of Environmental Impact Levels Observed at Acres Lake Floating Boardwalk as a result of Visitor Activities<sup>3</sup>**

<sup>3</sup> Impact severity was measured as a categorical variable which has a range of impact factors that are pre-determined; such as injuring, killing or taking wildlife as a severe impact (high) and temporary disturbance of wildlife being a low impact. These are explained fully in the method section above.



**Figure 4.15 Range of Environmental Impacts Observed at Acres Lake Floating Boardwalk**



**Figure 4.16 Visitor movement patterns at Acres Lake Floating Boardwalk**

Of the 82 sample groups recorded on site 67% of them undertook activities other than walking. These activities (identified above) resulted in 19 impacts being observed on site during the survey. Thus, 33% of activities on site resulted in impacts on the environment. The impact severity levels varied with 63% of the impacts being low, 37% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Injury or capture of wildlife	2
Littering	1
Moderate disturbance	1
Noise Pollution	5
Other	4
Temporary disturbance to wildlife	4
Transient emissions	2

#### 4.6 Ecological Monitoring Results

##### 4.6.1 Ecological Constraints

There are no designated sites within 2km of Acres Lake Floating Boardwalk.

##### 4.6.2 Habitat Descriptions

Acres lake is a small lake system with existing recreation amenity usage on site. The trees on the westside of the lake are characterised as a narrow riparian woodland which are backed by a coniferous plantation. The tall reed beds around the lake itself provide ecological resources for invertebrate species and provide refugia for breeding wading birds. These areas are the key resources for the site.

The site was investigated for bat activity and there were 5 species identified on site which use the river which extends from the site for foraging and commuting while the lake itself provides a key foraging resource. The absence of intrusive lighting structures at the area is key for the site. Visitor movements at the site are restricted to within the boardwalk itself which limits potential interactions.

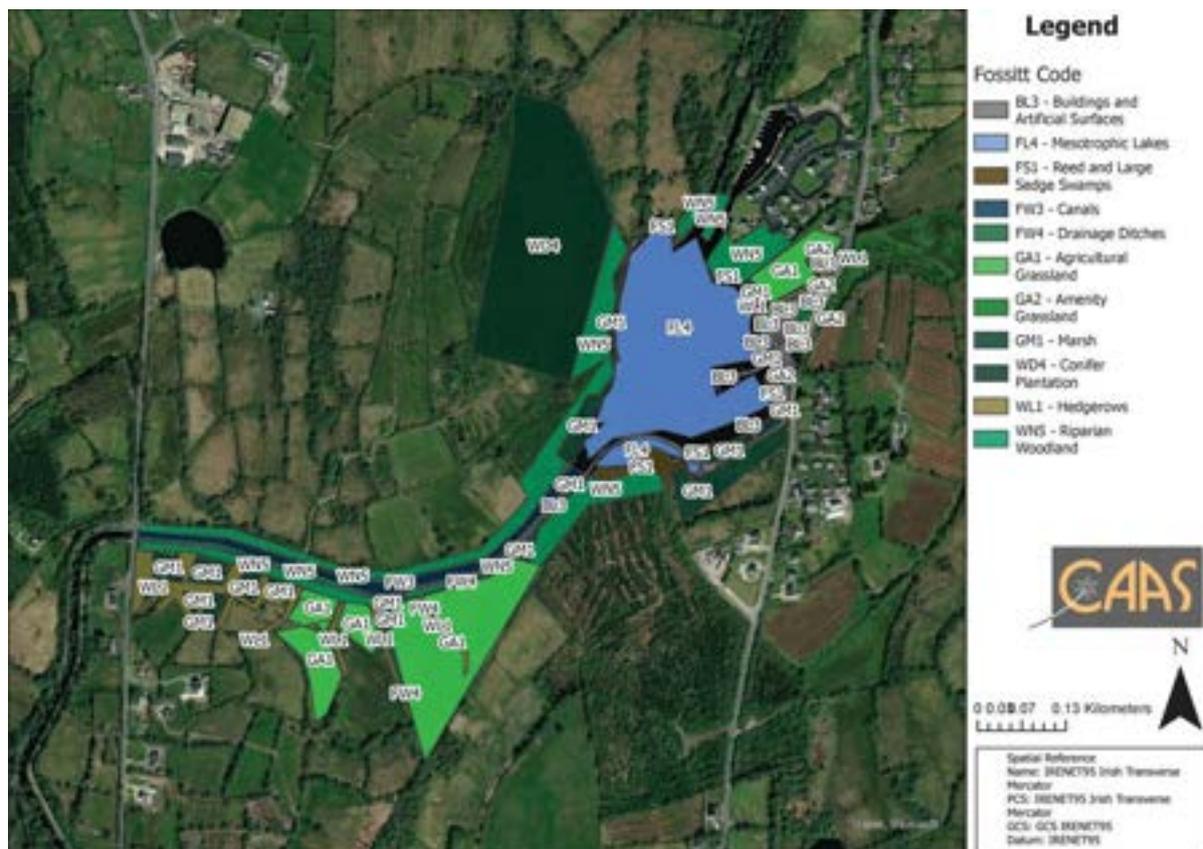


Figure 4.17 Habitats present at Acres Lake

#### 4.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>4</sup> following the assessment scale was "2" which means the majority of the habitats have a localised degree of negative impact, but slight and capable of rapid recovery. There were 2 recorded incidents of damage to habitats occurring off the marked paths on site. The probable causes appear to be agriculture.

#### 4.6.4 Breeding Bird Survey

The breeding bird survey conducted at Acres Lake Floating Boardwalk show that there are high numbers of wading species and a strong population of passerines. Of particular note are meadow pipits which were observed foraging in the fringes of the site. The site represents a stronghold for breeding birds – but there is risk from visitors to feed the wading species sub optimal food such as bread. Alternate food sources could be provided – along with signage – to raise awareness of the importance of nutrition when feeding wildlife. The trees within the riparian habitat and bankside vegetation are particularly important for the breeding bird populations.

**Table 4.1 Results of the breeding bird survey conducted at Acres Lake Floating Boardwalk<sup>5</sup>**

Common Name	Scientific Name	List Status	Number Recorded
Blackbird	<i>Turdus merula</i>	Green	4
Blackcap	<i>Sylvia atricapilla</i>	Green	2
Black-headed Gull	<i>Larus ridibundus</i>	Amber	3
Buzzard	<i>Buteo buteo</i>	Green	1
Chiffchaff	<i>Phylloscopus collybita</i>	Green	1
Cormorant	<i>Phalacrocorax carbo</i>	Amber	1
Dunlin	<i>Calidris alpina</i>	Red	1
Goldcrest	<i>Regulus regulus</i>	Amber	1
Goldfinch	<i>Carduelis carduelis</i>	Green	1
Great Tit	<i>Parus major</i>	Green	1
Hooded Crow	<i>Corvus cornix</i>	Green	2
House Martin	<i>Delichon urbicum</i>	Amber	2
Jackdaw	<i>Corvus monedula</i>	Green	4
Mallard	<i>Anas platyrhynchos</i>	Amber	9
Meadow Pipit	<i>Anthus pratensis</i>	Red	5
Moorhen	<i>Gallinula chloropus</i>	Green	1
Pied Wagtail	<i>Motacilla alba yarrelli</i>	Green	1
Redpoll	<i>Acanthis flammea</i>	Green	3
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	1
Sand Martin	<i>Riparia riparia</i>	Amber	1
Song Thrush	<i>Turdus philomelos</i>	Green	2
Swallow	<i>Hirundo rustica</i>	Amber	4
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	3
Wren	<i>Troglodytes troglodytes</i>	Green	3

#### 4.6.5 Mammals on Site

Although no otter was observed during the surveys – it is extremely likely that the site is host to a viable otter population based on the availability of high-quality suitable habitat observed during the mammal walkover survey. Several Wood Mice were recorded in the fields adjacent to the site foraging on grass seed. There were no other mammal signs recorded – it is likely that the boardwalk area itself is not used by mammals due to the enclosed yet exposed nature of the walkway – which would increase risk of predation.

**Table 4.2 List of mammals that have been recorded at NBDC Hectads G90 & G91**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	7
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	1
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	144

<sup>4</sup> This value was calculated using the methods set out in Appendix II

<sup>5</sup> Breeding bird surveys were undertaken in June 2022 during the dawn chorus on warm, dry and calm days.

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	3
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	88
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	1
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	15
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	5
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	3
Terrestrial mammal	Fallow Deer	<i>Dama dama</i>	2
Terrestrial mammal	House Mouse	<i>Mus musculus</i>	1
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	8
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	1
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	1
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	21
Terrestrial mammal	Red Deer	<i>Cervus elaphus</i>	1
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	7
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	7
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

#### 4.6.6 Bat Survey

There were no bat potential bat roost features identified on site during the preliminary surveys for potential bat roost features.

Daubenton's bat was the most common species in number of recorded passes; which would be expected due to the high volume of freshwater habitat in the park and along the transect. Soprano and common pipistrelle were also observed on site also. 3 passes were recorded for the Leisler's bat.

**Table 4.3 Bat survey results**

Common name	Scientific name	# Bat passes
Daubenton's bat	<i>Myotis daubentonii</i>	51
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	37
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	27
Leisler's bat	<i>Nyctalus leisleri</i>	3

**Table 4.4 List of bats that have been recorded at NBDC Hectads G90 & G91**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	144
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	1

#### 4.7 Recommendations

Given the site context and the robust nature of the site - the main recommendation for the site is to maintain the existing features and ensure there is no degradation of existing habitats particularly the reed beds and aquatic habitats. Furthermore, lighting features should not be erected on site to maintain the existing connectivity and activity for nocturnal species.

The site has a carpark capacity issue as it has very few spaces available to ensure accessibility. Efforts should be made to explore options for increasing the capacity. Additionally, engaging interpretive material should be provided across the site to activate an interactive and educational experience.

Alternate food sources could be provided – along with signage – to raise awareness of the importance of nutrition when feeding wildlife.

## Bray Head – Interesting Finds

### HIGH LEVELS OF CHOUGH FORAGING ACTIVITY

The chough – which is a red billed crow – is present on the site; this is a nationally rare and internationally protected species. It thrives where low intensity livestock farming systems occur close to suitable nesting sites on rock faces, in caves and in old buildings. In Britain and Ireland this combination is only found in the wilder and more remote west coasts and some adjacent inland areas.



### KEY RECOMMENDATION

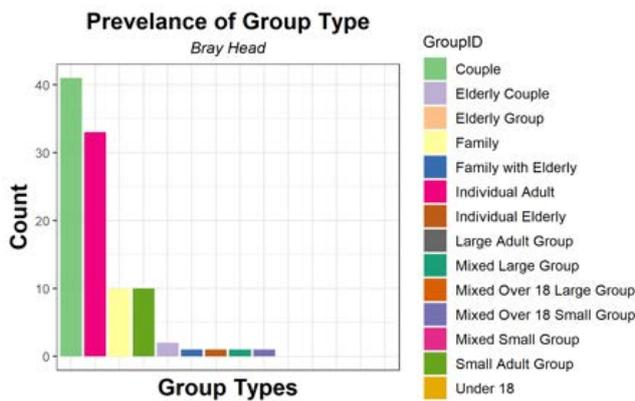
- The site is well managed in most respects related to tourism;
- Should visitor numbers increase - particularly along the upper trail through the heathland, there could be future issues for the site.
- Therefore, it is recommended that a boardwalk or stone pathway trail be explored as future options.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Low levels of impacts were observed on site.
- Hard infrastructure path along the main track means there were few activities undertaken on site.
- Most of the visitors to the site stayed for at least 48 minutes – given the nature of the site being a long walkway with an option of a loop.

### VISITOR NUMBERS AND DWELL TIME

- 206 people visited the site over 8 hours
- Average dwell time of 48 minutes



### Highlights:

- Chough present on site
- Upper trail is showing signs of overuse
- Long site dwell time of at least 48 minutes
- Site signage is limited – missed opportunity for wildlife



## 5 Bray Head

### 5.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;

- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 5.2 Methods & Surveys

The following surveys were undertaken at Bray Head:

### 5.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Bray Head was undertaken on the 17<sup>th</sup> of July 2021, with max temperatures reaching approximately 25.1° C, no rainfall and low levels of wind on the day<sup>6</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 5.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>6</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 5.2.3 Other Surveys

Additional surveys were undertaken at Bray Head to identify the species presence mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 5.3 Site Description of Bray Head

Bray Head hosts a 7km loop walk along the coast of Valentia Island, where the vacated Bray tower (Figure 5.2) along with the perfect view of the wonderful Skellig Islands awaits at the top of the trail (Figure 5.3). The start of the Bray Head loop walk itself can be reached through walking from the car park at Foilhommerum Bay. Bray Head is located within the Iveragh Peninsula SPA and borders the Valencia Harbour/Portmagee Channel SAC and contains habitats such as montane heath and dry meadows and grassy verges.

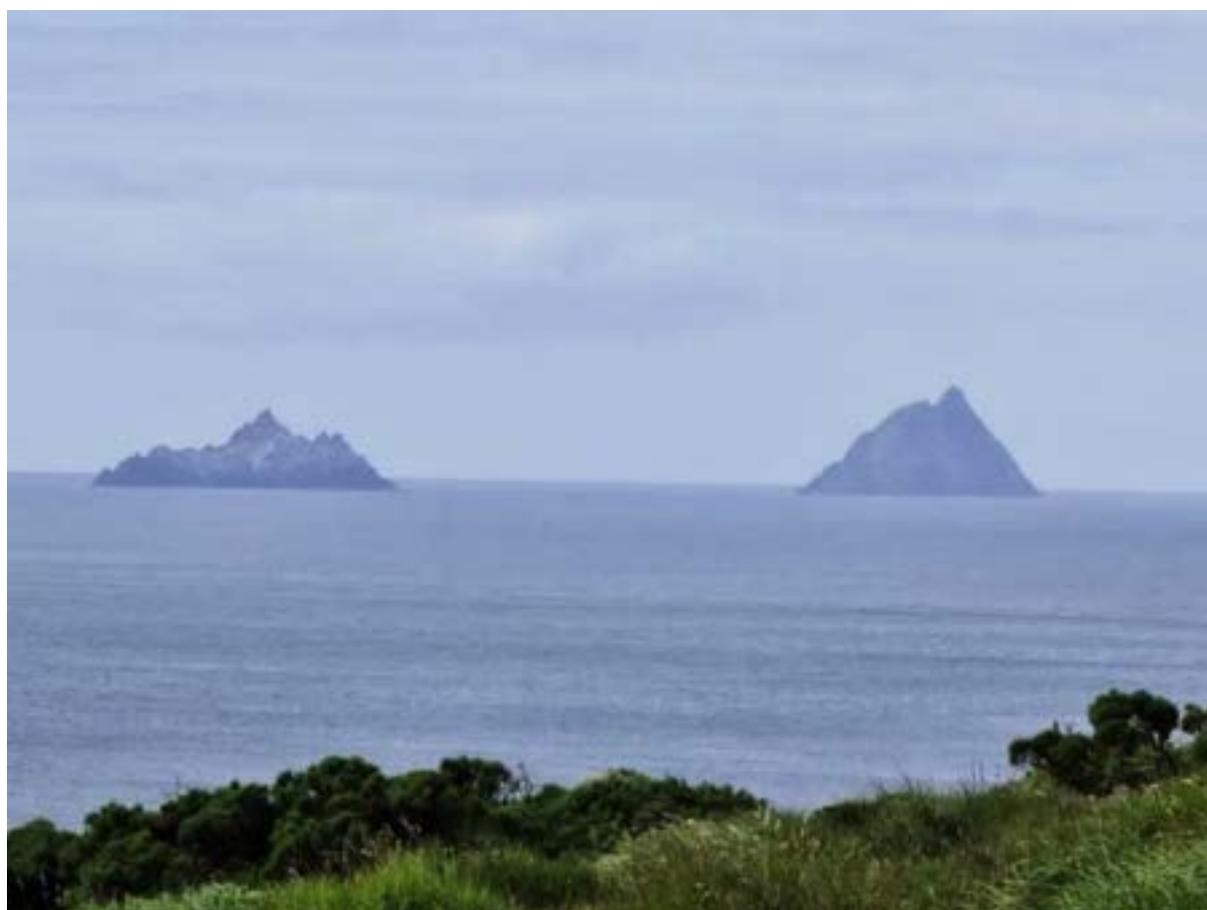
The receiving point to the site is a carpark with picnic benches and signage relating to heritage features around the site. There is a map with waymarked trails up to the tower and surrounding hilltop.



**Figure 5.1 Main trail leading to the tower at Bray Head**



**Figure 5.2 Tower at the main viewing point on the Bray head site**



**Figure 5.3 View of the Skellig's along the Bray Head trail**

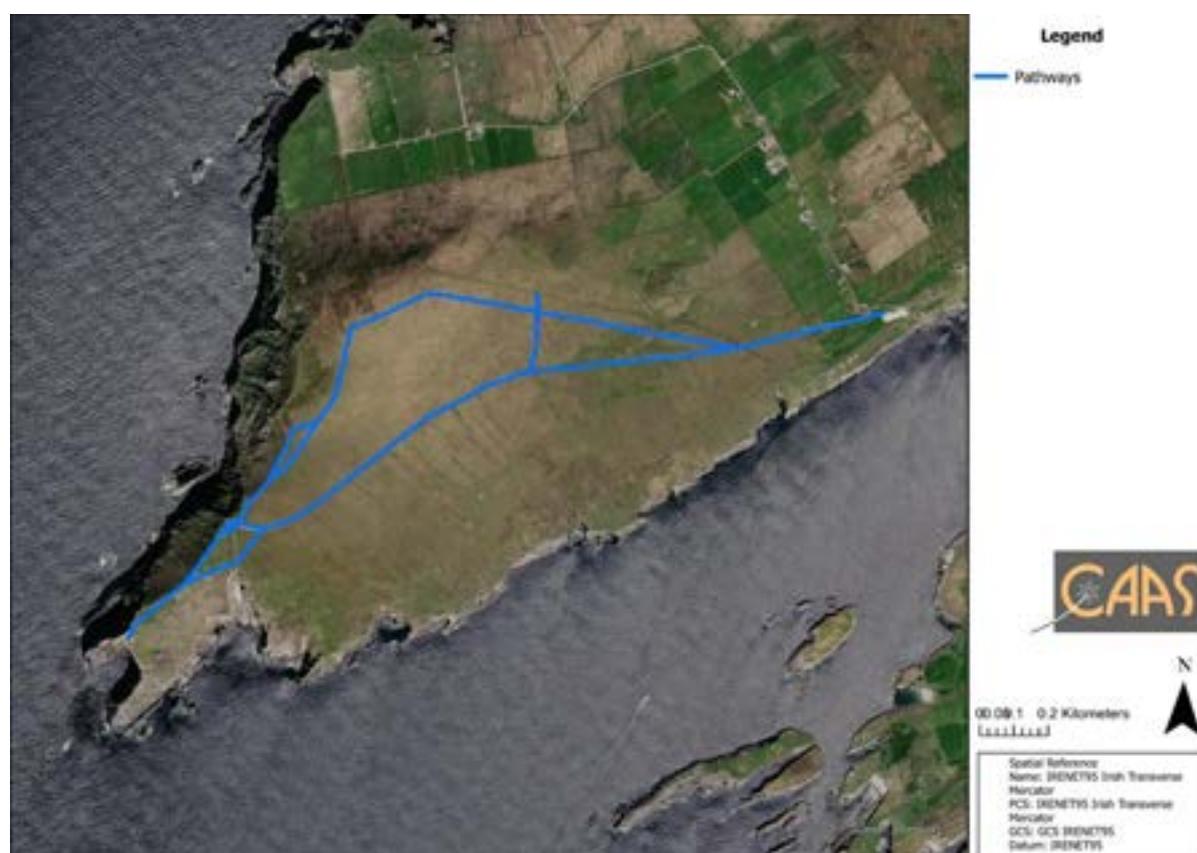
## 5.4 Pathways and Features Condition Results

### 5.4.1 Pathway Condition

The path is a mix of hard and soft trails which lead from the carpark to the main viewing point which is the tower (Figure 5.5). At and around the tower there are a number of desire lines and compaction areas – there are early signs of site overuse with some bare soil areas. The most used trail from the carpark to the tower is largely confined by two deep ditches which confine activity.

The northern trail to up to the highest point is a waymarked trail. This trail is through heathland habitat and there is evident signs of damage to the habitat within the locality of the path itself. In areas of steep topography there are higher rates of erosion and bare peat sub-strata. On the downward track leading back towards the carpark the trail is highly variable up to almost 8 meters at its widest part. This shows signs of extensive dispersion.

The vegetated paths show clear signs of compaction and impact from excess visitor numbers. Interventions should be considered to ensure that future loadings of the site can be facilitated by the trail network on site.



**Figure 5.4 Pathways identified at Bray Head**



**Figure 5.5 Tower at Bray Head**

#### **5.4.2 Features Condition**

The site has a number of trail markings and some facilities on site - however, there is a lack of signage related to the ecological value of the biodiversity at the site. This is seen to be a missed opportunity for environmental awareness. There area however signs and information boards which provide information on the heritage of Bray Head along with a sign designating Bray Head as part of the Wild Atlantic Way (Figure 5.7).



**Figure 5.6 Features recorded at Bray Head – these features are way mark signs and information signage**



**Figure 5.7 Features noted at Bray Head**

### 5.4.3 Hazards

There is erosion on some pathways along Bray Head (Figure 5.8) however, the hazard mapping identified no obvious safety issues or hazards for the site.



**Figure 5.8 Example of erosion at Bray Head**

### 5.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 206 visitors (which represent 100 sample group observations). The site is most popular amongst the Couple group with the dominant mode of transport being Car. The average dwell time for the site was 48 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Photographing
Exploring off trail
Picnicking
Dog walking (on lead)
Sitting
Birdwatching
Climbing
Cycling
Dog walking (off lead)
Eating
Flower picking
Flying drone
Jogging

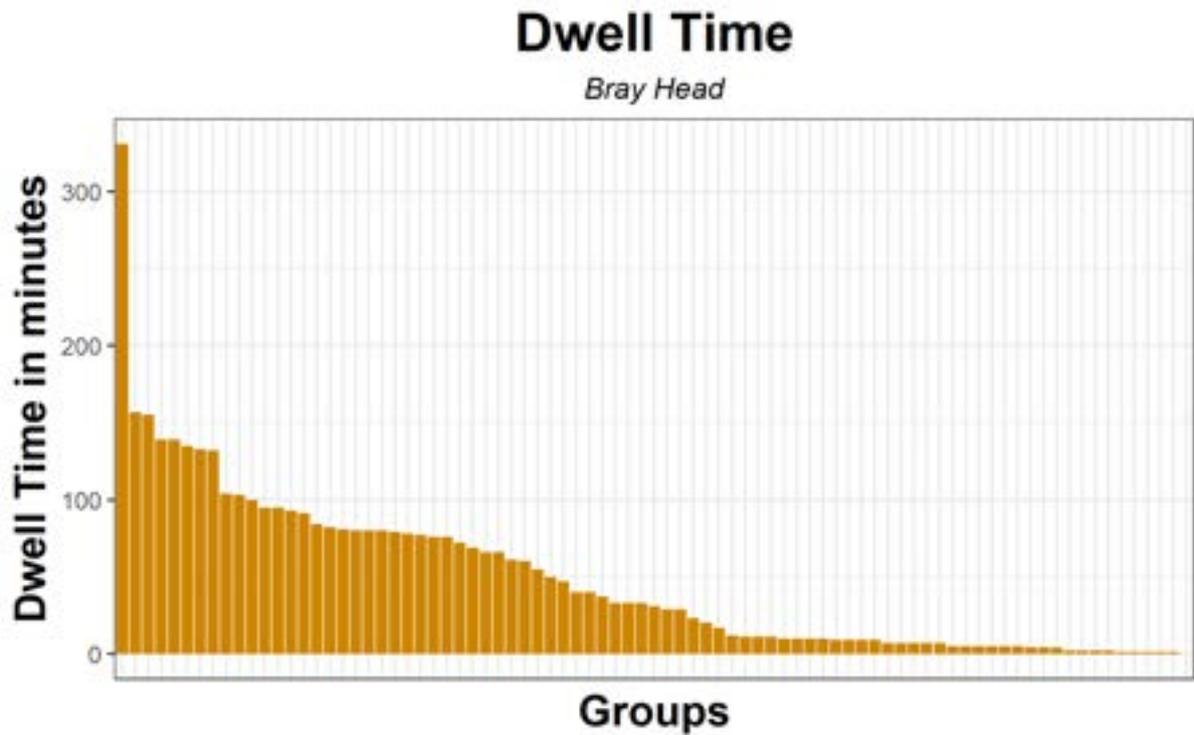


Figure 5.9 Duration of Time Spent at Bray Head

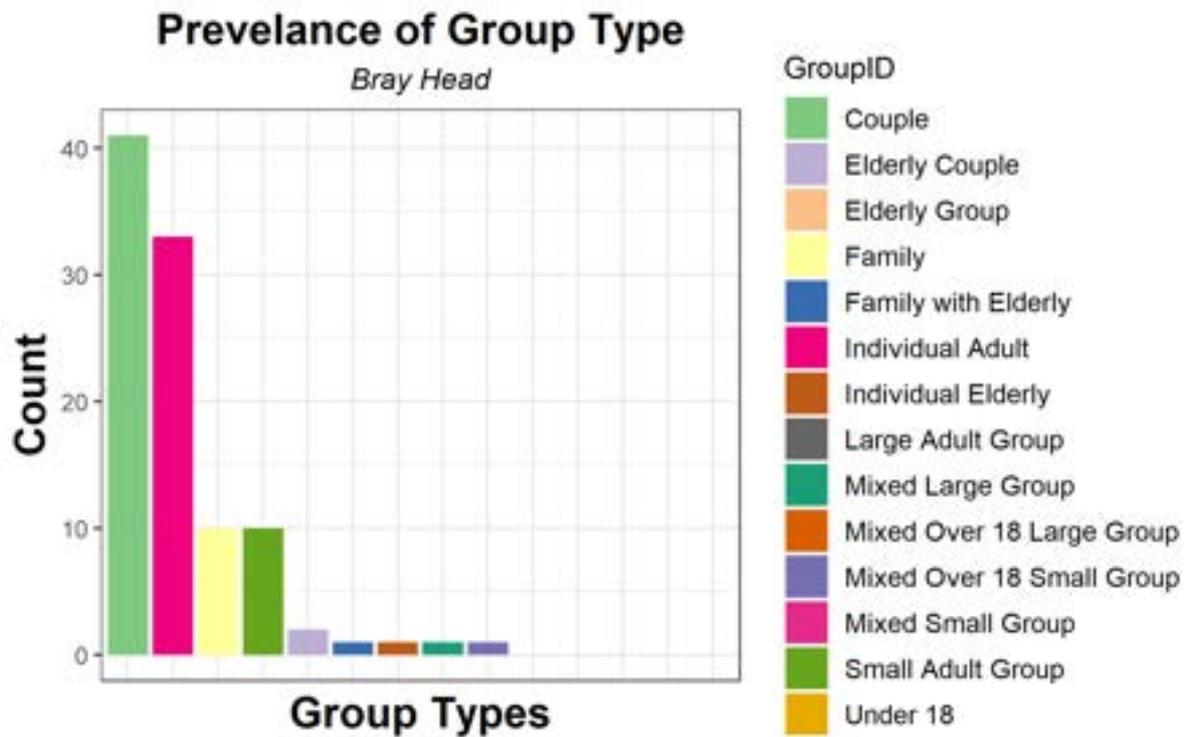
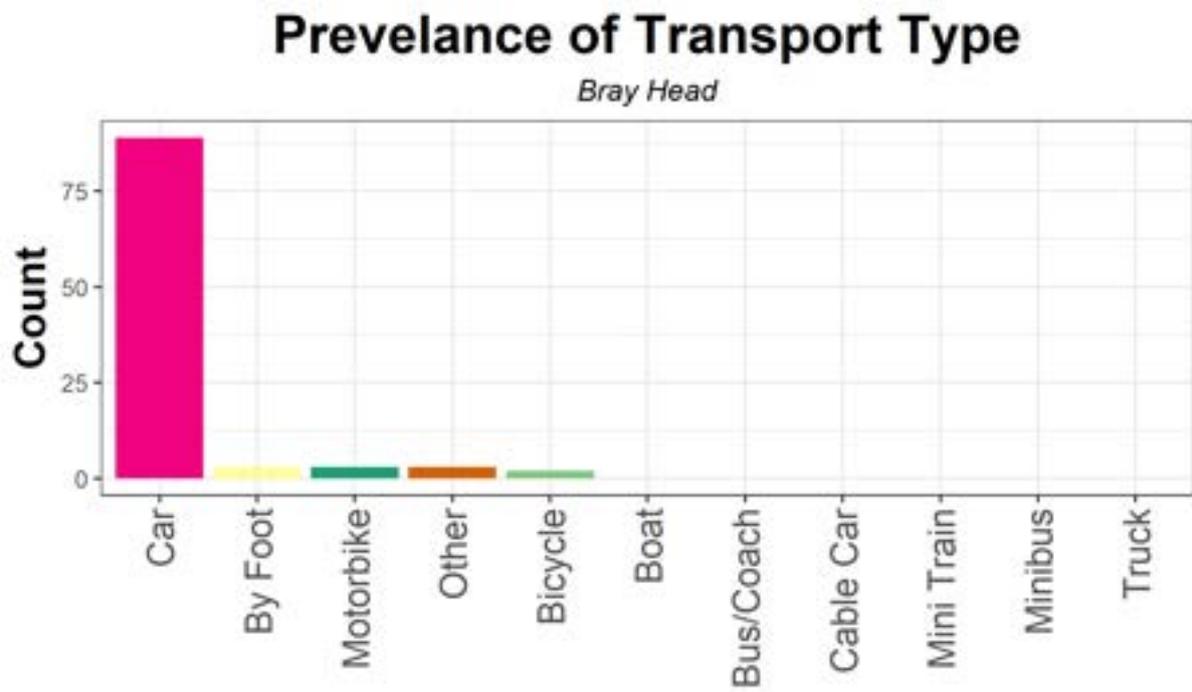
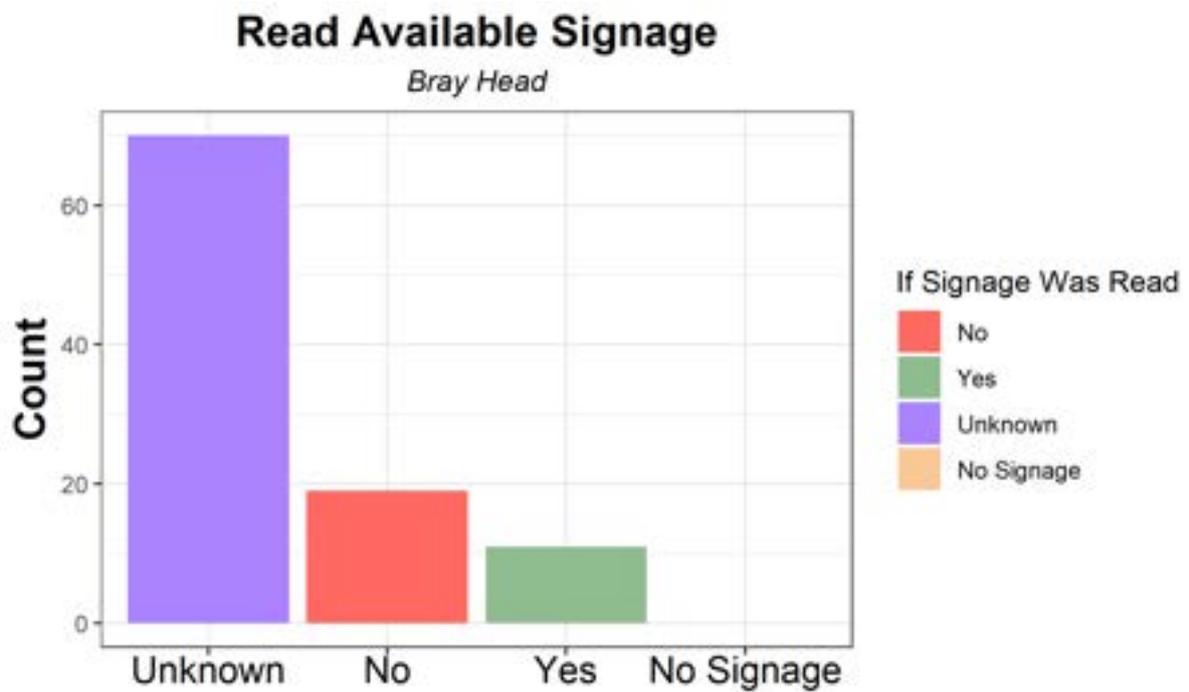


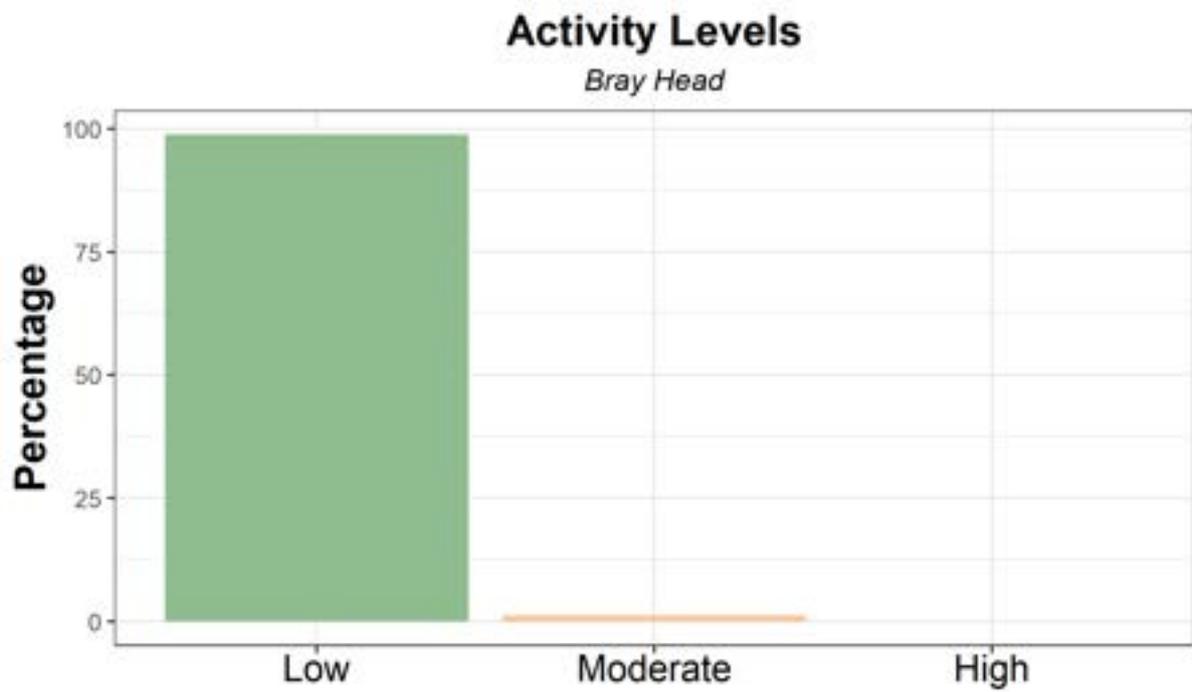
Figure 5.10 Groups of visitors that visited Bray Head



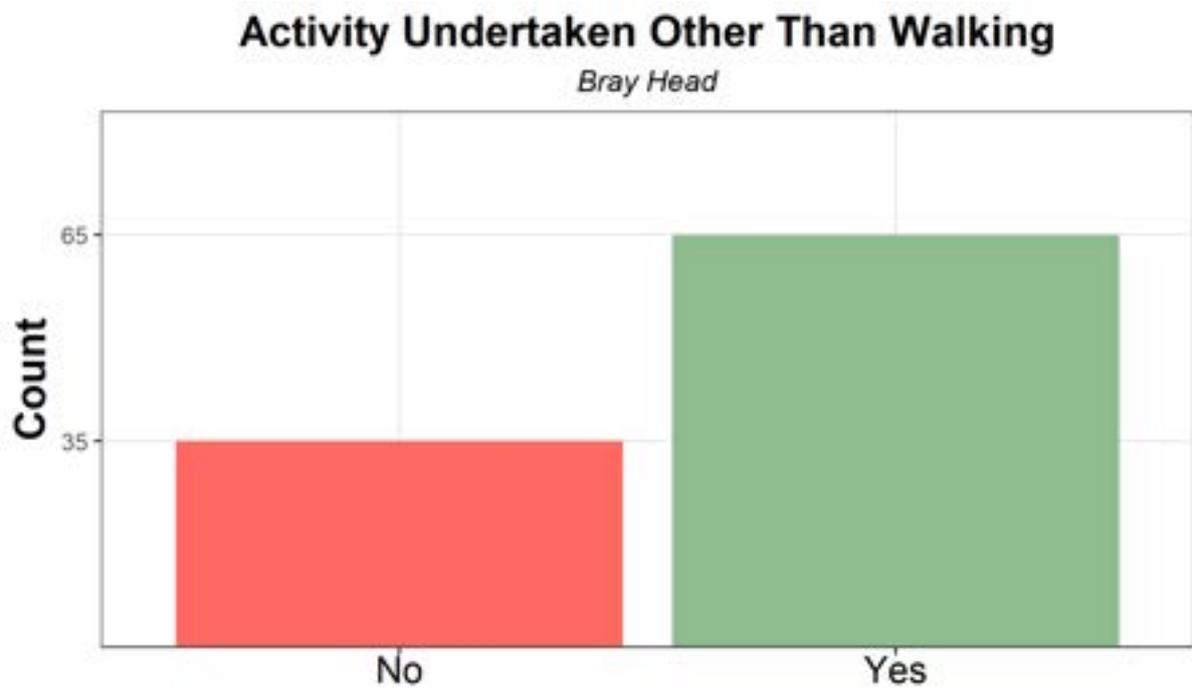
**Figure 5.11 Mode of transport used to visit Bray Head**



**Figure 5.12 Use of Interpretive Material at Bray Head**



**Figure 5.13 Categories of Activity Levels Observed at Bray Head**



**Figure 5.14 Activities undertaken other than walking**

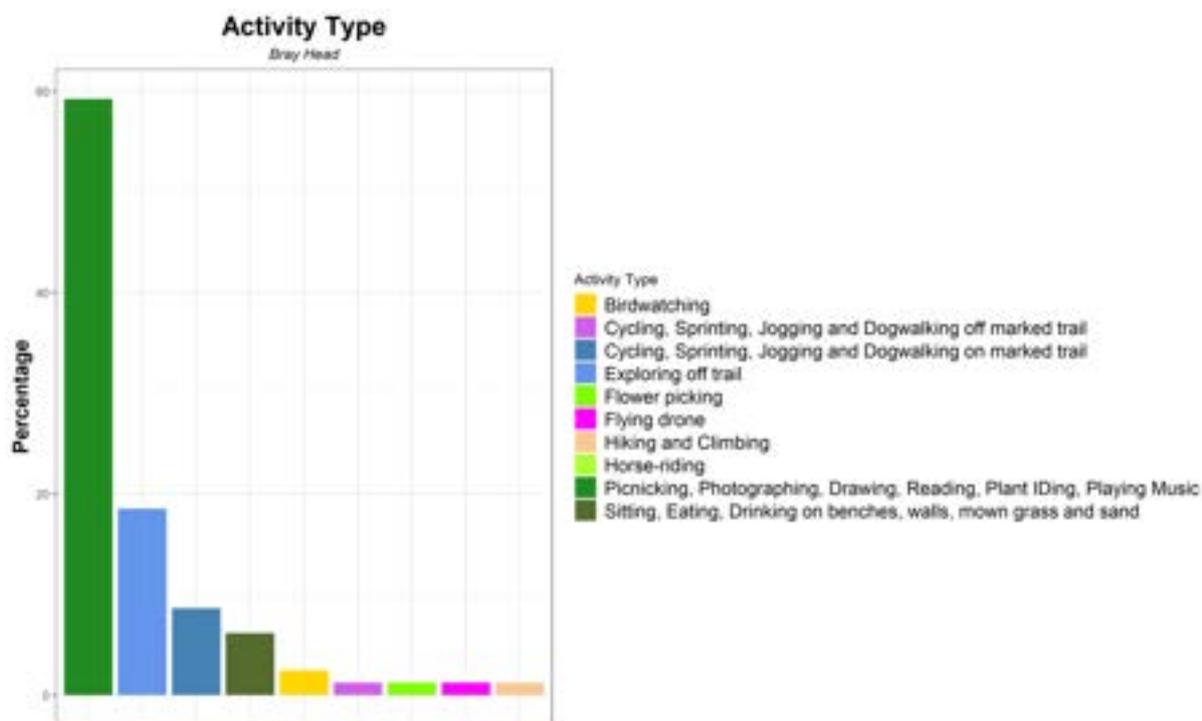


Figure 5.15 Range of Visitor Activities Observed at Bray Head

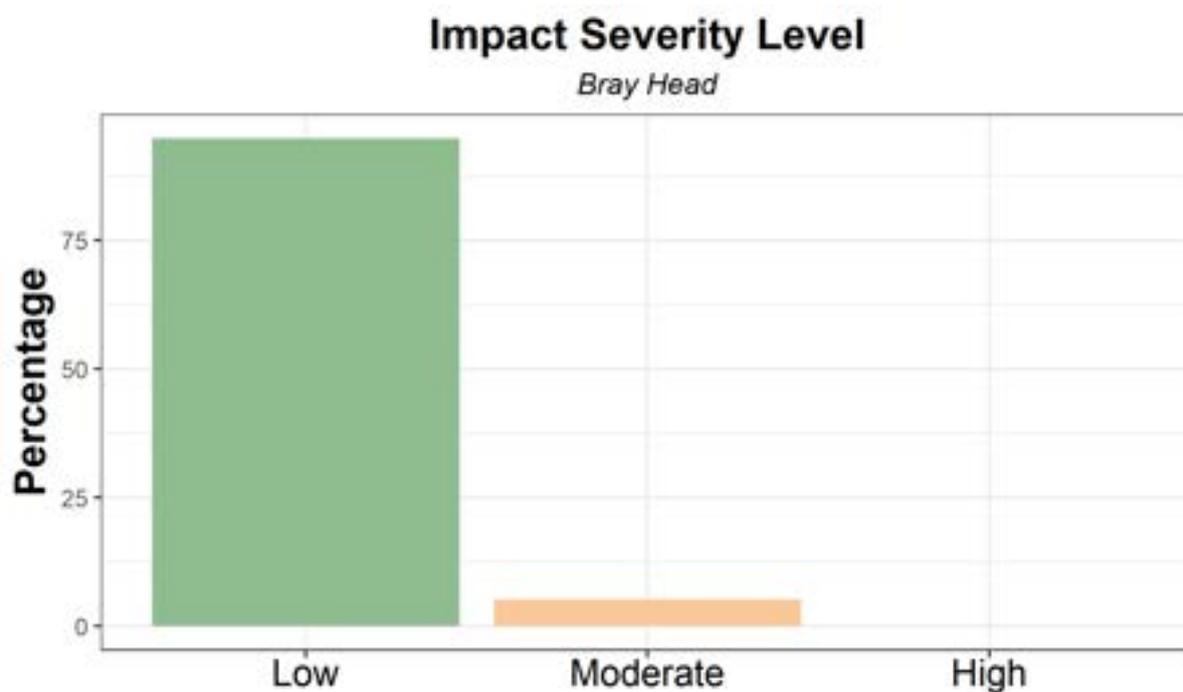


Figure 5.16 Categories of Environmental Impact Levels Observed at Bray Head as a result of Visitor Activities<sup>7</sup>

<sup>7</sup> Impact severity was measured as a categorical variable which has a range of impact factors that are pre-determined; such as injuring, killing or taking wildlife as a severe impact (high) and temporary disturbance of wildlife being a low impact. These are explained fully in the method section above.

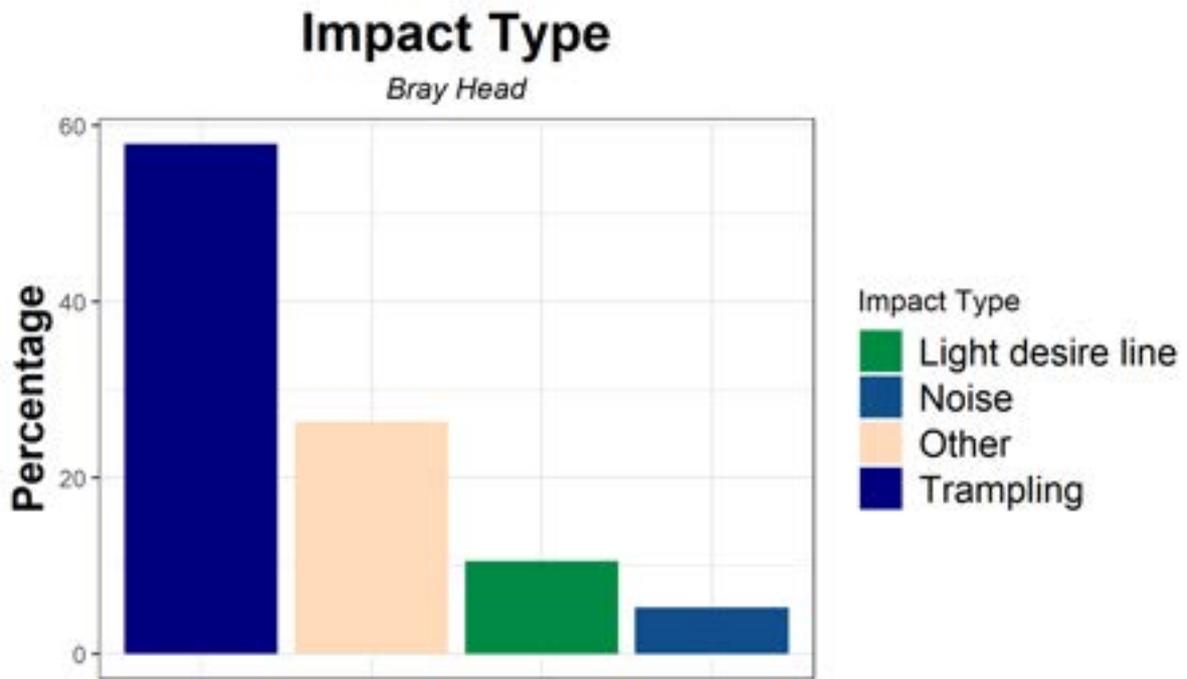


Figure 5.17 Range of Environmental Impacts Observed at Bray Head

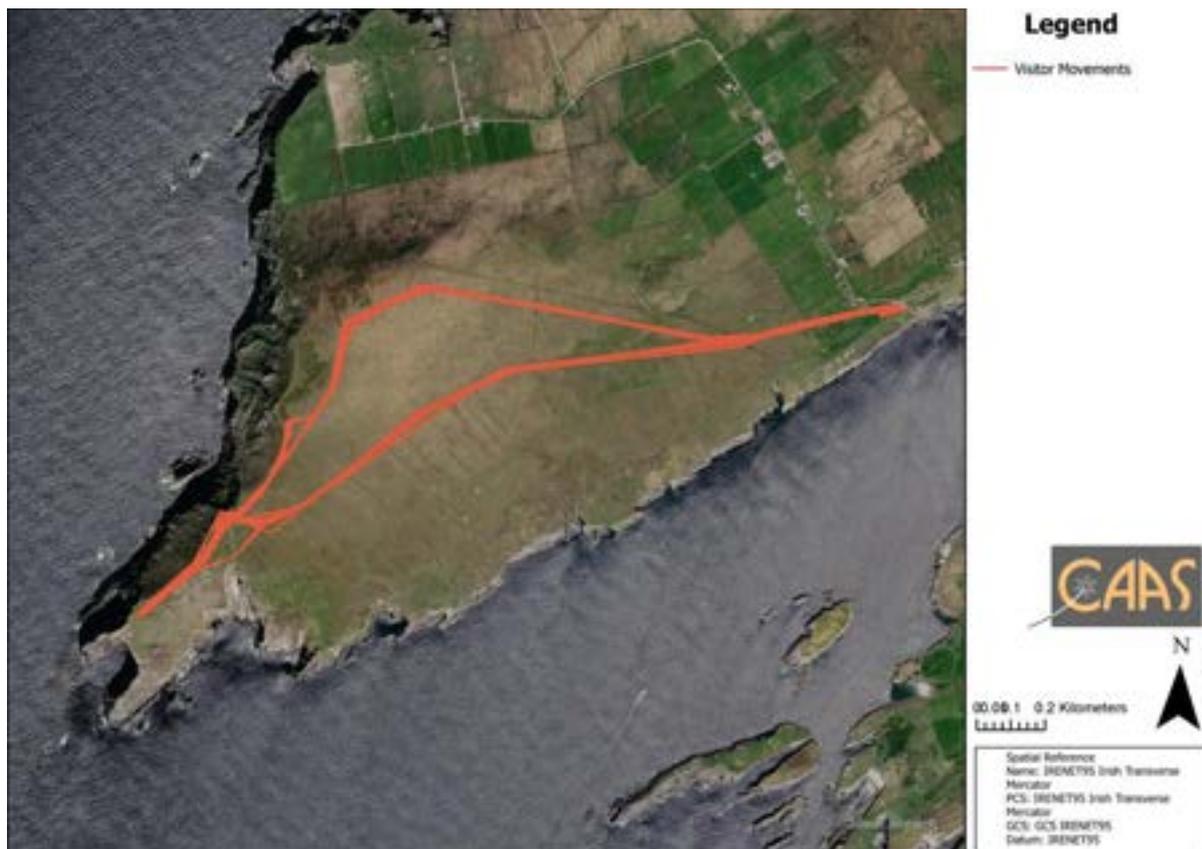


Figure 5.18 Visitor movement patterns at Bray Head

Of the 100 sample groups recorded on site 65% of them undertook activities other than walking. These activities (identified above) resulted in 19 impacts being observed on site during the survey. Thus, 23% of activities on site resulted in impacts on the environment. The impact severity levels varied with 95% of the impacts being low, 5% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Light desire line	2
Noise	1
Other	5
Trampling	11

## 5.6 Ecological Monitoring Results

### 5.6.1 Ecological Constraints

The habitats within 2km of Bray are sensitive to water pollution, invasive species and direct damage and the sensitive species found within 2km are sensitive to pollution and disturbance effects.

**Table 5.1 Designated sites within 2km of Bray Head and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001382]	Valencia Island Cliffs pNHA	0.00	pNHA	
[004154]	Iveragh Peninsula SPA	0.00	SPA	Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Peregrine falcon ( <i>Falco peregrinus</i> ) [A103], Guillemot ( <i>Uria aalge</i> ) [A199], Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346], Fulmar ( <i>Fulmarus glacialis</i> ) [A009]
[002262]	Valencia Harbour/Portmagee Channel SAC	0.14	SAC	Mudflats and sandflats not covered by seawater at low tide [1140], Reefs [1170], Large shallow inlets and bays [1160]
[001373]	Puffin Sound-Horse Island Cliffs pNHA	0.31	pNHA	

### 5.6.2 Habitat Descriptions

The main habitat at Bray head is mountain heath which dominates most of the landscape (Figure 5.19). The area has low intensity cattle graze present and it was recorded that a number of Chough use the site regularly. The area surrounding the castle at the top of the walkway is characterised by a very short grass sward – this is a low diversity mix which has higher intensity sheep graze which is resulting in a very short sward.

The site is well managed with the majority of the visitors staying along the soft infrastructure path. The main area of visitor activity which is off path – has incidences of exposed soils from trampling – however these are localised. The loop walk has less footfall but there is more damage to the habitats as a result – with the steep incline areas of the heath having high rates of exposed substrate and damage. The carpark side of the main peak on site has a widely dispersed network of trails showing dispersed damage – likely to be due to the topography and wet conditions of the site.



**Figure 5.19 Habitats present at Bray Head**

### 5.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>8</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 3 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be topography, substrata type and uncontrolled/disperse visitor movements.

### 5.6.4 Mammals on Site

No mammals were recorded on site during the field visit – however, the NBDC data shows there are a range of mammals within the receiving environment – particularly in the marine environment.

Mammals likely to occur on site include European rabbit, Irish hare, wood mouse and Irish Stoat.

**Table 5.2 List of mammals that have been recorded at NBDC Hectad V37**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	8
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	24
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	20
Marine mammal	Common Seal	<i>Phoca vitulina</i>	11
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	2
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	38
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	10
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	2
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	25
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	6
Marine mammal	True's Beaked Whale	<i>Mesoplodon mirus</i>	1
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	2

<sup>8</sup> This value was calculated using the methods set out in Appendix II

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	4
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	6
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	1
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	1
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	1
Terrestrial mammal	Sika Deer	<i>Cervus nippon</i>	1
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	1
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

## 5.7 Recommendations

The site is well managed in most respects related to tourism; however, should visitor numbers increase - particularly along the upper trail through the heathland, there could be future issues for the site. Therefore, it is recommended that a boardwalk or stone pathway trail be explored as future options. These trail types could be similar to those at Sliabh Liag or the Spink walk - However, if trails are explored these should be one-way systems or wide enough to facilitate 2-way traffic - with signage explaining the importance of path fidelity. Similarly, the area around the watch tower could be developed to ensure resilience in the grass sward to trampling through the use of sub terranean membranes which support flexibility in the substrate to reduce trampling effect.

Additionally, a more carefully managed grazing regime should be employed for the site - with specific efforts put into ensuring the grazing regime increases flora diversity while supporting the niche requirements of the chough known to occur on site.

## Carlingford – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Otters are also known to frequent Carlingford lough, although none were spotted during the visit. Carlingford Lough and the surrounding coastal area, play host to multiple whale and dolphin [cetacean] species including bottle nosed dolphins and within the last few years, a bowhead whale.



### KEY RECOMMENDATIONS

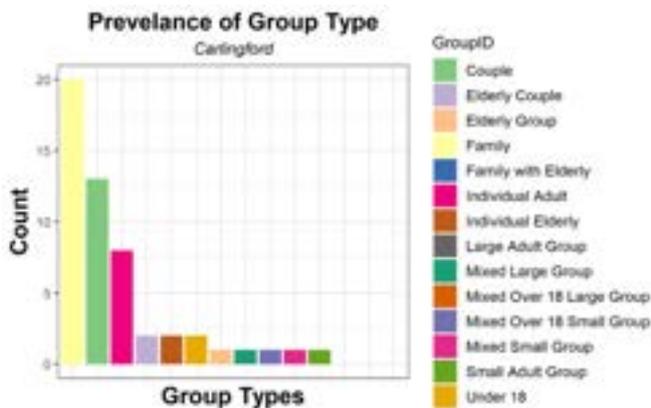
- Although there were no otter holts recorded on site – it is likely that this is a well defended territory.
- Urban landscaping could be employed to introduce pollination and invertebrate resources to the parklands and amenity grassland areas to promote biodiversity enhancements.
- Update the existing nature signage to give details on the broader ecological context beyond the bird species drawing found on site.
- Dumping and littering are the main impacts identified for the town. The litter management processes for the town should be reviewed with respect to the current demands on the existing bins.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Urban aspect of Carlingford means there were few high impact activities were undertaken on site.
- Given the urban aspect of the area, the most common impact observed was littering.
- Most of the visitors to the site stayed for at least 50 minutes – given the nature of the site being an urban area with a pier and a beach.

### VISITOR NUMBERS AND DWELL TIME

- 179 people visited the site over 8 hours
- Average dwell time of 50 minutes



### Highlights:

- Strong wintering bird population
- Strong habitat for local marine wildlife
- Long site dwell time of at least 50 minutes
- Site signage is limited – missed opportunity for wildlife



## 6 Carlingford

### 6.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;

- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning through to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 6.2 Methods & Surveys

The following surveys were undertaken at Carlingford:

### 6.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Carlingford was undertaken on the 23<sup>rd</sup> of July 2021, with max temperatures reaching approximately 25.1° C, no rainfall on the day<sup>9</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 6.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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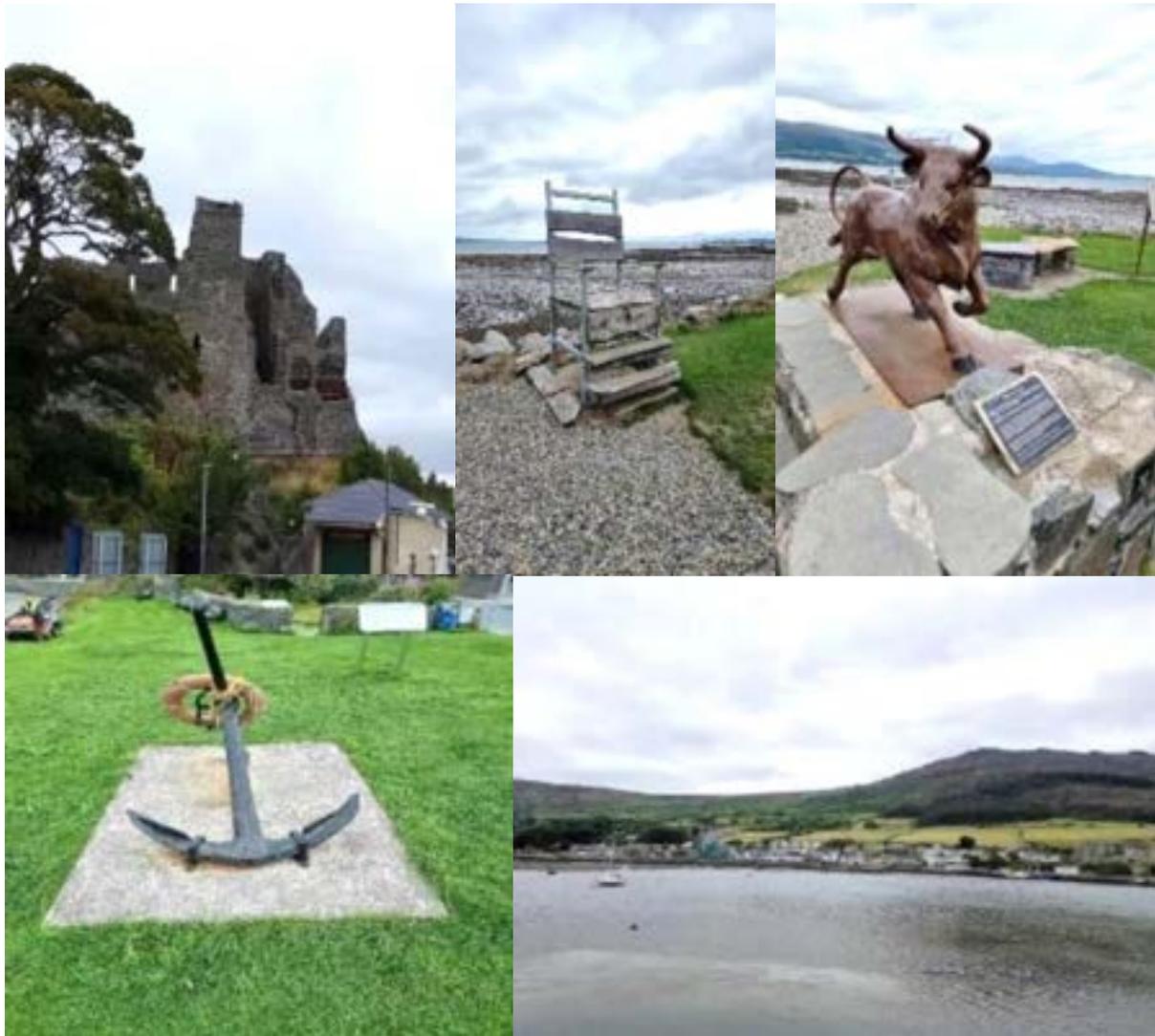
<sup>9</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 6.2.3 Other Surveys

Additional sample surveys were undertaken at Carlingford to identify the species presence of wintering birds. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

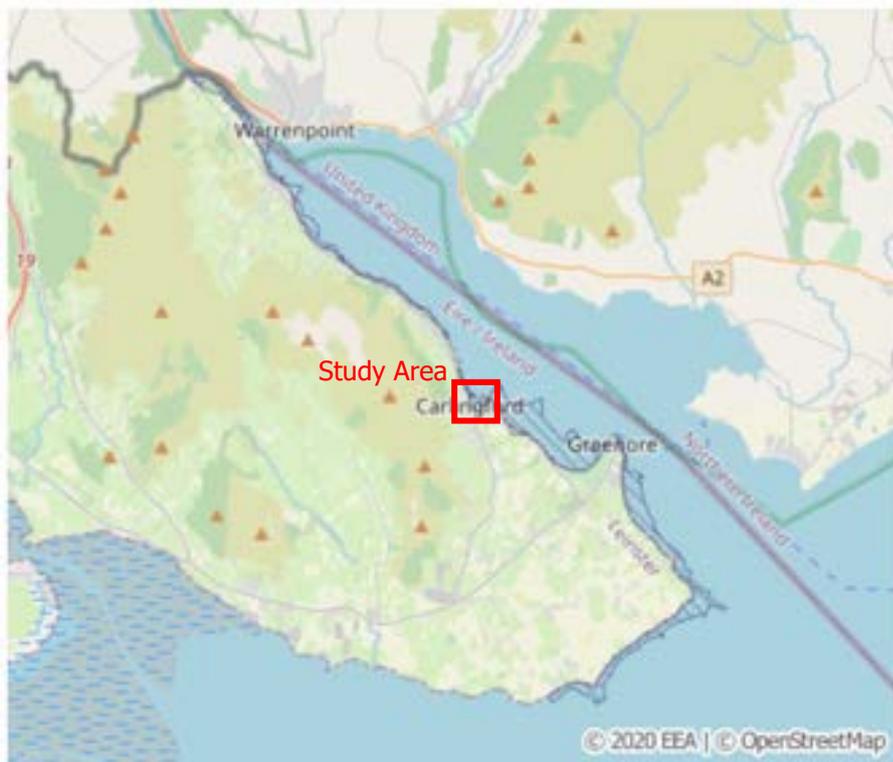
### 6.3 Site Description of Carlingford

Carlingford is a coastal town of medieval origins in County Louth and is conveniently halfway between the cities of Belfast and Dublin. Carlingford is located close to Slieve Foy and is on Carlingford Lough, which offer a range of recreational activities to locals and visitors alike. Carlingford Lough SPA and Carlingford Shore SAC are located directly next to the town of Carlingford and has coastal habitats such as mixed substrata shores and shingle and gravel shores. The harbour and adjoining marine waters are much used for adventure water sports.



**Figure 6.1 Carlingford**

## Carlingford Shore SAC



**Figure 6.2 Study Area within Carlingford SAC**

### **6.4 Pathways and Features Condition Results**

#### **6.4.1 Pathway Condition**

All of the pathways are along roads or hard surfaced piers. There are no notable damaged areas. Water access is mostly via concrete slipway structures.



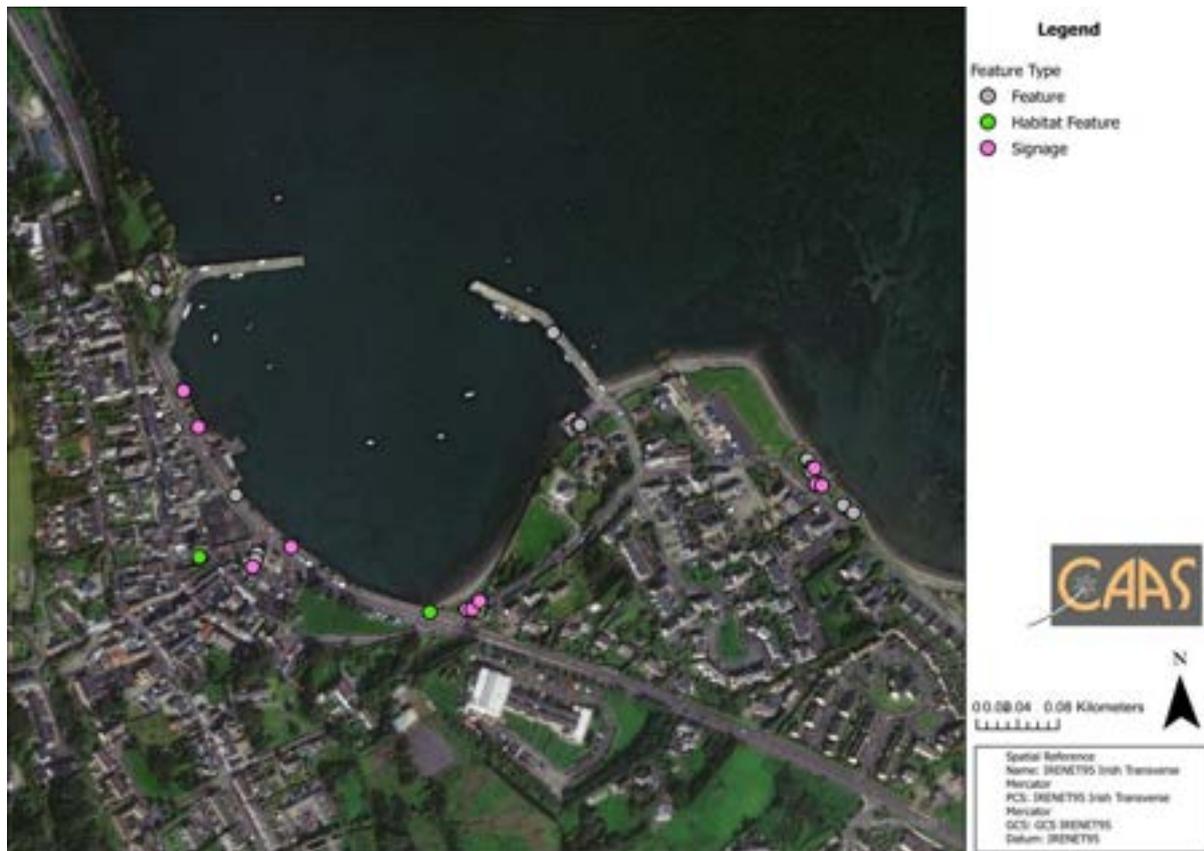
**Figure 6.3 Pathways identified at Carlingford**



**Figure 6.4 Pathways and water access at Carlingford**

#### **6.4.2 Features Condition**

Carlingford contains a number of informational signs related to both the historical and the natural aspects of the area (Figure 6.6). Along with these signs there are multiple attractions and monuments within Carlingford such as a fairy trail, a statue of the brown bull of Cooley, the giant's chair, and the ever-present Carlingford castle (Figure 6.6). Along with these, there are also other amenities relating to tourism and leisure with tennis courts, an adventure centre and a visitor office.



**Figure 6.5 Features recorded at Carlingford**



**Figure 6.6 Wildlife Sign at Carlingford and Carlingford castle**

### 6.4.3 Hazards

No hazards of any significance were reported in Carlingford.

### 6.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 179 visitors (which represent 52 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 50 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Picnicking
Dog walking (on lead)
Photographing
Sitting
Swimming
Cycling Swimming and Drinking cans
Kayaking
SUP Boarding
Tennis
Coffee
Cycling
Dog walking (off lead)
Fishing
Flying drone
Hiking
Jogging
Kayaking
Skateboarding

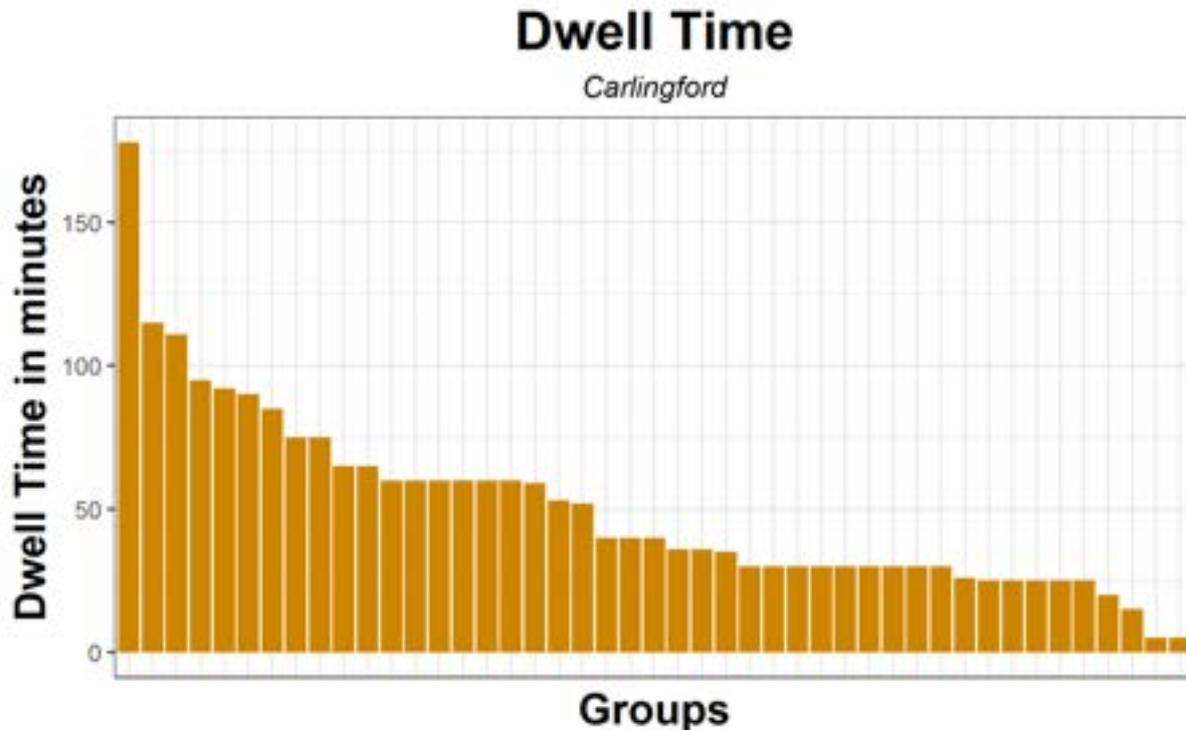


Figure 6.7 Duration of Time Spent at Carlingford

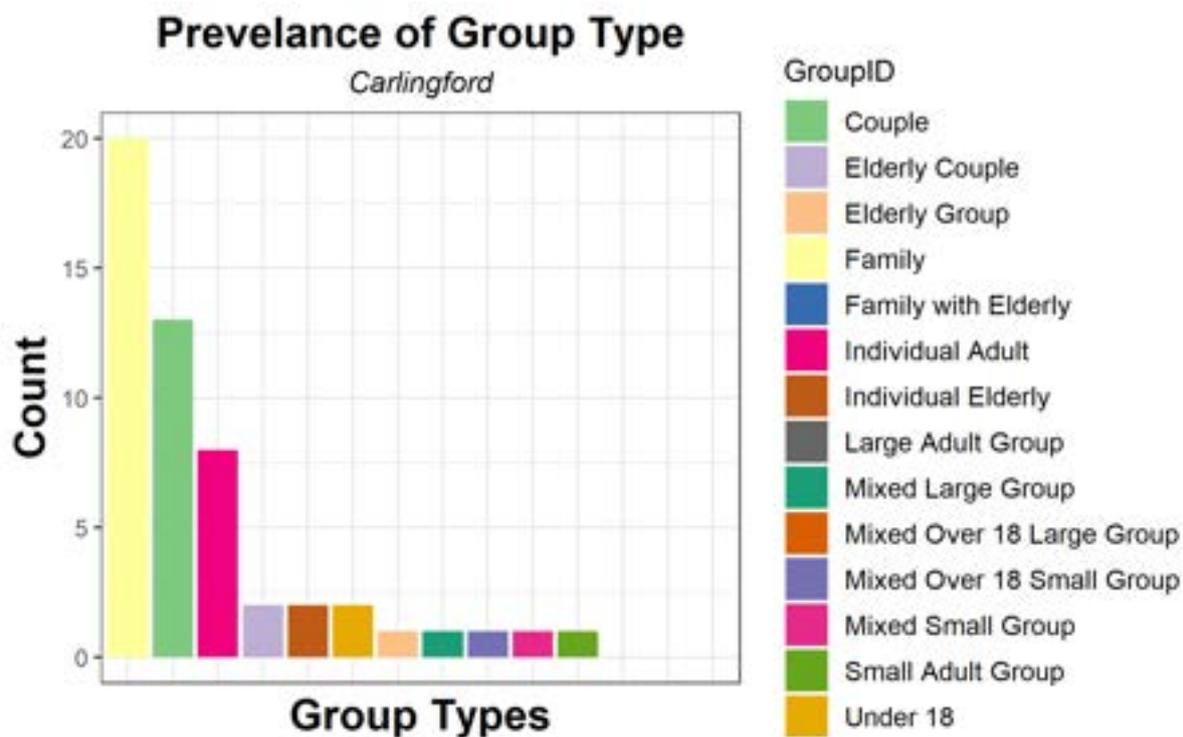


Figure 6.8 Groups of visitors that visited Carlingford

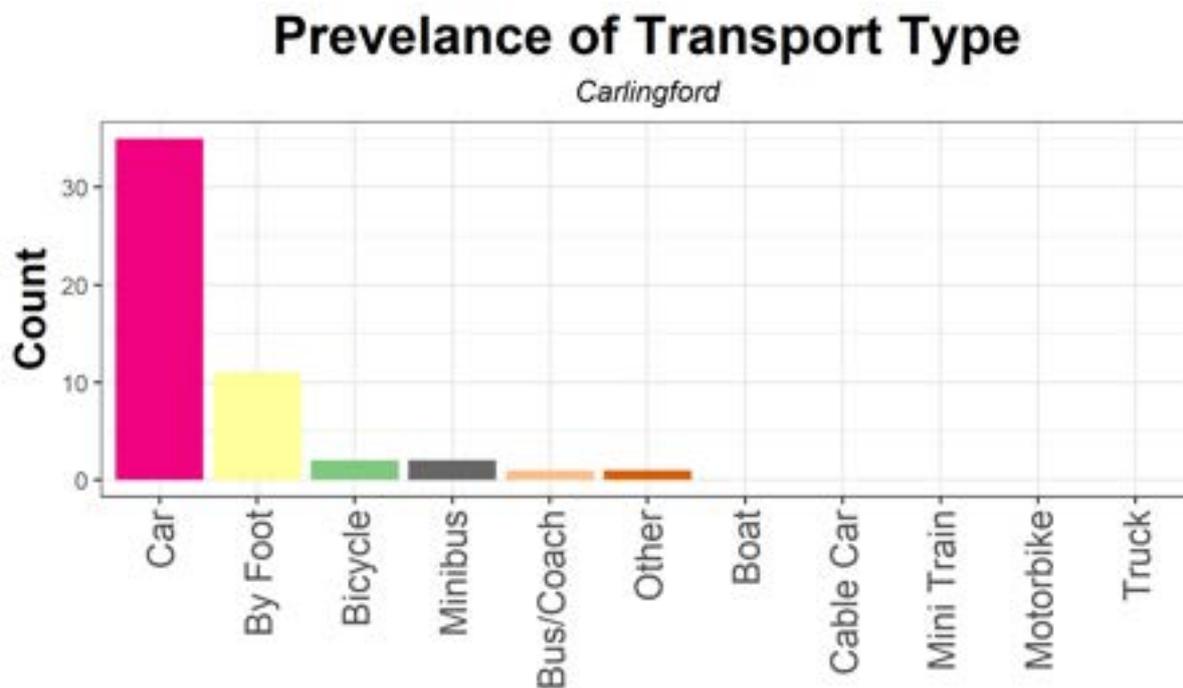
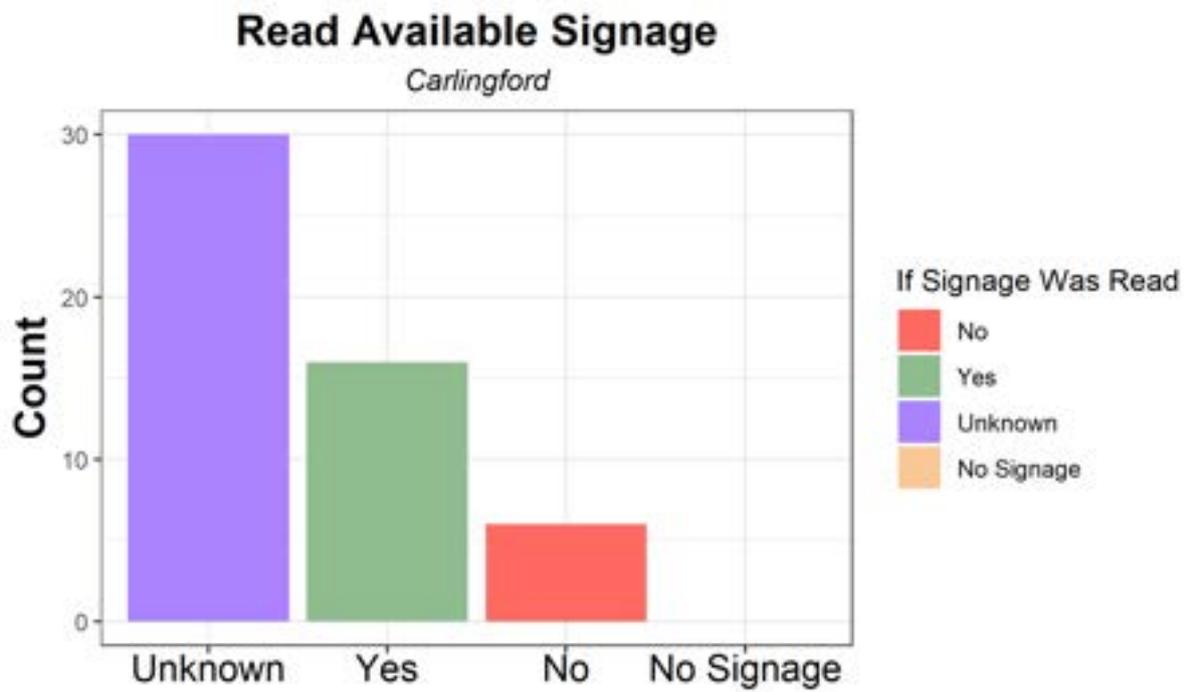
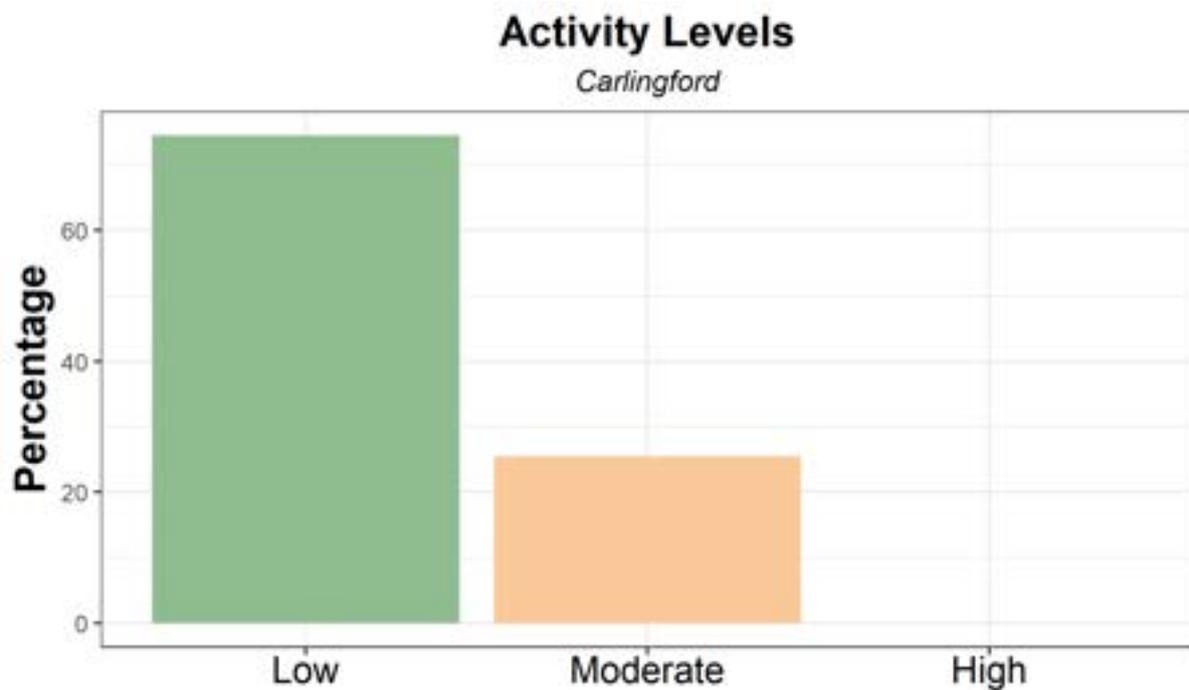


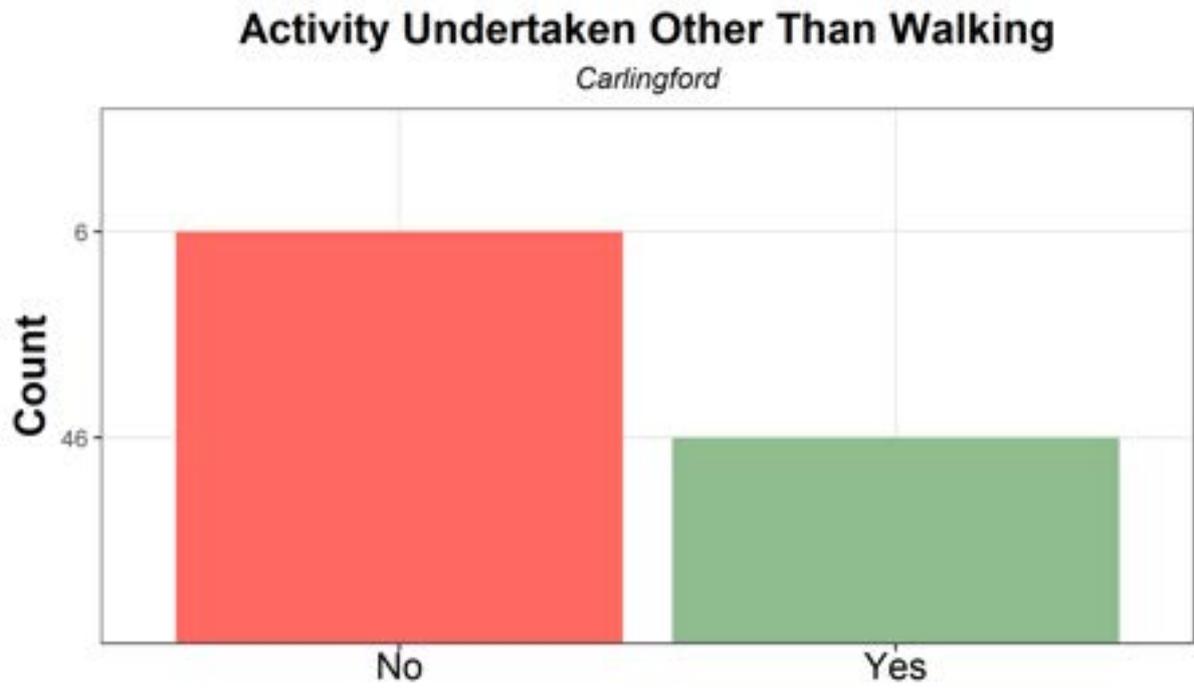
Figure 6.9 Mode of transport used to visit Carlingford



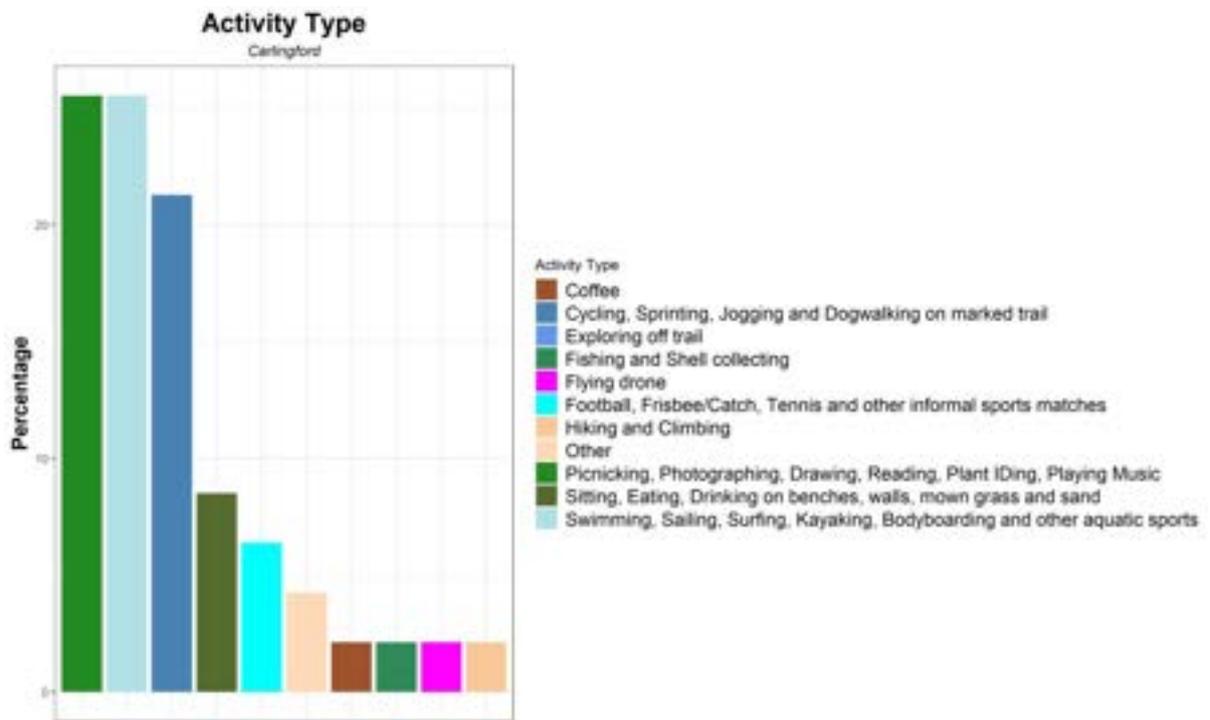
**Figure 6.10 Use of Interpretive Material at Carlingford**



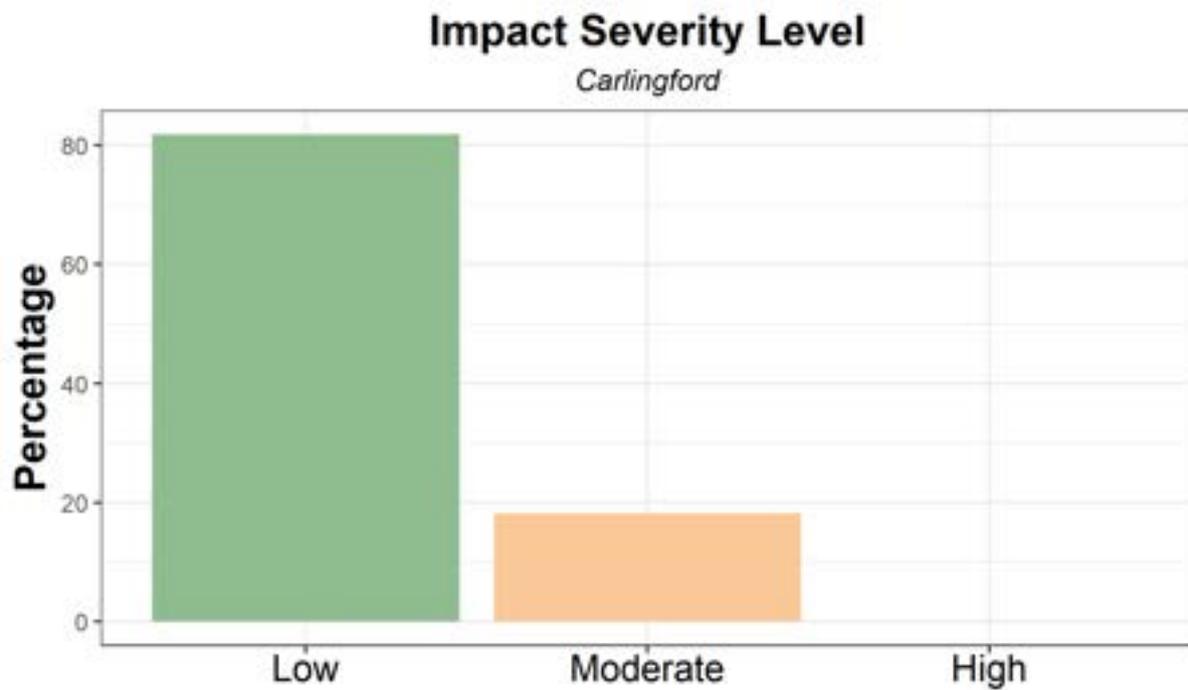
**Figure 6.11 Categories of Activity Levels Observed at Carlingford**



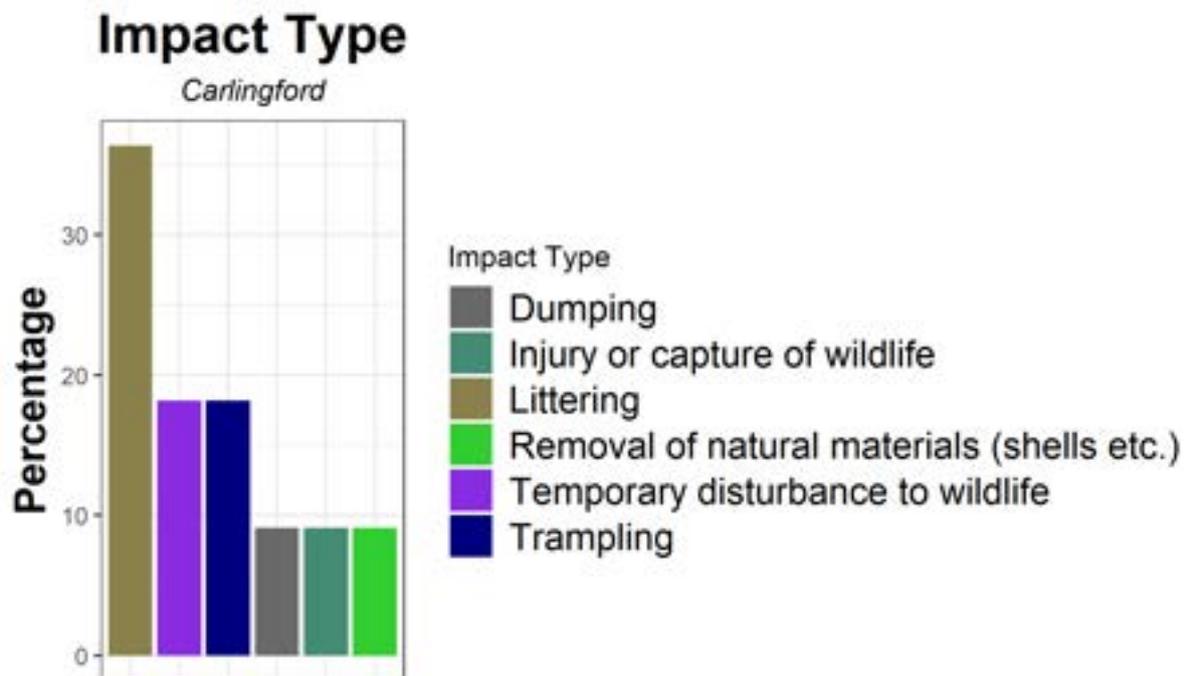
**Figure 6.12** Activities undertaken other than walking



**Figure 6.13** Range of Visitor Activities Observed at Carlingford



**Figure 6.14 Categories of Environmental Impact Levels Observed at Carlingford as a result of Visitor Activities**



**Figure 6.15 Range of Environmental Impacts Observed at Carlingford**



**Figure 6.16 Visitor movement patterns at Carlingford**

Of the 52 groups recorded on site 88% of them undertook activities other than walking. These activities (identified above) resulted in 11 impacts being observed on site during the survey. Thus, 23% of activities on site resulted in impacts on the environment. The impact severity levels varied with 82% of the impacts being low, 18% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Dumping	1
Injury or capture of wildlife	1
Littering	4
Removal of natural materials (shells etc.)	1
Temporary disturbance to wildlife	2
Trampling	2

## 6.6 Ecological Monitoring Results

### 6.6.1 Ecological Constraints

The species within Carlingford are sensitive to pollution, disturbance effects and invasive species. While habitats are sensitive to land management changes, anthropogenic disturbance, overgrazing, pollution and hydrological changes.

**Table 6.1 Designated sites within 2km of Carlingford and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000452]	Carlingford Lough pNHA	0.01	pNHA	
[002306]	Carlingford Shore SAC	0.01	SAC	Perennial vegetation of stony banks [1220], Annual vegetation of drift lines [1210]

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[004078]	Carlingford Lough SPA	0.33	SPA	Wetland and Waterbirds [A999], Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]
[000453]	Carlingford Mountain pNHA	0.86	pNHA	
[000453]	Carlingford Mountain SAC	0.86	SAC	Transition mires and quaking bogs [7140], Species-rich Nardus grasslands, on siliceous substrates in mountain areas - and submountain areas in Continental Europe [6230], Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> ) [8110], Alpine and Boreal heaths [4060], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Blanket bogs * if active bog [7130], European dry heaths [4030], Calcareous rocky slopes with chasmophytic vegetation [8210], Alkaline fens [7230]

### 6.6.2 Habitat Descriptions

As Carlingford is an urban area, a lot of the habitat in the area is buildings and artificial surfaces (Fossitt Code BL3) with patches of amenity grassland (Fossitt Code GA2). As Carlingford lough is situated in the area, the shore of Carlingford is made up of shore habitats like single and gravel shores (Fossitt Code LS1) and mixed substrata shores (Fossitt Code LR4), which makes up the majority of the shoreline habitat (Figure 6.17).

Visitor movement patterns were restricted to hard infrastructure areas around the town and its marine edge. The harbour itself had vessel movement within and, birds were observed using the harbour for foraging.



Figure 6.17 Habitats present at Carlingford

### 6.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the

overall habitat quality<sup>10</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features; however, this is largely due to the fact the site is an urban environment with 'Buildings and Artificial Surfaces' being the dominant habitat type with some amenity grassland and parkland areas throughout. There were 0 recorded incidents of damage to habitats occurring off the marked paths on site.

#### 6.6.4 Wintering Bird Survey

There was a nationally important flock size (greater than 60 individuals) of oyster catchers observed on site. Carlingford lough SPA is only designated for Light bellied brent geese which were not seen on site at the time of surveying – given the urban nature of the site it is not likely that they will use the site. Nonetheless there is a lot of sea bird activity at the site.

**Table 4.2 Results of the wintering bird survey conducted at Carlingford**

Common name	Scientific name	Record count
Black headed gul	<i>Larus ridibundus</i>	24
Cormorant	<i>Phalacrocorax carbo</i>	2
Curlew	<i>Numenius arquata</i>	6
Great crested grebe	<i>Podiceps cristatus</i>	18
Herring gul	<i>Larus argentatus</i>	6
Oyster catcher	<i>Haematopus ostralegus</i>	63
Redshank	<i>Tringa totanus</i>	4
Shag	<i>Phalacrocorax aristotelis</i>	2
Turnstone	<i>Arenaria interpres</i>	1

**Table 6.2 List of wintering birds that have been recorded at NBDC Hectad J11**

Taxonomic group	Common name	Scientific name	Record count
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	3
Bird	Black Brant	<i>Branta bernicla subsp. nigricans</i>	6
Bird	Black Guillemot	<i>Cephus grylle</i>	10
Bird	Black-headed Gull	<i>Larus ridibundus</i>	21
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	1
Bird	Black-tailed Godwit	<i>Limosa limosa</i>	5
Bird	Branta bernicla subsp. hrota	<i>Branta bernicla subsp. hrota</i>	6
Bird	Brent Goose	<i>Branta bernicla</i>	12
Bird	Common Goldeneye	<i>Bucephala clangula</i>	5
Bird	Common Coot	<i>Fulica atra</i>	1
Bird	Common Greenshank	<i>Tringa nebularia</i>	5
Bird	Common Guillemot	<i>Uria aalge</i>	3
Bird	Common Kingfisher	<i>Alcedo atthis</i>	4
Bird	Common Moorhen	<i>Gallinula chloropus</i>	4
Bird	Common Pochard	<i>Aythya ferina</i>	1
Bird	Common Redshank	<i>Tringa totanus</i>	15
Bird	Common Shelduck	<i>Tadorna tadorna</i>	15
Bird	Common Snipe	<i>Gallinago gallinago</i>	8
Bird	Common Tern	<i>Sterna hirundo</i>	2
Bird	Dunlin	<i>Calidris alpina</i>	8
Bird	Eurasian Curlew	<i>Numenius arquata</i>	21
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	17
Bird	Eurasian Teal	<i>Anas crecca</i>	7
Bird	Eurasian Wigeon	<i>Anas penelope</i>	5
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	2
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	4
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	3
Bird	Great Black-backed Gull	<i>Larus marinus</i>	9
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	18
Bird	Great Crested Grebe	<i>Podiceps cristatus</i>	10

<sup>10</sup> This value was calculated using the methods set out in Appendix II

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Great Northern Diver	<i>Gavia immer</i>	2
Bird	Greater Scaup	<i>Aythya marila</i>	7
Bird	Grey Heron	<i>Ardea cinerea</i>	19
Bird	Grey Plover	<i>Pluvialis squatarola</i>	1
Bird	Herring Gull	<i>Larus argentatus</i>	14
Bird	Iceland Gull	<i>Larus glaucooides</i>	1
Bird	Jack Snipe	<i>Lymnocyptes minimus</i>	1
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	1
Bird	Little Egret	<i>Egretta garzetta</i>	8
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	7
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	3
Bird	Mallard	<i>Anas platyrhynchos</i>	11
Bird	Mew Gull	<i>Larus canus</i>	16
Bird	Mute Swan	<i>Cygnus olor</i>	2
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	4
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	9
Bird	Razorbill	<i>Alca torda</i>	3
Bird	Red Knot	<i>Calidris canutus</i>	3
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	13
Bird	Red-necked Grebe	<i>Podiceps grisegena</i>	2
Bird	Red-throated Diver	<i>Gavia stellata</i>	2
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	7
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	11
Bird	Slavonian Grebe	<i>Podiceps auritus</i>	1
Bird	Surf Scoter	<i>Melanitta perspicillata</i>	2
Bird	Tufted Duck	<i>Aythya fuligula</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	1
Bird	White Wagtail	<i>Motacilla alba</i>	16
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	10
Bird	Whooper Swan	<i>Cygnus cygnus</i>	3

## 6.7 Recommendations

Dumping and littering are the main impacts identified for the town. The litter management processes for the town should be reviewed with respect to the current demands on the existing bins.

Although there were no otter holts recorded on site – it is likely that this is a well defended territory.

Sea fronting urban landscaping could be employed to introduce pollination and invertebrate resources to the parklands and amenity grassland areas to promote biodiversity enhancements.

Update the existing nature signage to give details on the broader ecological context beyond the bird species drawing found on site.

## Derrigimlagh Bog – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Derrigimlagh Bog is covered by a majority of cutover bog, which was previously cut for industrial use and still cut, but on a much smaller scale.



The bog itself has a low species diversity and requires management action to increase the habitat quality and species diversity present.

### KEY RECOMMENDATIONS

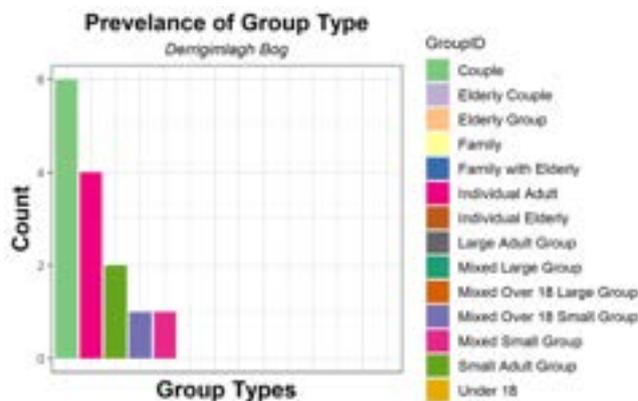
- There are opportunities present at the site to engage in long term habitat restoration to increase floral diversity and use the site as an exemplar location to showcase our cultural heritage related to turf – while also demonstrating biodiversity enhancement as we transition away from turf cutting processes.
- Seasonal attention is required to wear and tear at junctions between paved and board-walked areas and also along transitions to areas of bog vegetation. Consideration should be given to localised temporary sheep exclusion from the most affected areas to allow trail recovery.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- All visitors followed pathways which were designated for use and did not leave these paths.
- Most of the visitors to the site stayed for at least 83 minutes – given the linear and long nature of the boardwalk system.
- Majority of visitors to the site read signage that was available.

### VISITOR NUMBERS AND DWELL TIME

- 31 people visited the site over 8 hours
- Average dwell time of 83 minutes



### Highlights:

- Well maintained boardwalk and redefined use for previous roadways through the bog.
- Long site dwell time of at least 83 minutes.
- Large amounts of signage and interactive features relating to sites natural history.



## 7 Derrigimlagh Bog

### 7.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Ireland's regional areas; The Wild Atlantic Way, Ireland's Hidden Heartlands, Ireland's Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
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This culminated in our ability to make useful recommendations to site owners and managers and ultimately to development a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

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These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 7.2 Methods & Surveys

The following surveys were undertaken at Derrigimlagh Bog:

### 7.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Derrigimlagh Bog was undertaken on the 17<sup>th</sup> of July 2021, with max temperatures reaching 23.2° C, no rainfall and low levels of wind on the day<sup>11</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

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In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>11</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 7.2.3 Other Surveys

Additional sample surveys were undertaken at Derrigimlagh Bog to identify the species presence of mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 7.3 Site Description of Derrigimlagh Bog

The Derrigimlagh Discovery Point is a 5km signposted looped walk through the boglands. The site also contains important historic commemoration sites, namely the transmission of the first commercial transatlantic message in 1907 and also the site of the landing of first non-stop transatlantic flight in 1919.

The trail is 5km long following a roadway and gravel tracks with small sections of boardwalk through sensitive area encompassing habitats of bogs such as dystrophic lakes (Figure 5.1) and cutover bog. This walking loop borders and is part of both the Connemara Bog Complex SAC and SPA.



**Figure 7.1 Derrigimlagh Bog**

## Connemara Bog Complex SAC



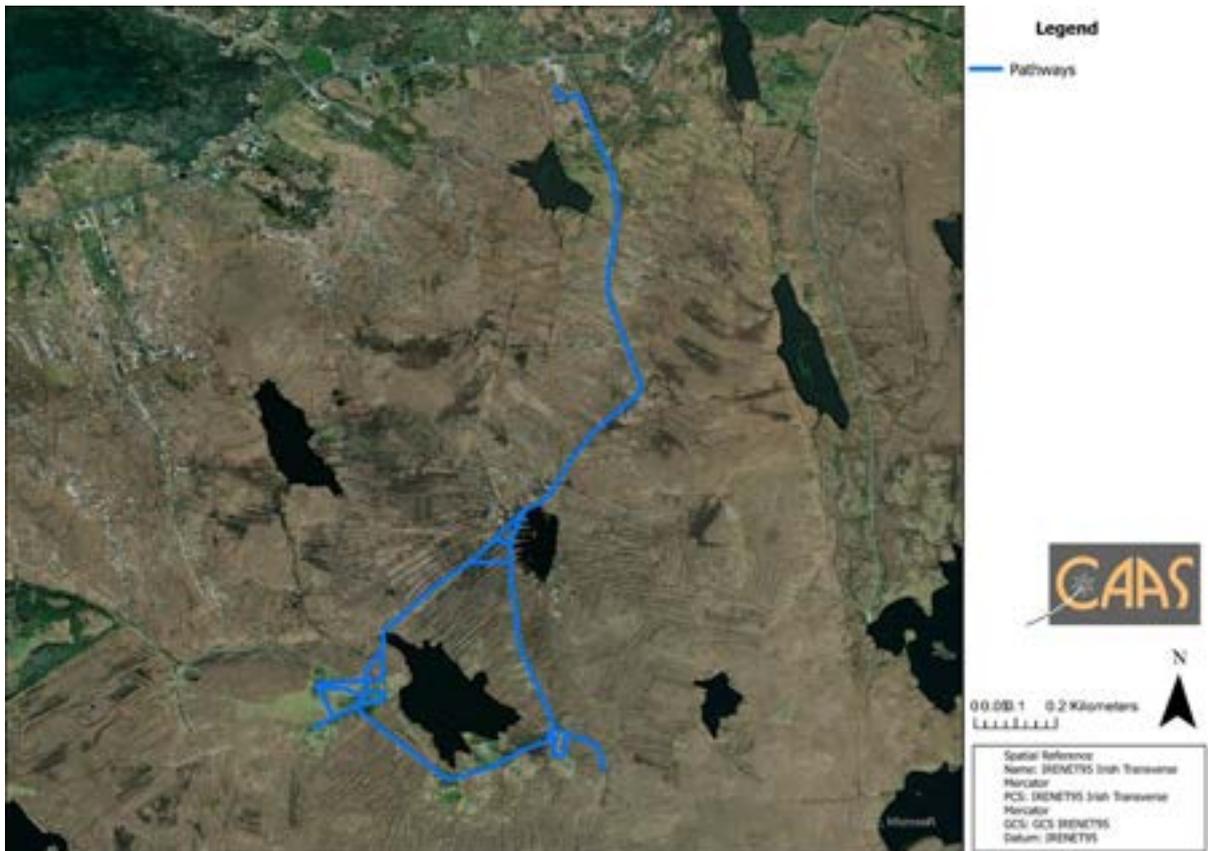
**Figure 7.2 Study Area within Connemara Bog Complex SAC**

### 7.4 Pathways and Features Condition Results

#### 7.4.1 Pathway Condition

The path is a mixture of both hard infrastructure and managed walkways which are consistent in size, respectively all the way through the path. The pathway is composed of a mixture of hard and soft infrastructure pathways which were previously used for transportation of peat from the bog, and comparatively new wooden boardwalk aimed to enhance the tourism aspect of the area.

As the pathways are hard surfaced, there is no evidence of erosion along the pathways, as there are little opportunities for erosion to occur on hard surfaced pathways. However, there are areas of wear and tear at junctions between paved and board-walked areas and also along transitions to areas of bog vegetation.



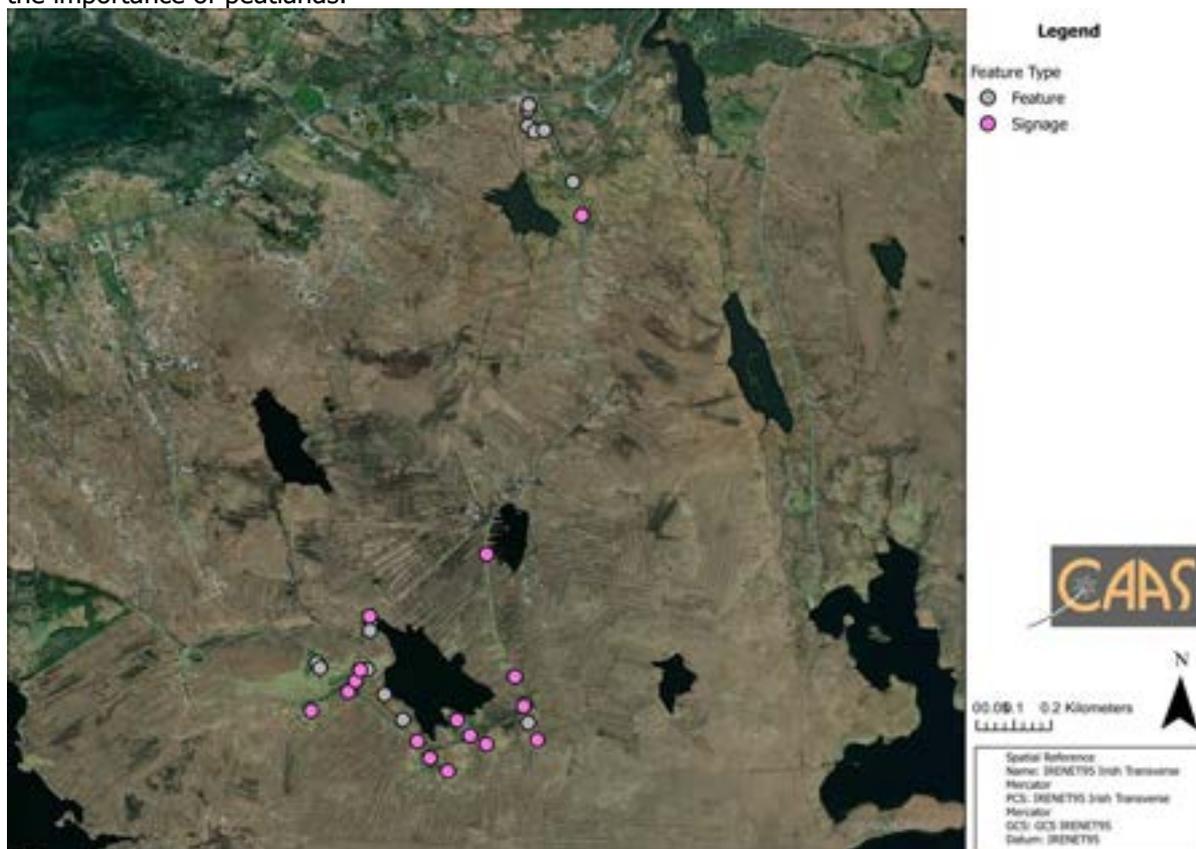
**Figure 7.3 Pathways identified at Derrigimlagh Bog**



**Figure 7.4 Boardwalk pathway at Derrigimlagh Bog**

**7.4.2 Features Condition**

The site has a large number of informational signs, some of which are interactive (Figure 7.6). These informational aspects of the site are placed along the designated boardwalk mainly relate to the heritage and cultural history of the site. There is a lack of signage related to the ecology of the area, especially the importance of peatlands.



**Figure 7.5 Features recorded at Derrigimlagh Bog**



**Figure 7.6 Features at Derrigimlagh Bog**

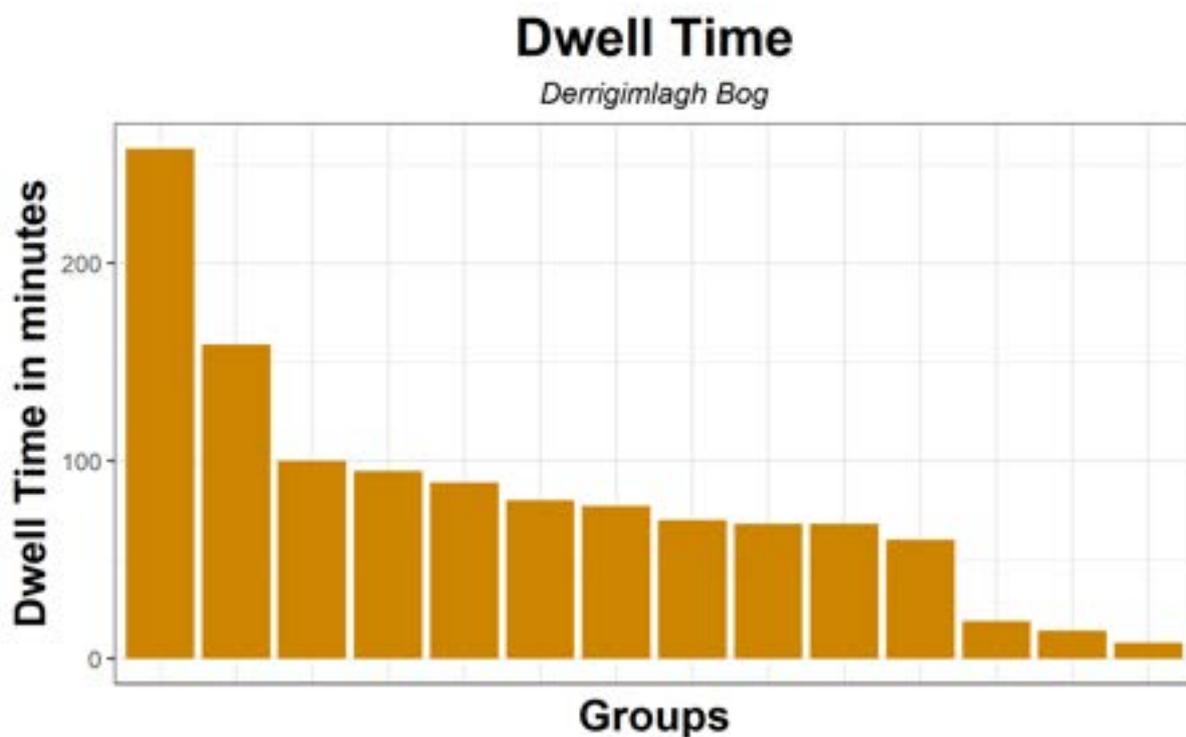
### 7.4.3 Hazards

The hazard mapping identified no significant hazards at Derrigimlagh Bog. There may be future localised issues due to wear and tear at junctions between paved and board-walked areas and also along transitions to areas of bog vegetation.

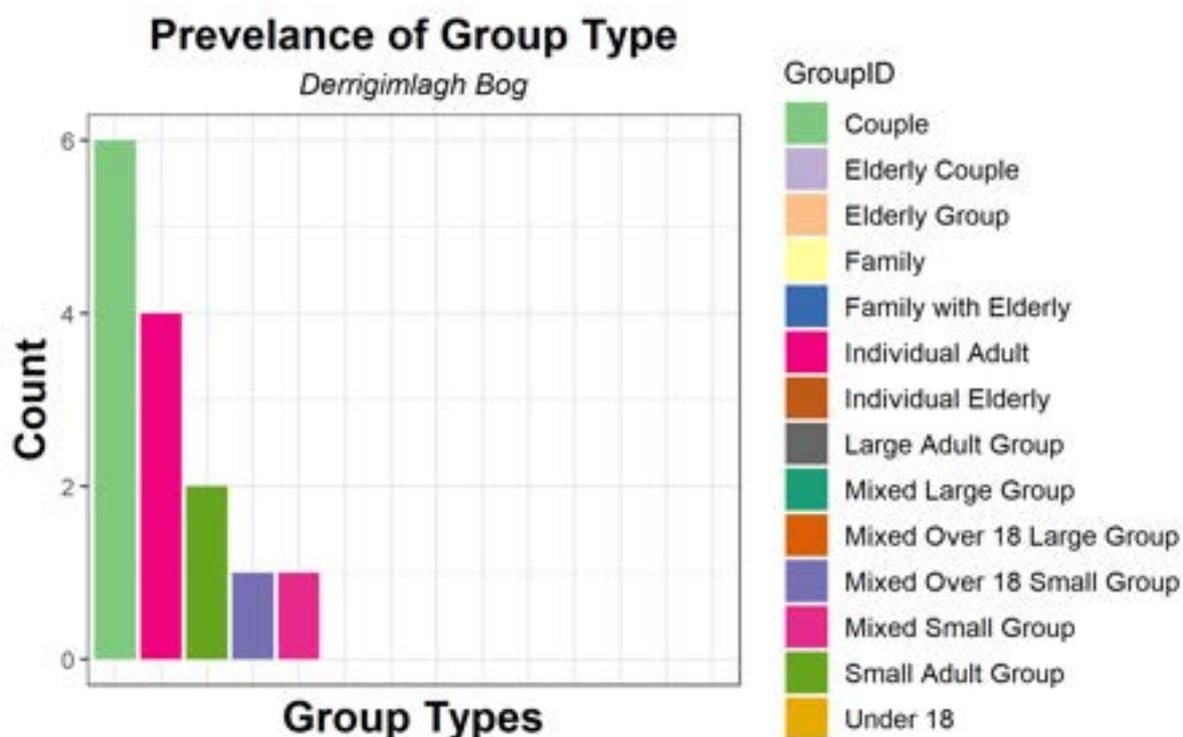
### 7.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 31 visitors (which represent 14 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being car. The average dwell time for the site was 83 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

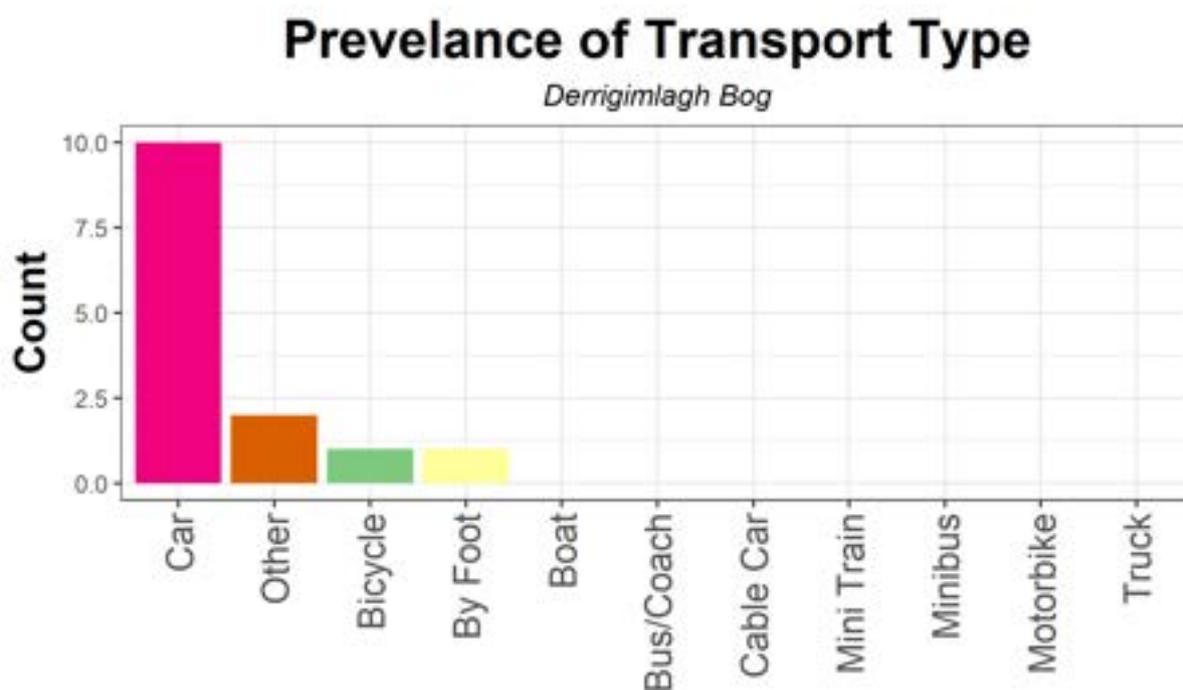
Activity Type
Sitting
Causing damage
Bog cutting
Cycling
Jogging
Sprinting



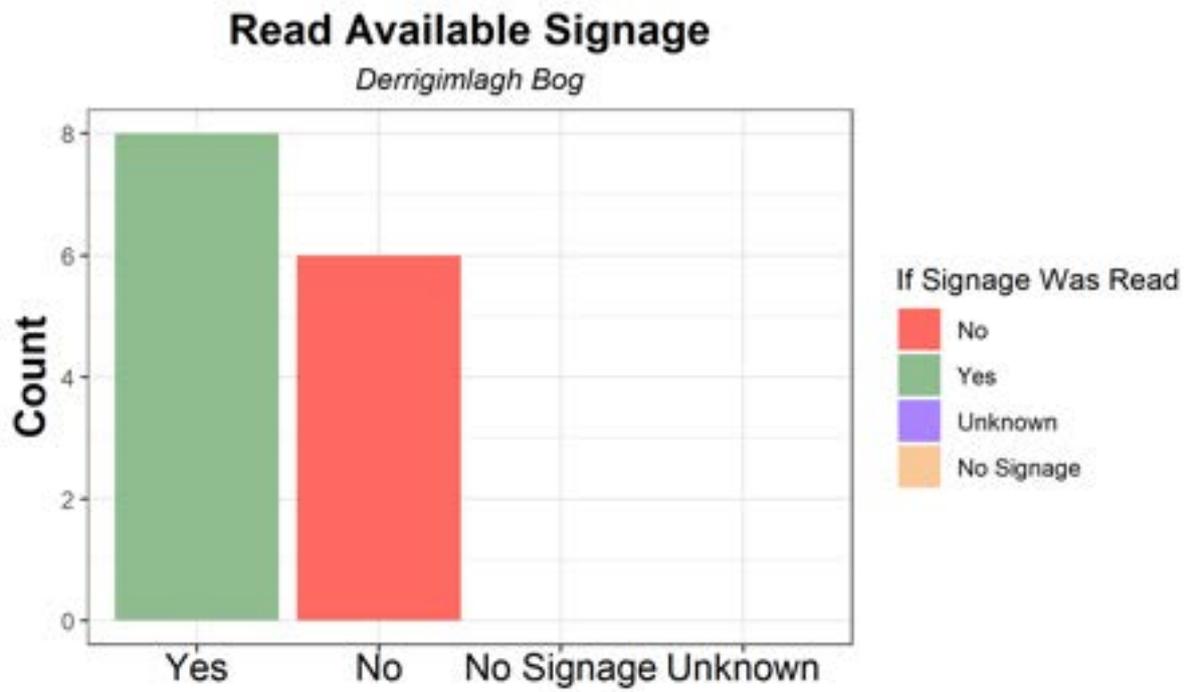
**Figure 7.7 Duration of Time Spent at Derrigimlagh Bog**



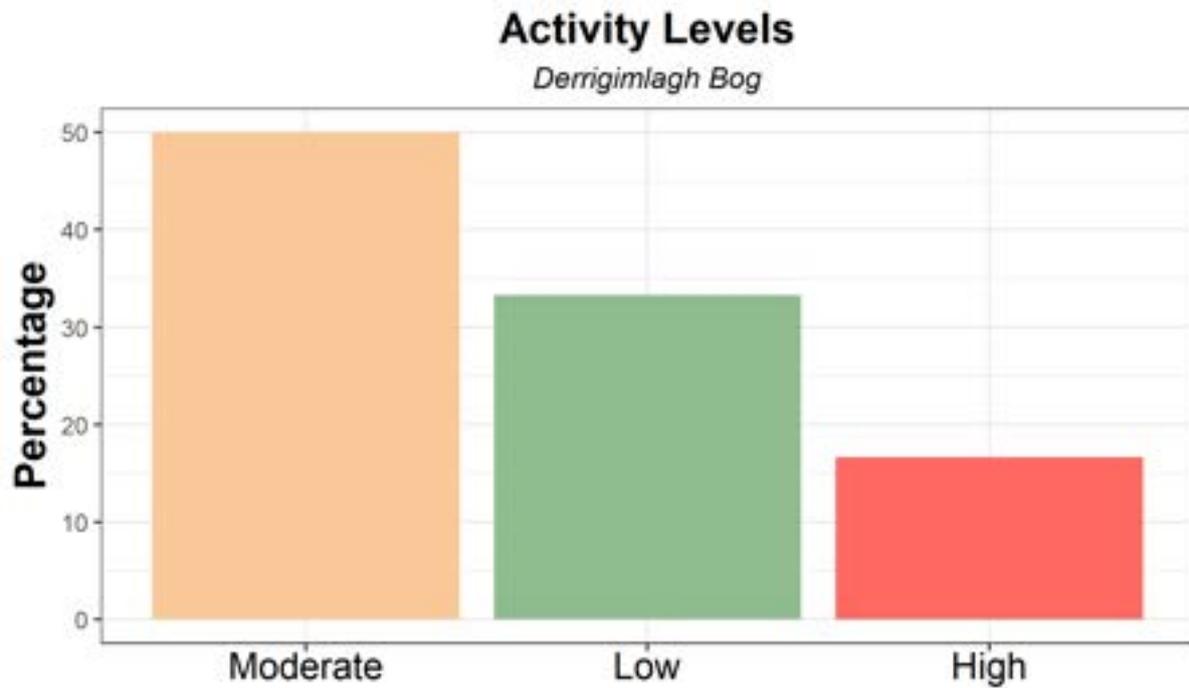
**Figure 7.8** Groups of visitors that visited Derrigimlagh Bog



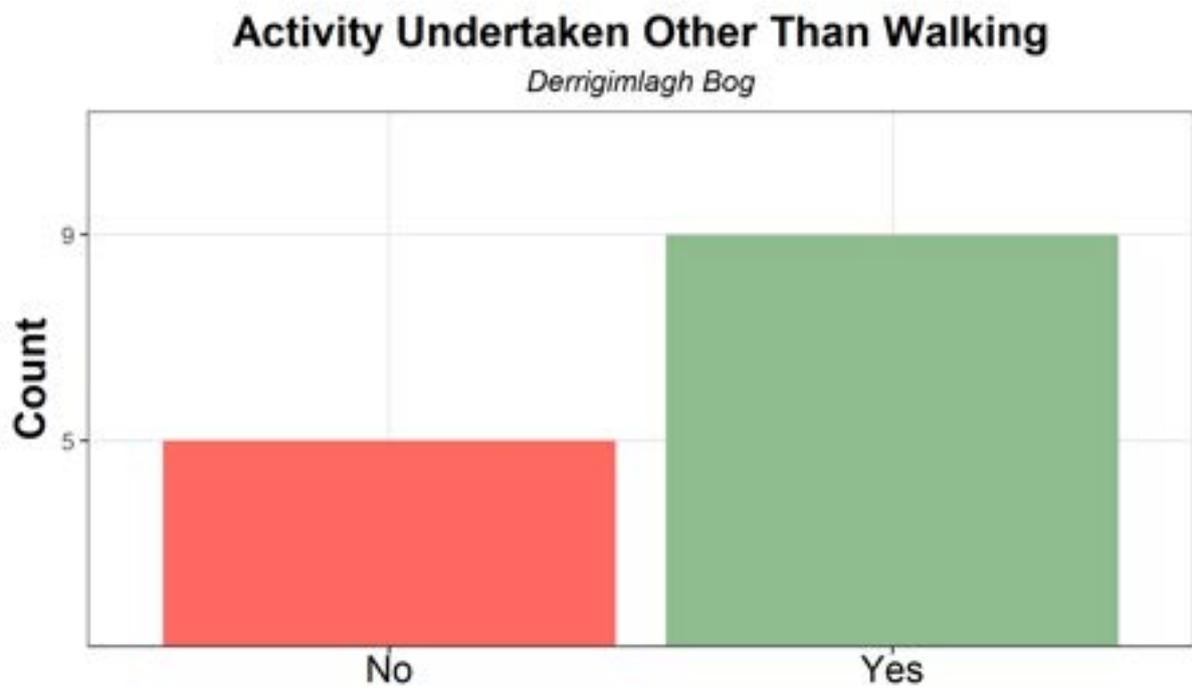
**Figure 7.9** Mode of transport used to visit Derrigimlagh Bog



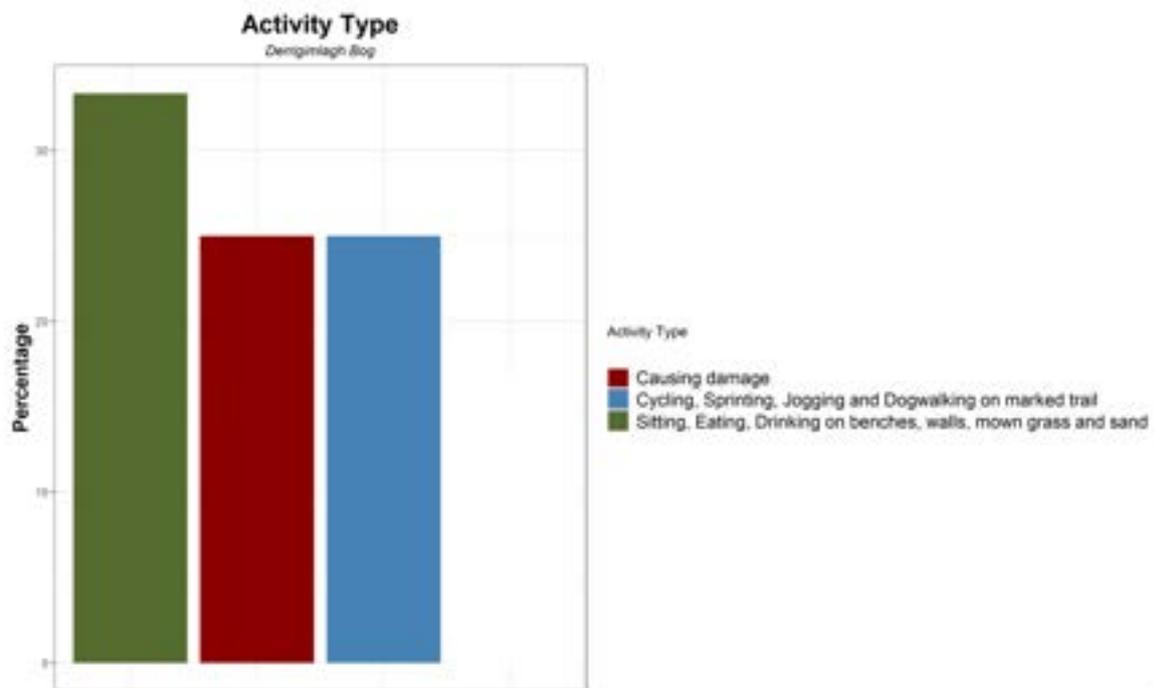
**Figure 7.10 Use of Interpretive Material at Derrigimlagh Bog**



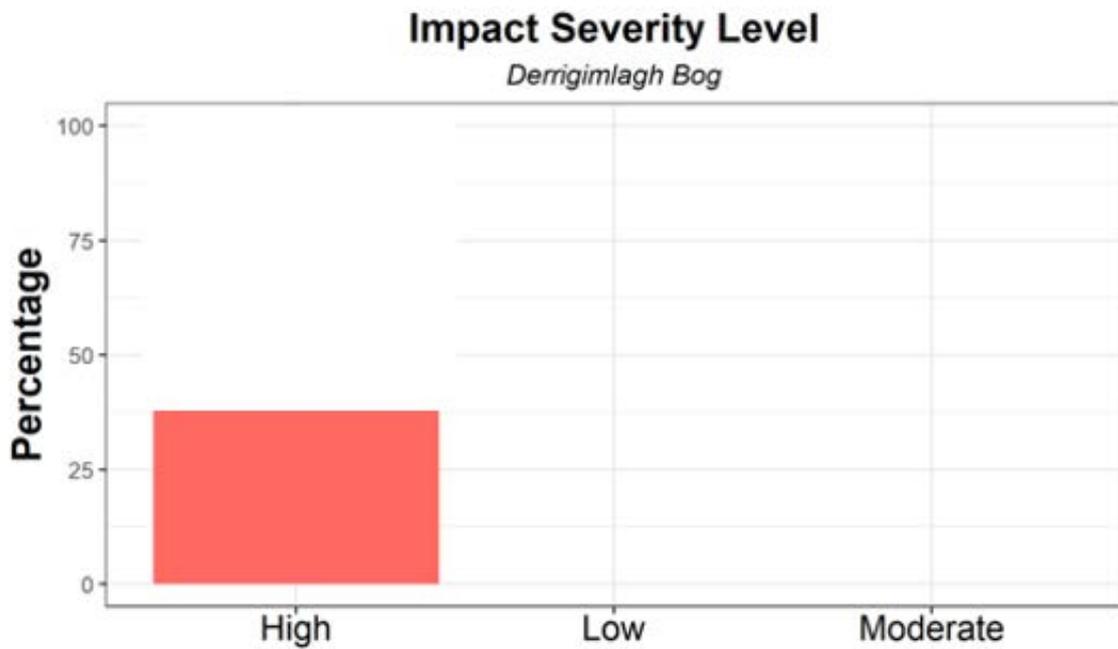
**Figure 7.11 Categories of Activity Levels Observed at Derrigimlagh Bog**



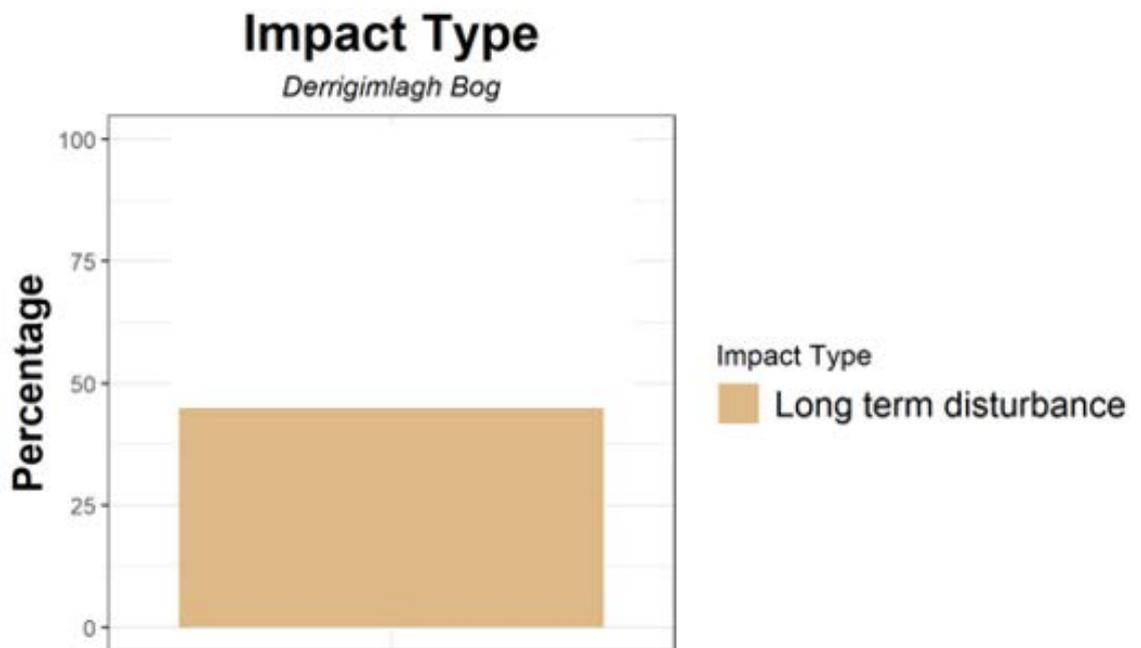
**Figure 7.12 Activities undertaken other than walking**



**Figure 7.13 Range of Visitor Activities Observed at Derrigimlagh Bog**



**Figure 7.14 Categories of Environmental Impact Levels Observed at Derrigimlagh Bog as a result of Visitor Activities**



**Figure 7.15 Range of Environmental Impacts Observed at Derrigimlagh Bog**



**Figure 7.16 Visitor movement patterns at Derrigimlagh Bog**

Of the 14 groups recorded on site 64% of them undertook activities other than walking. These activities (identified above) resulted in 5 impacts being observed on site during the survey. Thus, 42% of activities on site resulted in impacts on the environment. The impacts identified for the site were:

Impact Type	Count
Long term disturbance	5



**Figure 7.17 Peat cutting at Derrigimlagh Bog**

## 7.6 Ecological Monitoring Results

### 7.6.1 Ecological Constraints

The species and habitats within Derrigimlagh bog are sensitive to hydrological changes, land use management, aquaculture, anthropogenic disturbance and pollution.

**Table 7.1 Designated sites within 2km of Derrigimlagh Bog and relevant ecological receptors**

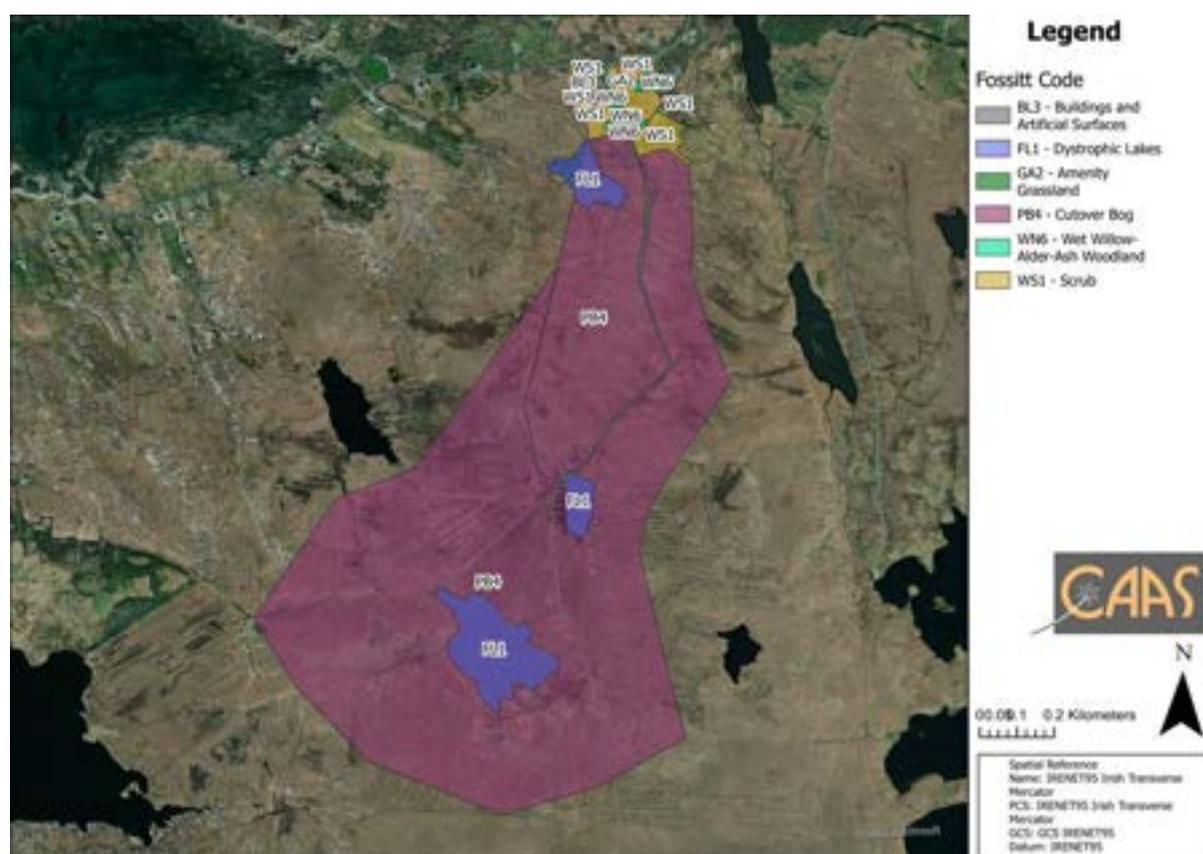
Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002034]	Connemara Bog Complex pNHA	0.18	pNHA	
[002034]	Connemara Bog Complex SAC	0.18	SAC	Atlantic salmon ( <i>Salmo salar</i> ) [1106], European dry heaths [4030], Marsh Fritillary ( <i>Euphydryas aurinia</i> ) [1065], Natural dystrophic lakes and ponds [3160], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caeruleae</i> ) [6410], Coastal lagoons [1150], Otter ( <i>Lutra lutra</i> ) [1355], Reefs [1170], Depressions on peat substrates of the Rhynchosporion [7150], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Alkaline fens [7230], Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110], Blanket bogs * if active bog [7130], Transition mires and quaking bogs [7140], Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0], Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260], Slender naiad ( <i>Najas flexilis</i> ) [1833], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]
[004181]	Connemara Bog Complex SPA	0.60	SPA	Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Common Gull ( <i>Larus canus</i> ) [A182], Merlin ( <i>Falco columbarius</i> ) [A098], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]

[002074]	Slyne Head Peninsula pNHA	0.64	pNHA	
[002074]	Slyne Head Peninsula SAC	0.64	SAC	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) * important orchid sites [6210], Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or Isoeto-Nanojuncetea [3130], Annual vegetation of drift lines [1210], Slender naiad ( <i>Najas flexilis</i> ) [1833], Perennial vegetation of stony banks [1220], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410], Alkaline fens [7230], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330], Petalwort ( <i>Petalophyllum ralfsii</i> ) [1395], Large shallow inlets and bays [1160], Coastal lagoons [1150], Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> ) [1349], Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110], Juniperus communis formations on heaths or calcareous grasslands [5130], Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [6510], European dry heaths [4030], Reefs [1170], Machairs * in Ireland [21A0], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> ) [6410], Embryonic shifting dunes [2110]

### 7.6.2 Habitat Descriptions

The main habitat at Derrigimlagh Bog is cutover bog (Fossitt Code PB4). There are also a number of relatively large dystrophic lakes (Fossitt Code FL1) contained within the cutover bog along with small areas of scrub (Fossitt Code WS1).

The trail network is well defined and therefore there is limited interaction between the visitor movements and the habitats. There is an opportunity for biodiversity enhancement measures to be incorporated into the management practices at this site to increase the overall natural value of the landscape.



**Figure 7.18 Habitats present at Derrigimlagh Bog**

### 7.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>12</sup> following the assessment scale was "3" which means the majority of the habitats have a widespread degree of negative impact<sup>13</sup>, but slight and capable of rapid recovery. There were 33 recorded incidents of damage to habitats occurring off the marked paths on site.

### 7.6.4 Mammals on Site

No mammals were recorded during the visit to Derrigimlagh Bog. The NBDC data shows that a large number of seals were recorded close to Derrigimlagh Bog, due to its close proximity to the west coast of Ireland. In terms of terrestrial mammals, soprano pipistrelles, badgers and otters were the most recorded species.

**Table 7.2 List of relevant mammals<sup>14</sup> that have been recorded at NBDC Hectad L64**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	1
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	1
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	2
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	2
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	5
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	5
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	4
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	2
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	1
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	2

<sup>12</sup> This value was calculated using the methods set out in Appendix II

<sup>13</sup> The majority of habitat impacts are due to sheep grazing and turf cutting, not visitor activity.

<sup>14</sup> NBDC Hectad L64 lists 11 Marine Mammals – mostly cetaceans as well as Grey Seals

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Terrestrial mammal	Red Deer	<i>Cervus elaphus</i>	1
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	1
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	19

### 7.7 Recommendations

There are opportunities present at the site to engage in long term habitat restoration to increase floral diversity and use the site as an exemplar location to showcase our cultural heritage related to turf – while also demonstrating biodiversity enhancement as we transition away from turf cutting processes.

Seasonal attention is required to wear and tear at junctions between paved and board-walked areas and also along transitions to areas of bog vegetation. Consideration should be given to localised temporary sheep exclusion from the most affected areas to allow trail recovery.

## Derrynane Beach – Interesting Finds

### HIGHLIGHTS

The site contains the ancestral home of Daniel O’Connell as well as a National Historic Park, Derrynane hosts to a wide range of mammals including badgers and Irish stoat. The surrounding area is also known to play host to natterjack toads, which are the rarest amphibian in Ireland and protected under the Habitats Directive.



Derrynane has a complex range of habitats from near ancient woodland and ornamental gardens, to freshwater and saltwater marshes, to diverse coastal grassland systems.

### KEY RECOMMENDATIONS

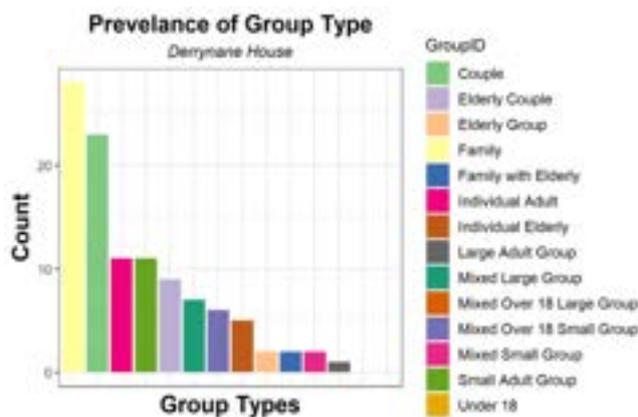
- Measures are needed to control the rabbit population which is causing dune destabilisation.
- A dynamic trail management system could be explored to help protect the leading edge of the dune from erosion.
- Dogs swimming in the natterjack toad pools was recorded as an issue for the site. Designated areas for dogs off the lead could help to control the impact while avoiding community conflict.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Majority of visitors only undertook walking on site, with only low impacts observed.
- Most common impact observed on site was trampling of vegetation.
- The OPW have strong habitat management processes and engage in an evidence-based management strategy.
- Most of the visitors to the site stayed for at least 40 minutes – given the nature of the site
- Majority of visitors to the site did not read signage that was available.

### VISITOR NUMBERS AND DWELL TIME

- 325 people visited the site over 8 hours
- Average dwell time of 40 minutes



### Highlights:

- Natterjack toad spawning area
- Lesser horseshoe bat roost
- Machaire habitat
- Long site dwell time of at least 40 minutes.
- Extremely well managed site



## 8 Derrynane Beach

### 8.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;

- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 8.2 Methods & Surveys

The following surveys were undertaken at Derrynane Beach:

### 8.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Derrynane Beach was undertaken on the 19<sup>th</sup> of June 2021, with max temperatures reaching 22.5° C, no rainfall and low levels of wind on the day<sup>15</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 8.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>15</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 8.2.3 Other Surveys

Additional sample surveys were undertaken at Derrynane Beach to identify the species presence of breeding birds, wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 8.3 Site Description of Derrynane Beach

Derrynane House was the ancestral home of one of the most historic figures in Irish history, Daniel O'Connell, located on the Iveragh peninsula, which contains the Ring of Kerry - a noted scenic route as well as the Iveragh Peninsula SAC. The beach is the centre of a stretch of coastline covering about 5km that contains a National Historic Park, a number of popular sandy beaches as well as visitor accommodation and facilities. Derrynane Beach, although a short trail, contains areas like marram dunes, machairs, a broadleaved forest and tall herb swamps.



Figure 8.1 Derrynane Beach

## Kenmare River SAC

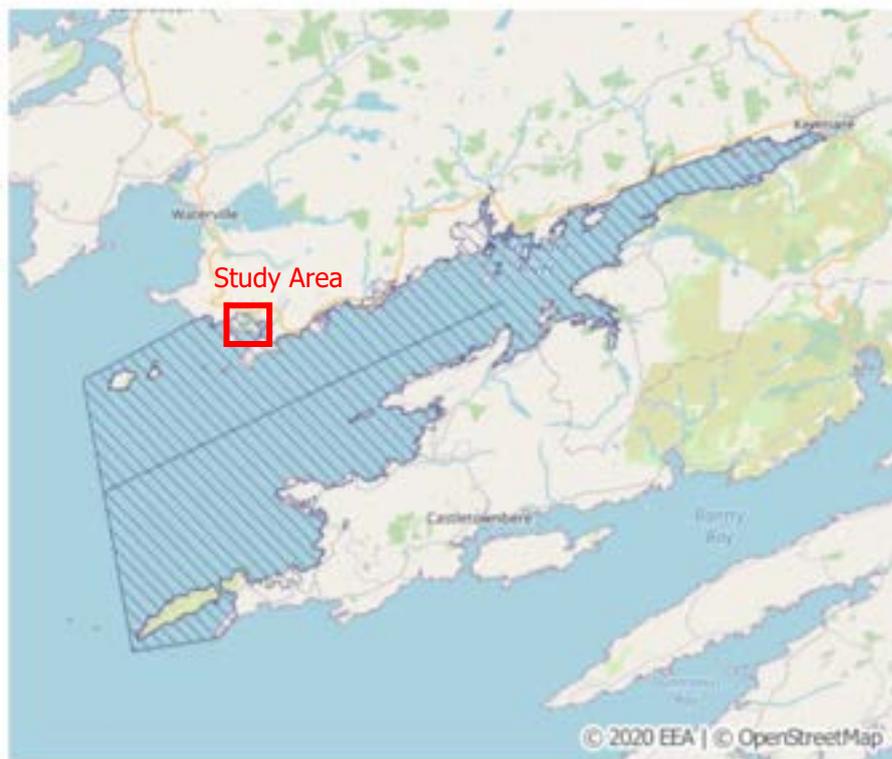


Figure 8.2 Study Area within Kenmare River SAC

## 8.4 Pathways and Features Condition Results

### 8.4.1 Pathway Condition

The paths are a mixture of hard infrastructure and soft infrastructure trails – as well as managed walkways and desire lines. The paths are all relatively consistent in width for each individual trail. Throughout the woodland and around the house the trail is hard/soft surfaced. Within the dune systems along the high traffic areas there are buried membranes to prevent substrate compaction. All paths are in high condition – but there are signs of trampling which are seen to be from horse riding. Along the inner bay edge (west of the site) there is signs of trampling and erosion from visitor movements along the ridge where the high density of movements is causing dune destabilisation.



**Figure 8.3 Pathways identified at Derrynane Beach**

### 8.4.2 Features Condition

The site contains not only Derrynane Beach itself, but there are also numerous signs which relate to the history, heritage, ecology and wildlife of the area. Derrynane Beach also contains trail maps which show the designated trails throughout the area.



**Figure 8.4 Features recorded at Derrynane Beach**



**Figure 8.5 Features at Derrynane Beach**

### 8.4.3 Hazards

No hazards of significance were recorded on site.

### 8.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 325 visitors (which represent 107 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 40 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Cycling
Exploring off trail
Horse-riding
Dog walking (on lead)
Hurling
Surfing
Swimming

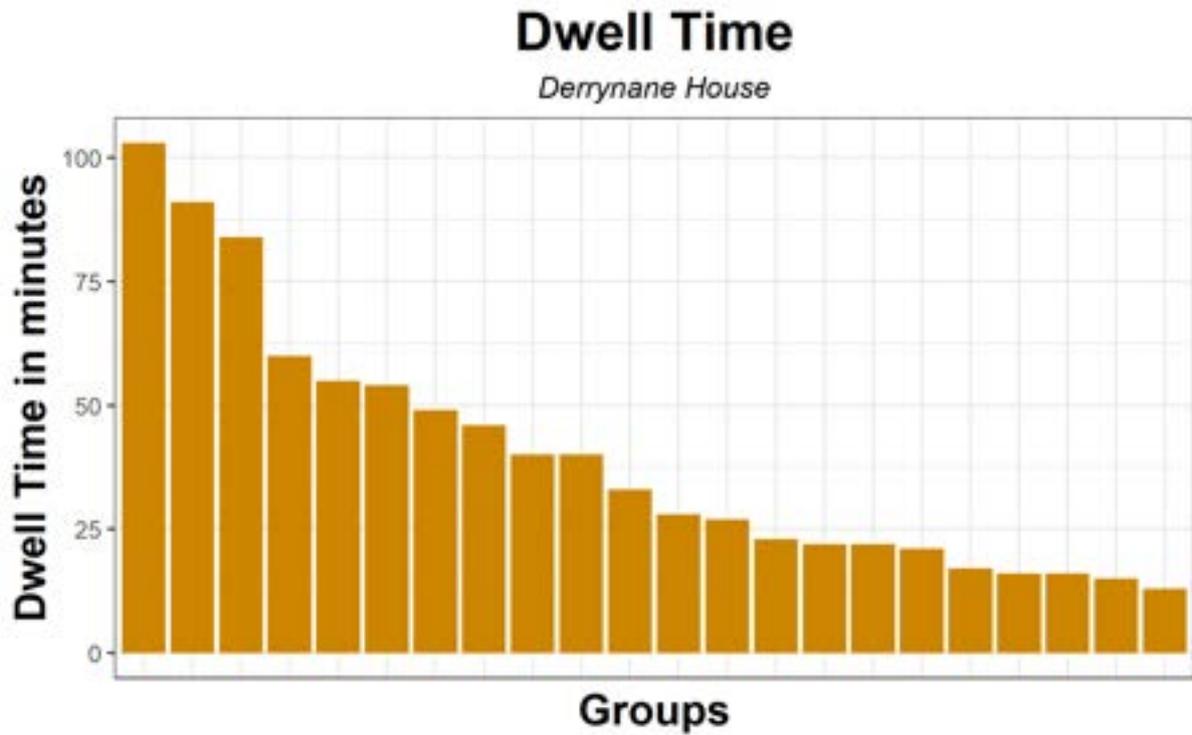
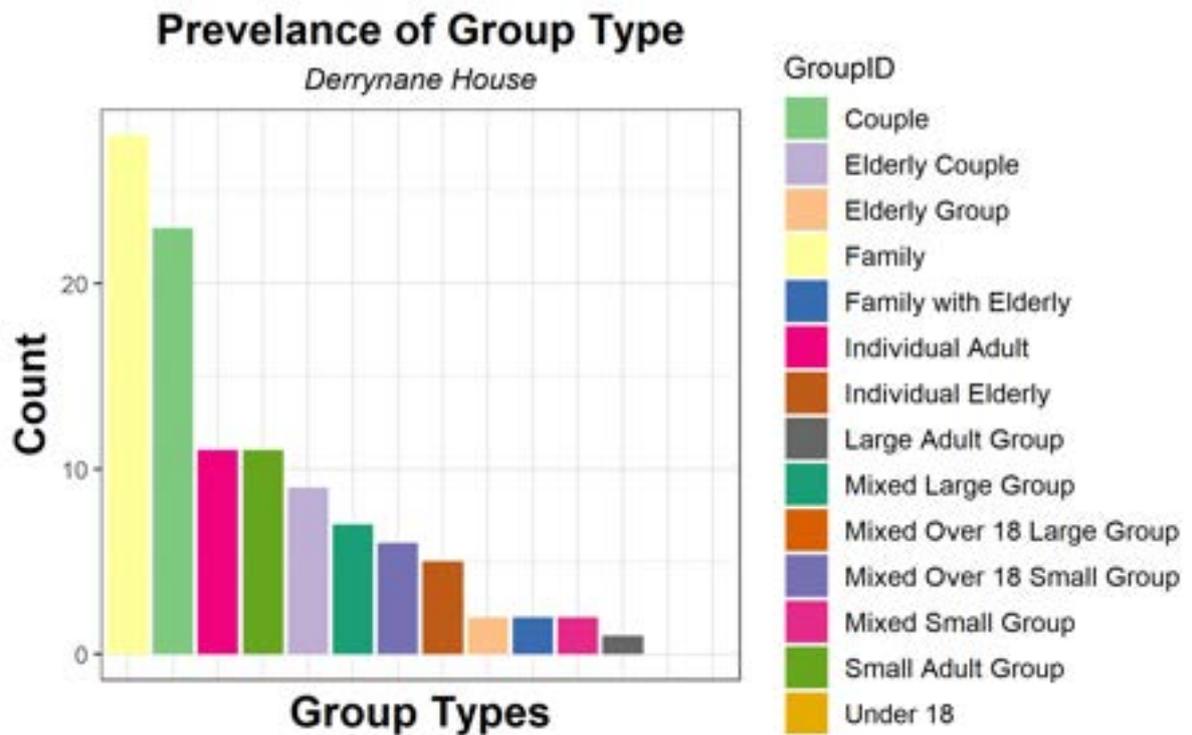
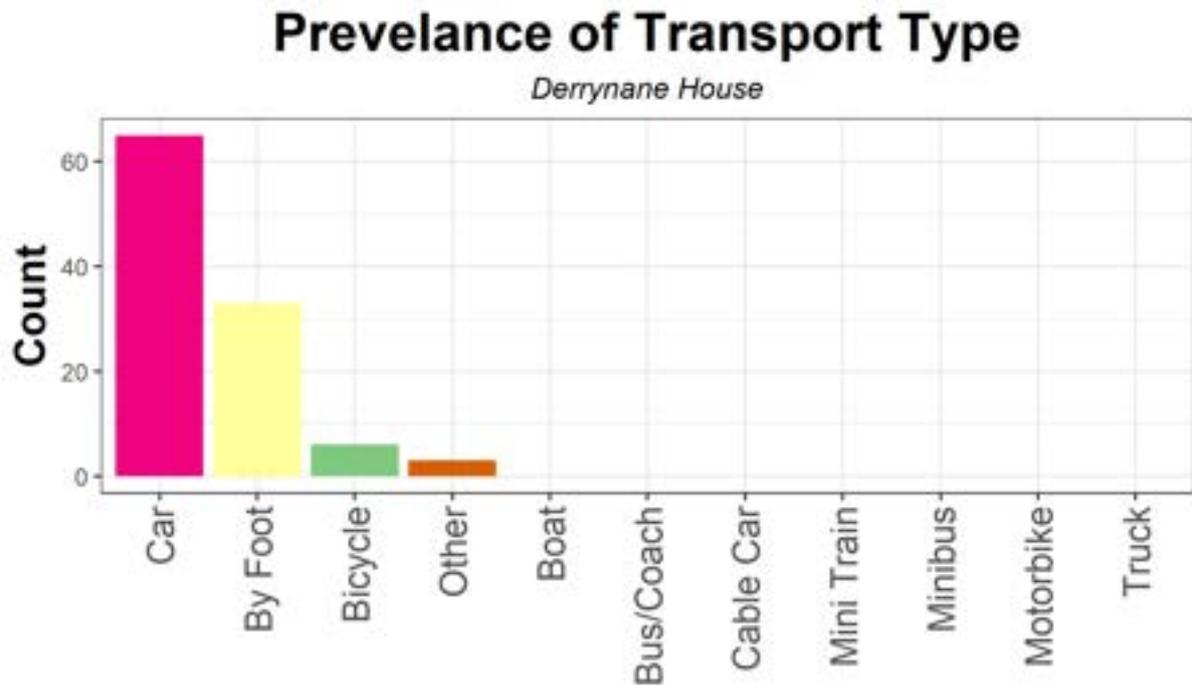


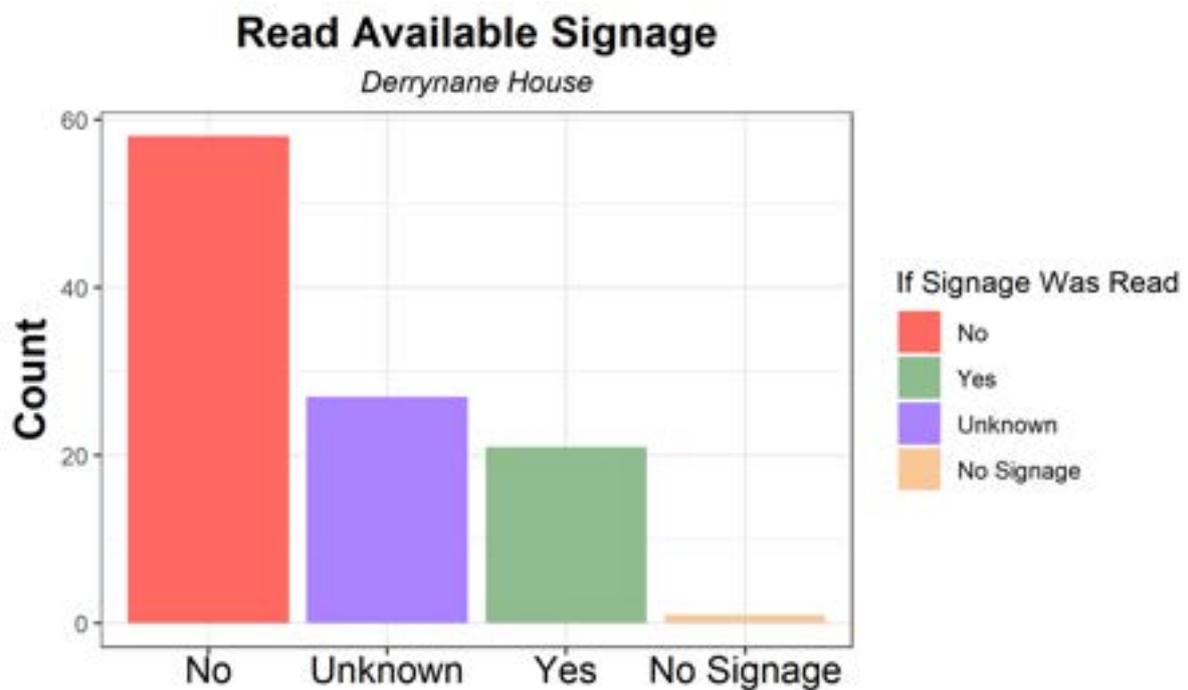
Figure 8.6 Duration of Time Spent at Derrynane Beach



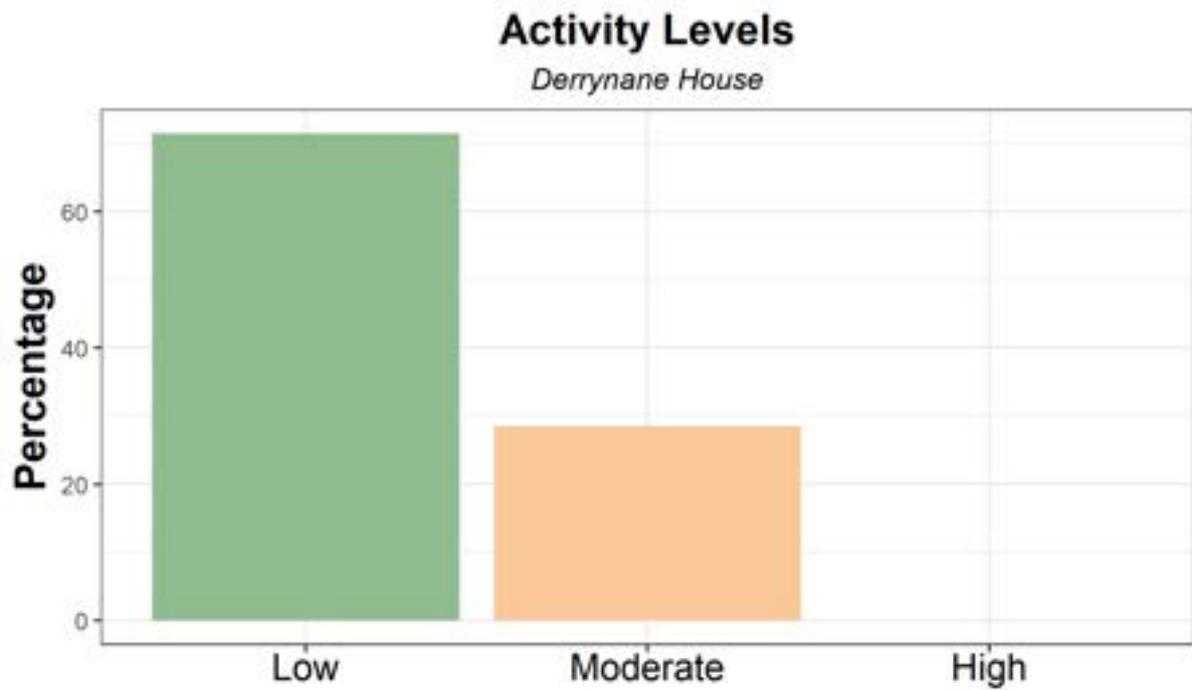
**Figure 8.7 Groups of visitors that visited Derrynane Beach**



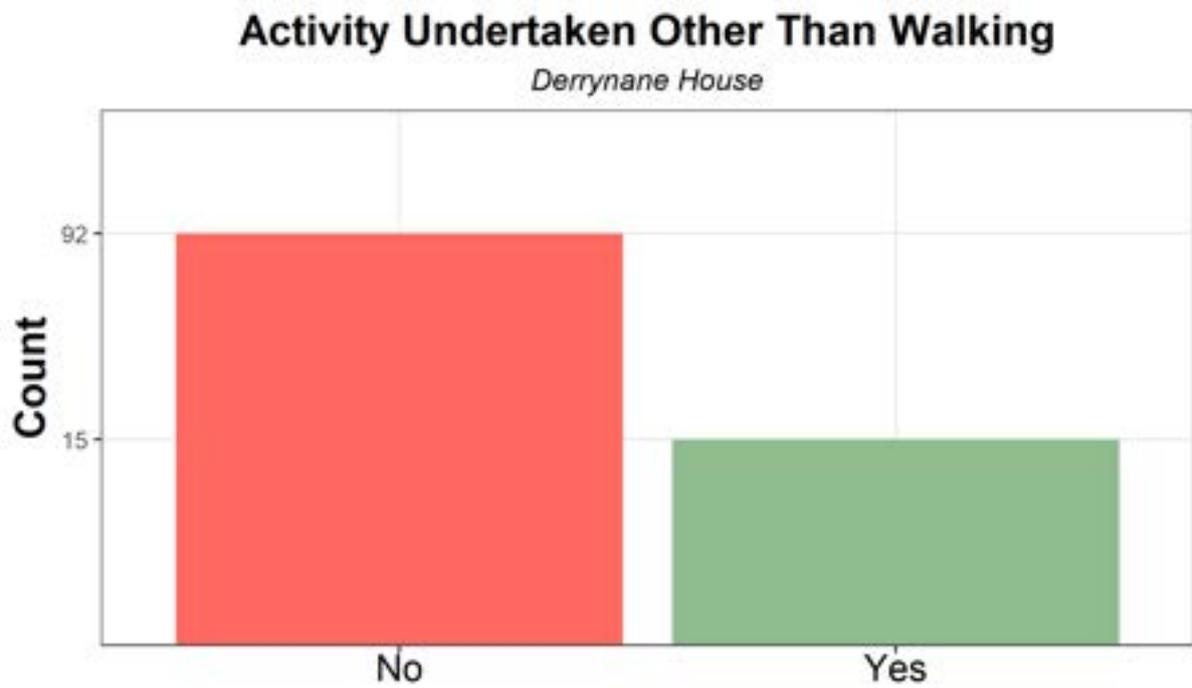
**Figure 8.8 Mode of transport used to visit Derrynane Beach**



**Figure 8.9 Use of Interpretive Material at Derrynane Beach**



**Figure 8.10 Categories of Activity Levels Observed at Derrynane Beach**



**Figure 8.11 Activities undertaken other than walking**

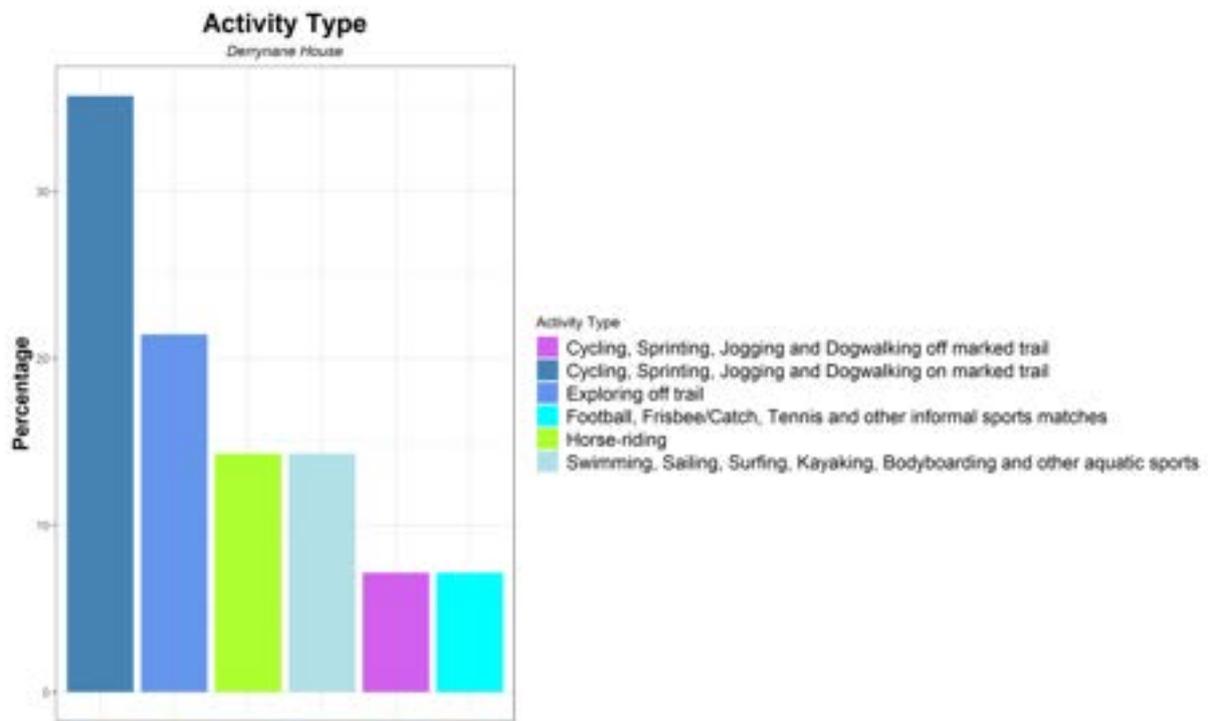


Figure 8.12 Range of Visitor Activities Observed at Derrynane Beach

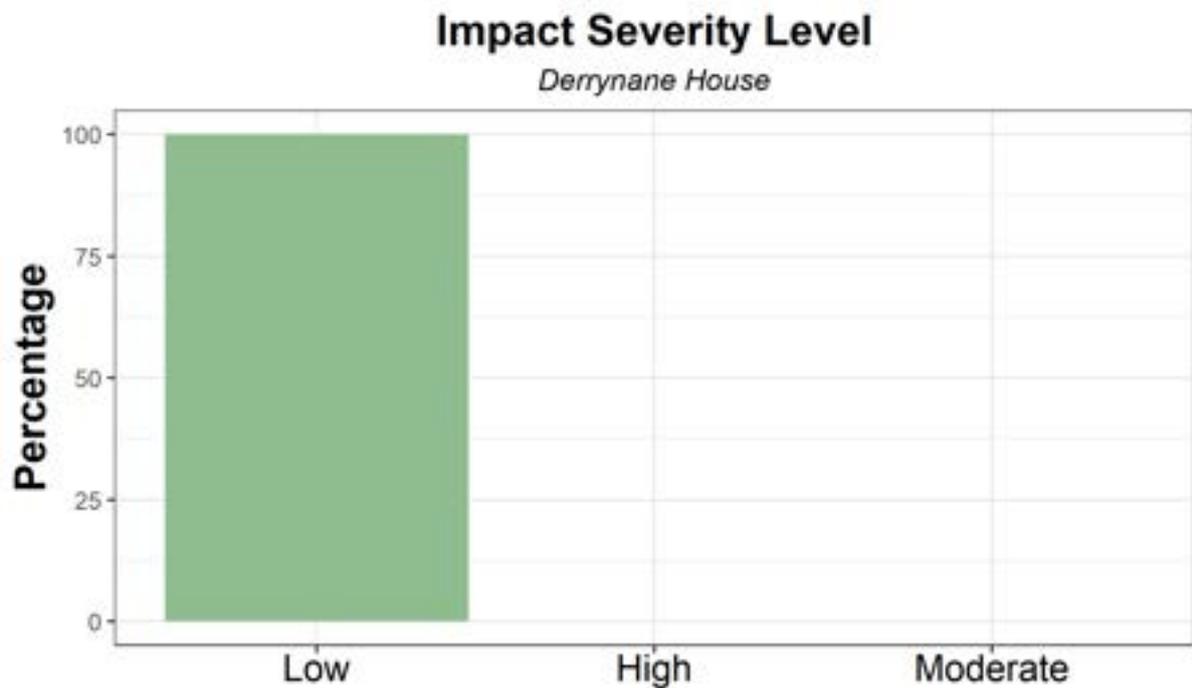


Figure 8.13 Categories of Environmental Impact Levels Observed at Derrynane Beach as a result of Visitor Activities

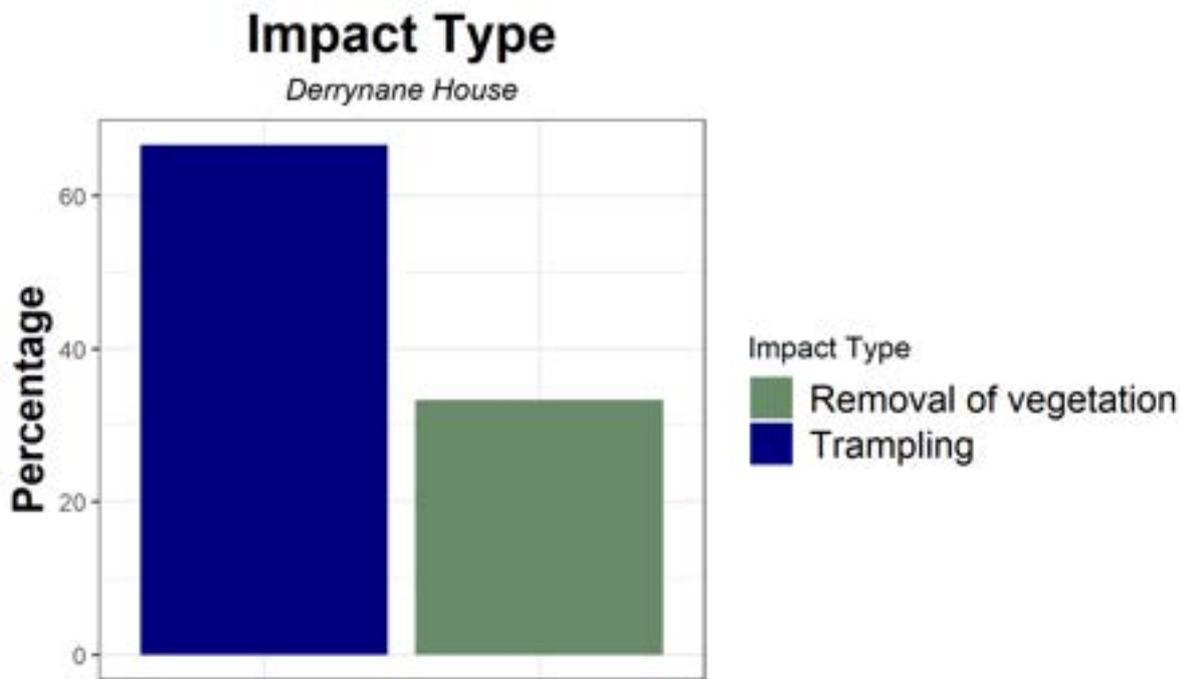


Figure 8.14 Range of Environmental Impacts Observed at Derrynane Beach

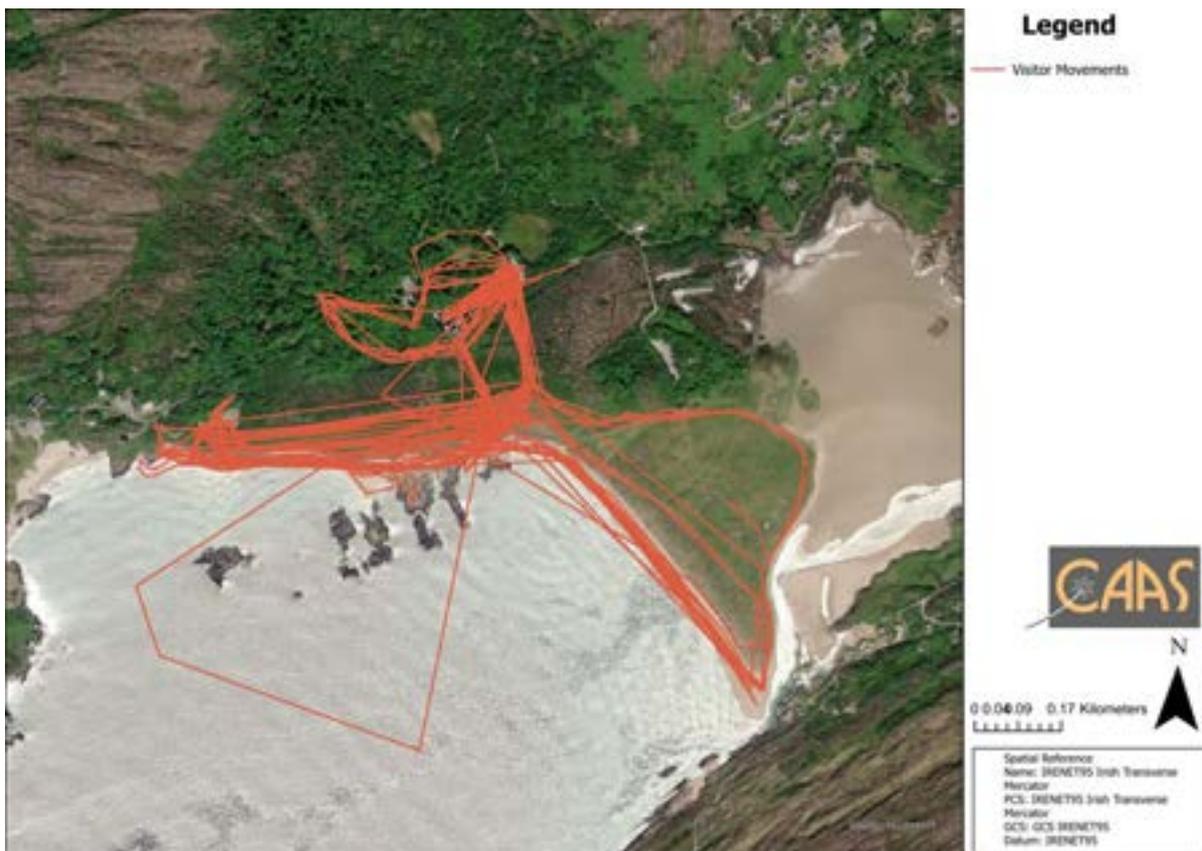


Figure 8.15 Visitor movement patterns at Derrynane Beach

Of the 107 groups recorded on site 14% of them undertook activities other than walking. These activities (identified above) resulted in 3 impacts being observed on site during the survey. Thus, 21% of activities on site resulted in impacts on the environment. The impact severity levels varied with 100% of the impacts being low, 0% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Removal of vegetation	1
Trampling	2

## 8.6 Ecological Monitoring Results

### 8.6.1 Ecological Constraints

Species within Derrynane are sensitive to pollution, disturbance effects, invasive species and habitat availability and the habitats are sensitive to hydrological changes, pollution, land use management changes and drainage.

**Table 8.1 Designated sites within 2km of Derrynane Beach and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001346]	Darrynane Bay Islands And Marsh, Lamb's Head pNHA	0.00	pNHA	
[004154]	Iveragh Peninsula SPA	0.11	SPA	Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Peregrine falcon ( <i>Falco peregrinus</i> ) [A103], Guillemot ( <i>Uria aalge</i> ) [A199], Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346], Fulmar ( <i>Fulmarus glacialis</i> ) [A009]
[000365]	Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment pNHA	0.91	pNHA	
[000365]	Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	0.91	SAC	Alpine and Boreal heaths [4060], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caeruleae</i> ) [6410], Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0], Otter ( <i>Lutra lutra</i> ) [1355], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation [3260], Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130], Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoetes-Nanojuncetea</i> [3130], Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110], European dry heaths [4030], <i>Taxus baccata</i> woods of the British Isles [91J0], River lamprey ( <i>Lampetra fluviatilis</i> ) [1099], Kerry Slug ( <i>Geomalacus maculosus</i> ) [1024], Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> ) [1303], Marsh Fritillary ( <i>Euphydryas aurinia</i> ) [1065], Atlantic salmon ( <i>Salmo salar</i> ) [1106], Slender naiad ( <i>Najas flexilis</i> ) [1833], Brook Lamprey ( <i>Lampetra planeri</i> ) [1096], Sea Lamprey ( <i>Petromyzon marinus</i> ) [1095], Freshwater Pearl Mussel ( <i>Margaritifera margaritifera</i> ) [1029], Slender Naiad ( <i>Najas flexilis</i> ) [1833], Killarney Shad ( <i>Alosa fallax killarnensis</i> ) [5046], Killarney fern ( <i>Trichomanes speciosum</i> ) [1421], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicis albae</i> ) [91E0], Depressions on peat substrates of the <i>Rhynchosporion</i> [7150], Blanket bogs * if active bog [7130], <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]

### 8.6.2 Habitat Descriptions

Derrynane Beach has a complex of habitats ranging from ornamental gardens and mixed broadleaved

woodlands to complex dune systems including machaire habitats and fixed dunes. The machaire is particularly diverse with an average species richness of 16 species per square meter. There are ponds on site which host natterjack toads as well as freshwater marsh habitats. To the west of the site there are also Atlantic salt meadow and mud flat habitats.

The movement patterns of visitors are well managed for the most part. However, along the western edge of the site there are signs of trampling causing dune destabilisation and erosion along the ridge.



**Figure 8.16 Habitats present at Derrynane Beach**

### 8.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>16</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 14 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be rabbit overpopulation causing dune destabilisation and local outdoor fitness classes.

### 8.6.4 Breeding Bird Survey

The birds recorded at Derrynane Beach encompass a good mix between waders and passerines due to both its coastal and woodland habitats. The most common bird recorded was the shag, with also a number of birds such as wrens, hooded crows and meadow pipits being recorded. A relatively large number of choughs were also recorded.

**Table 8.2 Results of the breeding bird survey conducted at Derrynane Beach**

Common Name	Scientific Name	List Status	Seen	Heard	Both	Number Recorded
Arctic Tern	<i>Sterna paradisaea</i>	Amber		heard		2
Blackcap	<i>Sylvia atricapilla</i>	Green		heard		4
Black Guillemot	<i>Cephus grylle</i>	Amber		heard		3

<sup>16</sup> This value was calculated using the methods set out in Appendix II

Common Name	Scientific Name	List Status	Seen	Heard	Both	Number Recorded
Black-headed Gull	<i>Larus ridibundus</i>	Amber		heard		3
Blue Tit	<i>Cyanistes caeruleus</i>	Green		heard		1
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green		heard		1
Chaffinch	<i>Fringilla coelebs</i>	Green	seen			4
Chiffchaff	<i>Phylloscopus collybita</i>	Green		heard		1
Chough	<i>Pyrrhocorax pyrrhocorax</i>	Amber		heard		8
Common Gull	<i>Larus canus</i>	Amber		heard		5
Cormorant	<i>Phalacrocorax carbo</i>	Amber		heard		2
Goldcrest	<i>Regulus regulus</i>	Amber		heard		1
Great Black-backed Gull	<i>Larus marinus</i>	Green		heard		2
Grey Heron	<i>Ardea cinerea</i>	Green		heard		2
Herring Gull	<i>Larus argentatus</i>	Amber		heard		4
Hooded Crow	<i>Corvus cornix</i>	Green		heard		13
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber		heard		1
Linnet	<i>Linaria cannabina</i>	Amber		heard		1
Mallard	<i>Anas platyrhynchos</i>	Amber		heard		1
Meadow Pipit	<i>Anthus pratensis</i>	Red		heard		10
Mistle Thrush	<i>Turdus viscivorus</i>	Green		heard		2
Oystercatcher	<i>Haematopus ostralegus</i>	Red		heard		2
Robin	<i>Erithacus rubecula</i>	Green		heard		1
Sand Martin	<i>Riparia riparia</i>	Amber		heard		10
Sandwich Tern	<i>Thalasseus sandvicensis</i>	Amber		heard		3
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	Green		heard		1
Shag	<i>Phalacrocorax aristotelis</i>	Amber		heard		21
Skylark	<i>Alauda arvensis</i>	Amber		heard		4
Song Thrush	<i>Turdus philomelos</i>	Green		heard		1
Stonechat	<i>Saxicola torquatus</i>	Green		heard		1
Wheatear	<i>Oenanthe oenanthe</i>	Amber		heard		1
Willow Warbler	<i>Phyllocopus trochilus</i>	Amber		heard		1
Woodpigeon	<i>Columba palumbus</i>	Green		heard		4
Wren	<i>Troglodytes troglodytes</i>	Green		heard		6

### 8.6.5 Mammals on Site

Mammals recorded on site included Irish stoat, wood mouse, hedgehog and bank vole. Bank vole is an invasive species. There is an extensive and problematic population of rabbits present on site causing dune destabilizing. Otter signs were recorded but none were seen. Derrynane Beach, however the NBDC data shows a mixture of both marine and terrestrial mammals due to its location on the coast. Seals and dolphins were the most common marine mammals spotted while badgers, otters, rabbits, hares and hedgehogs were found to be abundant in the NBDC data.

**Table 8.3 List of mammals recorded at Derrynane Beach**

Common name	Scientific name
European Otter	<i>Lutra lutra</i>
European Rabbit	<i>Oryctolagus cuniculus</i>
Bank Vole	<i>Myodes glareolus</i>
Irish Stoat	<i>Mustela erminea subsp. hibernica</i>
West European Hedgehog	<i>Erinaceus europaeus</i>
Wood Mouse	<i>Apodemus sylvaticus</i>

**Table 8.4 List of mammals that have been recorded at NBDC Hectads V55 & V56**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Atlantic White-sided Dolphin	<i>Lagenorhynchus acutus</i>	1
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	4
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	19

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	11
Marine mammal	Common Seal	<i>Phoca vitulina</i>	23
Marine mammal	Fin Whale	<i>Balaenoptera physalus</i>	1
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	3
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	1
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	2
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	6
Marine mammal	Phocidae	<i>Phocidae</i>	2
Marine mammal	Pinnipedia	<i>Pinnipedia</i>	1
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	1
Marine mammal	Sei Whale	<i>Balaenoptera borealis</i>	1
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	2
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	1
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	5
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	47
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	5
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	13
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	21
Terrestrial mammal	Feral Goat	<i>Capra hircus</i>	1
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	67
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	4
Terrestrial mammal	Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	4
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	1
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	2
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	4
terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Red Deer	<i>Cervus elaphus</i>	3
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	5
Terrestrial mammal	Sika Deer	<i>Cervus nippon</i>	5
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	2
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	24
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	2

### 8.6.6 Wintering Bird Survey

Species observations on site in winter included Great Northern Diver, Common Teal, Common Sandpiper and Eurasian Curlew. The mudflats to the west of the site were identified to be a site of high importance for winter waders for foraging.

**Table 8.5 Results of the wintering bird survey conducted at Derrynane Beach**

Common name	Scientific name	Record count
Great Northern Diver	<i>Gavia immer</i>	1
Common Teal	<i>Anas crecca</i>	5
Common Sandpiper	<i>Actitis hypoleucos</i>	9
Eurasian Curlew	<i>Numenius arquata</i>	7

**Table 8.6 List of wintering birds that have been recorded at NBDC Hectads V55 & V56**

Taxonomic group	Common name	Scientific name	Record count
Bird	Alcidae	<i>Alcidae</i>	1
Bird	Arctic Tern	<i>Sterna paradisaea</i>	5
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	2
Bird	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	1
Bird	Black-headed Gull	<i>Larus ridibundus</i>	18
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	5
Bird	Black-tailed Godwit	<i>Limosa limosa</i>	1
Bird	Black Guillemot	<i>Cephus grylle</i>	10
Bird	Bonaparte's Gull	<i>Larus philadelphia</i>	2

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Cattle Egret	<i>Bubulcus ibis</i>	4
Bird	Common Coot	<i>Fulica atra</i>	4
Bird	Common Crane	<i>Grus grus</i>	1
Bird	Common Cuckoo	<i>Cuculus canorus</i>	17
Bird	Common Greenshank	<i>Tringa nebularia</i>	6
Bird	Common Guillemot	<i>Uria aalge</i>	22
Bird	Common Kingfisher	<i>Alcedo atthis</i>	7
Bird	Common Moorhen	<i>Gallinula chloropus</i>	5
Bird	Common Pochard	<i>Aythya ferina</i>	3
Bird	Common Redshank	<i>Tringa totanus</i>	9
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	4
Bird	Common Scoter	<i>Melanitta nigra</i>	2
Bird	Common Shelduck	<i>Tadorna tadorna</i>	1
Bird	Common Snipe	<i>Gallinago gallinago</i>	16
Bird	Common Tern	<i>Sterna hirundo</i>	5
Bird	Dunlin	<i>Calidris alpina</i>	3
Bird	Eurasian Curlew	<i>Numenius arquata</i>	35
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	22
Bird	Eurasian Spoonbill	<i>Platalea leucorodia</i>	1
Bird	Eurasian Teal	<i>Anas crecca</i>	1
Bird	Eurasian Wigeon	<i>Anas penelope</i>	7
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	9
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	17
Bird	Gadwall	<i>Anas strepera</i>	1
Bird	Great Bittern	<i>Botaurus stellaris</i>	2
Bird	Great Black-backed Gull	<i>Larus marinus</i>	21
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	21
Bird	Great Crested Grebe	<i>Podiceps cristatus</i>	1
Bird	Great Northern Diver	<i>Gavia immer</i>	14
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	1
Bird	Green Sandpiper	<i>Tringa ochropus</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	32
Bird	Grey Plover	<i>Pluvialis squatarola</i>	1
Bird	Greylag Goose	<i>Anser anser</i>	1
Bird	Herring Gull	<i>Larus argentatus</i>	26
Bird	Kumlien's Iceland Gull	<i>Larus glaucooides subsp. kumlieni</i>	1
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	15
Bird	Little Egret	<i>Egretta garzetta</i>	9
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	5
Bird	Mallard	<i>Anas platyrhynchos</i>	25
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	12
Bird	Mew Gull	<i>Larus canus</i>	16
Bird	Mute Swan	<i>Cygnus olor</i>	11
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	3
Bird	Northern Gannet	<i>Morus bassanus</i>	29
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	6
Bird	Purple Sandpiper	<i>Calidris maritima</i>	1
Bird	Razorbill	<i>Alca torda</i>	5
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	9
Bird	Red-throated Diver	<i>Gavia stellata</i>	5
Bird	Red Knot	<i>Calidris canutus</i>	1
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	11
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	5
Bird	Sand Martin	<i>Riparia riparia</i>	6
Bird	Sanderling	<i>Calidris alba</i>	3
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	1
Bird	Squacco Heron	<i>Ardeola ralloides</i>	1
Bird	Surf Scoter	<i>Melanitta perspicillata</i>	15

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Tufted Duck	<i>Aythya fuligula</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	5
Bird	Whimbrel	<i>Numenius phaeopus</i>	2
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	5
Bird	Whooper Swan	<i>Cygnus cygnus</i>	2

### 8.7 Recommendations

The site is well managed with strong management practices focusing specifically on biodiversity. The site has engaging nature signage and regularly hosts community events which focus on nature exploration and education.

- Measures are needed to control the rabbit population which is causing dune destabilisation.
- A dynamic trail management system could be explored to help protect the leading edge of the dune from erosion.
- Dogs swimming in the natterjack toad pools was recorded as an issue for the site. Designated areas for dogs off the lead could help to control the impact while avoiding community conflict.

## Doonloughan – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

The site is mainly made up of machair, which is an important habitat and protected under the EU Habitats Directive. These only occur in western coastal areas of Ireland and Scotland.



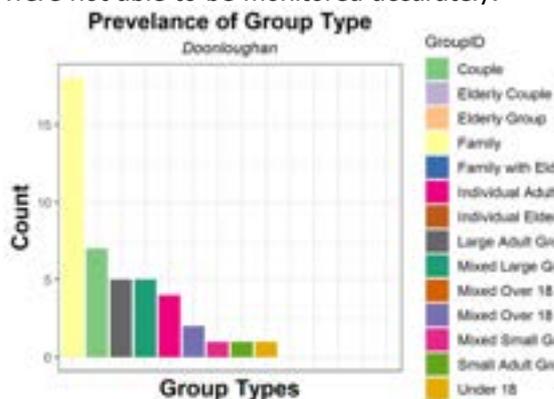
The Machaire present of site is extremely degraded and in need of direct intervention.

### KEY RECOMMENDATIONS

- On-site signage to raise awareness on the rarity and importance of the habitats found on site should be installed. A community awareness campaign should be run to promote environmental stewardship
- A visitor management strategy and associated trail network plan is required to alleviate pressures to the protected features by active management of vehicular access across the protected habitat.
- A habitat management plan is required to rehabilitate the dunes and protect the integrity of the machaire. A focus should be placed on increasing the floral diversity within the machaire.

### VISITOR NUMBERS AND DWELL TIME

- 202 people visited the site over 8 hours
- Due to the disperse nature of the site, the arrival and departure times of the groups were not able to be monitored accurately.



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site are not well controlled with high levels of severe impacts being caused by visitors.
- Majority of visitors undertook activities that that did not relate to walking.
- No signage available for visitors.
- Damage is occurring to the site and protected habitats within due to vehicular movement and visitor interactions.

### Highlights:

- Severe erosion and trail lines caused by human activity.
- Visitor control measures are needed.
- No signage on site related to wildlife and habitats at site.



## 9 Doonloughan

### 9.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 9.2 Methods & Surveys

The following surveys were undertaken at Doonloughan:

### 9.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Doonloughan was undertaken on the 18<sup>th</sup> of July 2021, with max temperatures reaching approximately 22.1° C, no rainfall and low levels of wind on the day<sup>17</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 9.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>17</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 9.2.3 Other Surveys

Additional sample surveys were undertaken at Doonloughan to identify the species presence of wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 9.3 Site Description of Doonloughan

Doonloughan is an isolated beach (Figure 7.1) in Mannin, western Galway that is used by many for both swimming and surfing. The area is completely within the Slyne Head Peninsula SAC and bordered by Slyne Head Islands SAC and contains habitats like machairs and rocky sea cliffs.



**Figure 9.1 Doonloughan beach**

## Slyne Head Peninsula SAC



Figure 9.2 Study Area within Slyne Head Peninsula SAC

### 9.4 Pathways and Features Condition Results

#### 9.4.1 Pathway Condition



Figure 9.3 Pathways identified at Doonloughan

The paths at Doonloughan consist of mostly sand beach and rock outcrop that are highly variable in terms of width. There are a large number of breakout paths at Doonloughan which have been caused by use of vehicles (Figure 9.4) and are generally the same width. There is a severe degree of compaction in these breakout paths, where sand has been exposed with high levels of erosion.



**Figure 9.4 Pathway at Doonloughan**

#### **9.4.2 Features Condition**

No features or signage were identified during the feature and signage mapping at Doonloughan.

#### **9.4.3 Hazards**

No significant hazards were recorded during hazard mapping at Doonloughan.

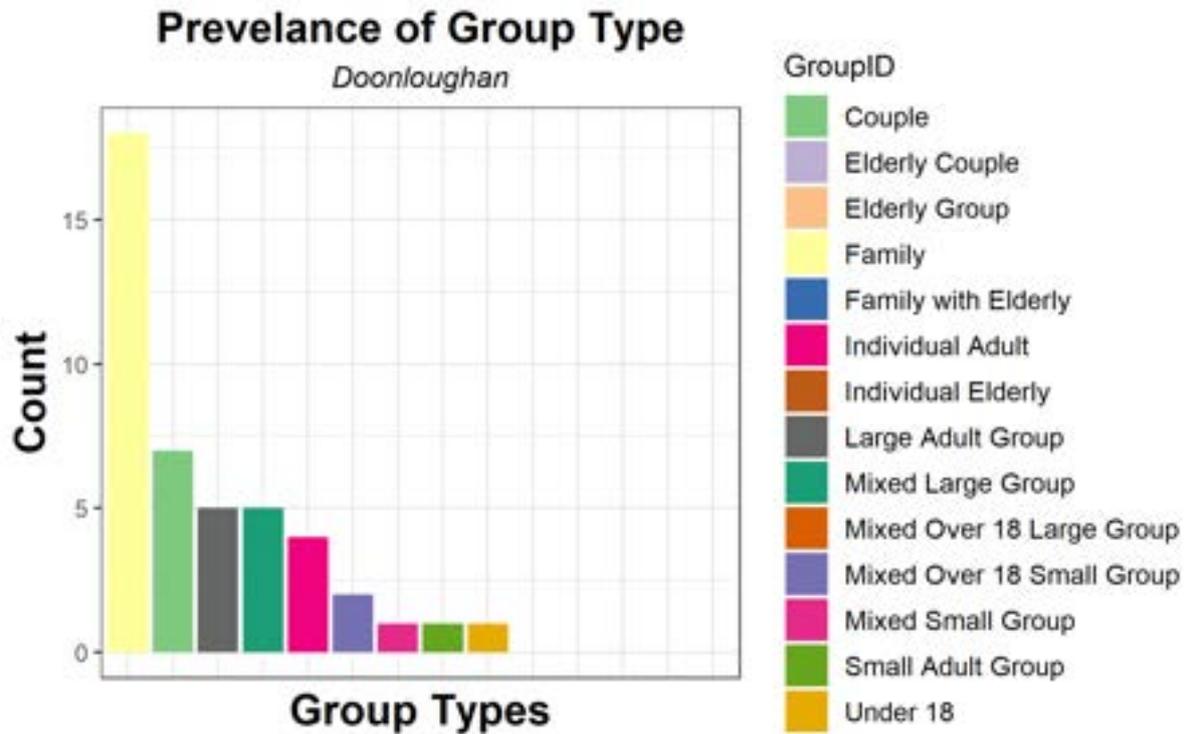
#### **9.5 Visitor Characterisation Survey**

The visitor monitoring surveys resulted in a total of 202 visitors (which represent 44 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site is unavailable<sup>18</sup>; however, the following activities were undertaken during the survey (listed in order of occurrence rate):

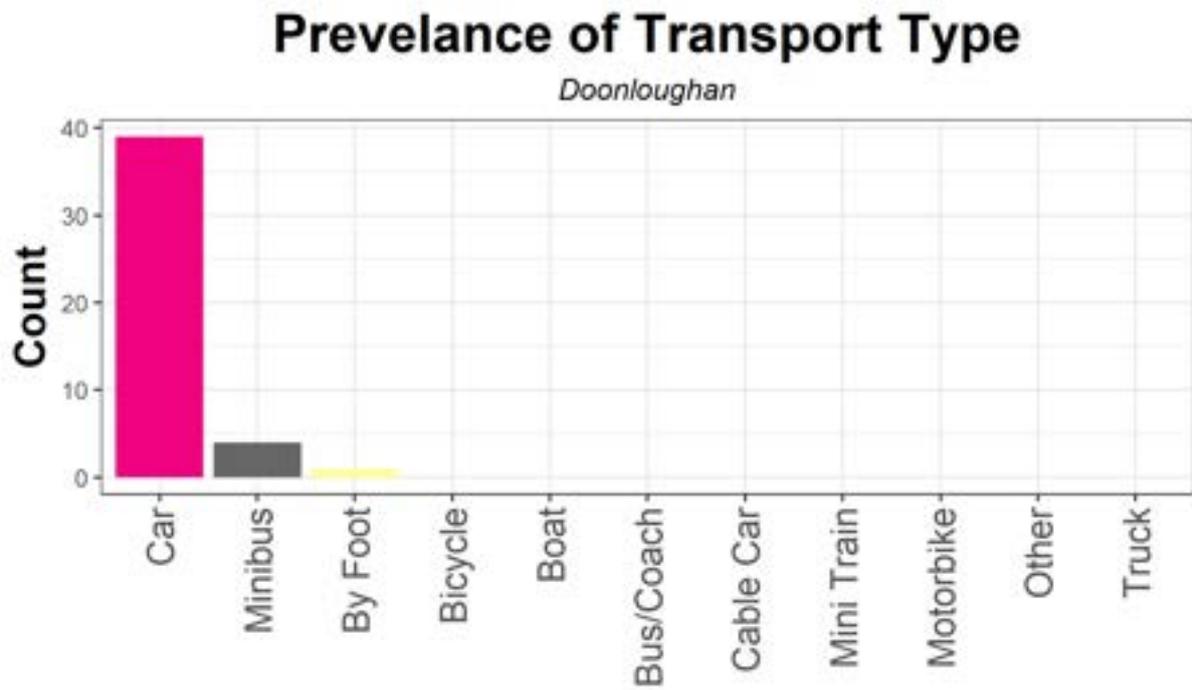
<b>Activity Type</b>
Camping
Off road driving
Lighting Campfire
BBQing
Picnicking
Dog walking (off lead)
Swimming
Littering

<sup>18</sup> Due to the disperse nature of the site, the arrival and departure times at Doonloughan is unavailable.

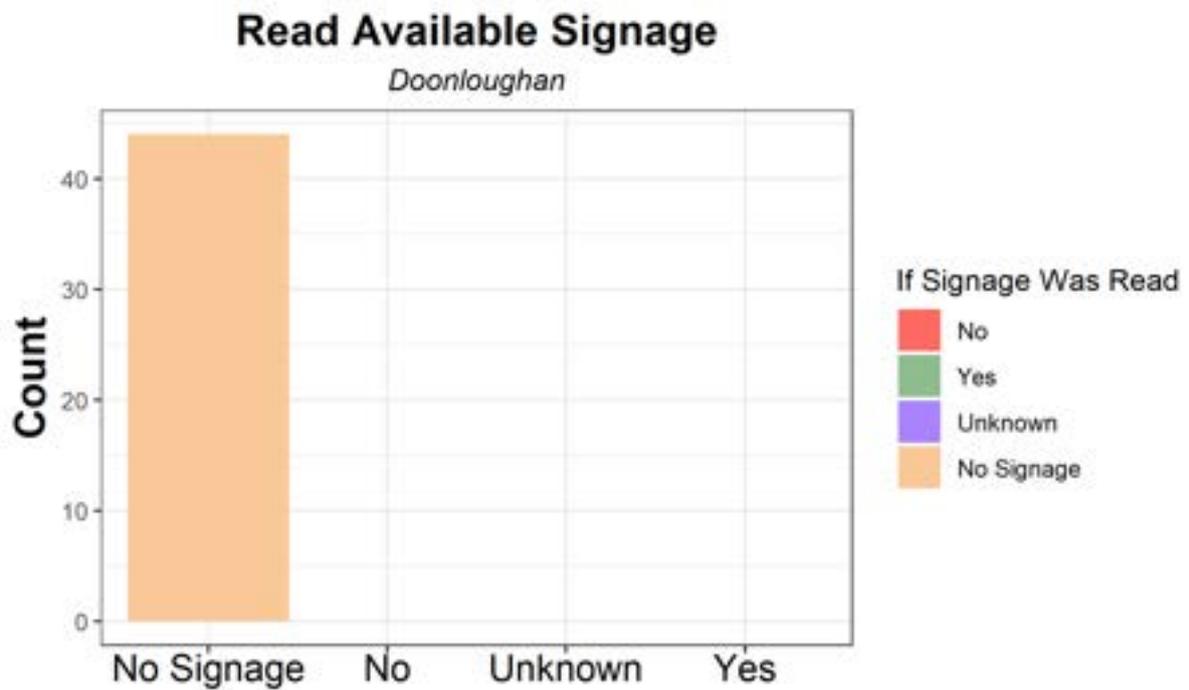
Activity Type
Sports Match (informal)
Fishing
Frisbee/ Catch
Playing Music
Reading
Sitting
Surfing



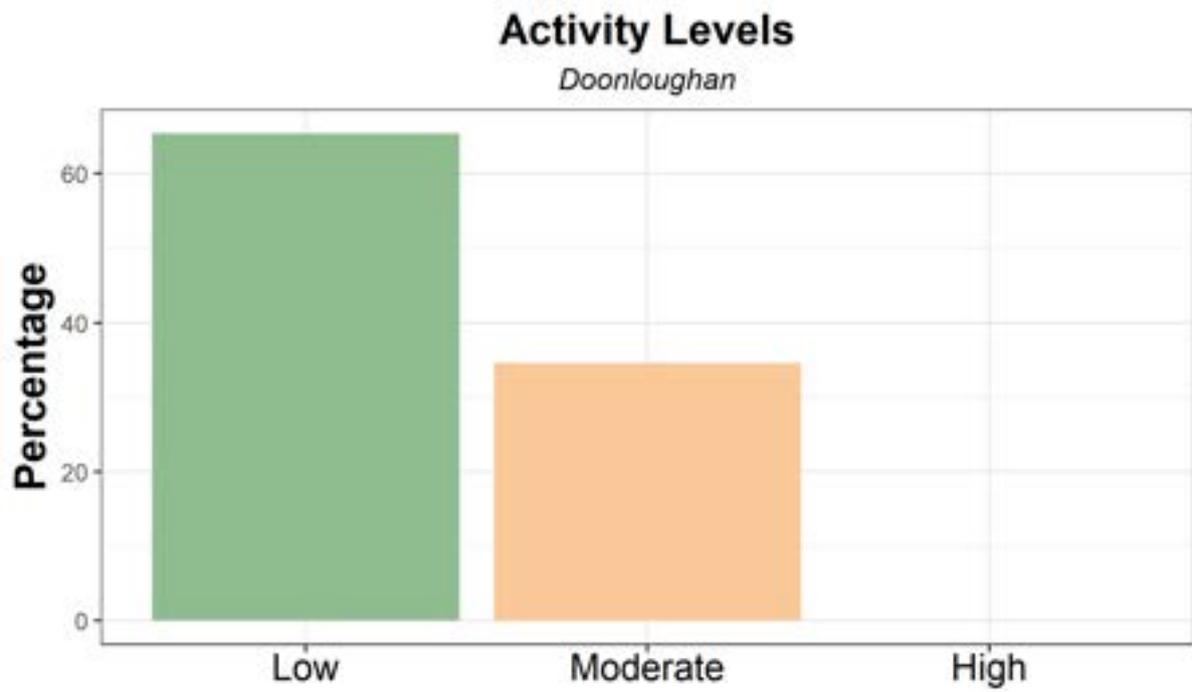
**Figure 9.5 Groups of visitors that visited Doonloughan**



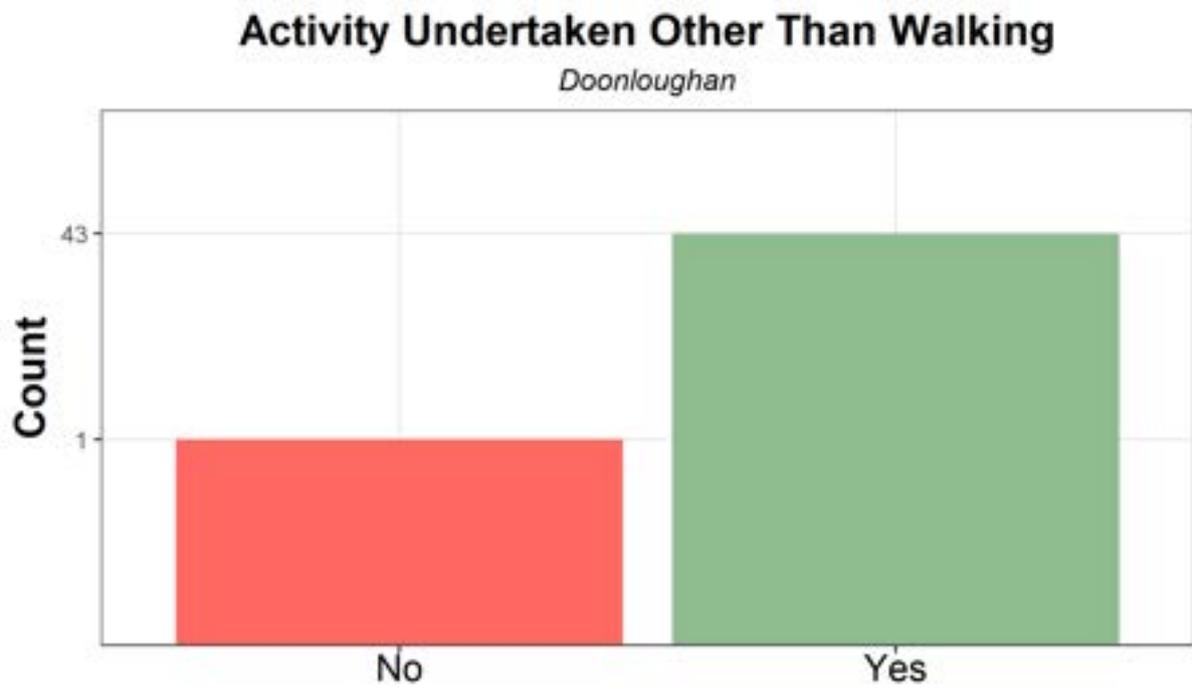
**Figure 9.6 Mode of transport used to visit Doonloughan**



**Figure 9.7 Use of Interpretive Material at Doonloughan**



**Figure 9.8 Categories of Activity Levels Observed at Doonloughan**



**Figure 9.9 Activities undertaken other than walking**

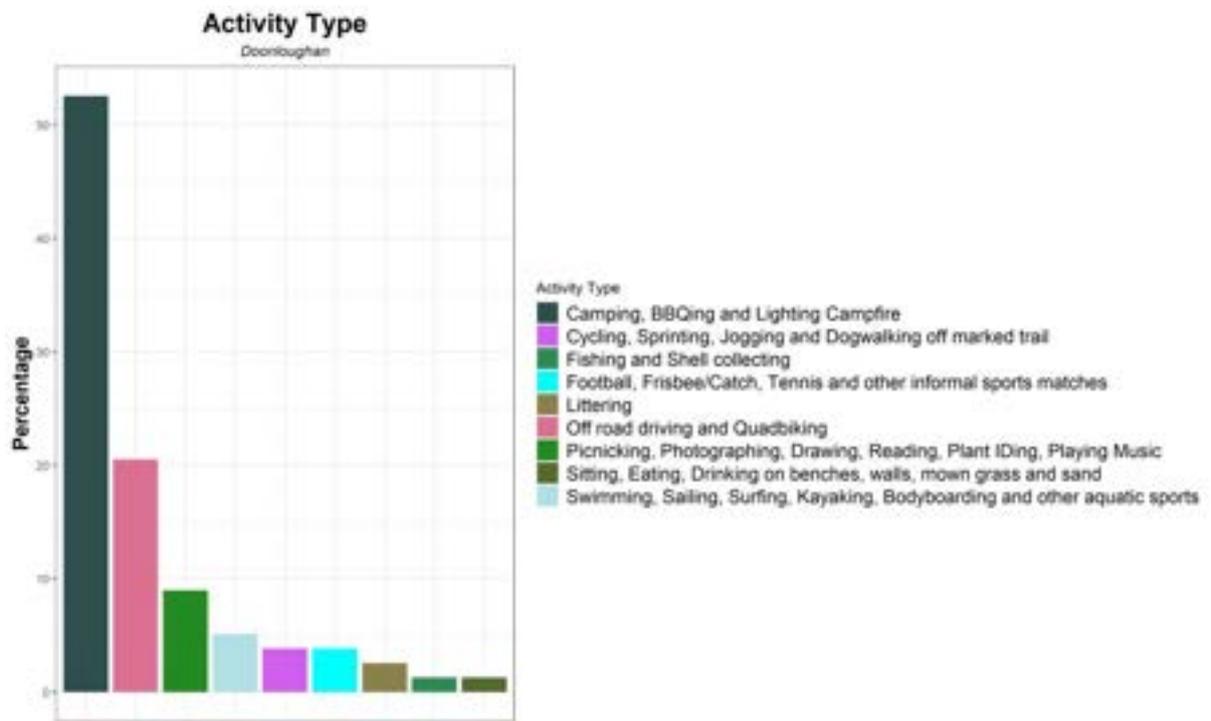


Figure 9.10 Range of Visitor Activities Observed at Doonloughan

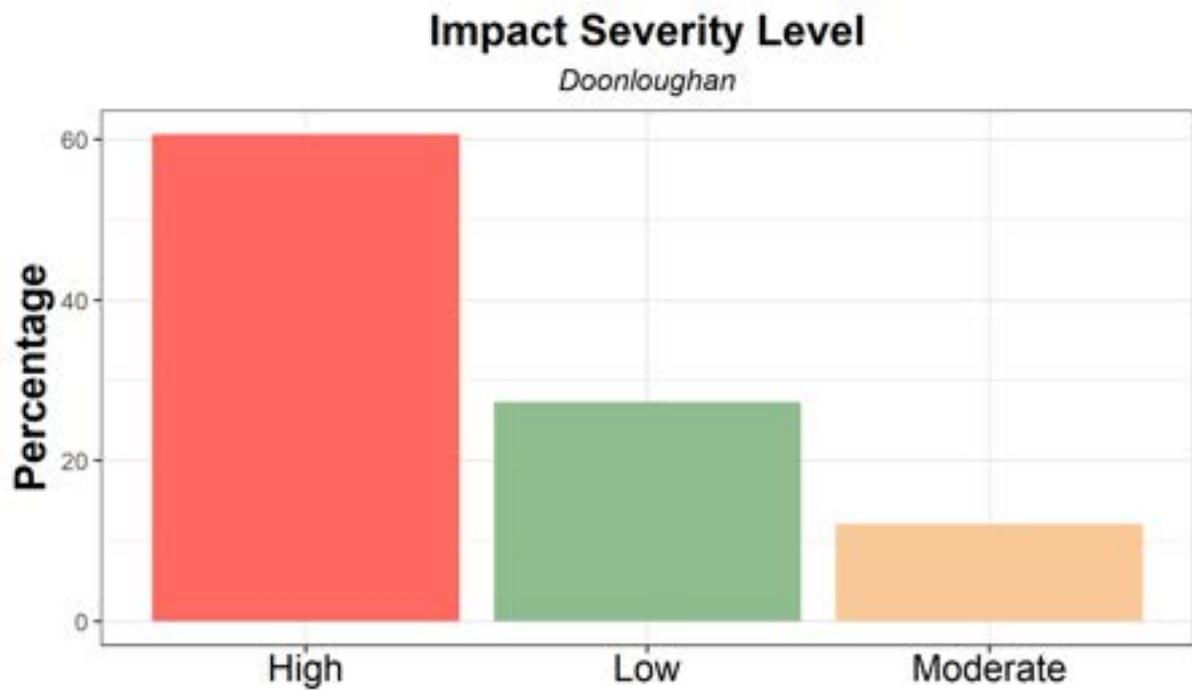
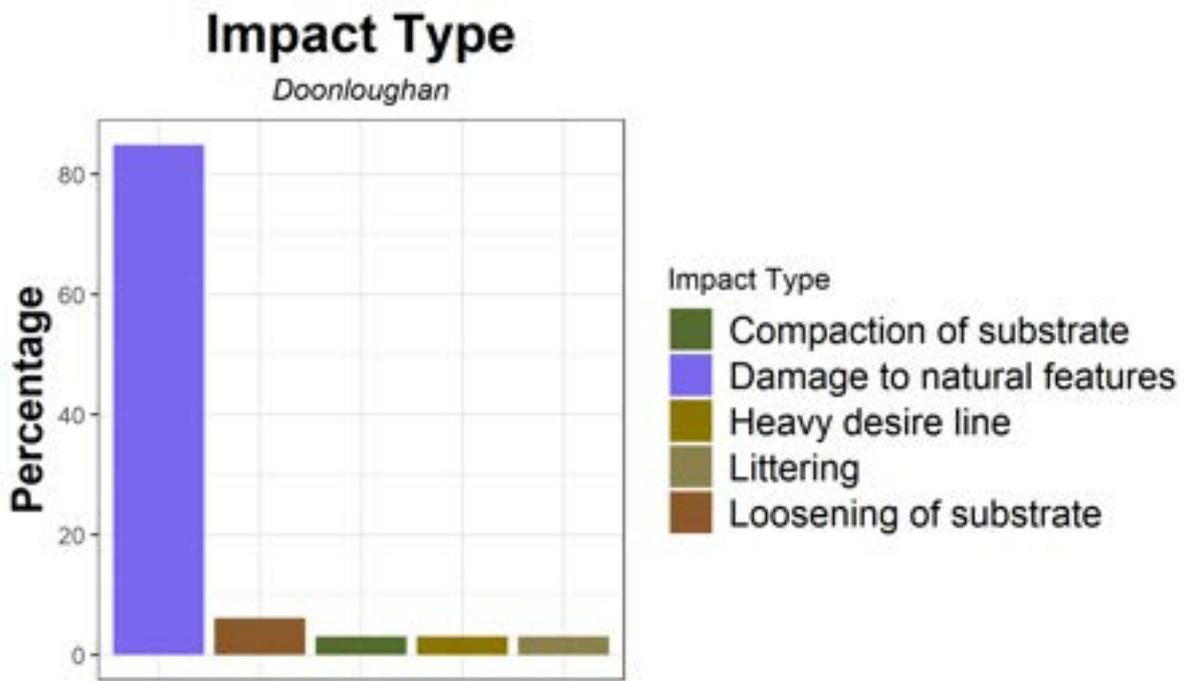
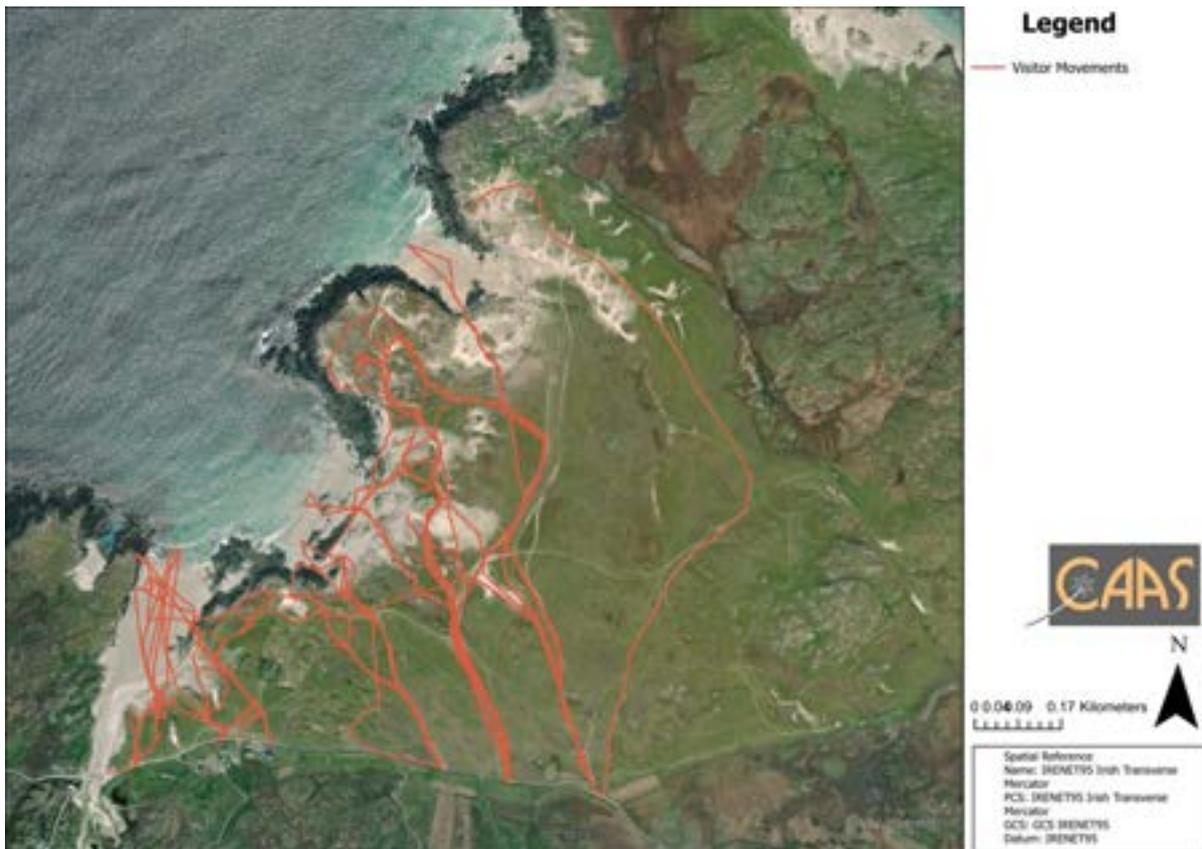


Figure 9.11 Categories of Environmental Impact Levels Observed at Doonloughan as a result of Visitor Activities



**Figure 9.12 Range of Environmental Impacts Observed at Doonloughan**



**Figure 9.13 Visitor movement patterns at Doonloughan**

Of the 44 groups recorded on site 98% of them undertook activities other than walking. These activities (identified above) resulted in 33 impacts being observed on site during the survey. Thus, 42% of activities on site resulted in impacts on the environment. The impact severity levels varied with 27% of the impacts being low, 12% of impacts being moderate, and 61% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Compaction of substrate	1
Damage to natural features	28
Heavy desire line	1
Littering	1
Loosening of substrate	2



Figure 9.14 Desire lines and erosion seen at Doonloughan

## 9.6 Ecological Monitoring Results

### 9.6.1 Ecological Constraints

The habitats within 2km of Doonloughan are sensitive to pollution, hydrological changes, alien species, land use management and overgrazing while species within these habitats are sensitive to habitat availability and water quality.

Table 9.1 Designated sites within 2km of Doonloughan and relevant ecological receptors

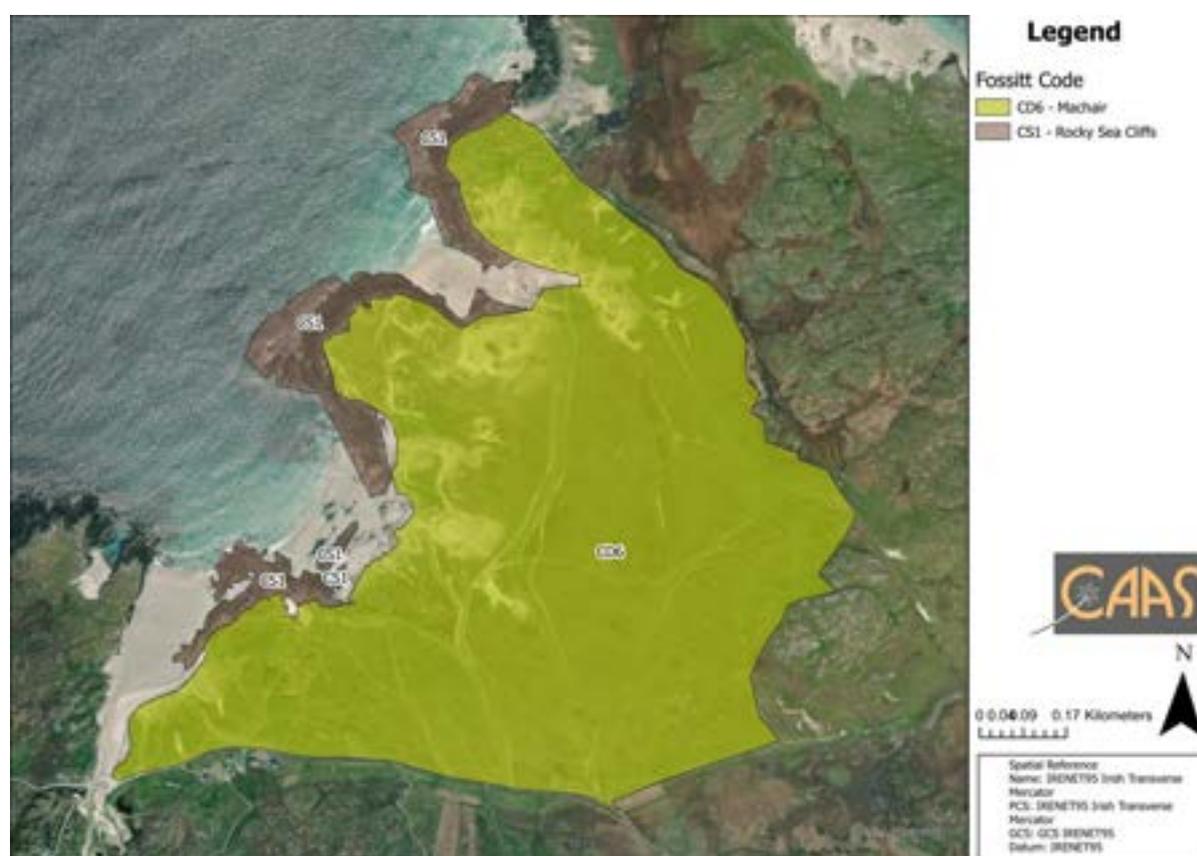
Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002074]	Slyne Head Peninsula SAC	0.00	SAC	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) * important orchid sites [6210], Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130], Annual vegetation of drift lines [1210], Slender naiad ( <i>Najas flexilis</i> ) [1833], Perennial vegetation of stony banks [1220], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410], Alkaline fens [7230], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330], Petalwort ( <i>Petalophyllum ralfsii</i> ) [1395], Large shallow inlets and bays [1160], Coastal lagoons [1150], Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> ) [1349], Oligotrophic waters containing very few minerals of sandy plains ( <i>Littorelletalia uniflorae</i> ) [3110], <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130], Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [6510], European dry heaths [4030], Reefs [1170], Machairs * in Ireland [21A0], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinia caeruleae</i> ) [6410], Embryonic shifting dunes [2110]

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000328]	Slyne Head Islands SAC	0.27	SAC	Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> ) [1349], Reefs [1170], Grey seal ( <i>Halichoerus grypus</i> ) [1364]
[000328]	Slyne Head Islands pNHA	0.59	pNHA	
[002998]	West Connacht Coast SAC	1.31	SAC	Bottlenose dolphin ( <i>Tursiops truncatus</i> ) [1349]

### 9.6.2 Habitat Descriptions

The habitats at Doonloughan are dominated by a network of machairs (Fossitt Code CD6) which align with the Annex I habitat for which the SAC is designated (Machairs\* in Ireland [21A0]). As Doonloughan is a coastal area, the rest of the habitat is made up of rocky sea cliffs (Fossitt Code CD6).

Vehicular movement is evident throughout the habitat; there is severe and dispersed damage to the protected features of the site due to amenity use. Direct intervention is needed throughout the site.



**Figure 9.15 Habitats present at Doonloughan**

### 9.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>19</sup> following the assessment scale was "4" which means the majority of the habitats have a localised negative impact, requiring intervention to allow full recovery. There were 31 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of damage were identified to be vehicles, walking and camping.

<sup>19</sup> This value was calculated using the methods set out in Appendix II

### 9.6.4 Mammals on Site

No mammals were recorded on site at Doonloughan during the visit. Due to its coastal location, the NBDC data shows that there are a large number of marine mammals in the area including dolphins and seals. With regards to terrestrial mammals, a small number were recorded including species such as rabbits and hares.

**Table 9.2 List of mammals that have been recorded at NBDC Hectad L54**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Atlantic White-sided Dolphin	<i>Lagenorhynchus acutus</i>	5
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	10
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	11
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	1
Marine mammal	Common Seal	<i>Phoca vitulina</i>	2
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	6
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	1,750
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	3
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	1
Marine mammal	Sperm Whale	<i>Physeter macrocephalus</i>	1
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	2
Marine mammal	True's Beaked Whale	<i>Mesoplodon mirus</i>	1
Marine mammal	White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	1
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	2
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	2
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	4
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	6
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	1
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	4

### 9.6.5 Wintering Bird Survey

A flock of storm petrel were observed flying over the site – and an elegant tern was roosting on the water to the west of the beach during the site visit. Elegant terns are a near threatened species.

**Table 9.3 Results of the wintering bird survey conducted at Doonloughan**

Common name	Scientific name	Record count
Storm petrel	<i>Hydrobates pelagicus</i>	17
Elegant tern	<i>Thalasseus elegans</i>	1

**Table 9.4 List of wintering birds that have been recorded at NBDC Hectad L54**

Taxonomic group	Common name	Scientific name	Record count
Bird	Alcidae	<i>Alcidae</i>	1
Bird	American Golden Plover	<i>Pluvialis dominica</i>	5
Bird	Arctic Tern	<i>Sterna paradisaea</i>	6
Bird	Barnacle Goose	<i>Branta leucopsis</i>	1
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	1
Bird	Black Guillemot	<i>Cepphus grylle</i>	6
Bird	Black-headed Gull	<i>Larus ridibundus</i>	8
Bird	Blue-winged Teal	<i>Anas discors</i>	1
Bird	Brent Goose	<i>Branta bernicla</i>	1
Bird	Canada Goose	<i>Branta canadensis</i>	1
Bird	Common Coot	<i>Fulica atra</i>	4
Bird	Common Eider	<i>Somateria mollissima</i>	4
Bird	Common Greenshank	<i>Tringa nebularia</i>	4
Bird	Common Moorhen	<i>Gallinula chloropus</i>	12
Bird	Common Pochard	<i>Aythya ferina</i>	1
Bird	Common Redshank	<i>Tringa totanus</i>	6
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	4

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Common Scoter	<i>Melanitta nigra</i>	3
Bird	Common Shelduck	<i>Tadorna tadorna</i>	4
Bird	Common Snipe	<i>Gallinago gallinago</i>	13
Bird	Common Tern	<i>Sterna hirundo</i>	2
Bird	Dunlin	<i>Calidris alpina</i>	8
Bird	Eurasian Curlew	<i>Numenius arquata</i>	7
Bird	Eurasian Dotterel	<i>Charadrius morinellus</i>	4
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	10
Bird	Eurasian Teal	<i>Anas crecca</i>	5
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	4
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	5
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	11
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	1
Bird	Fea's Petrel	<i>Pterodroma feae</i>	1
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	2
Bird	Great Black-backed Gull	<i>Larus marinus</i>	14
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	7
Bird	Great Northern Diver	<i>Gavia immer</i>	4
Bird	Great Skua	<i>Stercorarius skua</i>	2
Bird	Grey Heron	<i>Ardea cinerea</i>	11
Bird	Grey Plover	<i>Pluvialis squatarola</i>	3
Bird	Herring Gull	<i>Larus argentatus</i>	11
Bird	Iceland Gull	<i>Larus glaucooides</i>	2
Bird	Jack Snipe	<i>Lymnocyptes minimus</i>	2
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	11
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	11
Bird	Little Tern	<i>Sternula albifrons</i>	4
Bird	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	1
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	2
Bird	Mallard	<i>Anas platyrhynchos</i>	13
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	5
Bird	Mew Gull	<i>Larus canus</i>	17
Bird	Mute Swan	<i>Cygnus olor</i>	10
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	4
Bird	Northern Gannet	<i>Morus bassanus</i>	5
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	17
Bird	Purple Sandpiper	<i>Calidris maritima</i>	3
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	8
Bird	Red-throated Diver	<i>Gavia stellata</i>	3
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	14
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	3
Bird	Sanderling	<i>Calidris alba</i>	4
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	2
Bird	Sora	<i>Porzana carolina</i>	1
Bird	Tufted Duck	<i>Aythya fuligula</i>	2
Bird	Water Rail	<i>Rallus aquaticus</i>	5
Bird	Whooper Swan	<i>Cygnus cygnus</i>	4
Bird	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	2

## 9.7 Recommendations

- On-site signage to raise awareness on the rarity and importance of the habitats found on site should be installed. A community awareness campaign should be run to promote environmental stewardship
- A visitor management strategy and associated trail network plan is required to alleviate pressures to the protected features by active management of vehicular access across the protected habitat.
- A habitat management plan is required to rehabilitate the dunes and protect the integrity of the machaire. A focus should be places on increasing the floral diversity within the machaire.

## Dursey Island – Interesting Finds

### HIGHLIGHTS

Cable Car Access and isolation create key visitor experiences. The key ecological feature of interest for the site is the Chough population which is known to forage at the far end of the Island where sheep grazing is providing the necessary management to cultivate the preferred foraging resources for the species.

As the site is an island, there are a variety of marine mammals that are often seen in the local waters such as minke whales, risso’s dolphins and more common species such as grey seals and common dolphins.



The site also contains habitats provide ample foraging habitats for wintering bird species such as fulmar.

### KEY RECOMMENDATIONS

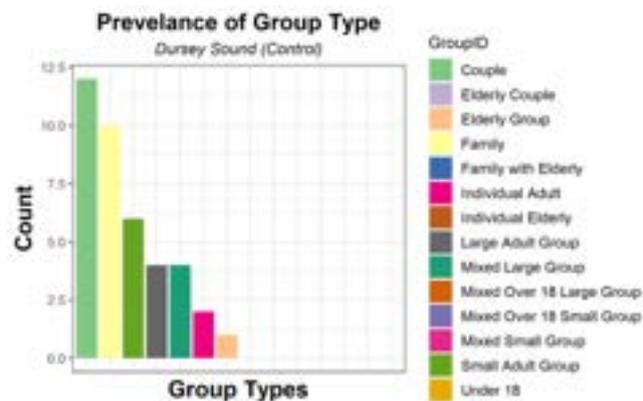
- The island has a range of trails which are in need of monitoring, management and investment to ensure continued use does not cause further damage to the habitats. A dynamic path management system could alleviate the pressures which are occurring.
- Ensure visitor movement patterns at the west of the island – where the chough is known to forage – are managed appropriately.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 75% of all activities undertaken were considered to be low level activities such as picnicking and photography.
- Most of the visitors to the site stayed for at least 157 minutes –given the nature of the site as an island only accessible by cable car.
- Majority of visitors did not read available signage.

### VISITOR NUMBERS AND DWELL TIME

- 140 people visited the site over 8 hours
- Average dwell time of 157 minutes



### Highlights:

- The cable car is a key feature of the island.
- Important site for species such as the chough.
- Limited tourism infrastructure.
- High numbers of marine mammals recorded.
- Long site dwell time of at least 157 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.

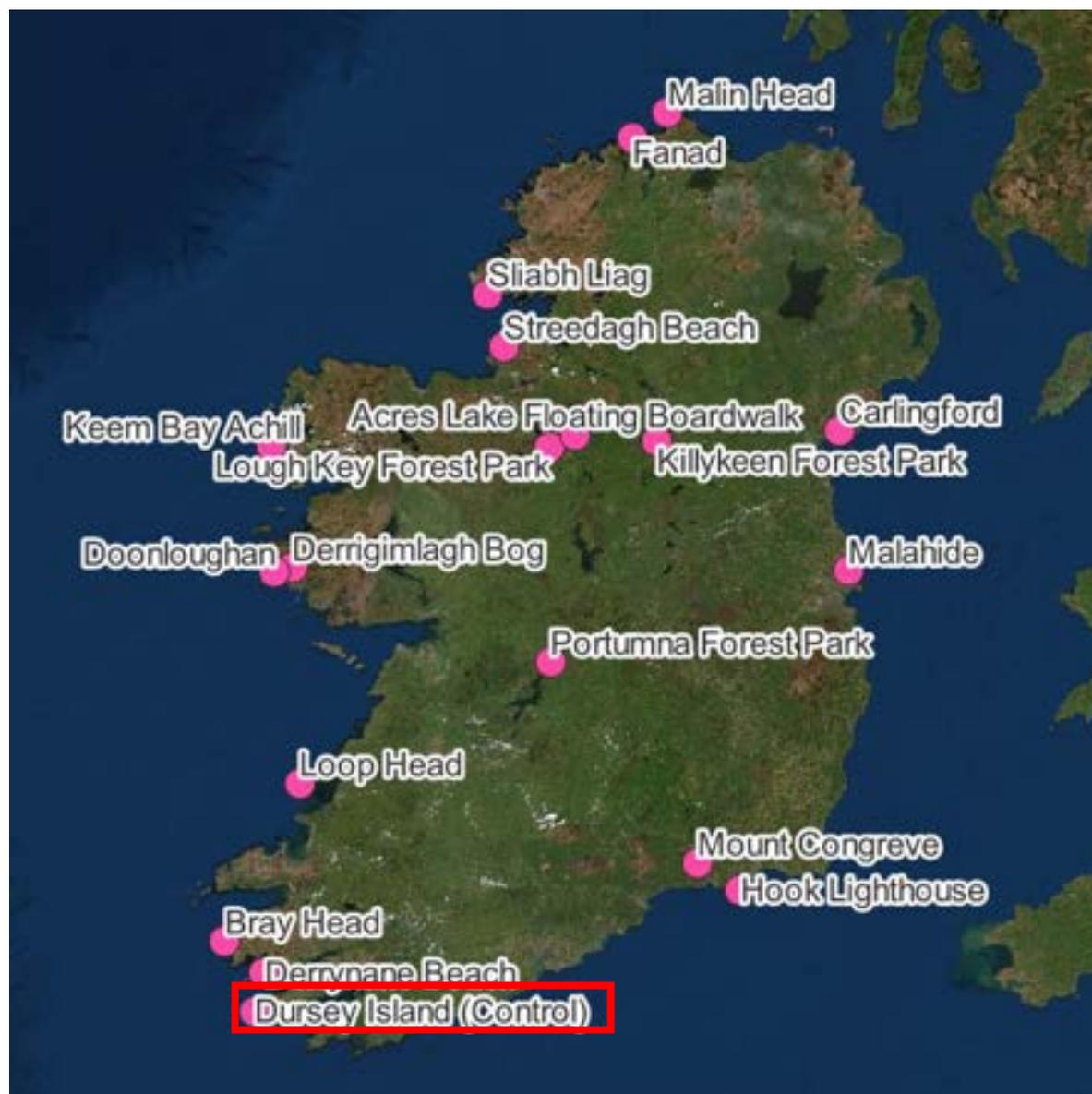


## 10 Dursey Island

### 10.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning through to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 10.2 Methods & Surveys

The following surveys were undertaken at Dursey Island (Control):

### 10.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Dursey Island was undertaken on the 5<sup>th</sup> of June 2021, with max temperatures reaching approximately 17.6° C, no rainfall and low levels of wind on the day<sup>20</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 10.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>20</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 10.2.3 Other Surveys

Additional sample surveys were undertaken at Dursey Island to identify the species presence of wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 10.3 Site Description of Dursey Island

Durseley Island is one of Cork's most westerly islands. Despite only being accessible by cable car from the Beara peninsula at Ballaghboy, is a popular destination for walkers. Dursey Island is completely within the Kenmare River SAC and despite its small size contains habitats such as montane heath and neutral grassland.



## Kenmare River SAC

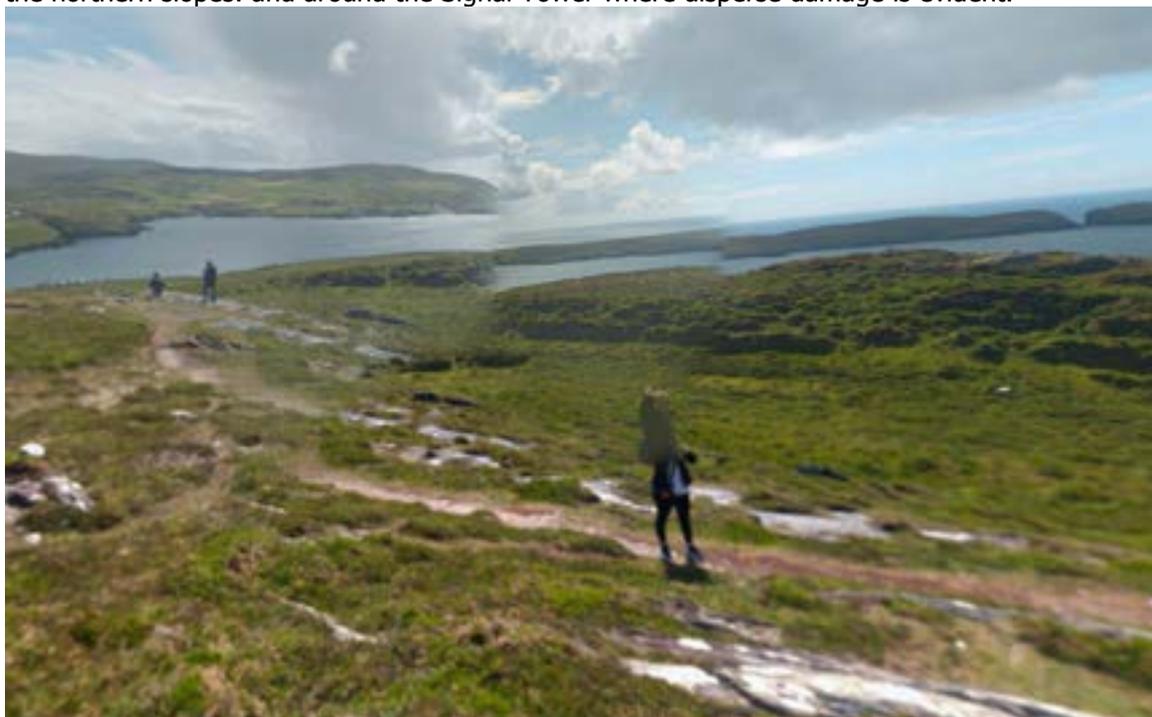


**Figure 10.1 Study Area within Kenmare River SAC**

### 10.4 Pathways and Features Condition Results

#### 10.4.1 Pathway Condition

The pathways at Dursey Island are a combination of even width hard infrastructure and small soft infrastructure paths. A varied amount of desire lines and eroded pathways which have been caused by human activity combined by sheep movement. Along these desire lines, fire damage was noticed due farmers burning land. The desire lines are particularly damaged at areas of steep incline along trails on the northern slopes, and around the Signal Tower where disperse damage is evident.





**Figure 10.2 Pathways identified at Dursey Island (Control)**



**Figure 10.3 Main pathway across Dursey Island**

#### 10.4.2 Features Condition

The only features on site are signposts indicating trail directions and Dursey Island Signal Tower which is a disused structure. There is also a cable car on site which provides access to the site itself.



**Figure 10.4 Features recorded at Dursey Island (Control)**



**Figure 10.5 Dursey Signal Tower**

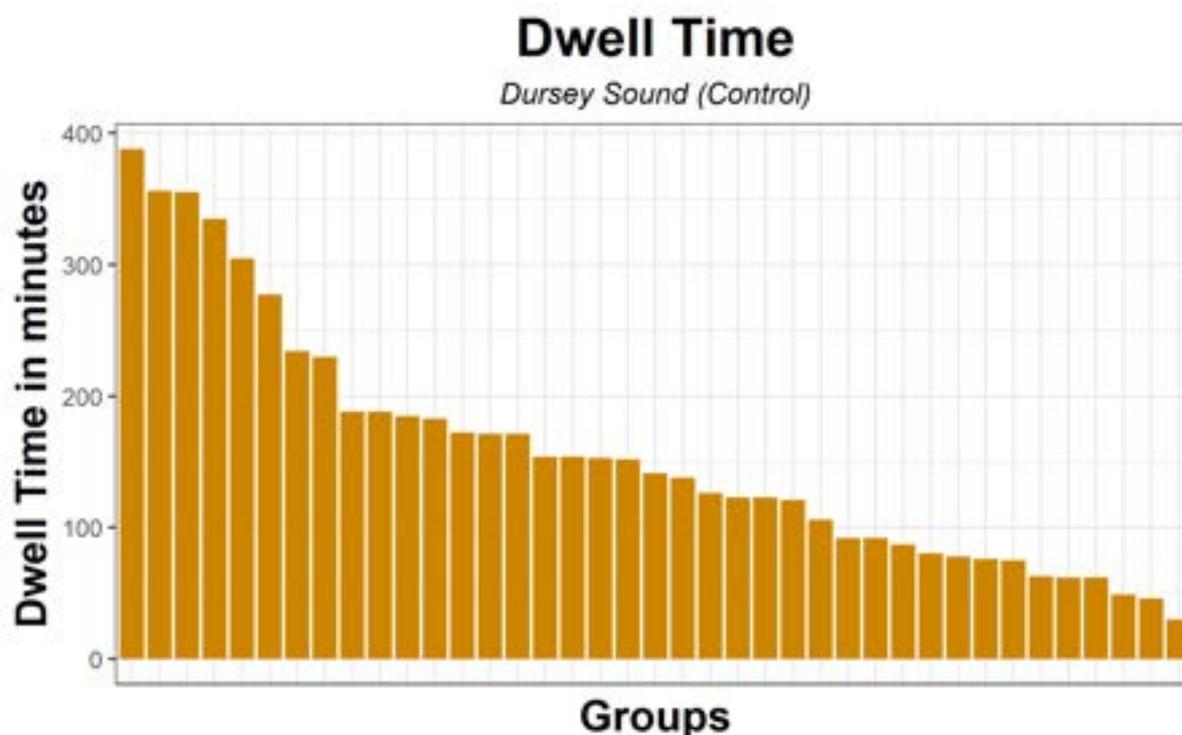
### 10.4.3 Hazards

Other than unrestricted access to steep clifftop areas, no hazards were recorded at Dursey Island (Control).

### 10.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 140 visitors (which represent 39 group observations). The site is most popular amongst the Couple group accessing via the cable car. The average dwell time for the site was 157 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Photographing
Picnicking
Dog walking (on lead)
Birdwatching
Flying drone
Paper lanterns
Sitting
Sprinting



**Figure 10.6 Duration of Time Spent at Dursey Island (Control)**

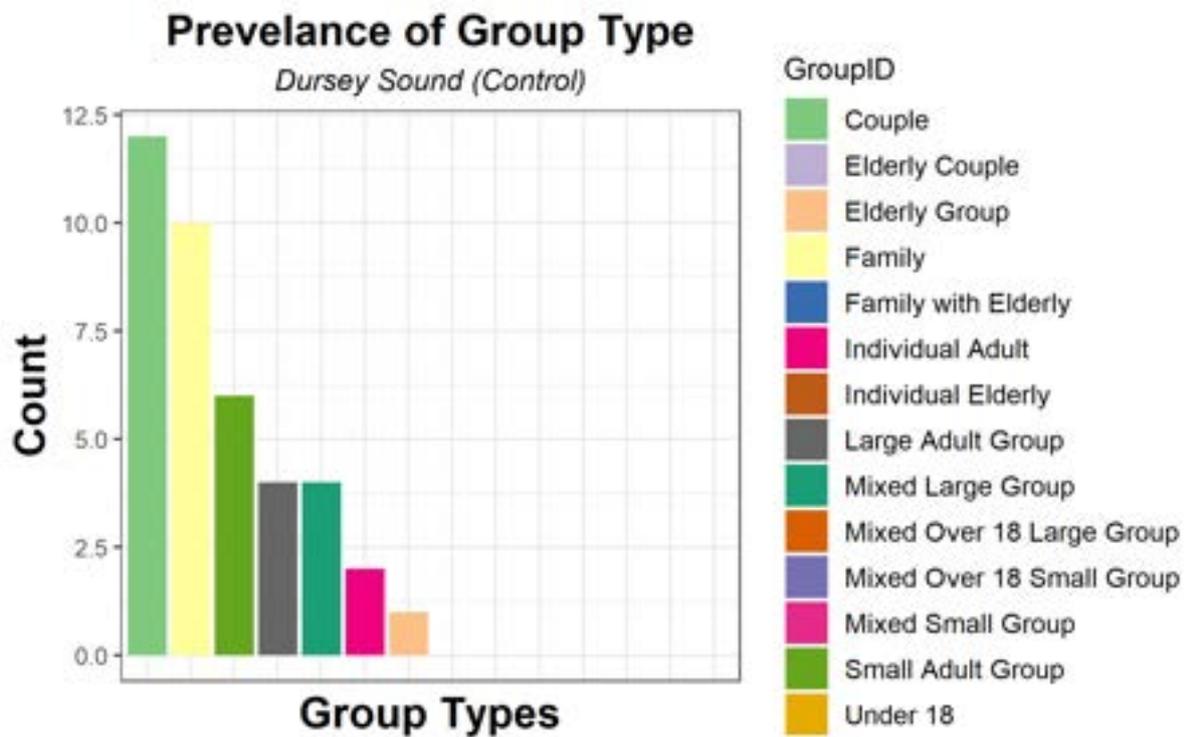


Figure 10.7 Groups of visitors that visited Dursey Island (Control)

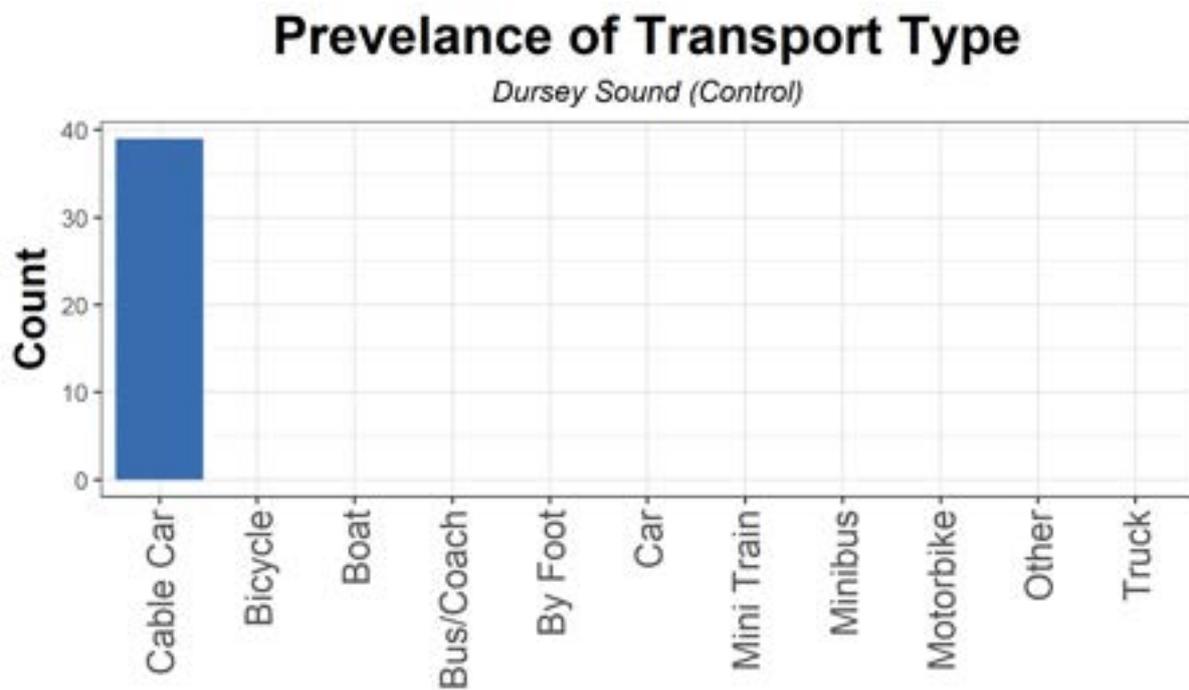
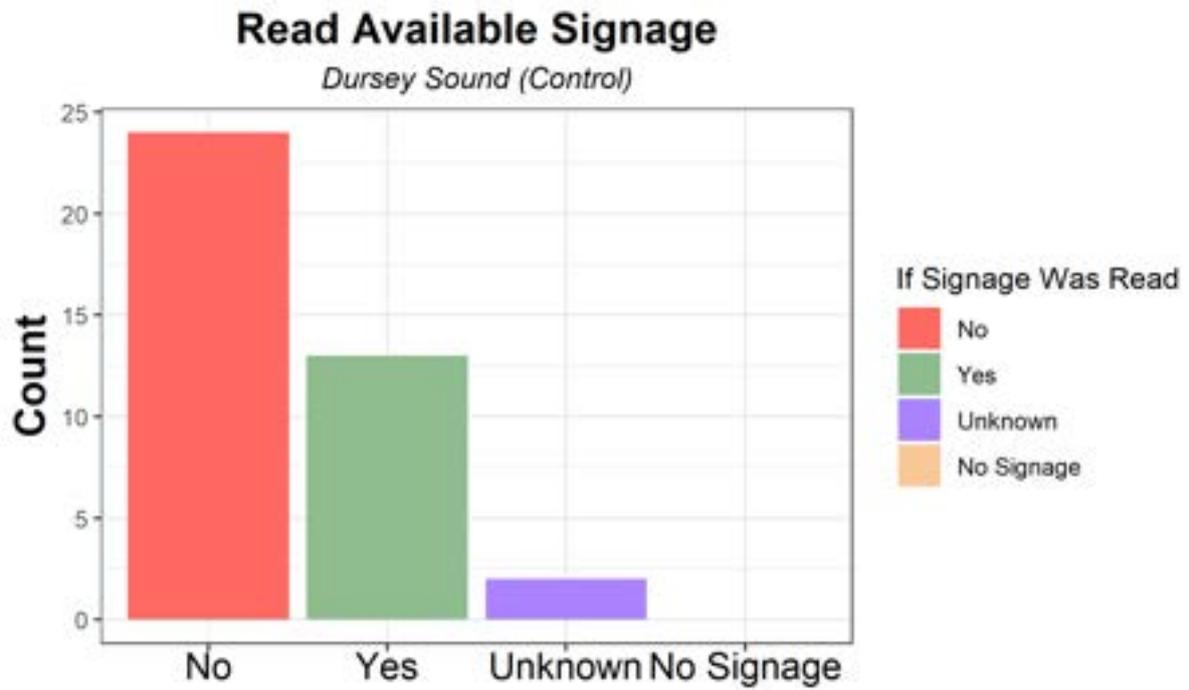
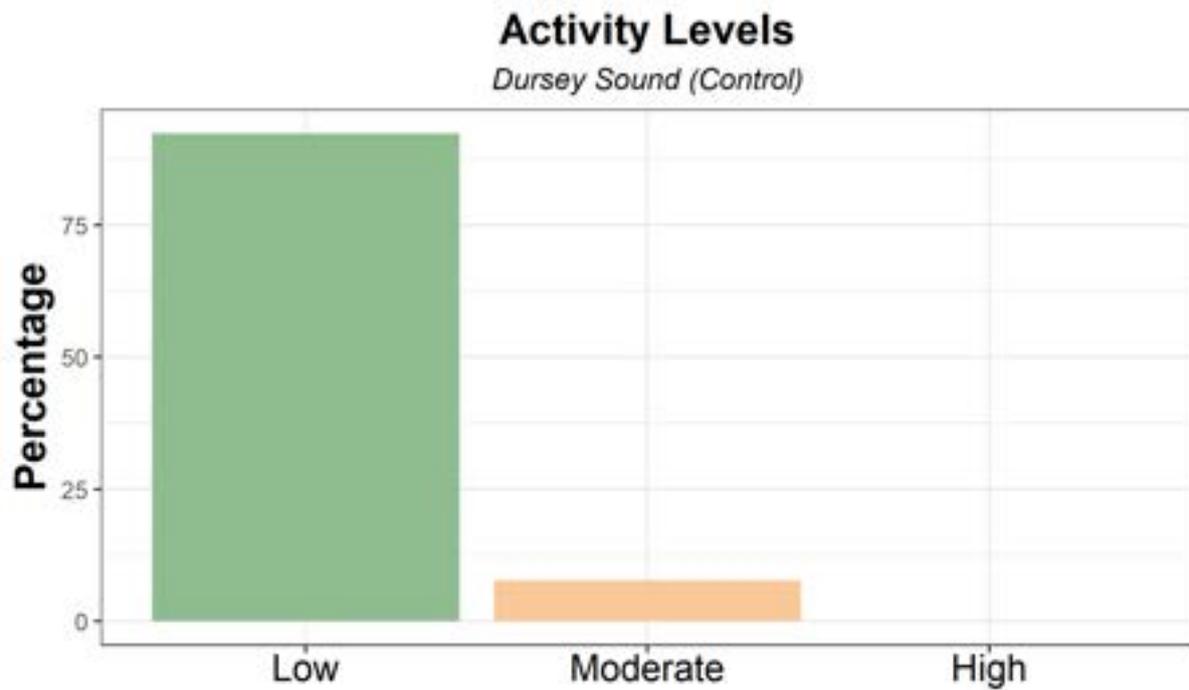


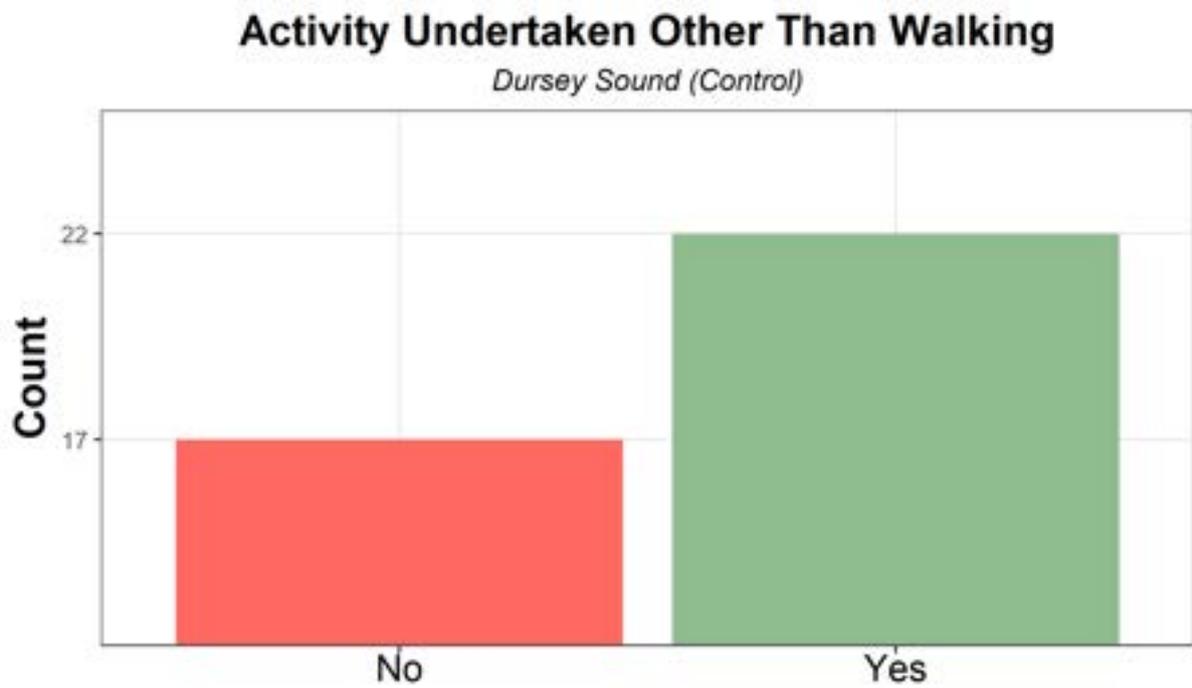
Figure 10.8 Mode of transport used to visit Dursey Island (Control)



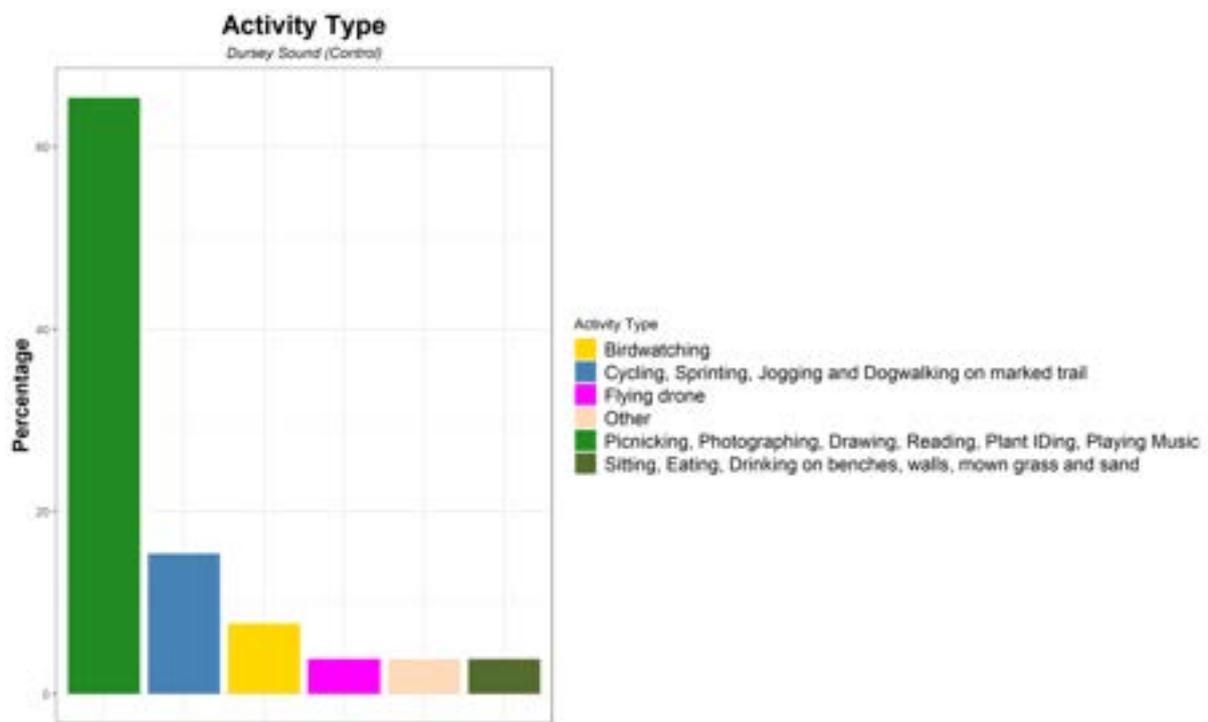
**Figure 10.9 Use of Interpretive Material at Dursey Island (Control)**



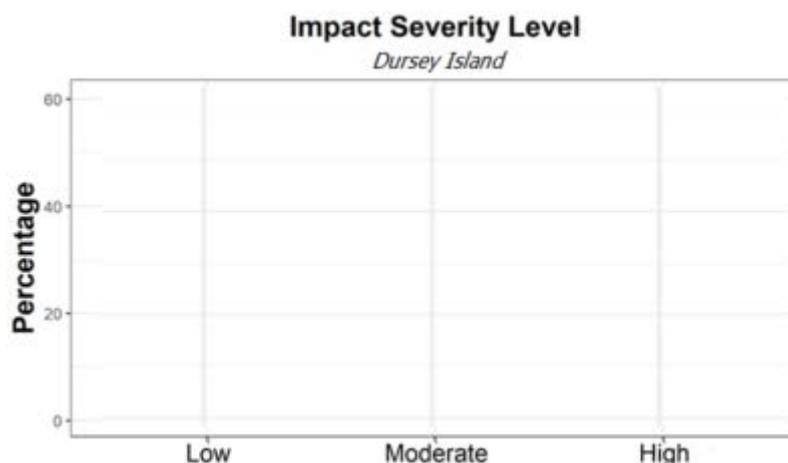
**Figure 10.10 Categories of Activity Levels Observed at Dursey Island (Control)**



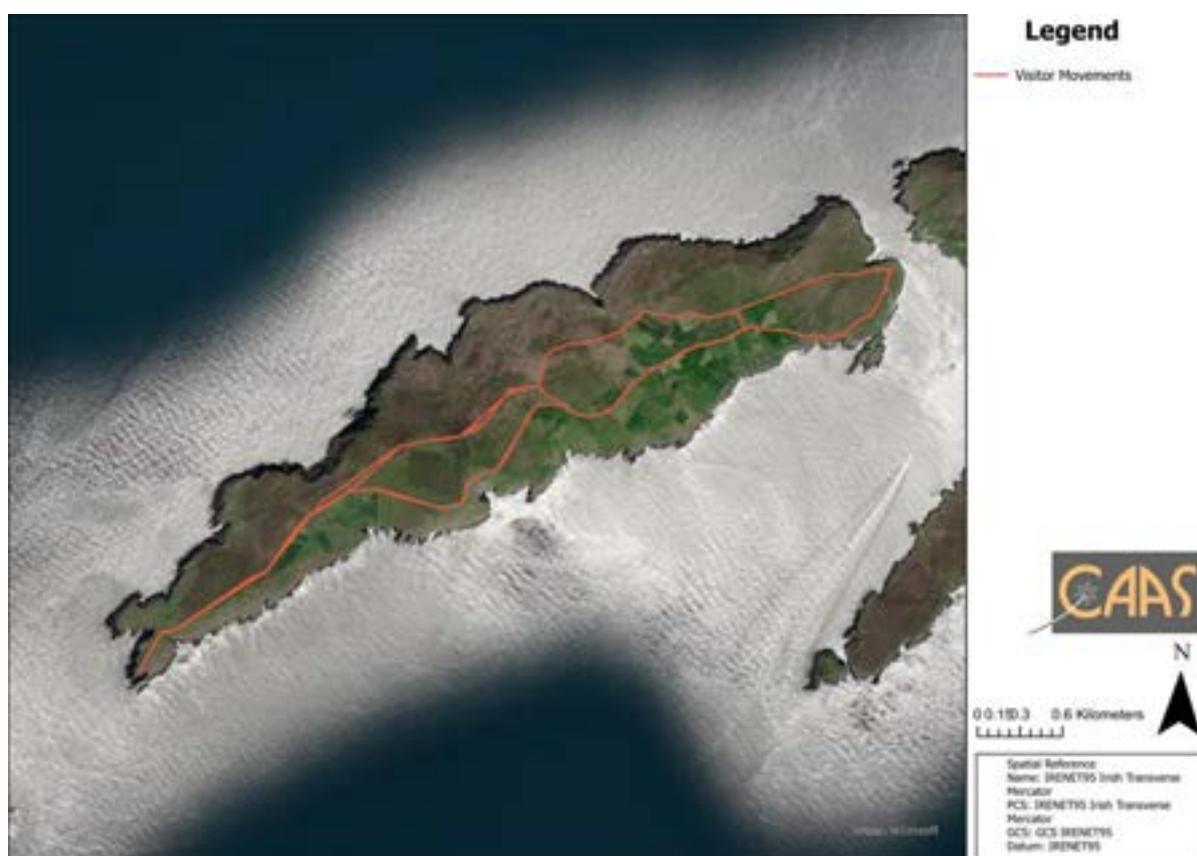
**Figure 10.11** Activities undertaken other than walking



**Figure 10.12** Range of Visitor Activities Observed at Dursey Island



**Figure 10.13 Categories of Environmental Impact Levels Observed at Dursey Island as a result of Visitor Activities (No observable impacts)**



**Figure 10.14 Visitor movement patterns at Dursey Island (Control)**

Of the 39 groups recorded on site 56% of them undertook activities other than walking. These activities (identified above) resulted in no impacts on the environment.

## 10.6 Ecological Monitoring Results

### 10.6.1 Ecological Constraints

Habitats within 2km of Dursey Island are sensitive to hydrological changes, land use management, pollution, alien species and overgrazing. The species that reside in these habitats are sensitive to aquaculture, land use management, hydrological changes and anthropogenic disturbance.

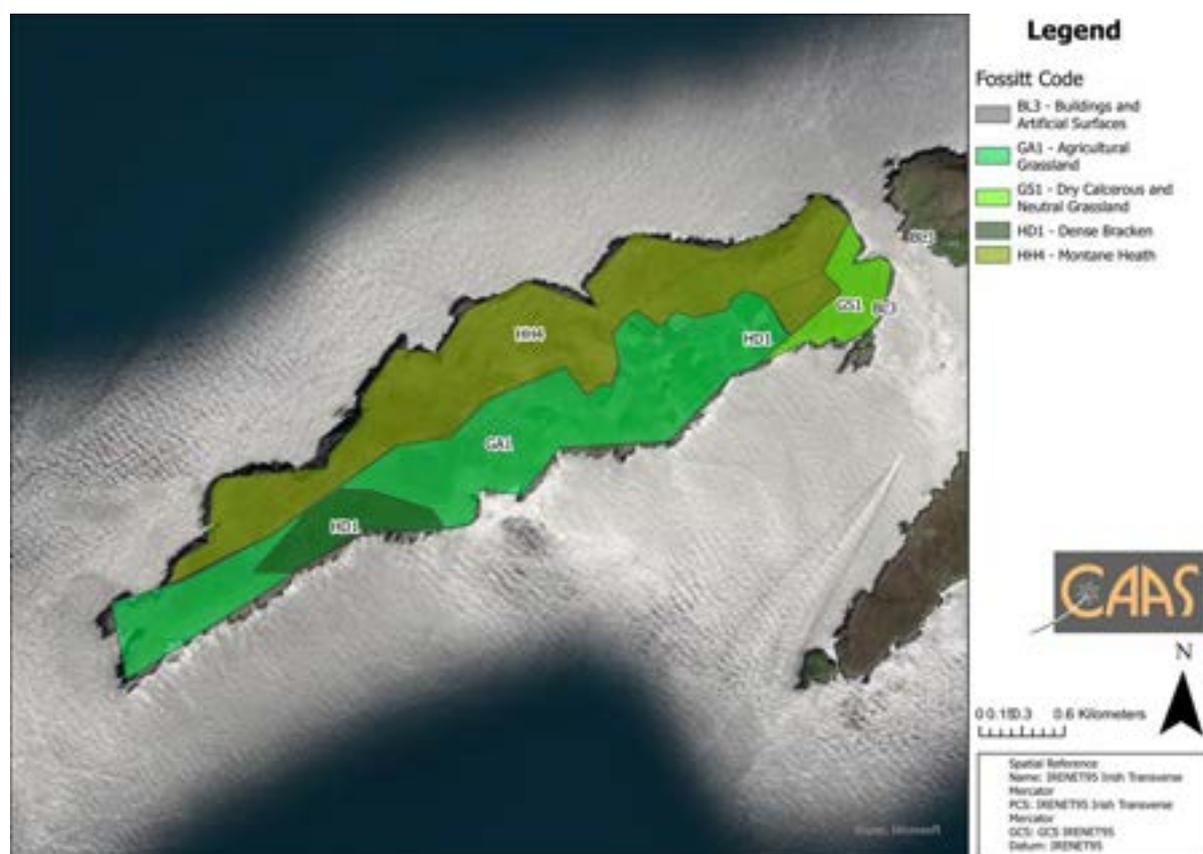
**Table 10.1 Designated sites within 2km of Dursey Island and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000086]	Durseley Island pNHA	0.00	pNHA	
[004155]	Beara Peninsula SPA	0.00	SPA	Fulmar ( <i>Fulmarus glacialis</i> ) [A009], Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]
[002158]	Kenmare River SAC	0.33	SAC	European dry heaths [4030], Narrow-mouthed whorl snail ( <i>Vertigo angustior</i> ) [1014], Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120], Large shallow inlets and bays [1160], Atlantic salt meadows ( <i>Glaucopuccinellietalia maritima</i> ) [1330], Lesser horseshoe bat ( <i>Rhinolophus hipposideros</i> ) [1303], <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130], Otter ( <i>Lutra lutra</i> ) [1355], Submerged or partially submerged sea caves [8330], Reefs [1170], Fixed coastal dunes with herbaceous vegetation - grey dunes [2130], Harbour seal ( <i>Phoca vitulina</i> ) [1365], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]

### 10.6.2 Habitat Descriptions

The habitats at Dursey Island (Figure 10.15) can be broken down into two distinct sections across the island. The northern half of the island is designated as montane heath (Fossitt Code HH4) while the southern part of the island is mainly made up of agricultural grassland (Fossitt Code GA1) with sections of the southern part being made up of dense bracken (Fossitt Code HD1) and dry and calcareous grassland (GS1). These habitats provide habitat for the qualifying species, fulmar and chough, for which the SPA, Beara Peninsula, is designated.

Although there were no observable impacts from the visitor monitoring data there is evidence of trampling, compaction and erosion due to visitor movements at the site. It is thought that the impacts are associated with the repeat site usage and consistent imperceptible effects from each individual group over time. This is particularly evident at steep areas along the upper trail network and at the Signal Tower.



**Figure 10.15 Habitats present at Dursey Island (Control)**

### 10.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>21</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 8 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be agricultural related activities such as gradual degradation over time by visitors, controlled burns by farmers and sheep.

### 10.6.4 Mammals on Site

**Table 10.2 List of mammals that have been recorded at NBDC Hectads V54, V44 & V43**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Atlantic White-sided Dolphin	<i>Lagenorhynchus acutus</i>	4
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	16
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	166
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	79
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	1
Marine mammal	Delphinidae	<i>Delphinidae</i>	1
Marine mammal	Fin Whale	<i>Balaenoptera physalus</i>	1
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	240
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	3
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	3
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	133
Marine mammal	Phocidae	<i>Phocidae</i>	1
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	114
Marine mammal	Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>	1
Marine mammal	Sperm Whale	<i>Physeter macrocephalus</i>	1
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	1
Marine mammal	Walrus	<i>Odobenus rosmarus</i>	1

<sup>21</sup> This value was calculated using the methods set out in Appendix II

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Bank Vole	<i>Myodes glareolus</i>	2
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	2
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	31
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	3
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	10
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	4
Terrestrial mammal	Feral Goat	<i>Capra hircus</i>	2
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	2
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	2
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	3
Terrestrial mammal	Sika Deer	<i>Cervus nippon</i>	1
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

### 10.6.5 Wintering Bird Survey

The grass sward at the tip is very attractive to Choughs due to the grazing regime present. On the date of survey 7 individuals were seen here however, there are records that the flock can sometimes exceed 50 birds. Other birds observed foraging off Dursey island were gannets and a great northern diver. The island is noted for sightings of rare migrating birds.

**Table 10.3 Results of the wintering bird survey conducted at Dursey Island**

Common name	Scientific name	Record count
Chough	<i>Pyrhocorax pyrrhocorax</i>	7
Gannet	<i>Morus bassanus</i>	3
Great Northern Diver	<i>Gavia immer</i>	1

**Table 10.4 List of wintering birds that have been recorded at NBDC Hectads V54, V44, & V43**

Taxonomic group	Common name	Scientific name	Record count
Bird	American Golden Plover	<i>Pluvialis dominica</i>	3
Bird	Arctic Tern	<i>Sterna paradisaea</i>	2
Bird	Atlantic Puffin	<i>Fratercula arctica</i>	23
Bird	Balearic Shearwater	<i>Puffinus mauretanicus</i>	4
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	1
Bird	Black-headed Gull	<i>Larus ridibundus</i>	7
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	105
Bird	Black Guillemot	<i>Cepphus grylle</i>	27
Bird	Cattle Egret	<i>Bubulcus ibis</i>	3
Bird	Common Crane	<i>Grus grus</i>	2
Bird	Common Greenshank	<i>Tringa nebularia</i>	6
Bird	Common Guillemot	<i>Uria aalge</i>	144
Bird	Common Moorhen	<i>Gallinula chloropus</i>	1
Bird	Common Redshank	<i>Tringa totanus</i>	6
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	3
Bird	Common Scoter	<i>Melanitta nigra</i>	1
Bird	Common Snipe	<i>Gallinago gallinago</i>	17
Bird	Common Tern	<i>Sterna hirundo</i>	1
Bird	Cory's Shearwater	<i>Calonectris diomedea</i>	5
Bird	Eurasian Curlew	<i>Numenius arquata</i>	9
Bird	Eurasian Dotterel	<i>Charadrius morinellus</i>	7
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	36
Bird	Eurasian Teal	<i>Anas crecca</i>	2
Bird	Eurasian Wigeon	<i>Anas penelope</i>	1
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	9
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	7
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	41
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	34

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Fea's Petrel	<i>Pterodroma feae</i>	1
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	7
Bird	Great Black-backed Gull	<i>Larus marinus</i>	51
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	30
Bird	Great Northern Diver	<i>Gavia immer</i>	8
Bird	Great Snipe	<i>Gallinago media</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	13
Bird	Grey Phalarope	<i>Phalaropus fulicarius</i>	1
Bird	Herring Gull	<i>Larus argentatus</i>	66
Bird	Iceland Gull	<i>Larus glaucooides</i>	7
Bird	Jack Snipe	<i>Lymnocyptes minimus</i>	6
Bird	King Eider	<i>Somateria spectabilis</i>	2
Bird	Larus	<i>Larus</i>	1
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	35
Bird	Little Auk	<i>Alle alle</i>	1
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	2
Bird	Little Plover	<i>Charadrius dubius</i>	1
Bird	Macaronesian Shearwater	<i>Puffinus baroli</i>	1
Bird	Mallard	<i>Anas platyrhynchos</i>	9
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	67
Bird	Mediterranean Gull	<i>Larus melanocephalus</i>	2
Bird	Mew Gull	<i>Larus canus</i>	14
Bird	Mute Swan	<i>Cygnus olor</i>	1
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	187
Bird	Northern Gannet	<i>Morus bassanus</i>	472
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	11
Bird	Northern Parula	<i>Parula americana</i>	2
Bird	Northern Shoveler	<i>Anas clypeata</i>	1
Bird	Purple Sandpiper	<i>Calidris maritima</i>	3
Bird	Razorbill	<i>Alca torda</i>	90
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	1
Bird	Red-throated Diver	<i>Gavia stellata</i>	5
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	9
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	10
Bird	Sanderling	<i>Calidris alba</i>	2
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	1
Bird	Sooty Shearwater	<i>Puffinus griseus</i>	7
Bird	Sterna	<i>Sterna</i>	3
Bird	Stone-curlew	<i>Burhinus oedicnemus</i>	1
Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	4
Bird	Whimbrel	<i>Numenius phaeopus</i>	1
Bird	White-rumped Sandpiper	<i>Calidris fuscicollis</i>	1
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	6

## 10.7 Recommendations

- The island has a range of trails which are in need of monitoring, management and investment to ensure continued use does not cause further damage to the habitats.
- A dynamic path management system could alleviate the pressures which are occurring.
- Ensure visitor movement patterns at the west of the island – where the chough is known to forage – are managed appropriately.

## Fanad – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Fanad Head is a noted whale watching site. There is high quality heathland habitat surrounding Fanad. This habitat supports special conservation interest species for which Fanad is designated such as chough.



The coastal area itself plays host to a number of marine mammal species such as bottle nosed dolphins and grey seals, while there have been sightings of passing fin whale, minke whale, orcas, dolphins and porpoise

### KEY RECOMMENDATIONS

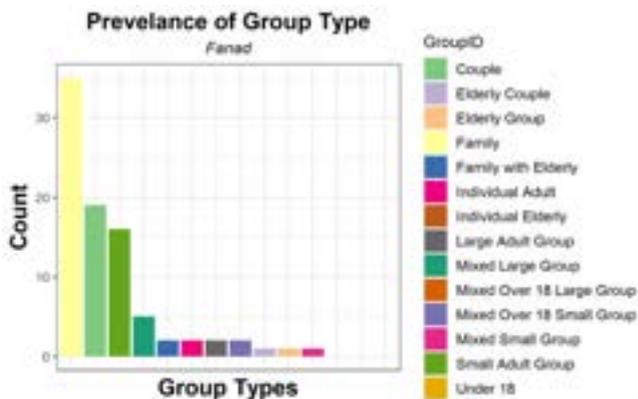
- Path areas at entries should be reinforced and managed to reduce compactions and de-vegetation.
- Access to hazardous cliff top areas should be managed.
- The habitats on site could be managed for increased coastal diversity through bespoke heathland management practices to increase the floral diversity.
- Additional interpretation material focusing on the ecological landscape and important features of the area could increase engagement with the site.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 60% of all activities undertaken were considered to be low level activities such as picnicking and photography.
- Majority of visitors only undertook walking on site.
- Most of the visitors to the site stayed for at least 35 minutes –given the nature of the site as a small cliff area with a lighthouse.
- Majority of visitors read signage that was available on site.

### VISITOR NUMBERS AND DWELL TIME

- 311 people visited the site over 8 hours
- Average dwell time of 35 minutes



## 11 Fanad

### 11.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 11.2 Methods & Surveys

The following surveys were undertaken at Fanad:

### 11.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Fanad was undertaken on the 11<sup>th</sup> of July 2021, with max temperatures reaching approximately 18.6° C, low levels of rainfall and low levels of wind on the day<sup>22</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 11.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>22</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 11.2.3 Other Surveys

Additional sample surveys were undertaken at Fanad to identify the species presence of wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 11.3 Site Description of Fanad

Centred on Fanad Lighthouse, this Discovery Point also directs visitors to views and trails along the rocky Atlantic shore. The site is contained within both the Ballyhoorisky Point to Fanad Head SAC along with the Horn Head to Fanad Head SPA and contains large areas of dry siliceous heath.



**Figure 11.1 Fanad**

## Ballyhoorisky Point to Fanad Head SAC



**Figure 11.2 Study Area within Ballyhoorisky Point to Fanad Head SAC**

### 11.4 Pathways and Features Condition Results

#### 11.4.1 Pathway Condition

Due to the small size and complex surfaces at this site there are not many designated pathways. There is a road (Figure 11.4) at the site along with highly varied soft infrastructure pathways and desire lines, which have seen compaction to the soil due to use of vehicles and a large number of walkers in the area.



**Figure 11.3 Pathways identified at Fanad**



**Figure 11.4 Pathways at Fanad**

#### 11.4.2 Features Condition

At Fanad, there are various tourism signage, including information signs giving information on the surrounding area and trails as well as road signs and a sign designating Fanad as part of the Wild Atlantic Way (Figure 11.6). Along with the noted lighthouse, there are also abandoned buildings in the area. In terms of amenities, there is a Visitor Centre, car park, toilets and cafe.



Figure 11.5 Features recorded at Fanad



Figure 11.6 Features at Fanad

### 11.4.3 Hazards

In terms of hazards, it was noted that a broken fence led to an unprotected cliff edge (Figure 11.8) that showed signs of regular activity. This was the only hazard that was recorded during habitat mapping.



**Figure 11.7 Hazards recorded at Fanad**



**Figure 11.8 Hazard at Fanad**

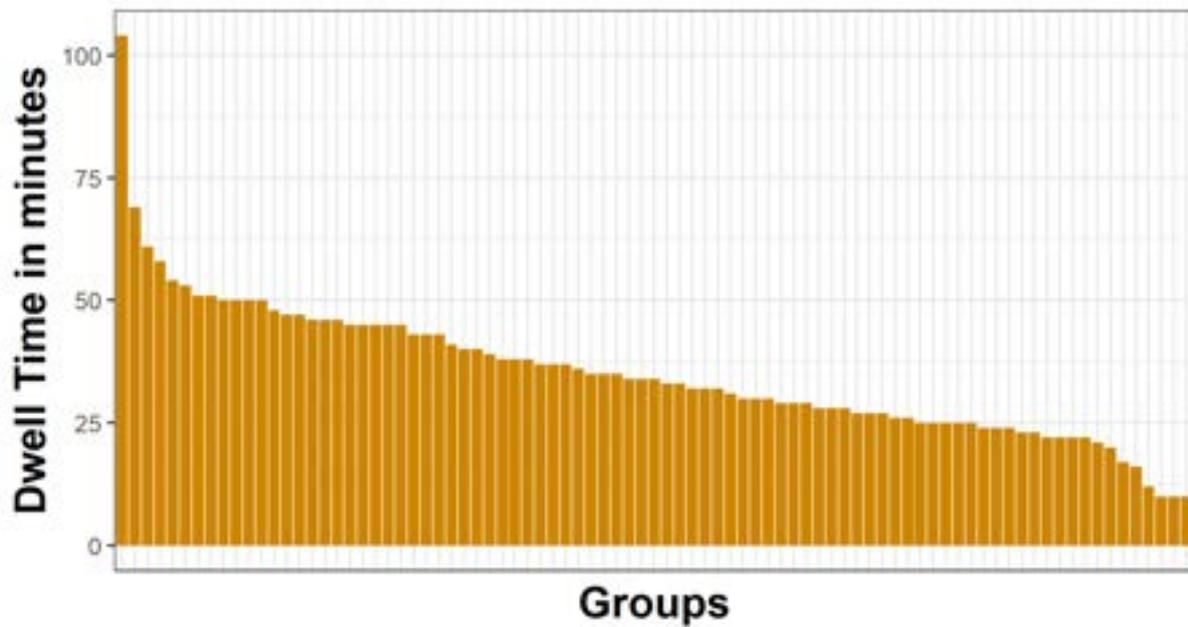
### 11.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 311 visitors (which represent 86 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 35 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Photographing
Exploring off trail
Picnicking
Dog walking (on lead)
Sitting
Flying drone
Wheelchair user
Baby buggy
Birdwatching
Fishing
Frisbee/ Catch

## Dwell Time

*Fanad*



**Figure 11.9 Duration of Time Spent at Fanad**

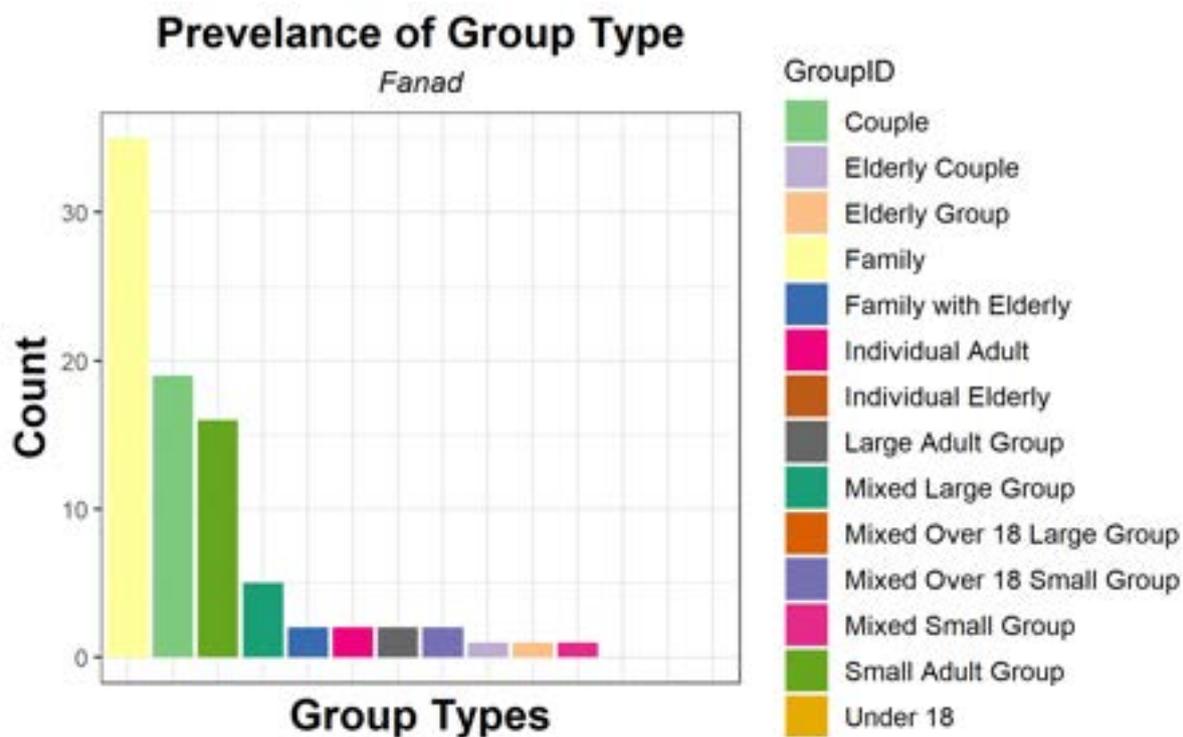


Figure 11.10 Groups of visitors that visited Fanad

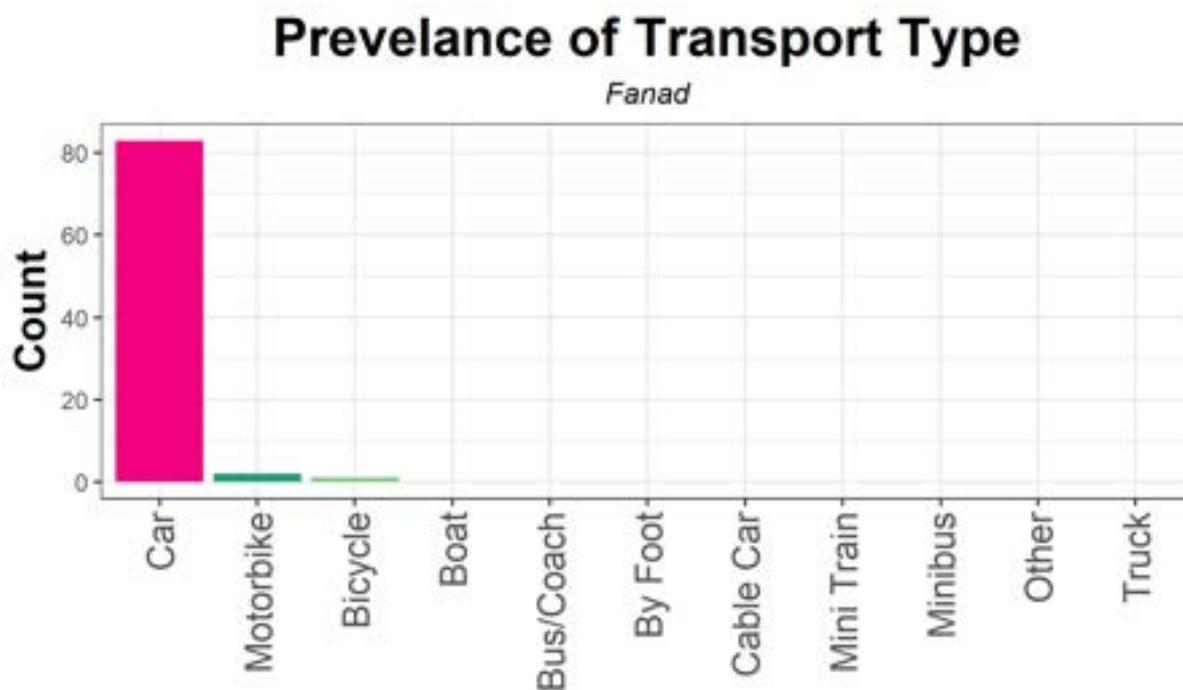
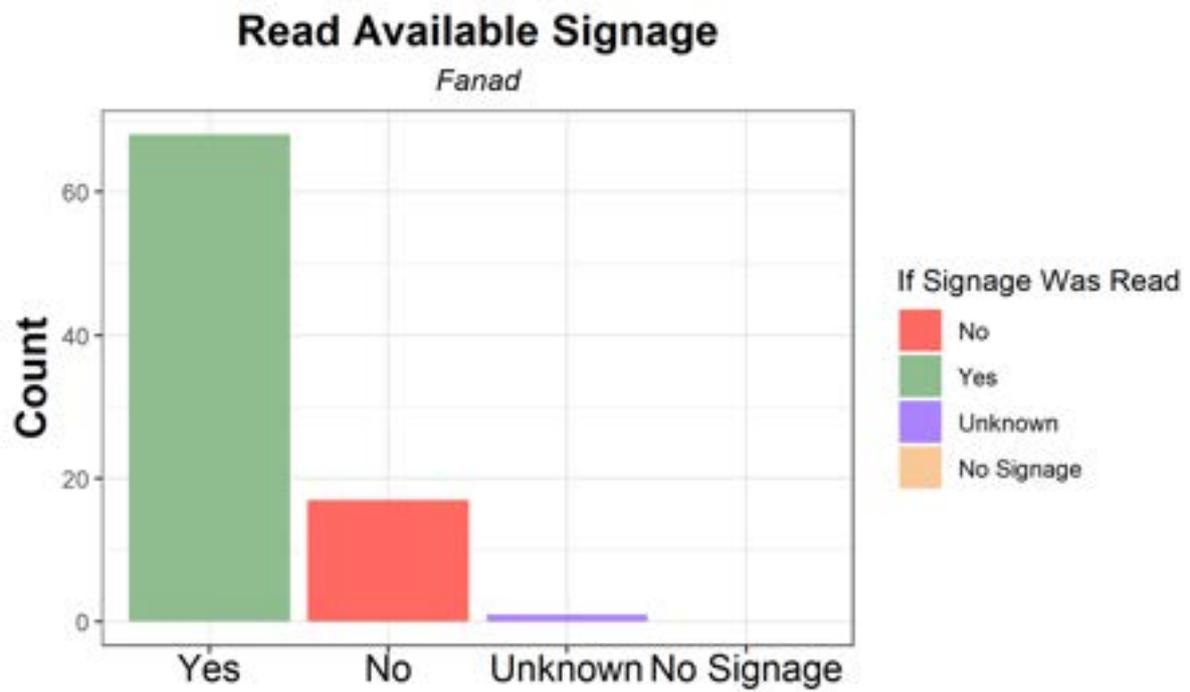
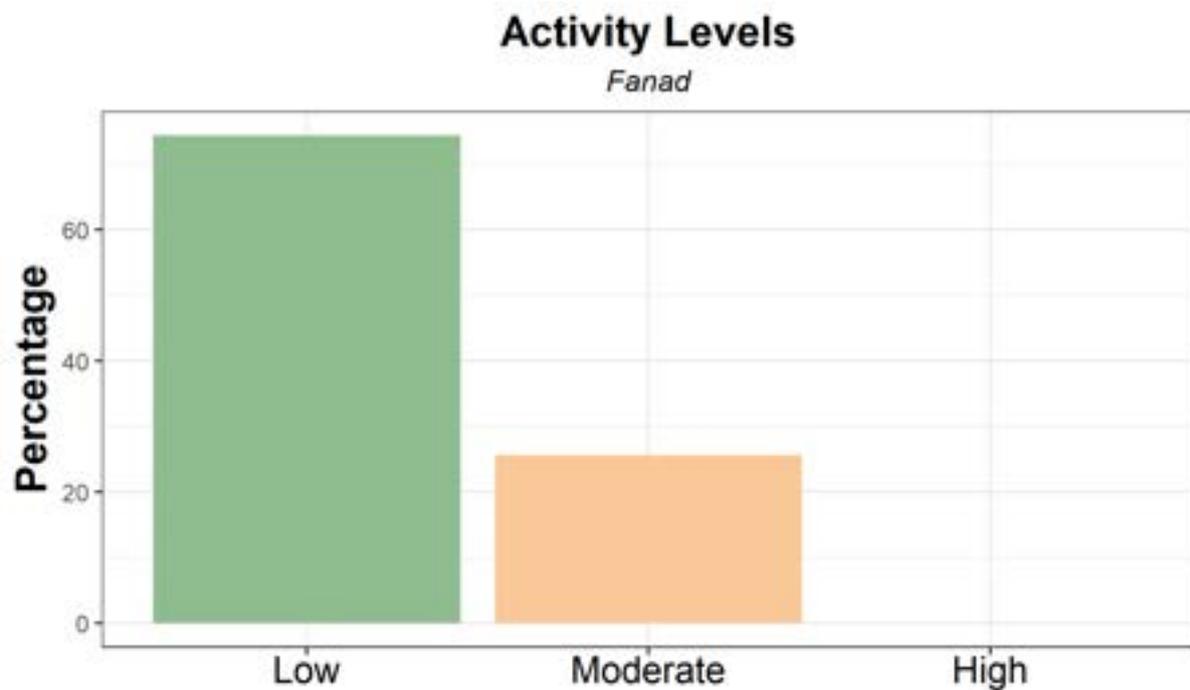


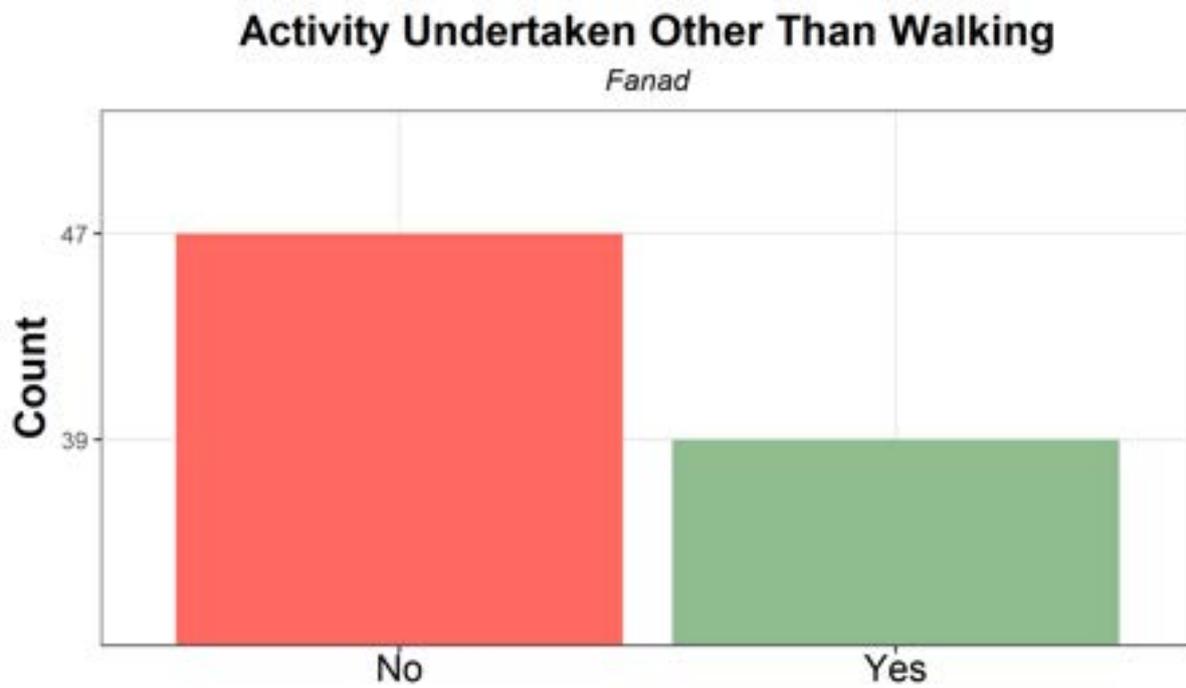
Figure 11.11 Mode of transport used to visit Fanad



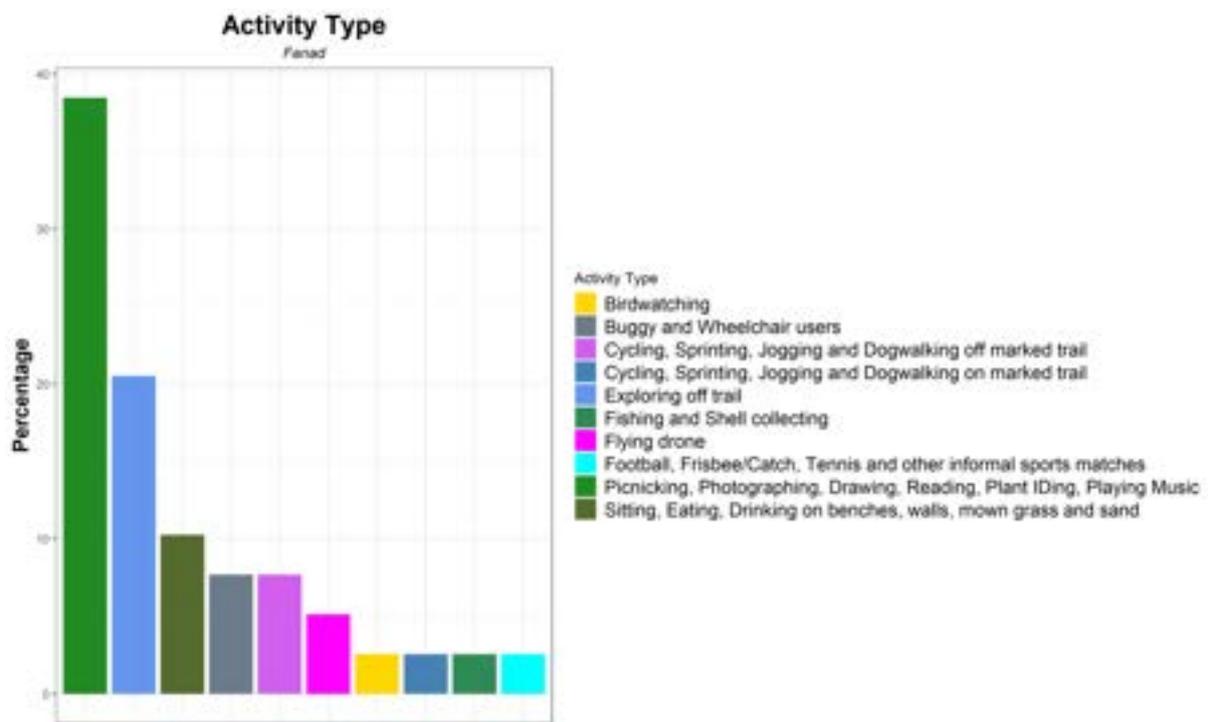
**Figure 11.12 Use of Interpretive Material at Fanad**



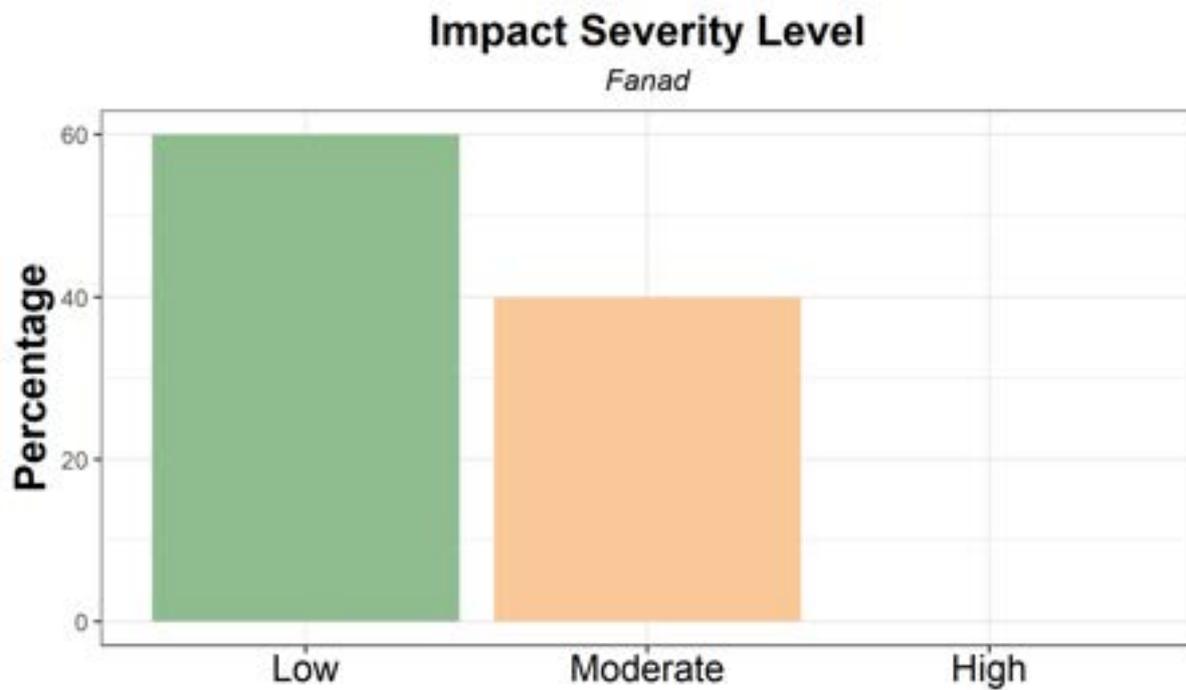
**Figure 11.13 Categories of Activity Levels Observed at Fanad**



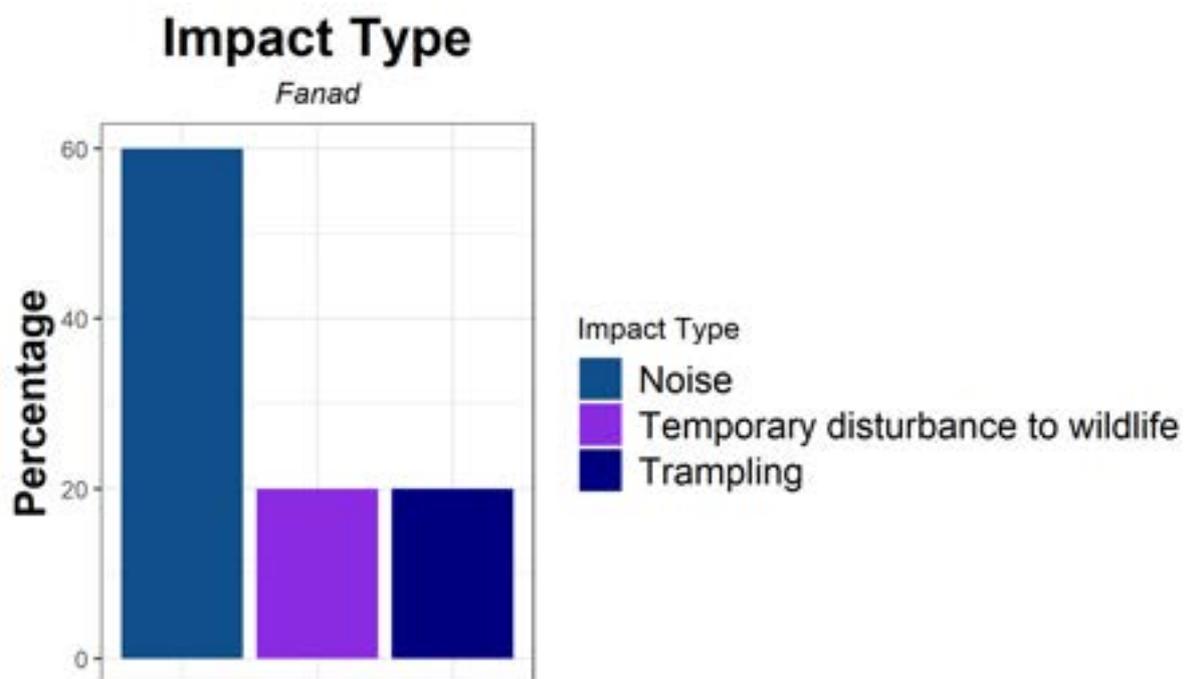
**Figure 11.14** Activities undertaken other than walking



**Figure 11.15** Range of Visitor Activities Observed at Fanad



**Figure 11.16 Categories of Environmental Impact Levels Observed at Fanad as a result of Visitor Activities**



**Figure 11.17 Range of Environmental Impacts Observed at Fanad**



**Figure 11.18 Visitor movement patterns at Fanad**

Of the 86 groups recorded on site 45% of them undertook activities other than walking. These activities (identified above) resulted in 5 impacts being observed on site during the survey. Thus, 13% of activities on site resulted in impacts on the environment. The impact severity levels varied with 60% of the impacts being low, 40% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Noise	3
Temporary disturbance to wildlife	1
Trampling	1

## 11.6 Ecological Monitoring Results

### 11.6.1 Ecological Constraints

The habitats and species within Fanad are sensitive to aquaculture, land use management, pollution and hydrological changes.

**Table 11.1 Designated sites within 2km of Fanad and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001975]	Ballyhooriskey Point To Fanad Head pNHA	0	pNHA	

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001975]	Ballyhooriskey Point to Fanad Head SAC	0	SAC	Slender Naiad ( <i>Najas flexilis</i> ) [1833], Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or Isoeto-Nanojuncetea [3130], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Narrow-mouthed Whorl Snail ( <i>Vertigo angustior</i> ) [1014], Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140], Perennial vegetation of stony banks [1220]
[004194]	Horn Head to Fanad Head SPA	0	SPA	Chough ( <i>Pyrhocorax pyrrhocorax</i> ) [A346], Guillemot ( <i>Uria aalge</i> ) [A199], Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Shag ( <i>Phalacrocorax aristotelis</i> ) [A018], Barnacle goose ( <i>Branta leucopsis</i> ) [A045], Fulmar ( <i>Fulmarus glacialis</i> ) [A009], Peregrine falcon ( <i>Falco peregrinus</i> ) [A103], Razorbill ( <i>Alca torda</i> ) [A200], Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Greenland White-fronted Goose ( <i>Anser albifrons flavirostris</i> ) [A395]

### 11.6.2 Habitat Descriptions

The habitats of Fanad are mainly made up of areas of dry siliceous heath (Fossitt Code HH1), which align with the special conservation interests for which the SPA, Horn Head to Fanad, is designated as it is suitable foraging habitat for these species. The more managed part of Fanad, the lighthouse and the immediate surrounding area contains more managed habitats such as agricultural grassland (Fossitt Code GA1).

There is a network of desire lines through the heathland to the north of the roadway where there is visitor access. The area to the south is fenced off with no authorised access to visitors. The desire lines to the north have mild compaction and show indications of low visitor numbers.

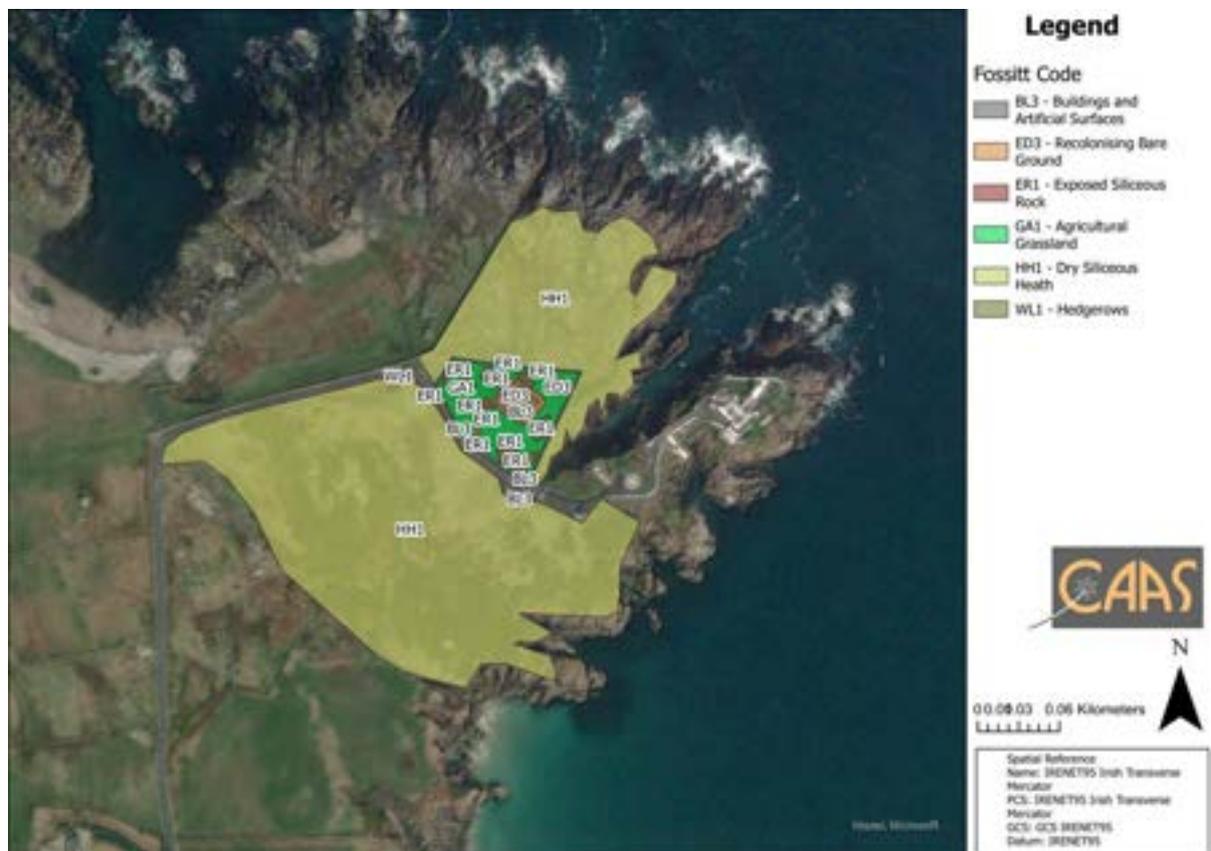


Figure 11.19 Habitats present at Fanad

### 11.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>23</sup> following the assessment scale was "2" which means the majority of the habitats have a localised degree of negative impact, but slight and capable of rapid recovery. There were 3 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be walking by visitors involving repeat low levels of impact gradually causing compaction of substrate to form trails. These are dispersed across the site.

### 11.6.4 Mammals on Site

No mammals were recorded on site at Fanad. The NBDC data shows that the majority of recorded mammals in the area are marine mammals, due to the location of Fanad on the northern coast of Ireland with bottle-nosed dolphins and grey seals having been the species that were spotted the most. In terms of terrestrial mammals, otters and rabbits occur the most according to the NBDC data.

**Table 11.2 List of mammals that have been recorded at NBDC Hectad C24**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	17
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	3
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	9
Marine mammal	Common Seal	<i>Phoca vitulina</i>	7
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	1
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	9
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	1
Marine mammal	Killer Whale	<i>Orcinus orca</i>	2
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	6
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	3
Marine mammal	Phocidae	<i>Phocidae</i>	1
Marine mammal	Pinnipedia	<i>Pinnipedia</i>	1
Terrestrial mammal	American Mink	<i>Mustela vison</i>	1
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	1
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	5
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	4
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	3
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	2
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	1

### 11.6.5 Wintering Bird Survey

The only bird recorded on site was the great shearwater; however, the following species were observed in the vicinity of Fanad head along the coast on the day of survey. Fulmar, gannet, cormorant, shag, guillemot, razorbill, kittiwake, oystercatcher, sanderling and ringed plover.

**Table 11.3 Results of the wintering bird survey conducted at Fanad**

Common name	Scientific name	Record count
Great Shearwater	<i>Puffinus gravis</i>	9

**Table 11.4 List of wintering birds that have been recorded at NBDC Hectad C24**

Taxonomic group	Common name	Scientific name	Record count
Bird	Alcidae	<i>Alcidae</i>	9
Bird	Arctic Skua	<i>Stercorarius parasiticus</i>	1
Bird	Arctic Tern	<i>Sterna paradisaea</i>	1
Bird	Atlantic Puffin	<i>Fratercula arctica</i>	4
Bird	Baird's Sandpiper	<i>Calidris bairdii</i>	1
Bird	Black Guillemot	<i>Cephus grylle</i>	12

<sup>23</sup> This value was calculated using the methods set out in Appendix II

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Black-headed Gull	<i>Larus ridibundus</i>	7
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	29
Bird	Black-throated Diver	<i>Gavia arctica</i>	1
Bird	Common Eider	<i>Somateria mollissima</i>	10
Bird	Common Goldeneye	<i>Bucephala clangula</i>	2
Bird	Common Guillemot	<i>Uria aalge</i>	52
Bird	Common Moorhen	<i>Gallinula chloropus</i>	7
Bird	Common Redshank	<i>Tringa totanus</i>	6
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	2
Bird	Common Scoter	<i>Melanitta nigra</i>	1
Bird	Common Shelduck	<i>Tadorna tadorna</i>	1
Bird	Common Snipe	<i>Gallinago gallinago</i>	7
Bird	Common Tern	<i>Sterna hirundo</i>	3
Bird	Dunlin	<i>Calidris alpina</i>	4
Bird	Eurasian Curlew	<i>Numenius arquata</i>	12
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	15
Bird	Eurasian Teal	<i>Anas crecca</i>	1
Bird	Eurasian Wigeon	<i>Anas penelope</i>	1
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	2
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	29
Bird	Gavia	<i>Gavia</i>	3
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	19
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	11
Bird	Great Northern Diver	<i>Gavia immer</i>	2
Bird	Great Skua	<i>Stercorarius skua</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	9
Bird	Greylag Goose	<i>Anser anser</i>	1
Bird	Herring Gull	<i>Larus argentatus</i>	37
Bird	Iceland Gull	<i>Larus glaucoides</i>	2
Bird	Kumlien's Iceland Gull	<i>Larus glaucoides subsp. kumlieni</i>	3
Bird	Larus	<i>Larus</i>	2
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	6
Bird	Little Egret	<i>Egretta garzetta</i>	1
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	7
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	2
Bird	Long-tailed Tit	<i>Aegithalos caudatus</i>	3
Bird	Mallard	<i>Anas platyrhynchos</i>	14
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	4
Bird	Mew Gull	<i>Larus canus</i>	17
Bird	Mute Swan	<i>Cygnus olor</i>	7
Bird	Northern Eider	<i>Somateria mollissima subsp. borealis</i>	2
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	147
Bird	Northern Gannet	<i>Morus bassanus</i>	45
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	8
Bird	Purple Sandpiper	<i>Calidris maritima</i>	2
Bird	Razorbill	<i>Alca torda</i>	14
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	3
Bird	Red-throated Diver	<i>Gavia stellata</i>	3
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	10
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	4
Bird	Sanderling	<i>Calidris alba</i>	2
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	1
Bird	Semipalmated Sandpiper	<i>Calidris pusilla</i>	1
Bird	Sooty Shearwater	<i>Puffinus griseus</i>	2
Bird	Tufted Duck	<i>Aythya fuligula</i>	7
Bird	Twite	<i>Carduelis flavirostris</i>	2

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Velvet Scoter	<i>Melanitta fusca</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	2
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	2
Bird	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	1

### 11.7 Recommendations

- Path areas at entries should be reinforced and managed to reduce compactions and de-vegetation.
- Access to hazardous cliff top areas should be managed.
- The habitats on site could be managed for increased coastal diversity through bespoke heathland management practices to increase the floral diversity.
- Additional interpretation material focusing on the ecological landscape and important features of the area could increase engagement with the site.

## Hook Lighthouse – Interesting Finds

### HIGHLIGHTS

There are a wide variety of marine mammals within the area of Hook Lighthouse including a large number of grey seals. It is a popular whale watching site during winter – particularly for humpback whales.



The cliffs of Hook Lighthouse provide ample habitat to support a wide range of birds such as kittiwakes and northern gannets. While well preserved fossils can be seen around the lighthouse.

### KEY RECOMMENDATIONS

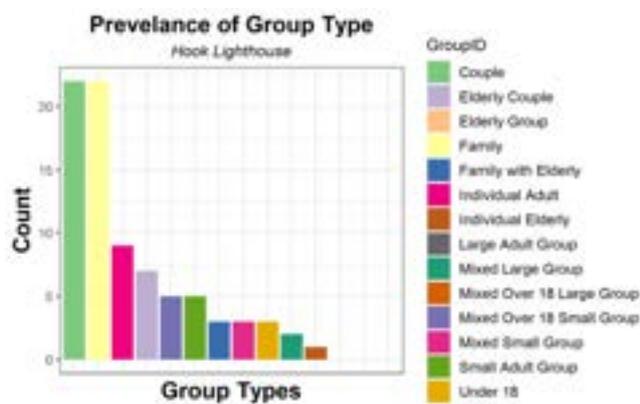
- There is insufficient parking around the lighthouse site for the volume of visitors resulting in disperse damage to the natural features of the site – however, these features have negligible ecological value but this gives rise to a poor appearance.
- Shore edge access management, including path provision needs to be addressed as amenity and safety issues.
- Given the high volume of visitors, this is a missed opportunity for nature communication through informative signage focused on the natural assets in the area.

### VISITOR INTERACTION & MANAGEMENT

- There are high levels of erosion and compaction along desire lines adjoining the rocky shore with a large percentage of the habitat surrounding these pathways being damaged.
- Majority of visitors only undertook walking on site.
- Most of the visitors to the site stayed for at least 50 minutes.
- Majority of visitors read signage that was available on site.

### VISITOR NUMBERS AND DWELL TIME

- 210 people visited the site over 8 hours
- Average dwell time of 50 minutes



### Highlights:

- Parking, campervan and caravan issues need to be examined.
- Long site dwell time of at least 50 minutes.
- Site signage on ecology is limited – missed opportunity for wildlife and habitats.

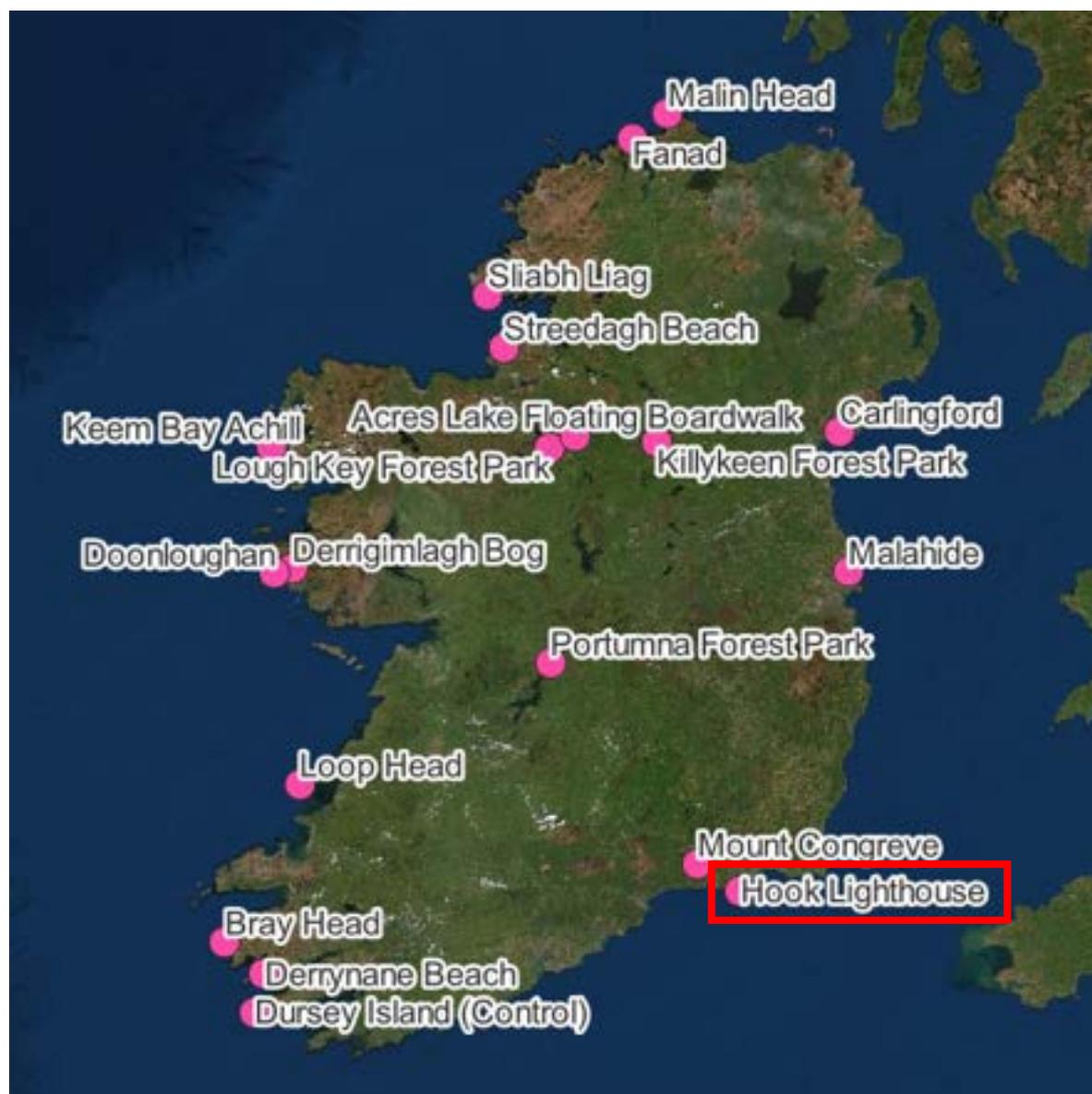


## 12 Hook Lighthouse

### 12.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 12.2 Methods & Surveys

The following surveys were undertaken at Hook Lighthouse:

### 12.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Hook Lighthouse was undertaken on the 31<sup>st</sup> of July 2021, with max temperatures reaching approximately 18.5° C, low levels of rainfall and low levels of wind on the day<sup>24</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 12.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>24</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 12.2.3 Other Surveys

Additional sample surveys were undertaken at Hook Lighthouse to identify the species presence of wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 12.3 Site Description of Hook Lighthouse

Aside from the attraction of Hook Lighthouse (Figure 10.1) being the oldest operational lighthouse in the world, it is considered to host one of the most stunning views in County Wexford, located at the tip of Hook Head. Guided tours of the lighthouse are plentiful and various species of marine wildlife can be spotted from the area, particularly during the winter. The lighthouse is contained within the Hook Head SAC and includes a range of habitats such as dry meadows and grassy verges and rocky sea cliffs.



**Figure 12.1 Hook Lighthouse**

## Hook Head SAC



**Figure 12.2 Study Area within Hook Head SAC**

### 12.4 Pathways and Features Condition Results

#### 12.4.1 Pathway Condition

There are two sets of conditions at this site. Those within the lighthouse compound, which are well managed and those surrounding which are not. There are high levels of erosion and compaction especially between the road and sea with hardly any vegetation growth in places. Longer stay patterns caused by campervans and caravans are intensifying this issue. To the east of the lighthouse there is severe pathway erosion through grasslands above the shore. with a large percentage of the habitat surrounding these pathways being damaged.



**Figure 12.3 Pathways identified at Hook Lighthouse**



**Figure 12.4 Pathway at Hook Lighthouse**

#### **12.4.2 Features Condition**

The site itself contains numerous features such as Hook Lighthouse itself along with a playground area (Figure 12.1). There is also a large sit-down area with benches along with a car park and set down areas for visitors to the site. The majority of the signage at Hook Lighthouse rightfully relates to warning signs that alert visitors of the potential of hazardous currents in the area. The remaining signage in the

area are directional signage which guide visitors around Hook Lighthouse. There is a lack of signage in the area which relates to the ecology and wildlife of the surrounding area.



**Figure 12.5 Features recorded at Hook Lighthouse**





**Figure 12.6 Features at Hook Lighthouse**

**12.4.3 Hazards**

The hazard mapping identified multiple points at Hook Lighthouse where strong currents have been observed along the edge of the site (Figure 12.8) and cliff edges where there are no barriers.



**Figure 12.7 Hazards recorded at Hook Lighthouse**



**Figure 12.8 Hazards at Hook Lighthouse**

### 12.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 210 visitors (which represent 82 group observations). The site is most popular amongst the Couple Family group with the dominant mode of transport being car. The average dwell time for the site was 50 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Picnicking
Cycling
Dog walking (on lead)
Exploring off trail
Photographing
Sitting
BBQing
Delivery to lighthouse
Dog walking (off lead)
Jogging

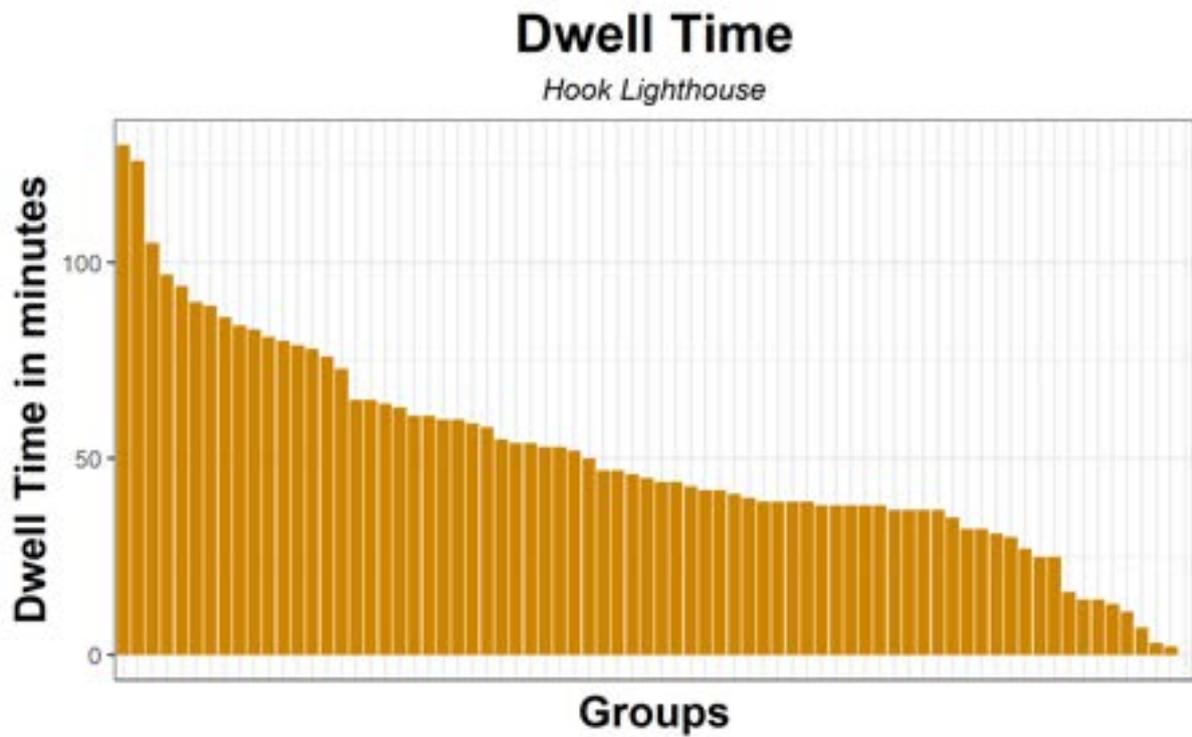


Figure 12.9 Duration of Time Spent at Hook Lighthouse

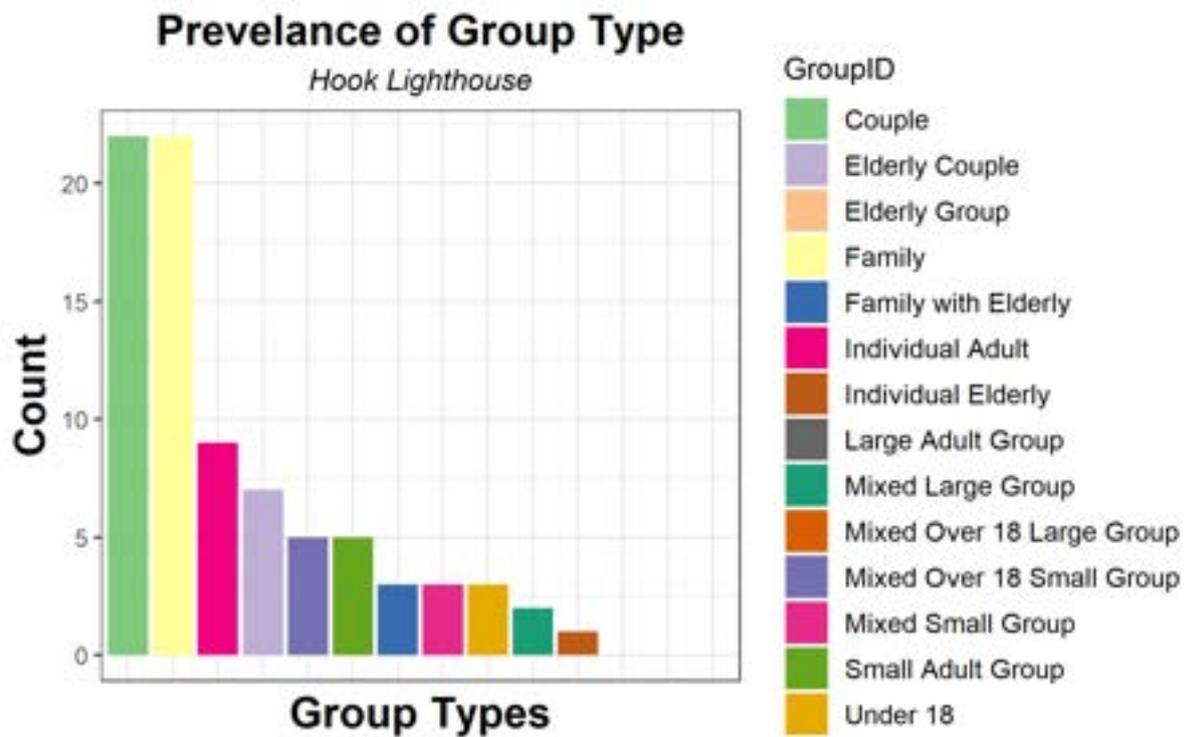
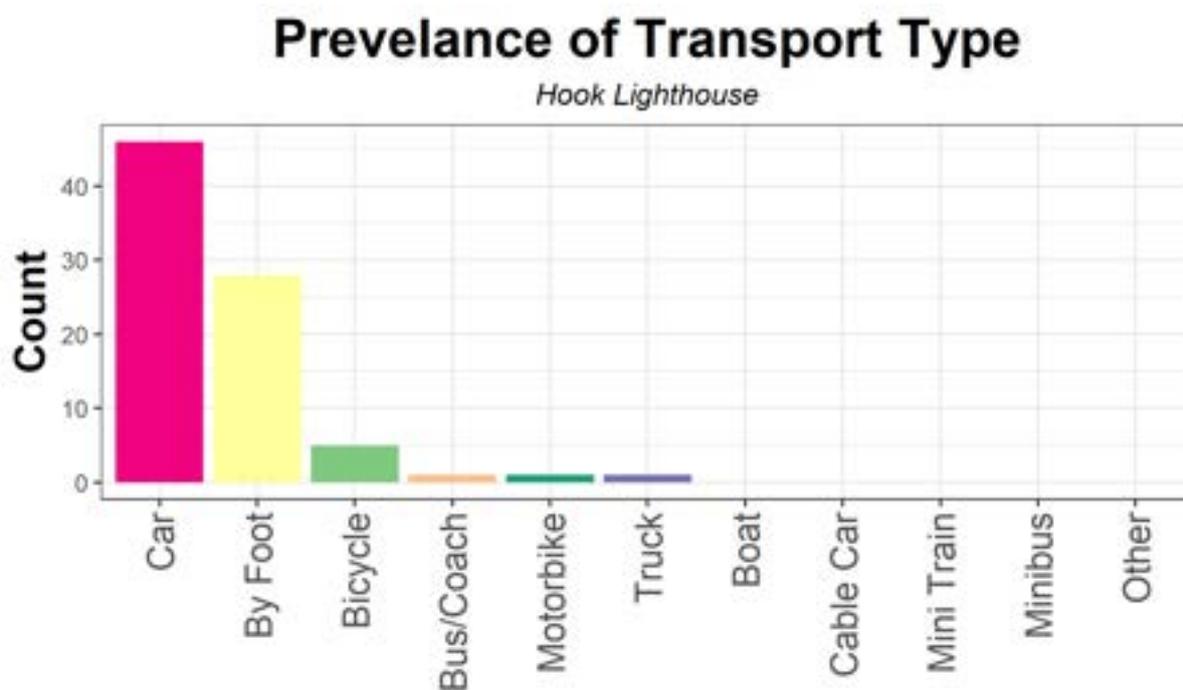
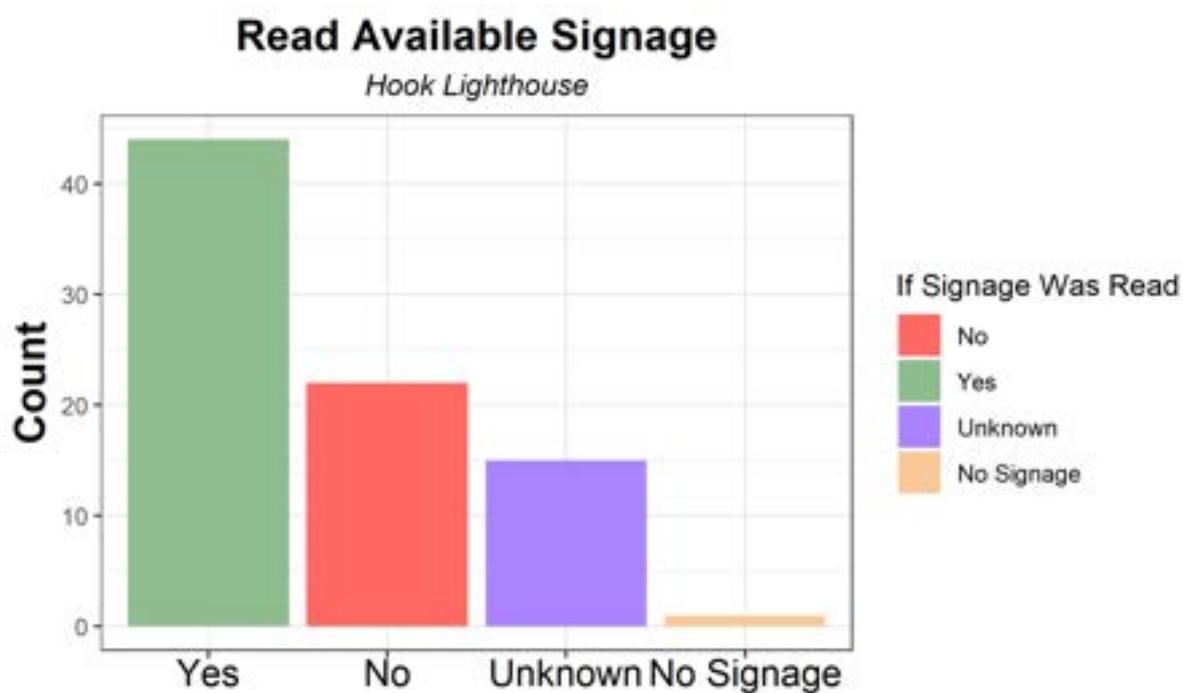


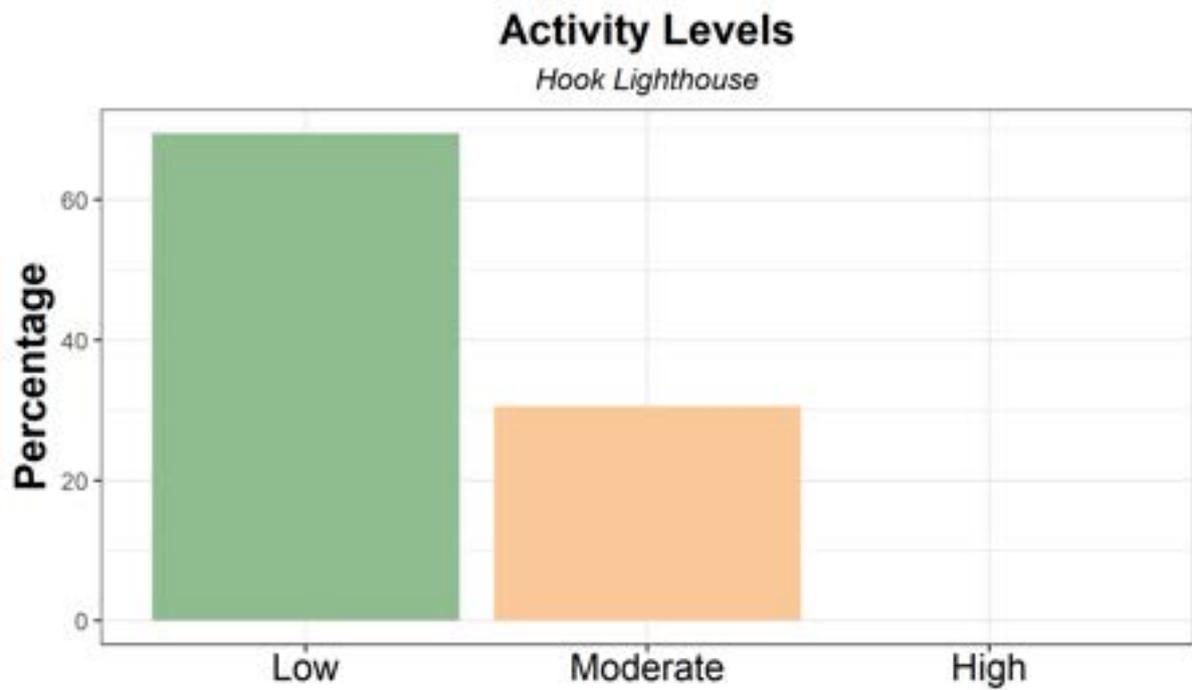
Figure 12.10 Groups of visitors that visited Hook Lighthouse



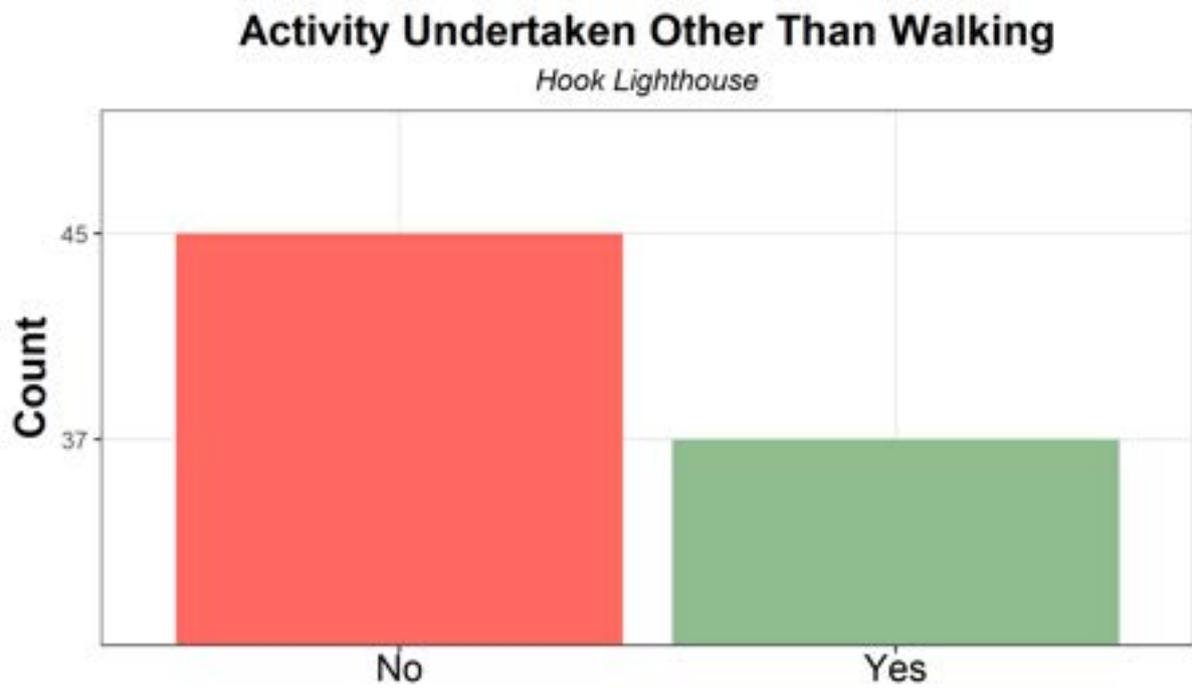
**Figure 12.11 Mode of transport used to visit Hook Lighthouse**



**Figure 12.12 Use of Interpretive Material at Hook Lighthouse**



**Figure 12.13 Categories of Activity Levels Observed at Hook Lighthouse**



**Figure 12.14 Activities undertaken other than walking**

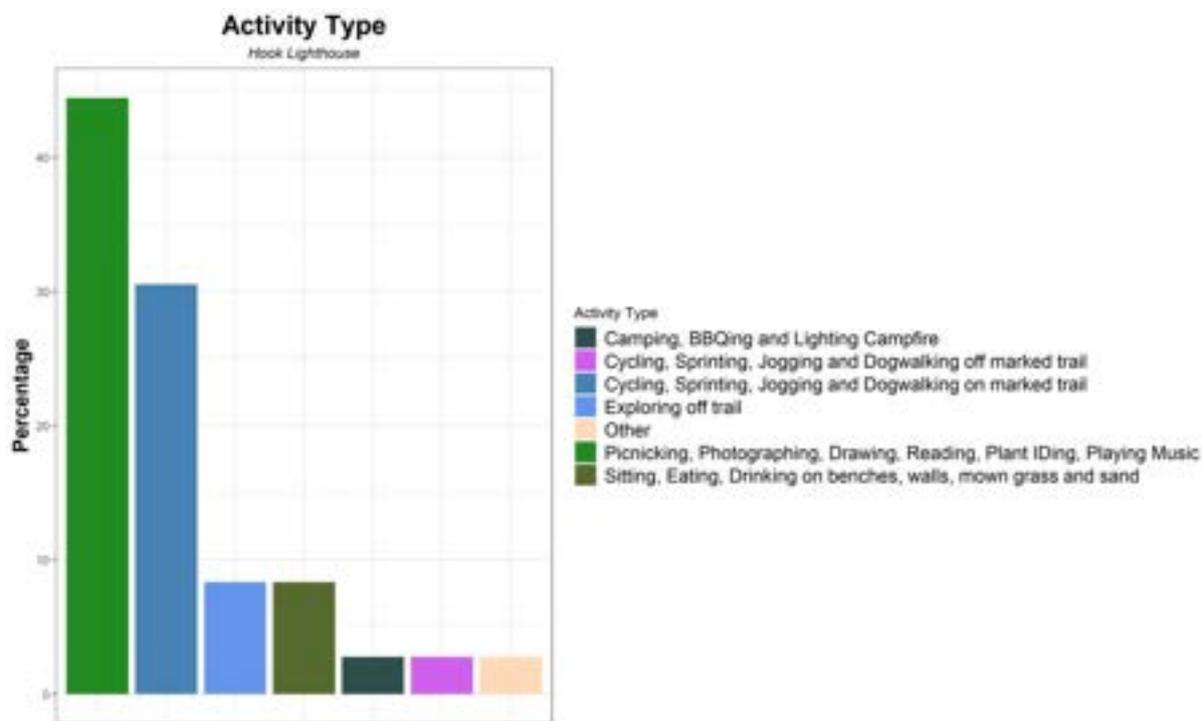


Figure 12.15 Range of Visitor Activities Observed at Hook Lighthouse

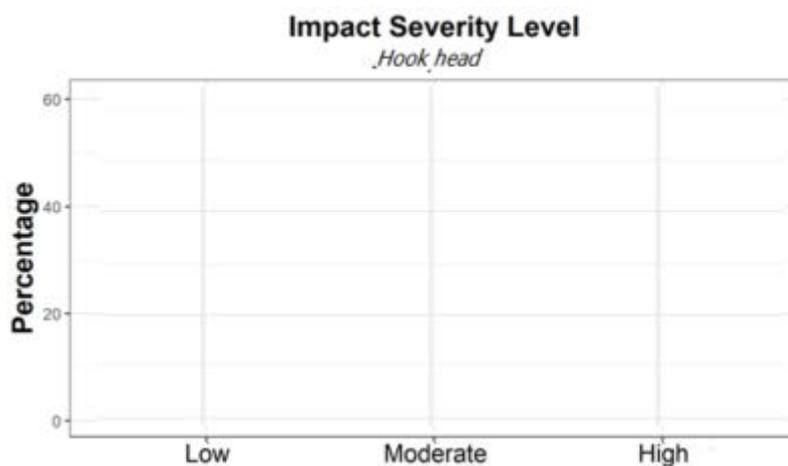
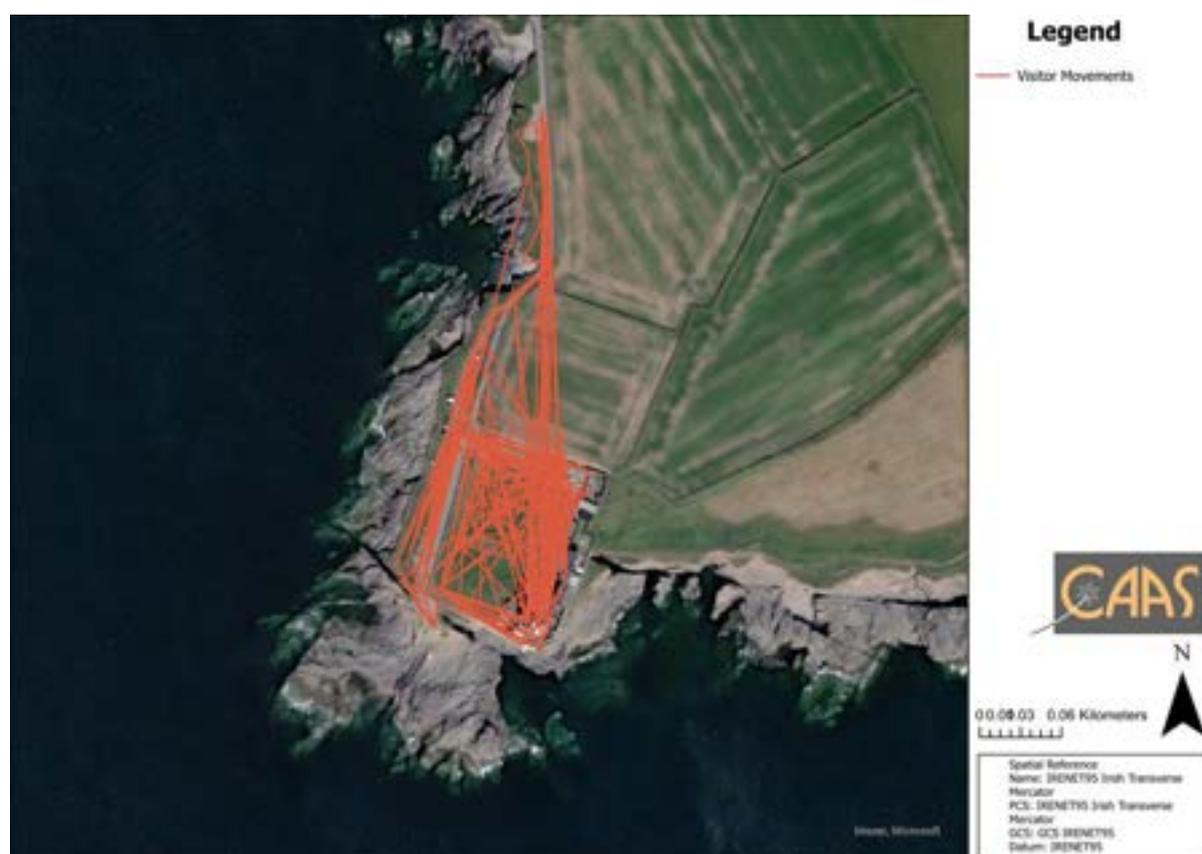


Figure 10.8 Categories of Environmental Impact Levels Observed at Hook Lighthouse as a result of Visitor Activities



**Figure 12.16 Visitor movement patterns to the west of Hook Lighthouse**

Of the 82 groups recorded on site 45% of them undertook activities other than walking. These activities (identified above) resulted in no observable impacts to the receiving environment individually. However, there is clear evidence that the site is impacted by visitor interactions in combination (see below).

## 12.6 Ecological Monitoring Results

### 12.6.1 Ecological Constraints

The habitats around hook lighthouse are sensitive to land use management, pollution, alien species and anthropogenic disturbance.

**Table 12.1 Designated sites within 2km of Hook Lighthouse and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000764]	Hook Head pNHA	0	pNHA	
[000764]	Hook Head SAC	0	SAC	Reefs [1170], Large shallow inlets and bays [1160], Vegetated Sea cliffs of the Atlantic and Baltic Coasts [1230]

### 12.6.2 Habitat Descriptions

The majority of Hook Lighthouse is made up of rocky sea cliffs (Fossitt Code CS1), which align with the SAC, Hook Head, is designated (Vegetated Sea cliffs of the Atlantic and Baltic Coasts [1230]). The area surrounding Hook Lighthouse itself is made up of a more managed habitat in dry meadows and grassy verges (Fossitt Code GS2).

There is serious erosion and damage caused by carparking, vehicular movement and overuse/trampling from visitors on the grassland habitats on site. This has resulted in exposed areas and a poorly presented site – however, the affected habitats have negligible ecological value and therefore hard infrastructure carparking could be explored to improve the overall aesthetic of the site.



**Figure 12.17 Habitats present at Hook Lighthouse**

### 12.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>25</sup> following the assessment scale was "3" which means the majority of the habitats have a widespread degree of negative impact, but slight and capable of rapid recovery. There were 4 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to vehicles, camping and fires.

The causes of the damage were identified to be parking and turning vehicles, camping, burning fires and general site overuse.

### 12.6.4 Mammals on Site

No mammals were recorded at Hook Lighthouse. The NBDC data shows that the majority of mammals observed in the area are marine mammals, especially whales due to the coastal nature of Hook Lighthouse. The terrestrial mammals in the area are made of species such as badgers and hares while fin whales and grey seals were the most observed marine mammals.

**Table 12.2 List of mammals that have been recorded at NBDC Hectad X79**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	3
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	18
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	20
Marine mammal	Common Seal	<i>Phoca vitulina</i>	1
Marine mammal	Delphinidae	<i>Delphinidae</i>	2
Marine mammal	Fin Whale	<i>Balaenoptera physalus</i>	48
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	33
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	23
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	5

<sup>25</sup> This value was calculated using the methods set out in Appendix II

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Phocidae	<i>Phocidae</i>	2
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	3
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	2
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	5
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	1
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	2
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	2
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	1
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	1
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

### 12.6.5 Wintering Bird Survey

Common gull species were observed foraging off the coast of hook head during the survey.

**Table 12.3 Results of the wintering bird survey conducted at Hook Lighthouse**

Common name	Scientific name	Record count
Herring Gull	<i>Larus argentatus</i>	16
Black-headed Gull	<i>Larus ridibundus</i>	26

**Table 12.4 List of wintering birds that have been recorded at NBDC Hectad X79**

Taxonomic group	Common name	Scientific name	Record count
Bird	Atlantic Puffin	<i>Fratercula arctica</i>	1
Bird	Black-headed Gull	<i>Larus ridibundus</i>	8
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	26
Bird	Brent Goose	<i>Branta bernicla</i>	1
Bird	Common Crane	<i>Grus grus</i>	2
Bird	Common Greenshank	<i>Tringa nebularia</i>	1
Bird	Common Guillemot	<i>Uria aalge</i>	9
Bird	Common Moorhen	<i>Gallinula chloropus</i>	9
Bird	Common Redshank	<i>Tringa totanus</i>	5
Bird	Common Shelduck	<i>Tadorna tadorna</i>	1
Bird	Common Snipe	<i>Gallinago gallinago</i>	4
Bird	Common Tern	<i>Sterna hirundo</i>	2
Bird	Dunlin	<i>Calidris alpina</i>	3
Bird	Eurasian Curlew	<i>Numenius arquata</i>	7
Bird	Eurasian Dotterel	<i>Charadrius morinellus</i>	5
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	14
Bird	Eurasian Teal	<i>Anas crecca</i>	3
Bird	Eurasian Wigeon	<i>Anas penelope</i>	1
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	1
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	3
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	10
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	4
Bird	Fea's Petrel	<i>Pterodroma feae</i>	1
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	1
Bird	Goldcrest	<i>Regulus regulus</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	16
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	13
Bird	Great Egret	<i>Ardea alba</i>	1
Bird	Great Northern Diver	<i>Gavia immer</i>	6
Bird	Great Skua	<i>Stercorarius skua</i>	1
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	5
Bird	Grey Plover	<i>Pluvialis squatarola</i>	4
Bird	Herring Gull	<i>Larus argentatus</i>	14

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Iceland Gull	<i>Larus glaucooides</i>	2
Bird	Larus	<i>Larus</i>	4
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	12
Bird	Little Auk	<i>Alle alle</i>	1
Bird	Little Plover	<i>Charadrius dubius</i>	1
Bird	Mallard	<i>Anas platyrhynchos</i>	9
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	8
Bird	Mew Gull	<i>Larus canus</i>	8
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	16
Bird	Northern Gannet	<i>Morus bassanus</i>	31
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	5
Bird	Purple Sandpiper	<i>Calidris maritima</i>	3
Bird	Razorbill	<i>Alca torda</i>	3
Bird	Red-throated Diver	<i>Gavia stellata</i>	5
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	6
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	7
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	2
Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	1
Bird	Whimbrel	<i>Numenius phaeopus</i>	5

### 12.7 Recommendations

- There is insufficient parking around the lighthouse site for the volume of visitors resulting in disperse damage to the natural features of the site – however, these features have negligible ecological value but this gives rise to a poor appearance.
- Shore edge access management, including path provision needs to be addressed as amenity and safety issues.
- Given the high volume of visitors, this is a missed opportunity for nature communication through informative signage focused on the natural assets in the area.

## Keem Bay Achill – Interesting Finds

### HIGHLIGHTS

Keem Bay has been voted 'Best Beach' in both national and global surveys. It is a Signature Discovery Point on the Wild Atlantic Way.



The bay itself is known to host seasonal migratory species such as the basking shark. It also has important marine community compositions on the cold-water reefs.

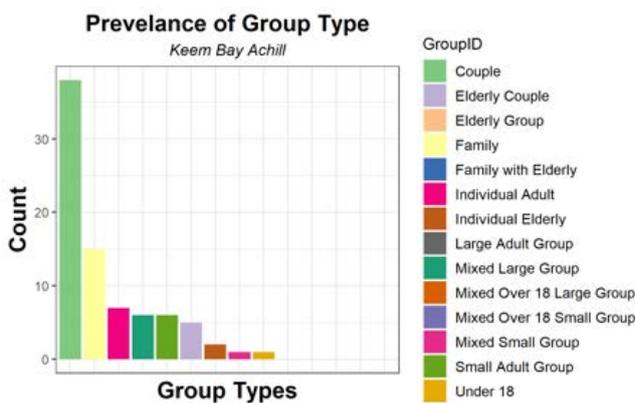
### KEY RECOMMENDATIONS

- Given its remote nature there is evidence of high volumes of wild camping. Camping and site overuse are the recorded as threats to the site related to tourism.
- These impacts are localised to the path's tracks and trails (or directly adjacent).
- A dynamic path management system could alleviate the pressures which are occurring.
- Consideration should be given to the appointment of a seasonal warden/ environmental awareness tourism engagement officer.



### VISITOR NUMBERS AND DWELL TIME

- 220 people visited the site over 8 hours
- Average dwell time of 85 minutes



### Highlights:

- Path management system is needed
- Camping and BBQ control measures are needed.
- Long site dwell time of at least 85 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.

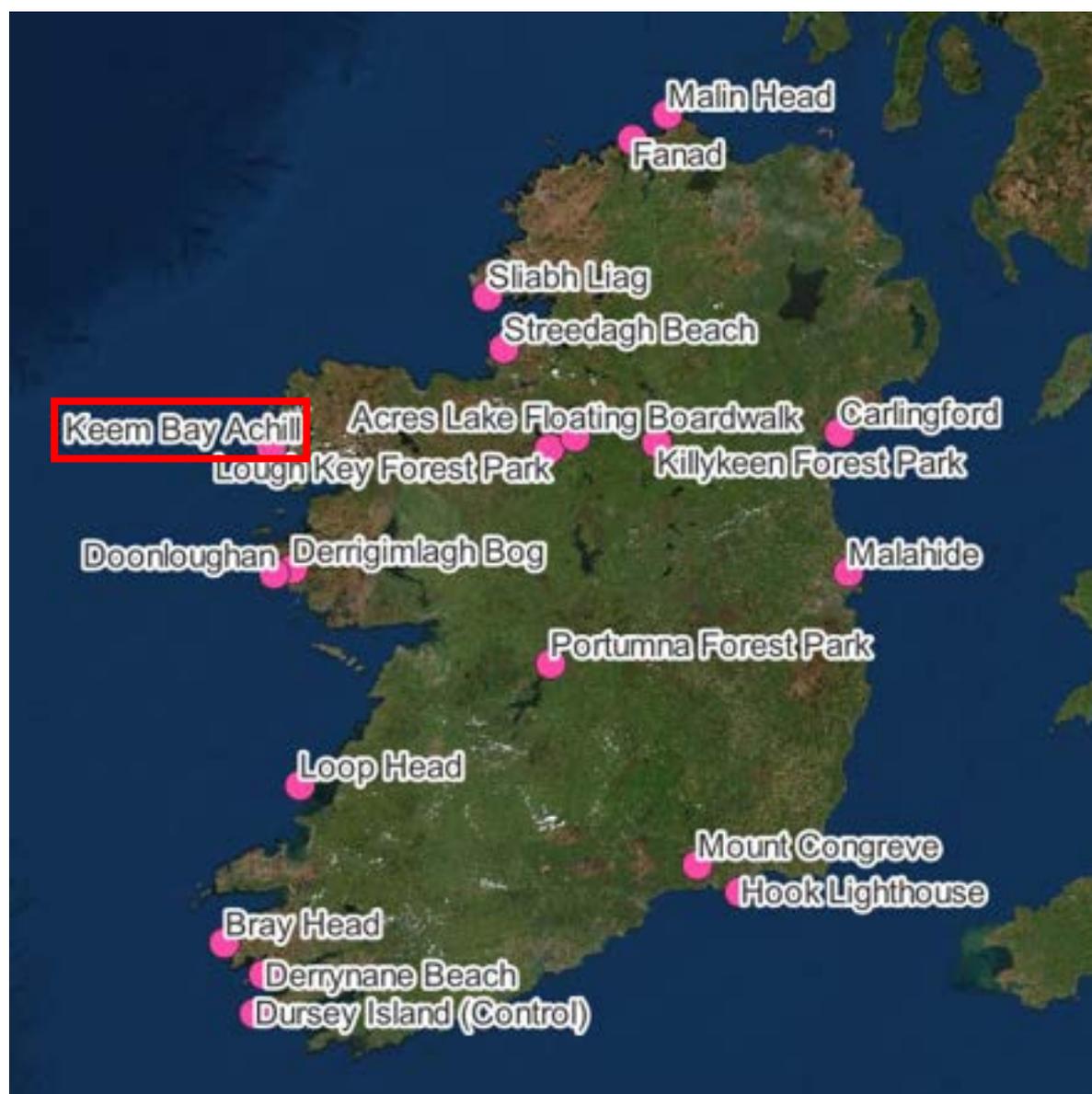


## 13 Keem Bay Achill

### 13.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Ireland's regional areas; The Wild Atlantic Way, Ireland's Hidden Heartlands, Ireland's Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;

- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to development a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 13.2 Methods & Surveys

The following surveys were undertaken at Keem Bay:

### 13.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Keem Bay Achill was undertaken on the 26<sup>th</sup> of June 2021, with max temperatures reaching approximately 17.2° C, no rainfall and moderate levels of wind on the day<sup>26</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 13.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>26</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 13.2.3 Other Surveys

Additional sample surveys were undertaken at Keem Bay to identify the species presence mammals and winter bird surveys. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 13.3 Site Description of Keem Bay Achill

Keem Bay is located on the west coast of Achill Island in County Mayo, just past the village of Dooagh. Keem Bay contains relatively isolated and protected beach (Figure 2.1) that is popular for various water sports. It is well managed with parking and visitor facilities. The area itself makes up part of both the Coraghuan/Slievemore and Achill Head Special Areas of Conservation and contains multiple habitats such as wet heath, sand shores and sedimentary sea cliffs. The site is used as one of the access points by walkers on the The Croaghnaun Cliffs Walk. That lie to the west of the Bay.



**Figure 13.1 Keem Bay Achill**

## Achill Head SAC



**Figure 13.2 Study Area within Achill Head SAC**

### 13.4 Pathways and Features Condition Results

#### 13.4.1 Pathway Condition

The site has hard infrastructure access tracks to the beach – these have clear signs of being undersized with the edge habitats eroding with heavily compacted substrate. The trail to the cliff edge is a vegetated trail which is highly variable with a number of breakout points evident throughout. This path is up to 10m in width at its widest point. Erosion and damage to the path is most evident at the steep incline elements. Substrate exposure levels typically ranged from 15-30% showing the trail is over capacity.



**Figure 13.3 Pathways identified at Keem Bay Achill**



**Figure 13.4 Pathways at Keem Bay Achill**

#### 13.4.2 Features Condition

The signage at Keem Bay Achill contains information regarding wildlife which can be seen in the area, and trail maps (Figure 13.6). Also present are water safety signs with regard to safety when undertaking leisure and recreational activities and man-made signs prohibiting campfires. Also dotted around the area are bins, benches and a small number of disused buildings. Along with these, there are also facilities for lifeguards.



**Figure 13.5 Features recorded at Keem Bay Achill**



**Figure 13.6 Signs at Keem Bay Achill**

### 13.4.3 Hazards

Multiple impacts were noted at Keem Bay Achill including, a large number of fire pits and burned areas that were visible close to the beach area (Figure 13.7). Along with this, a number of desire lines were noted along with signs of camping. The cliff top paths to the west of the bay have very high unprotected exposure to high steep cliffs.

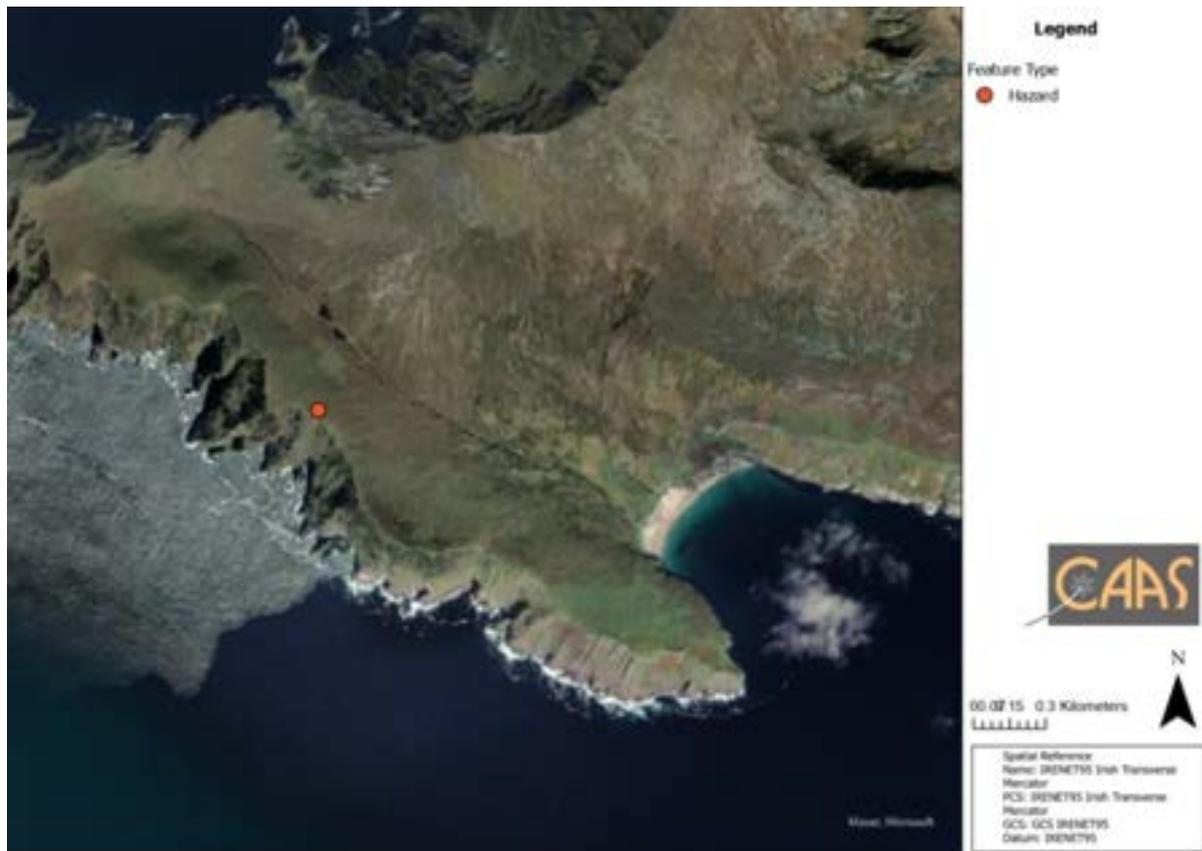


Figure 13.7 Hazards recorded at Keem Bay Achill



Figure 13.8 Remnants of a campfire at Keem Bay Achill

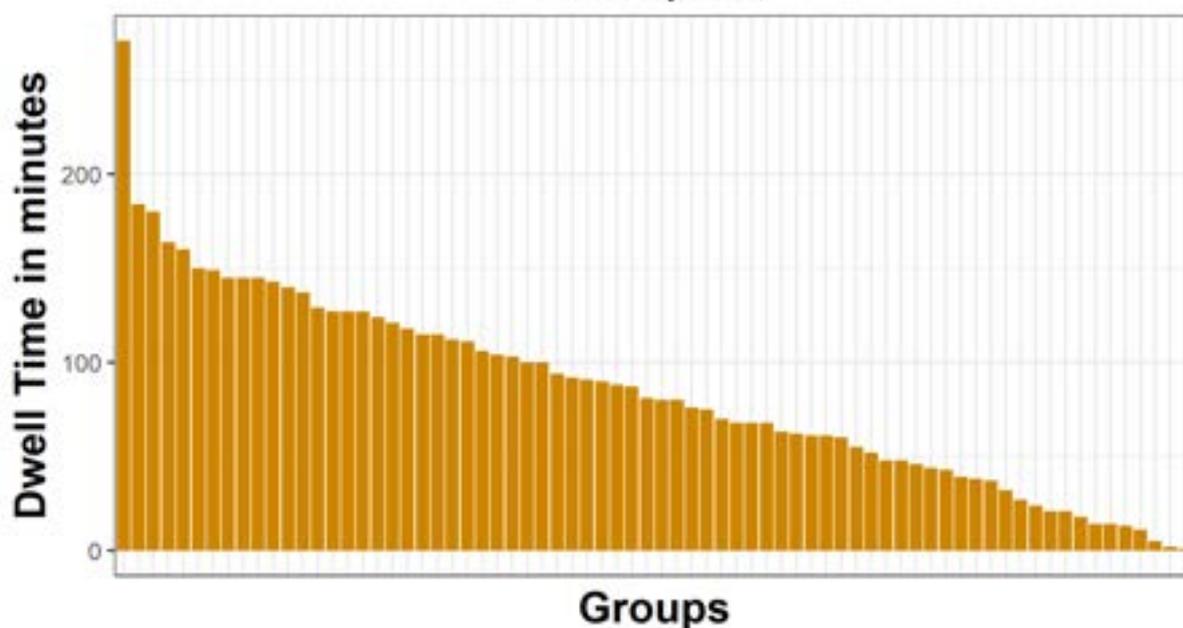
### 13.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 220 visitors (which represent 81 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being Car. The average dwell time for the site was 85 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Swimming
Sitting
Cycling
Bodyboarding
Camping
Hiking
Other Aquatic Sport
Photographing
Picnicking
Scuba diving
Dog walking (on lead)
Exploring off trail
Frisbee/ Catch
Snorkeling
Surfing

## Dwell Time

*Keem Bay Achill*



**Figure 13.9 Duration of Time Spent at Keem Bay Achill**

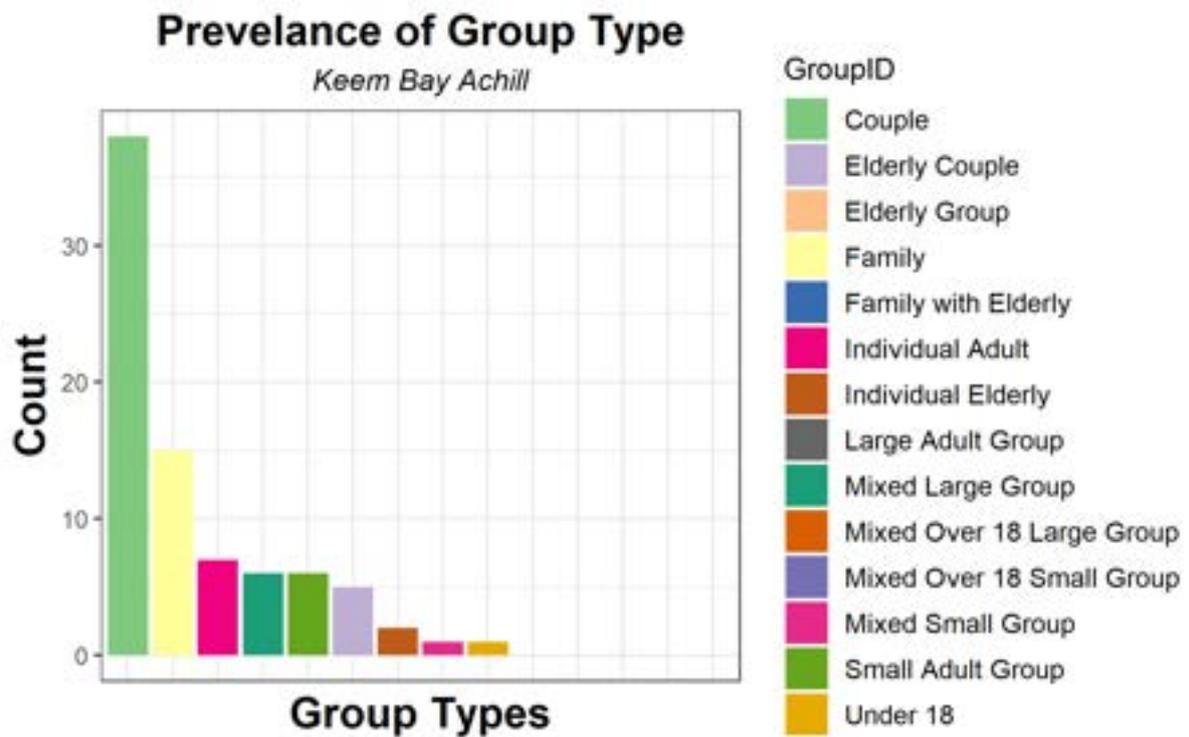


Figure 13.10 Groups of visitors that visited Keem Bay Achill

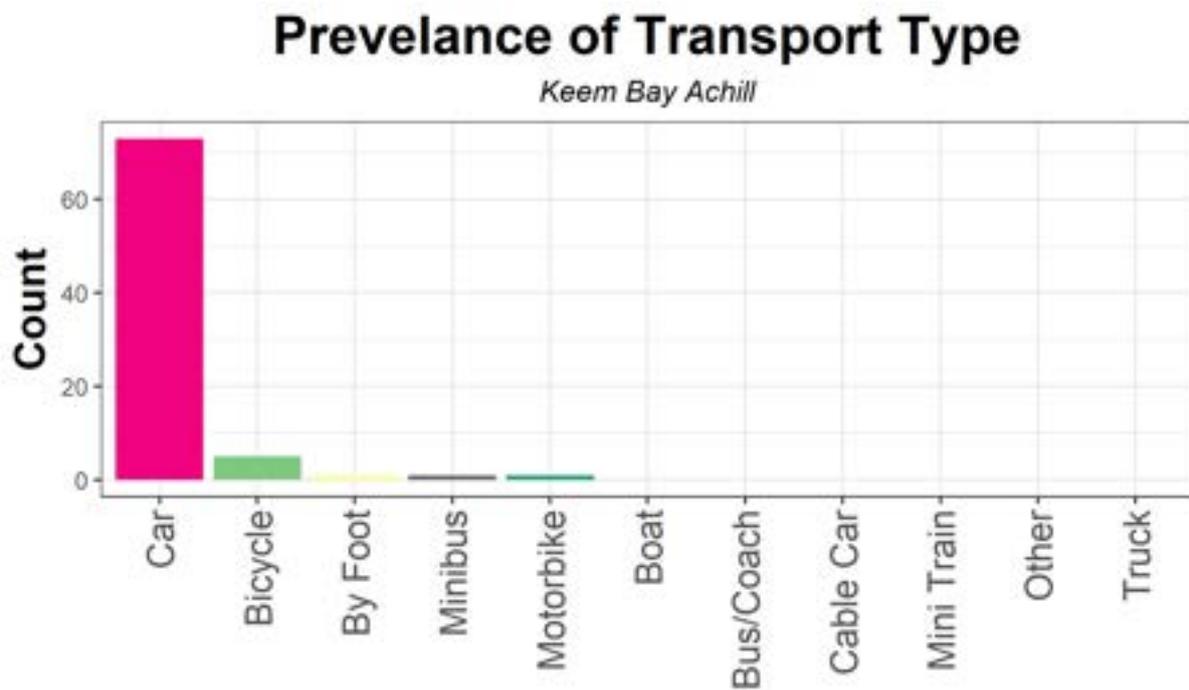
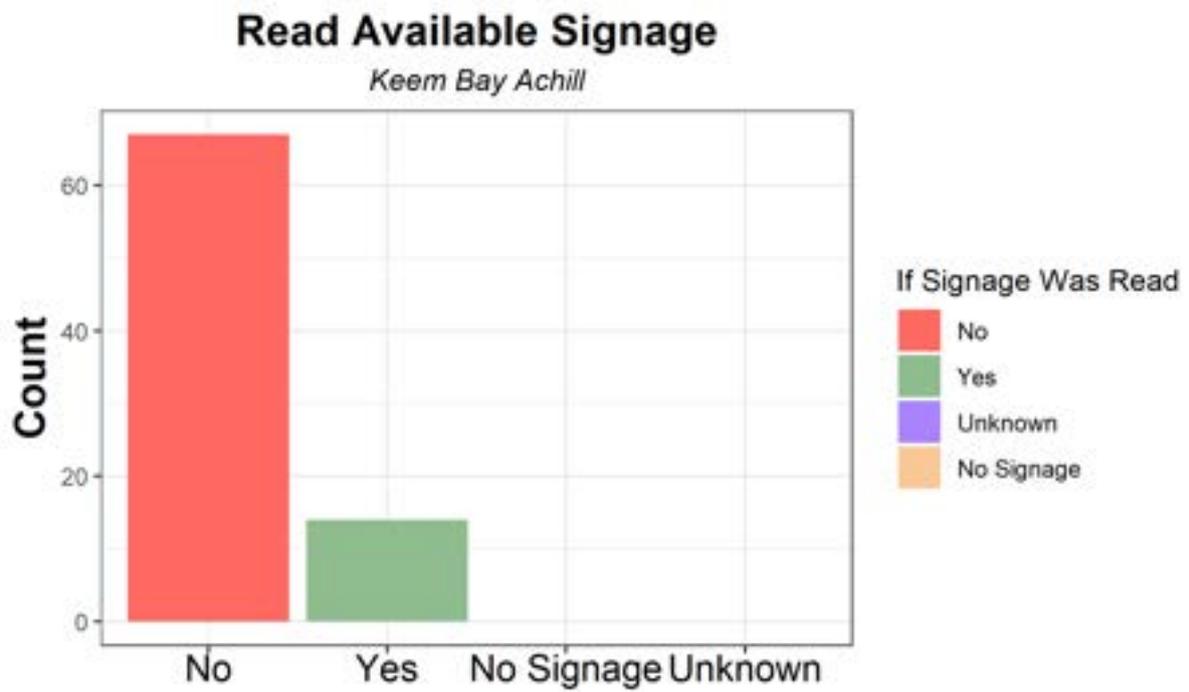
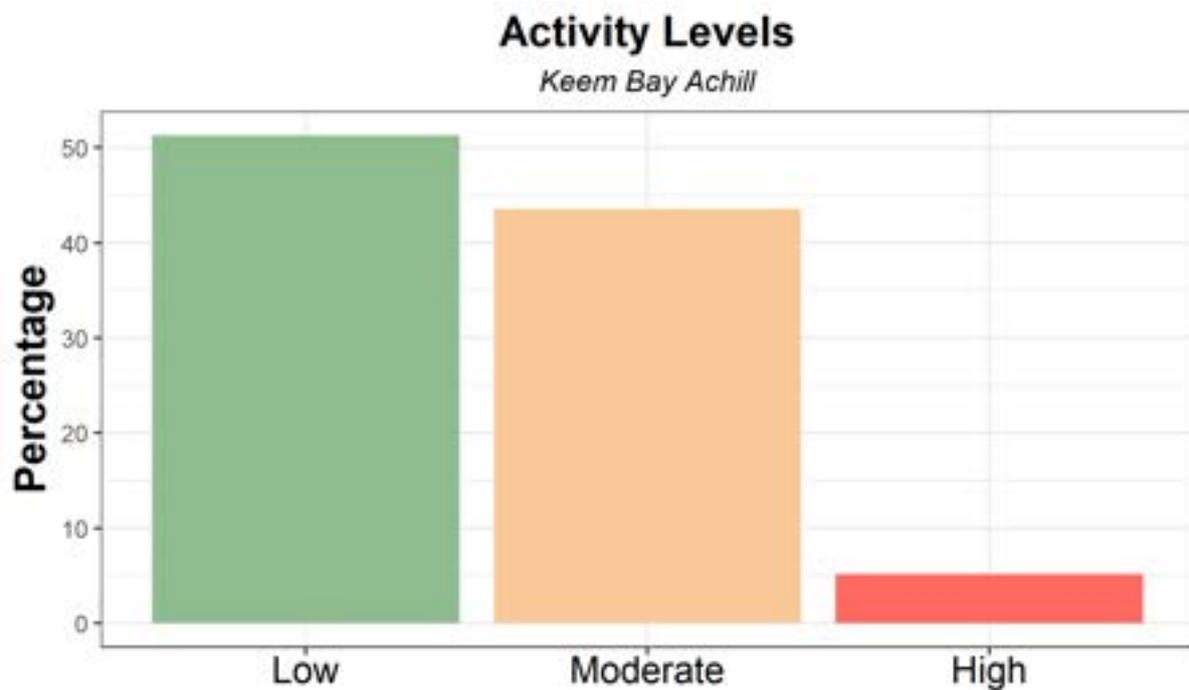


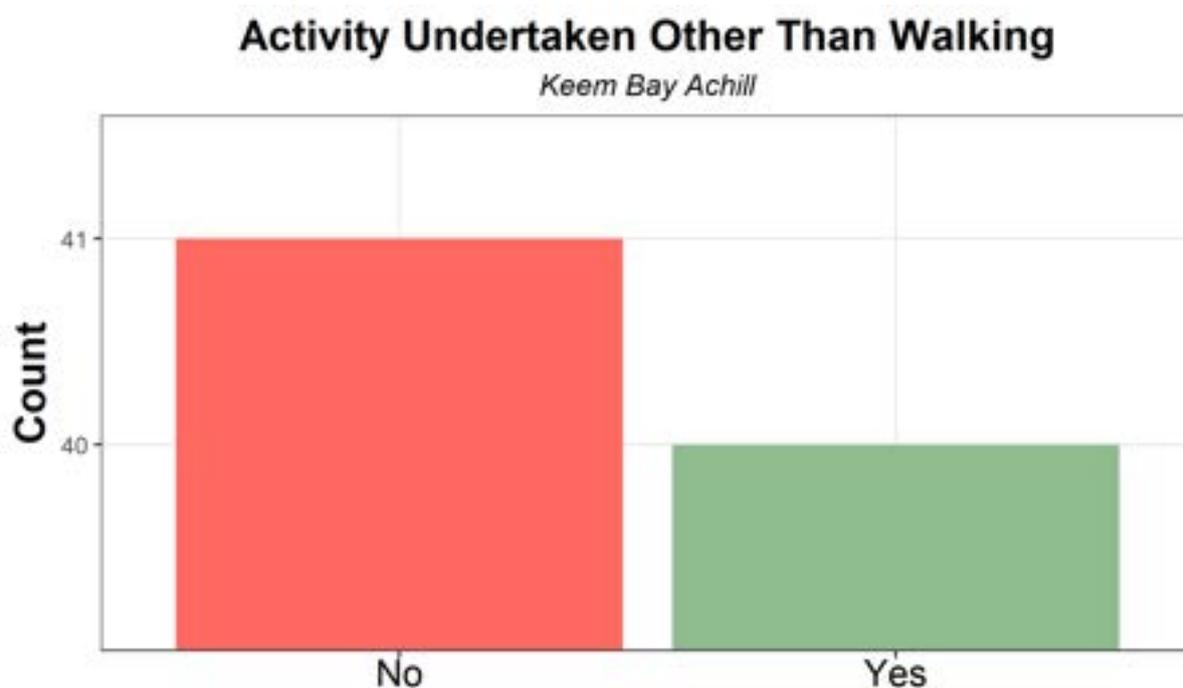
Figure 13.11 Mode of transport used to visit Keem Bay Achill



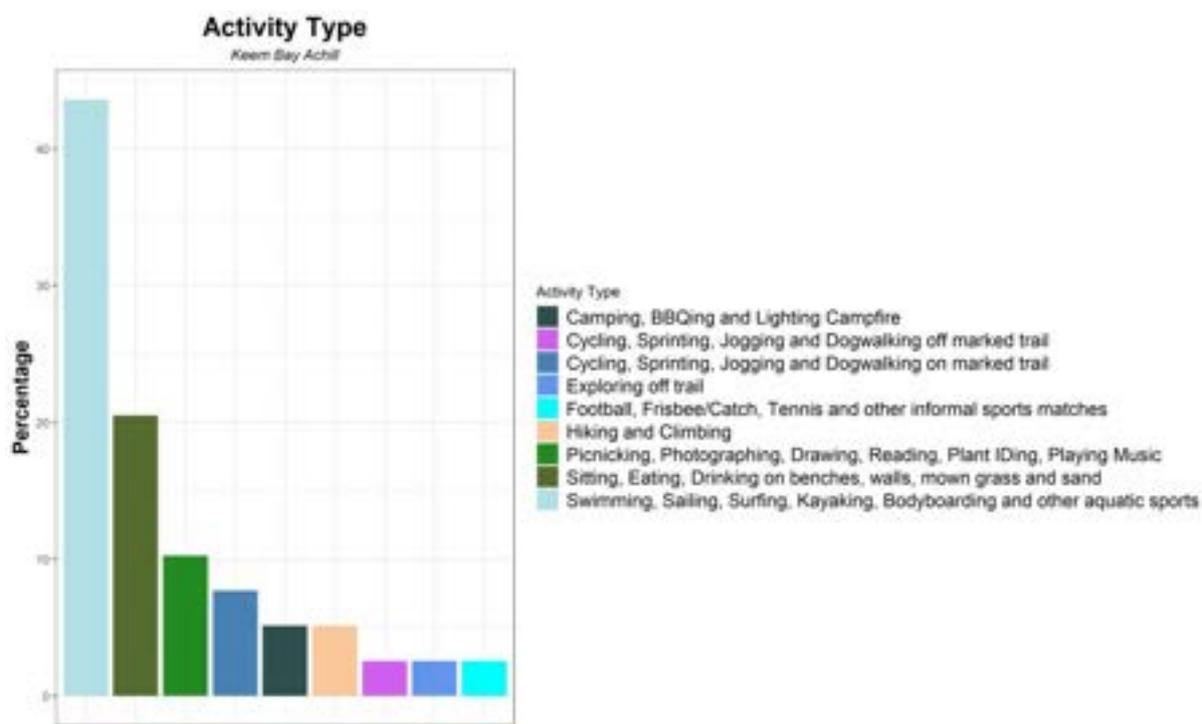
**Figure 13.12 Use of Interpretive Material at Keem Bay Achill**



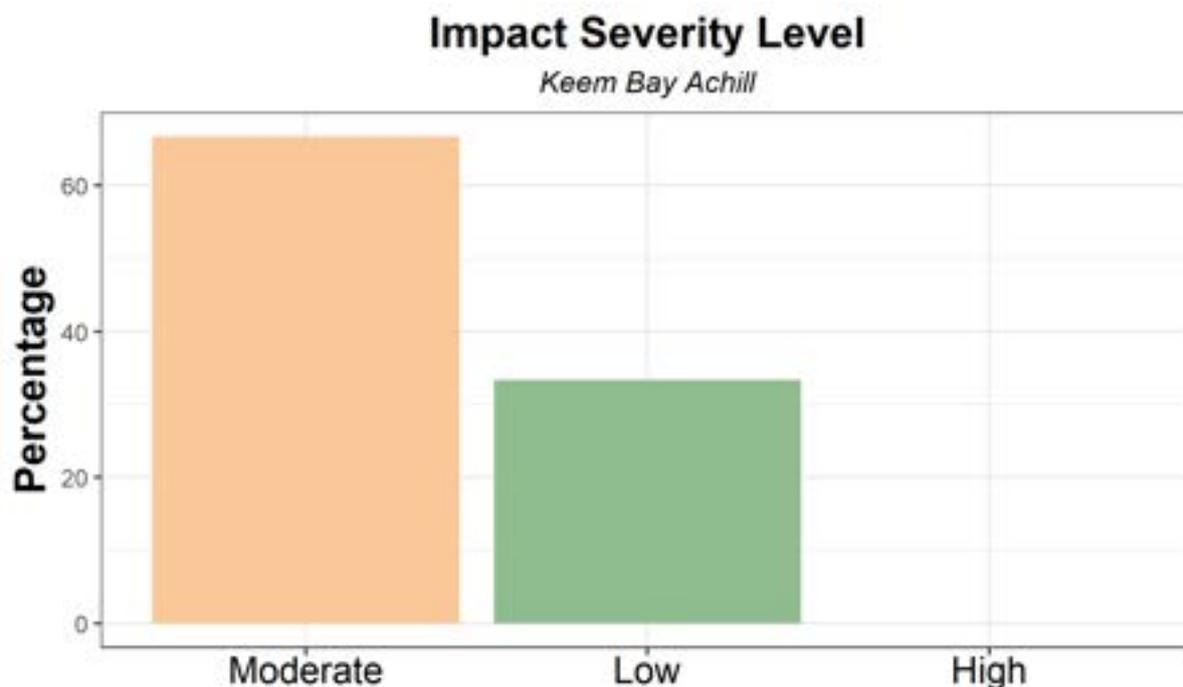
**Figure 13.13 Categories of Activity Levels Observed at Keem Bay Achill**



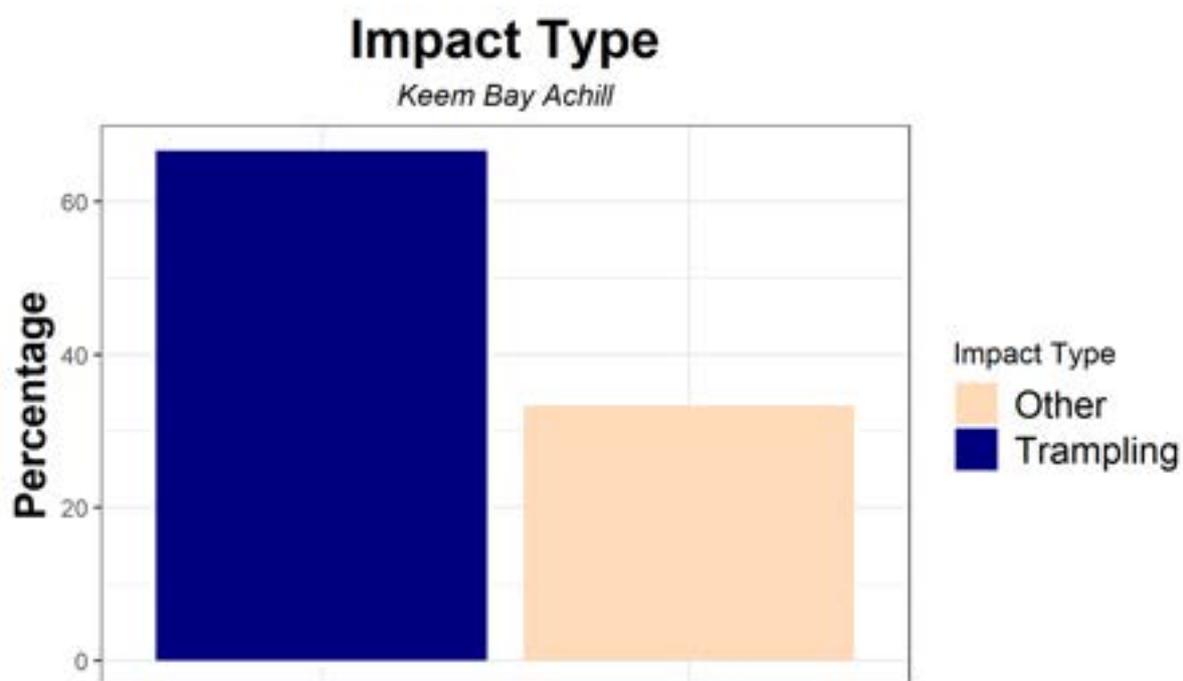
**Figure 13.14 Activities undertaken other than walking**



**Figure 13.15 Range of Visitor Activities Observed at Keem Bay Achill**

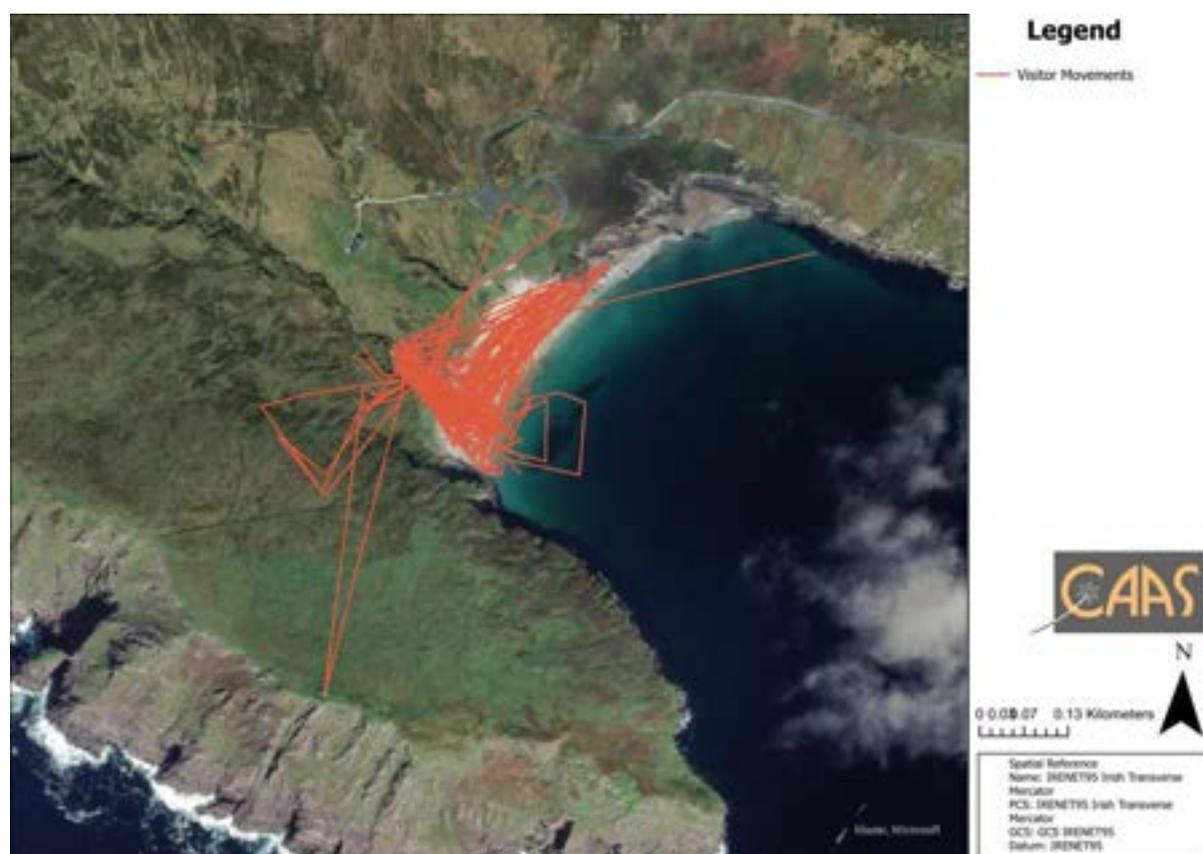


**Figure 13.16 Categories of Environmental Impact Levels Observed at Keem Bay Achill as a result of Visitor Activities<sup>27</sup>**



**Figure 13.17 Range of Environmental Impacts Observed at Keem Bay Achill**

<sup>27</sup> Impact severity was measured as a categorical variable which has a range of impact factors that are pre-determined; such as injuring, killing or taking wildlife as a severe impact (high) and temporary disturbance of wildlife being a low impact. These are explained fully in the method section above.



**Figure 13.18 Visitor movement patterns at Keem Bay Achill**

Of the 81 groups recorded on site 49% of them undertook activities other than walking. These activities (identified above) resulted in 3 impacts being observed on site during the survey. Thus, 8% of activities on site resulted in impacts on the environment. The impact severity levels varied with 33% of the impacts being low, 67% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Other	1
Trampling	2

## 13.6 Ecological Monitoring Results

### 13.6.1 Ecological Constraints

The habitats within 2km of Keem Bay Achill are sensitive to pollution, hydrological changes, overgrazing and land use management.

**Table 13.1 Designated sites within 2km of Keem Bay Achill and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001955]	Croaghaun/Slievemore pNHA	0.00	pNHA	
[001955]	Croaghaun/Slievemore SAC	0.00	SAC	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Blanket bogs * if active bog [7130], European dry heaths [4030], Alpine and Boreal heaths [4060], Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> ) [8110]

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002268]	Achill Head SAC	0.05	SAC	Large shallow inlets and bays [1160], Mudflats and sandflats not covered by seawater at low tide [1140], Reefs [1170]

### 13.6.2 Habitat Descriptions

The habitats at Keem Bay are shingle shores – but the surrounding habitats along the upland areas are wet heath (Fossitt Code HH3) which align with the Annex I habitat for which the SAC is designated (Northern Atlantic wet heaths with *Erica tetralix* [4010]). The cliff face itself is a sedimentary cliff edge.

Although fewer visitors were observed departing from the lower altitudes and most of the movements were recorded at the beach itself. It is evident through the path condition assessment that the trails through the heathland are eroding with 100% exposed substrate in some instances.



**Figure 13.19 Habitats present at Keem Bay Achill**

### 13.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>28</sup> following the assessment scale was "2" which means the majority of the habitats have a localised degree of negative impact, but slight and capable of rapid recovery. There were 14 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be fire pits, desire lines, litter and dog fouling.

### 13.6.4 Mammals on Site

No mammals were recorded on site at Keem Bay Achill. The NBDC data shows that there are not many terrestrial mammals in the area and the majority of observations were of marine mammals, this is due to both the location of Keem Bay Achill and the habitats available. The only two terrestrial mammals recorded were badgers and otters, with grey seals and bottle-nosed dolphins being the most observed marine species.

<sup>28</sup> This value was calculated using the methods set out in Appendix II

**Table 13.2 List of mammals that have been recorded at NBDC Hectad F50**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	16
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	8
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	6
Marine mammal	Common Seal	<i>Phoca vitulina</i>	1
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	45
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	2
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	1
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	3
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	3

**13.6.5 Wintering Bird Survey**

The shallow bay provides good habitat for winter waders – however, most of the activity observed on site was in the deeper areas of the bay. Additionally, the areas along the coast (including Keel Bay) had high levels of winter waders. There is thought to be high levels of seasonal variations in site use by waders but the species known to occur are seen below.

**Table 13.3 Results of the wintering bird survey conducted at Keem Bay**

Common name	Scientific name	Record count
Herring Gull	<i>Larus argentatus</i>	7

The only birds observed to be foraging on site during the winter bird survey were herring gull (7 individuals); however, there are a number of species known to occur within the receiving environment.

**Table 13.4 List of wintering birds that have been recorded around Keem Bay**

Taxonomic group	Common name	Scientific name	Record count
Bird	Arctic Skua	<i>Stercorarius parasiticus</i>	1
Bird	Black Guillemot	<i>Cepphus grylle</i>	5
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	8
Bird	Common Guillemot	<i>Uria aalge</i>	2
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	2
Bird	Common Snipe	<i>Gallinago gallinago</i>	8
Bird	Eurasian Curlew	<i>Numerius arquata</i>	2
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	8
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	4
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	10
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	2
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	3
Bird	Great Black-backed Gull	<i>Larus marinus</i>	14
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	3
Bird	Great Northern Diver	<i>Gavia immer</i>	3
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	2
Bird	Greenland White-fronted Goose	<i>Anser albifrons subsp. flavirostris</i>	2
Bird	Herring Gull	<i>Larus argentatus</i>	17
Bird	Hooded Crow	<i>Corvus cornix</i>	14
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	8
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	2
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	2
Bird	Mallard	<i>Anas platyrhynchos</i>	4
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	18
Bird	Mew Gull	<i>Larus canus</i>	3
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	47
Bird	Northern Gannet	<i>Morus bassanus</i>	13
Bird	Purple Sandpiper	<i>Calidris maritima</i>	1
Bird	Razorbill	<i>Alca torda</i>	4

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	3
Bird	Sooty Shearwater	<i>Puffinus griseus</i>	1
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	5

### 13.7 Recommendations

A designated BBQ area would help to alleviate the existing problems related to uncontrolled fires – this could also include a fire pit area (on existing hard stand areas) to facilitate the social campfire experiences currently being undertaken on site in an uncontrolled manner.

Educational signage is required on site to ensure visitors understand the importance of the Wet Heathland habitat and the need to stick to the way marked trail.

Low intensity interventions should be explored with regard to trail restoration and improvements – such as rope enclosures to allow recovery of damaged areas. Where necessary path stabilising membranes should be installed however, this should be undertaken with regard to the Habitats Directive. Where necessary this may require the NPWS to incorporate management actions into the management plan for the SAC as a satisfactory AA process cannot be completed for any such works.

It is recommended that a warden is present during the peak season. This warden can manage the trails, ensure there is no littering or fire management issues and help to monitor any traffic congestion issues. This could also provide opportunities for broadening awareness of the importance of coastal systems and habitat management practices.

## Killykeen Forest Park – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

The woodland habitats of Killykeen and the surrounding area are perfect habitats for bat species such as the brown long eared bat to thrive as they require specific foraging habitat.



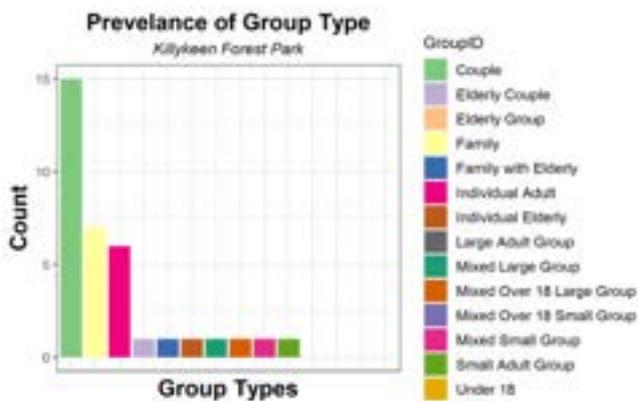
The site has a strong population of red squirrels and pine marten present. Moreover, due to the site’s location along Lough Oughter, it also provides perfect habitat for otters, although no otter holts were recorded. Additionally, the site is known to host winter waders such as the scaup.

### KEY RECOMMENDATIONS

- Management practices to support strong invertebrate populations should be explored as a foraging resource for bats on site. This could include stabilising standing dead wood (for safety) while leaving them upright. Placing piles of various sizes of deadwood along the woodland edge. Construction of banks and berms for invertebrate nesting and basking etc.
- Increasing roost availability through the installation of bat boxes – and potentially a bespoke lesser horseshoe bat roost structures accompanied by an attraction protocol if the species is confirmed to be present.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

### VISITOR NUMBERS AND DWELL TIME

- 91 people visited the site over 8 hours
- Average dwell time of 73 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 60% of all activities undertaken were considered to be low level activities such as picnicking and jogging.
- No observable impacts were recorded on site.
- Most of the visitors to the site stayed for at least 73 minutes –given the nature of the site.

### Highlights:

- Provides great habitat for bat species along with other mammals
- Long site dwell time of at least 73 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.



## 14 Killykeen Forest Park

### 14.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

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## 14.2 Methods & Surveys

The following surveys were undertaken at Killykeen Forest Park:

### 14.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Killykeen Forest Park was undertaken on the 7<sup>th</sup> of August 2021, with max temperatures reaching approximately 17.5° C, high levels of rainfall and low levels of wind on the day<sup>29</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitor s and local amenity use.

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<sup>29</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 14.2.3 Other Surveys

Additional sample surveys were undertaken at Killykeen Forest Park to identify the species presence of breeding birds, mammals and bats. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

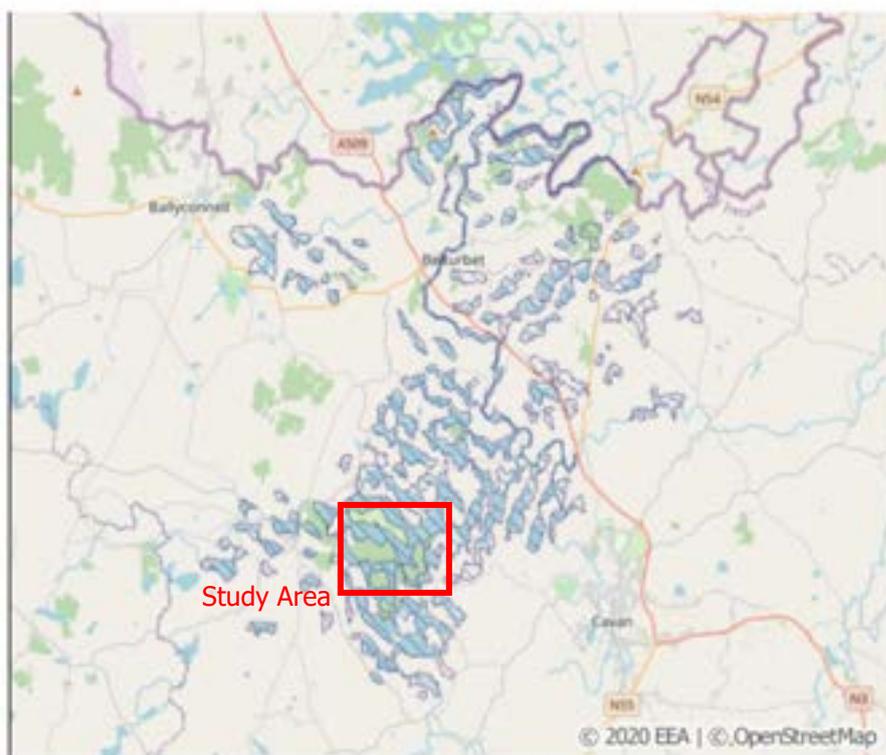
### 14.3 Site Description of Killykeen Forest Park

Killykeen Forest Park (Figure 14.1), a Coillte managed site, hosts a 3km long loop walk that traverses the forest with views of Lough Oughter. The site is well-used as it is quite close to the town of Cavan. It contains habitats such as broadleaved and yew woodland along with tall herb swamps. The loop walk is surrounded by both the Lough Oughter SPA and Lough Oughter and Associated Lough SAC.



**Figure 14.1 Killykeen Forest Park**

## Lough Oughter and Associated Loughs SAC



**Figure 14.2 Study Area within Lough Oughter and Associated Loughs SACE**

### 14.4 Pathways and Features Condition Results

#### 14.4.1 Pathway Condition

The site has hard infrastructure access tracks through the forest – these are well managed and maintained. The trail edge close to the carparking area and bridge show signs of path widening for small sections where it is evident that visitors cut corners etc. Or at the toilet facilities. This path is up to 2.5m in width at its widest point. There are no records of damage to the path with no substrate exposure.



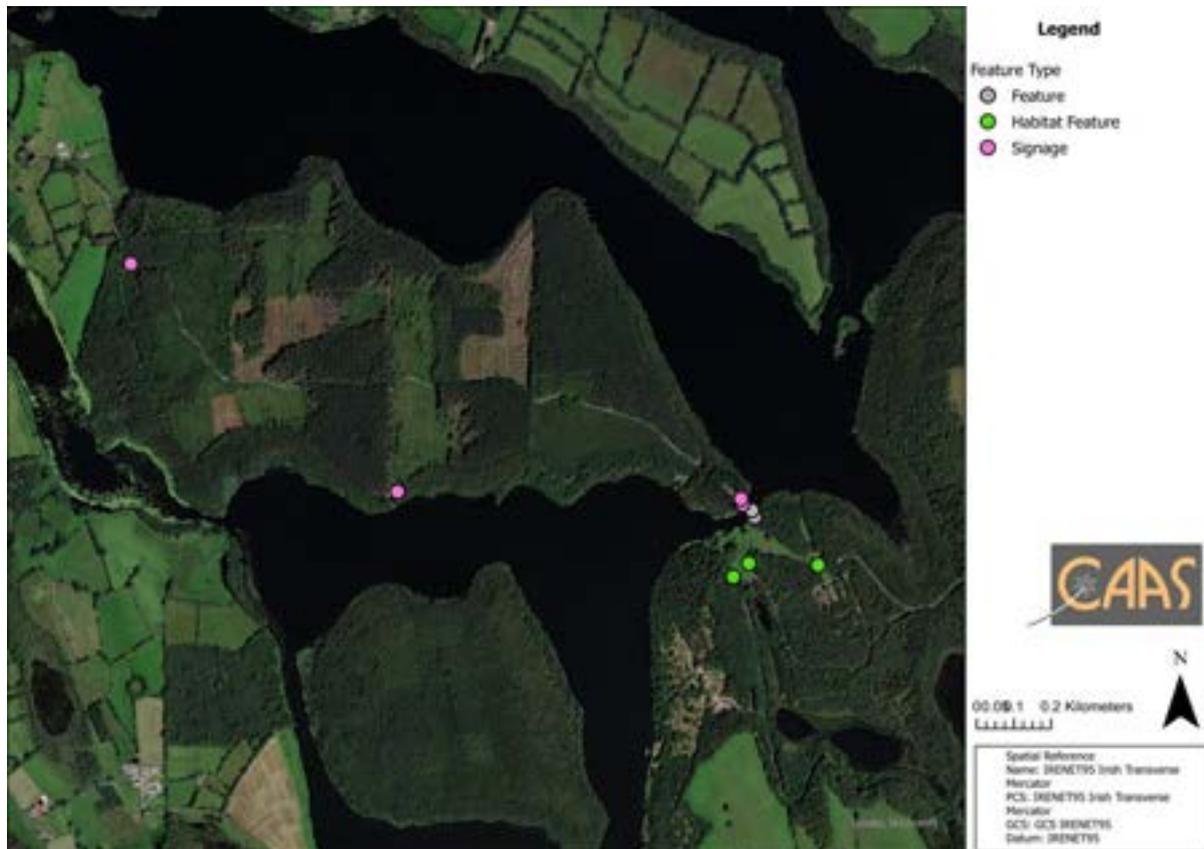
**Figure 14.3 Pathways identified at Killykeen Forest Park**



**Figure 14.4 Pathway at Killykeen Forest Park**

### **14.4.2 Features Condition**

There are numerous signs at Killykeen Forest Park, these mainly pertain to trail maps which show the designated pathways throughout Killykeen Forest Park along with signage that cautions visitors on rules of the park itself (Figure 14.6). Despite the relatively high ecological and naturalistic value of Killykeen Forest Park itself, there is a lack of signage which relates to this. There are also multiple disused buildings close to the entrance of the park which may act as potential bat roosts.



**Figure 14.5 Features recorded at Killykeen Forest Park**



**Figure 14.6 Features at Killykeen Forest Park**

#### 14.4.3 Hazards

No hazards were noted or observed at Killykeen Forest Park from the hazard mapping.

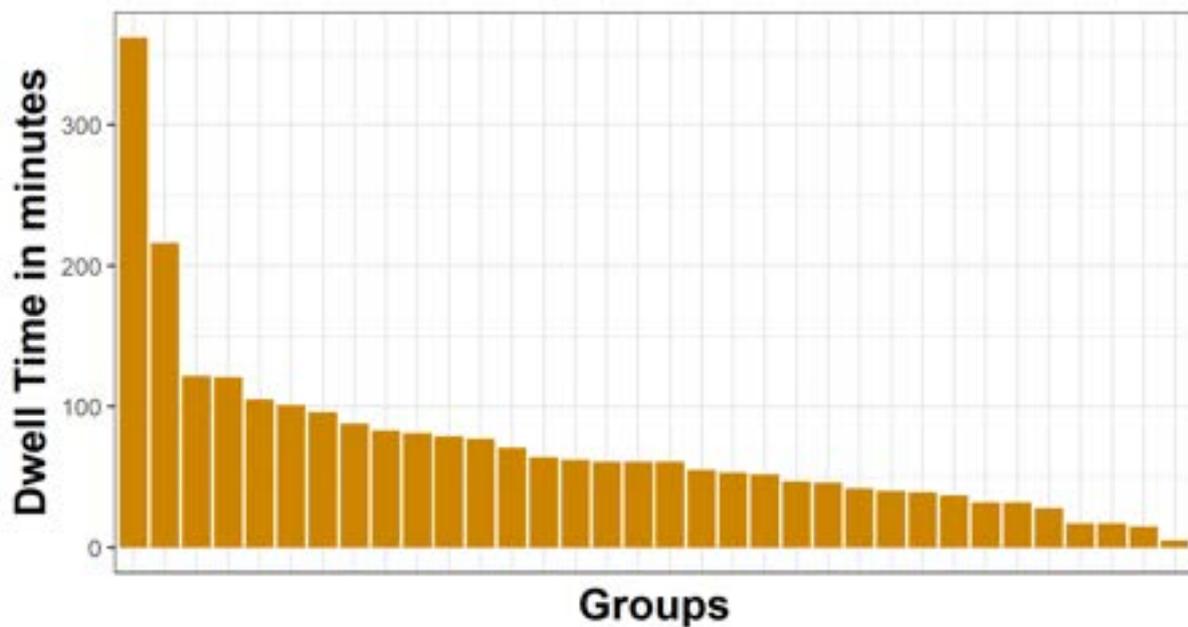
#### 14.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 91 visitors (which represents 35 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being car. The average dwell time for the site was 73 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

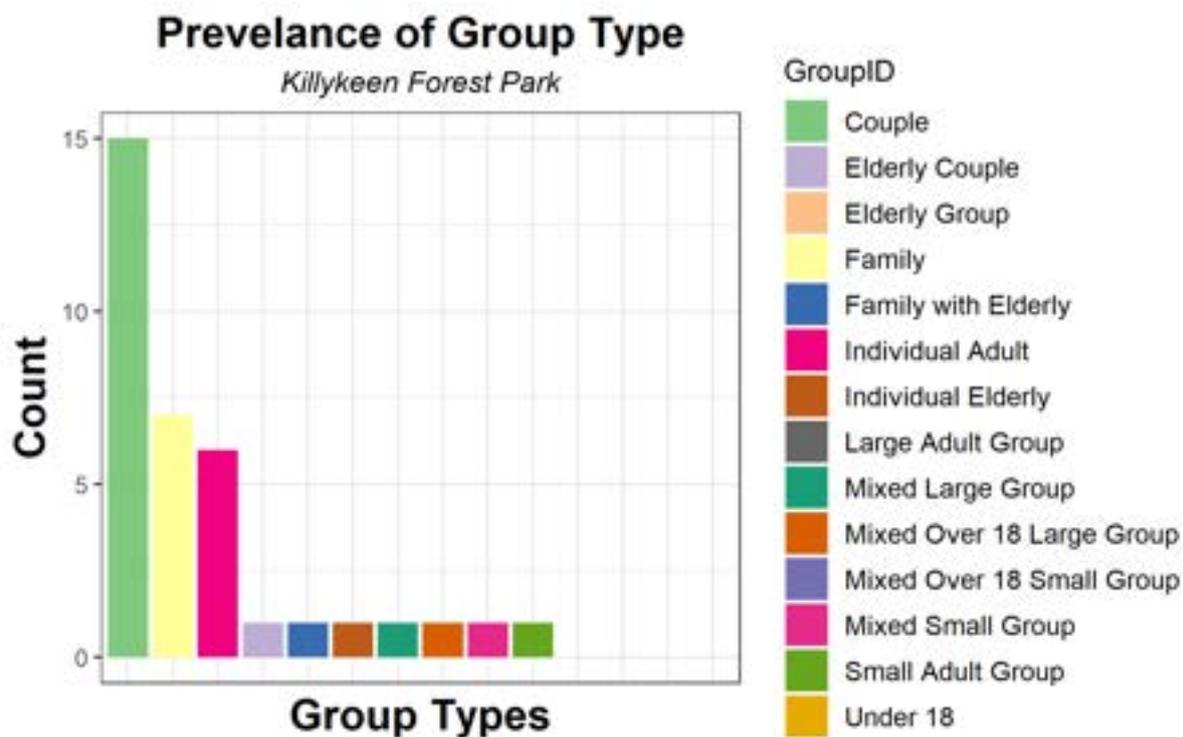
Activity Type
Dog walking (on lead)
Fishing
Sitting
Cycling
Dog walking (off lead)
Jogging
Litter picking
Picnicking
Sports Match (informal)
Sprinting
Swimming

## Dwell Time

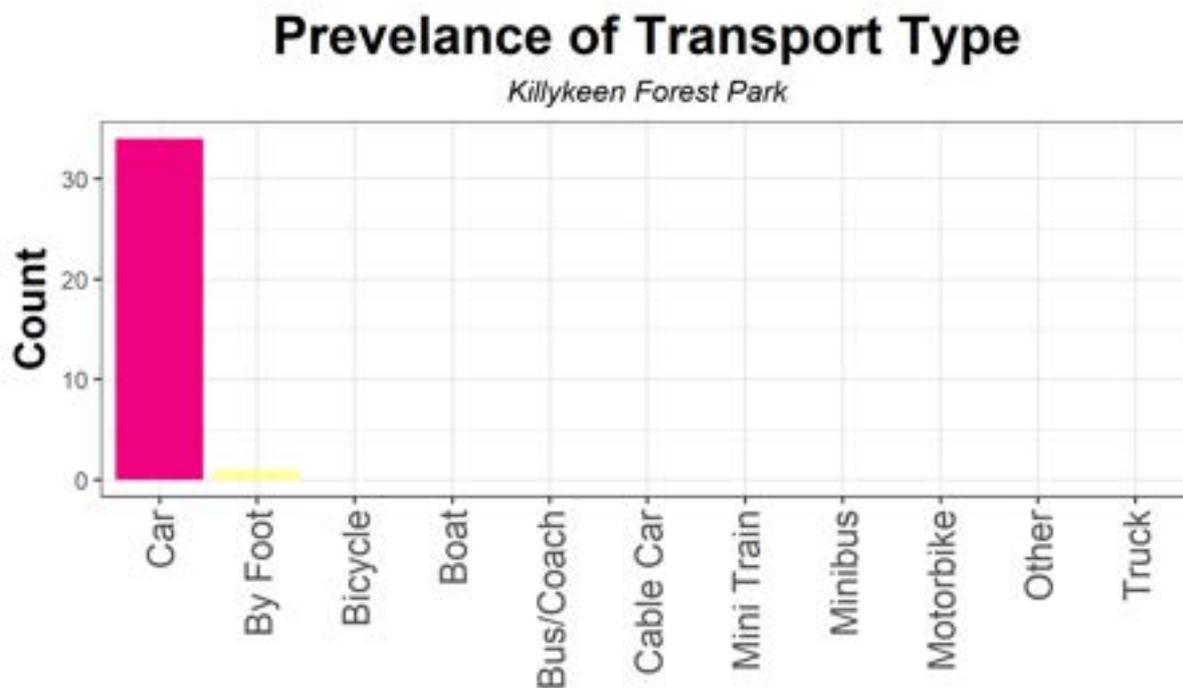
*Killykeen Forest Park*



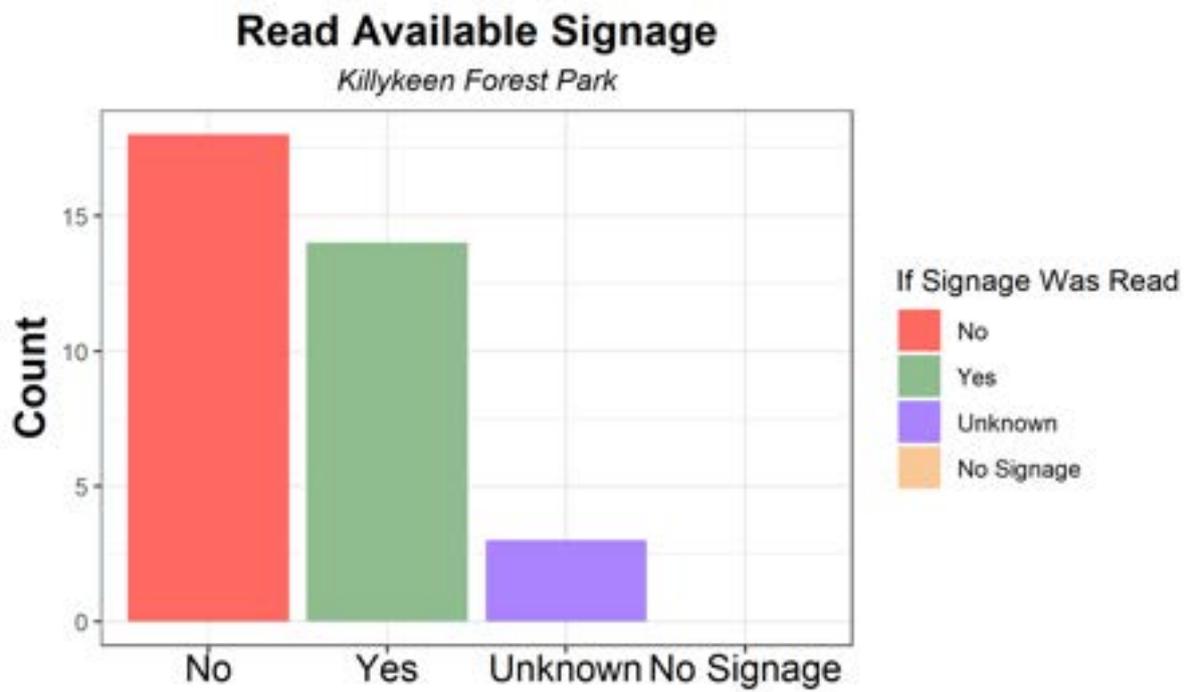
**Figure 14.7 Duration of Time Spent at Killykeen Forest Park**



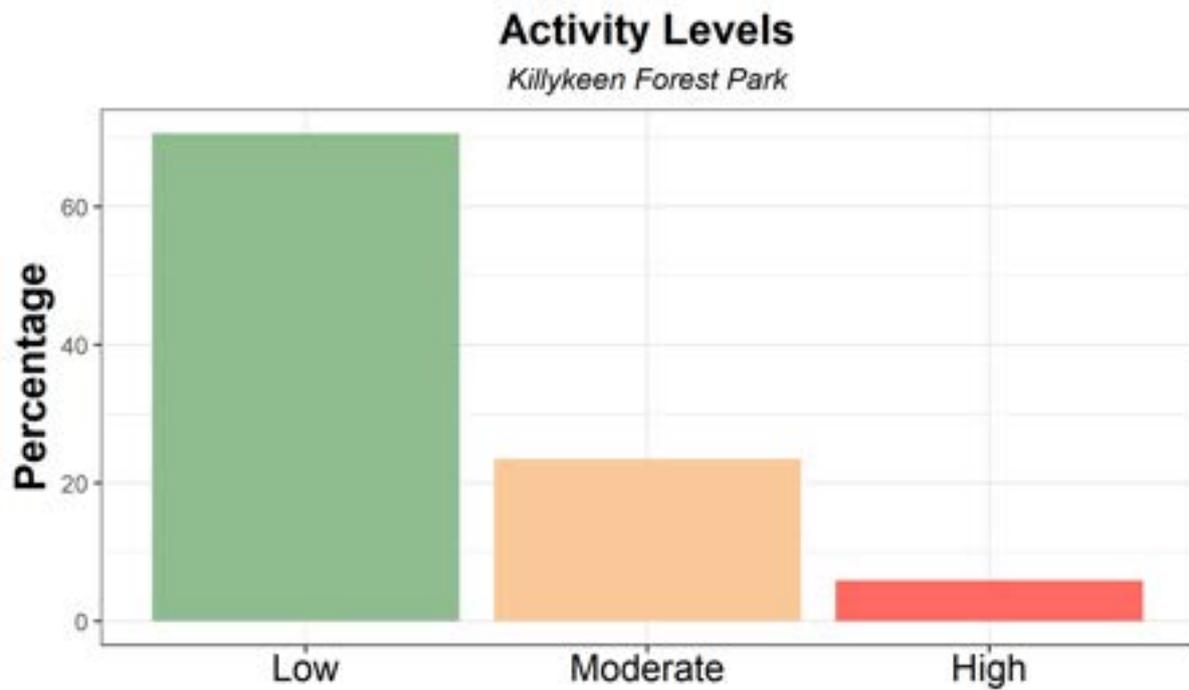
**Figure 14.8** Groups of visitors that visited Killykeen Forest Park



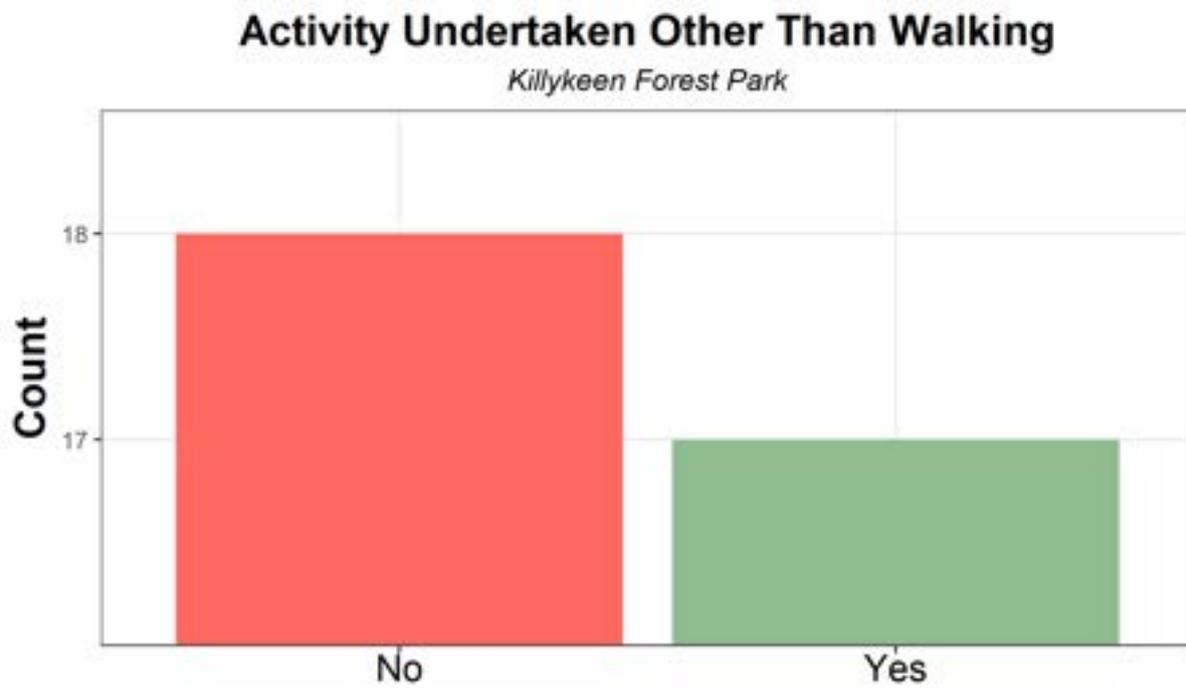
**Figure 14.9** Mode of transport used to visit Killykeen Forest Park



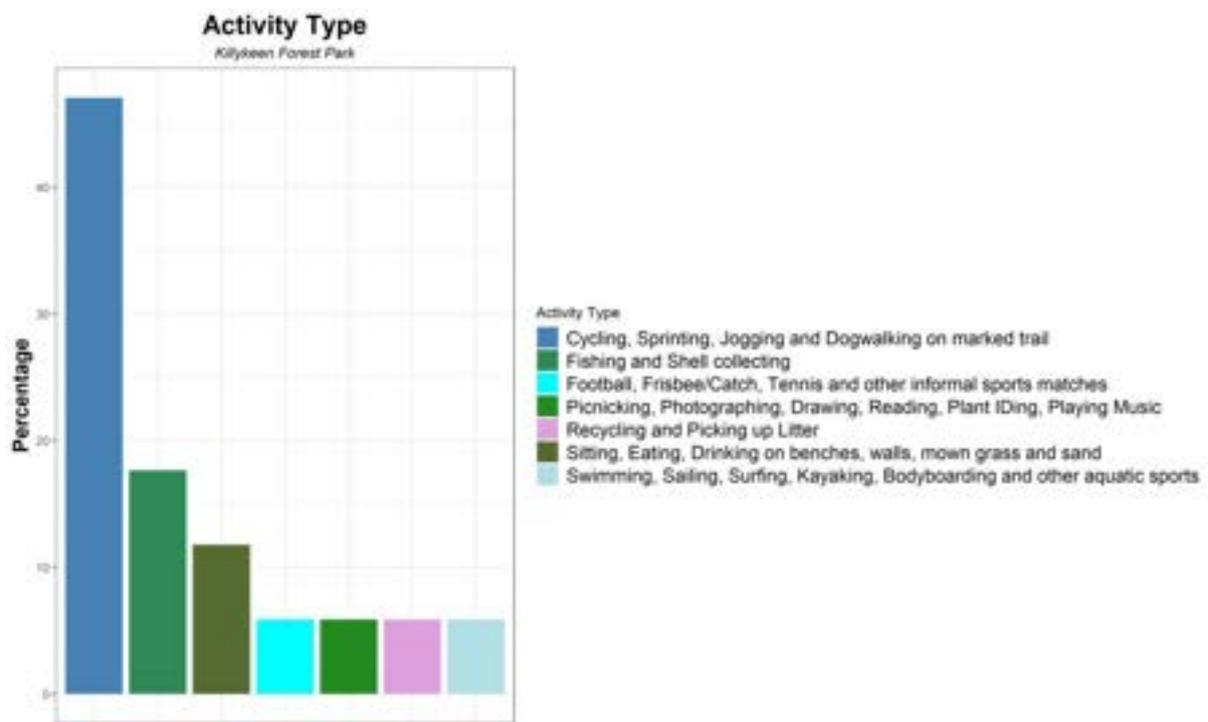
**Figure 14.10 Use of Interpretive Material at Killykeen Forest Park**



**Figure 14.11 Categories of Activity Levels Observed at Killykeen Forest Park**



**Figure 14.12** Activities undertaken other than walking



**Figure 14.13** Range of Visitor Activities Observed at Killykeen Forest Park



**Figure 14.14 Visitor movement patterns at Killykeen Forest Park**

Of the 35 groups recorded on site 49% of them undertook activities other than walking. These activities (identified above) resulted in no impacts on the environment within the site.

## 14.6 Ecological Monitoring Results

### 14.6.1 Ecological Constraints

The species that reside in the habitats within Killykeen Forest Park are sensitive to aquaculture, pollution, anthropogenic disturbance and hydrological changes. The habitats these species reside in are known to be sensitive to hydrological changes, pollution, land use management and alien species.

**Table 14.1 Designated sites within 2km of Killykeen Forest Park and relevant ecological receptors**

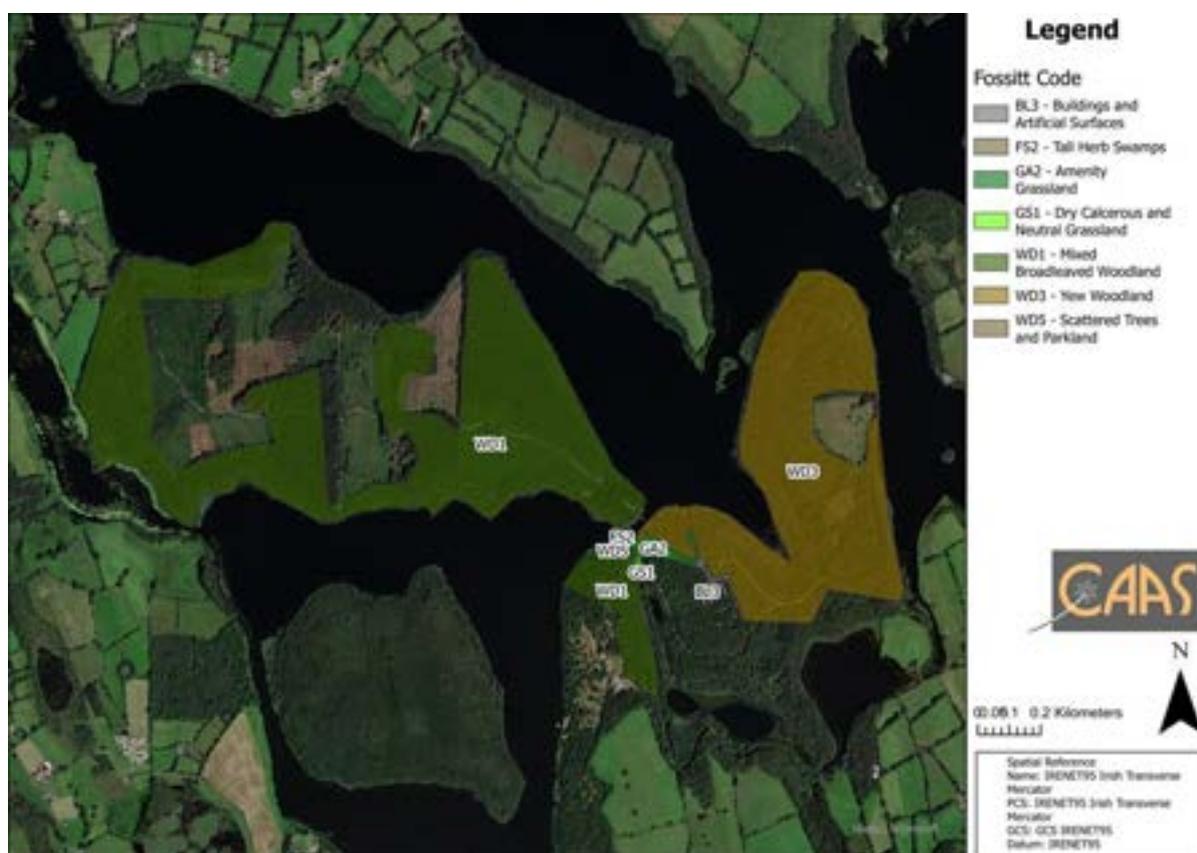
Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000007]	Lough Oughter And Associated Loughs pNHA	0.00	pNHA	
[004049]	Lough Oughter SPALough Oughter Complex SPA	0.06	SPA	Wetland and Waterbirds [A999], Wigeon ( <i>Anas penelope</i> ) [A050], Whooper Swan ( <i>Cygnus cygnus</i> ) [A038], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005]

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000007]	Lough Oughter and Associated Loughs SAC	0.08	SAC	Otter ( <i>Lutra lutra</i> ) [1355], Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150], Bog woodland [91D0]

#### 14.6.2 Habitat Descriptions

The habitats of Killykeen Forest Park are mainly made of up two woodland habitats, mixed broadleaved woodland (Fossitt Code WD1) and yew woodland (Fossitt Code WD3)

The trail edge close to the carparking area and bridge show signs of path widening for small sections where it is evident that visitors cut corners etc. Or at the toilet facilities. However, there is no damage to habitats identified due to this movement.



**Figure 14.15 Habitats present at Killykeen Forest Park**

#### 14.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>30</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. However, there was localised destruction of habitat identified through commercial clear felling in 4-point counts. The causes of damage were identified to be commercial felling.

#### 14.6.4 Breeding Bird Survey

Killykeen Forest Park contains a variety of passerine and wader birds, in large part to both the woodland and lakeside habitat of the site. Due to the lakeside habitat, the most common species that was

<sup>30</sup> This value was calculated using the methods set out in Appendix II

recorded at Killykeen Forest Park were heron, coot, moorhen, cormorant and great crested grebe also being observed. Other birds which were observed in high numbers were blackbirds, blackcaps and song thrushes.

**Table 14.2 Results of the breeding bird survey conducted at Killykeen Forest Park**

Common Name	Scientific Name	List Status	Number Recorded
Heron	<i>Ardea cinerea</i>	Green	1
Coot	<i>Fulica atra</i>	Amber	3
Moorhen	<i>Gallinula chloropus</i>	Green	3
Cormorant	<i>Phalacrocorax carbo</i>	Amber	5
Great crested grebe	<i>Podiceps cristatus</i>	Amber	7
Blackcap	<i>Sylvia atricapilla</i>	Green	10
Black-headed Gull	<i>Larus ridibundus</i>	Amber	6
Song thrush	<i>Turdus philomelos</i>	Green	2

#### 14.6.5 Mammals on Site

No mammals were recorded at Killykeen Forest Park. As the NBDC data shows, a large number of different terrestrial mammal species have been observed in the area. This includes a large number of bats, with brown long-eared bats being the most common species observed. A large number of badgers have also been recorded within the area along with other species such as red squirrels and hares.

**Table 14.3 List of mammals that have been recorded at NBDC Hectad H30**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	4
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	29
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	5
Terrestrial mammal	Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	5
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	86
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	29
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	8
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	1
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	15
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	3
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	11
Terrestrial mammal	Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	6
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	3
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	11
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	6
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	3
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	9
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	8

#### 14.6.6 Bat Survey

The site is a hotspot for bats, with high activity levels for brown long eared and Daubentons bats. It is likely that the bats are roosting in some of the buildings on site – particularly those close to the lake.

**Table 14.4 Locations of bats recorded at Killykeen Forest Park**

Common name	Scientific name	Record count
Brown Long-eared Bat	<i>Plecotus auritus</i>	25
Daubenton's Bat	<i>Myotis daubentonii</i>	71
Natterer's Bat	<i>Myotis nattereri</i>	5
Pipistrelle	<i>Pipistrellus pipistrellus</i>	10

**Table 14.5 List of bats that have been recorded at NBDC Hectad H30**

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	29
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	5
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	11
Terrestrial mammal	Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	6
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	3
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	6
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	9

### 14.7 Recommendations

- Management practices to support strong invertebrate populations should be explored as a foraging resource for bats on site. This could include stabilising standing dead wood (for safety) while leaving them upright. Placing piles of various sizes of deadwood along the woodland edge. Construction of banks and berms for invertebrate nesting and basking etc.
- Increasing roost availability through the installation of bat boxes – and potentially a bespoke lesser horseshoe bat roost structures accompanied by an attraction protocol if the species is confirmed to be present.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

## Loop Head – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Loop Head is well-known site for watching migratory birds as well as off shore whales and dolphins. Fulmars and Kittiwakes breed on the northern tip of Loop Head and Dermot and Grania’s Rock. The cliffs at Bullaunnaleama host colonies of Guillemots, Razorbills and Kittiwakes



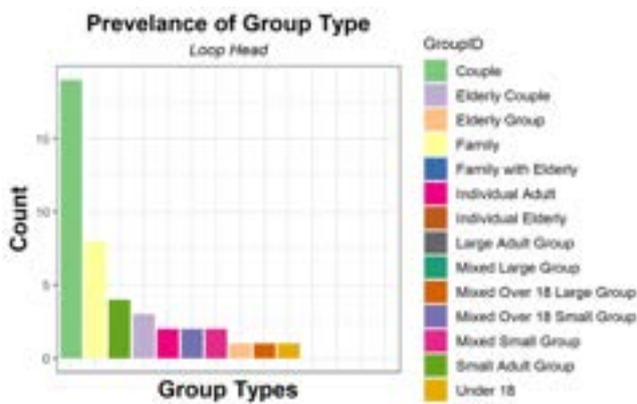
Loop Head also hosts a large population of grey seal

### KEY RECOMMENDATIONS

- Vehicular access to the heathlands beyond the carpark should be managed– there is evidence that the vegetated habitats are used as an overspill carpark which the site is full.
- Trail network management should be explored; trail marking and stabilisation as one option or the use of a dynamic trail management system which could alleviate the pressures which are occurring.
- Habitat management strategies could be developed for the site to increase the floral diversity of the grass and heathland habitats on site.
- Introduce signage with respect to the resident population of breeding guillemots.

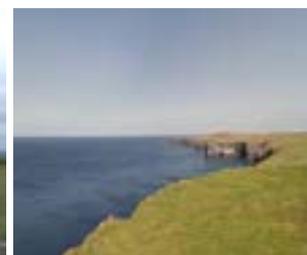
### VISITOR NUMBERS AND DWELL TIME

- 124 people visited the site over 8 hours
- Average dwell time of 27 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Nearly 80% of all activities undertaken were considered to be low level activities such as dog walking and jogging.
- Of impacts that were noted, the majority were considered low level impacts such as trampling of vegetation and light desire lines
- Most of the visitors to the site stayed for at least 27 minutes –given the relatively small nature of the site.
- Majority of visitors did not read signage that was available on site.



## 15 Loop Head

### 15.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 15.2 Methods & Surveys

The following surveys were undertaken at Loop Head:

### 15.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Loop Head was undertaken on the 19<sup>th</sup> of June 2021, with max temperatures reaching approximately 18° C, no rainfall and low levels of wind on the day<sup>31</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 15.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>31</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 15.2.3 Other Surveys

Additional sample surveys were undertaken at Loop Head to identify the species presence of wintering birds and mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 15.3 Site Description of Loop Head

Loop Head contains attractions such as the Loop Head lighthouse (Figure 15.1), access to water sports and boat journeys to view marine mammals. It is also a Signature Discovery Point on the Wild Atlantic Way. The area itself is completely encompassed by the Loop Head SPA and the Lower Shannon SAC with expected habitats that range from dry siliceous heath.



**Figure 15.1 Loop Head**

## Lower River Shannon SAC



**Figure 15.2 Study Area within Lower River Shannon SAC**

### 15.4 Pathways and Features Condition Results

#### 15.4.1 Pathway Condition

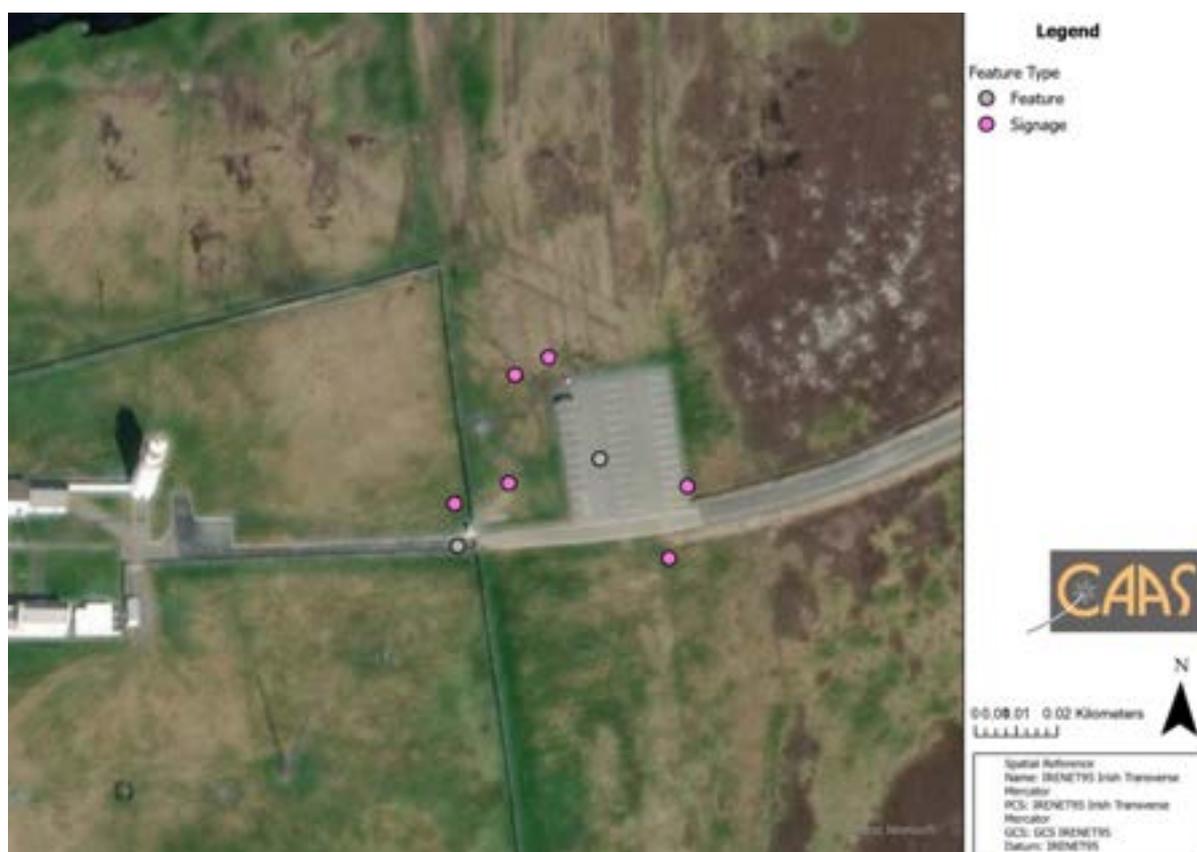
The paths at Loop Head mainly consist of managed pathways which are of varying width. These pathways also show localised severe levels of soil compaction along with evident trampling due to walkers. There is also a small section of hard infrastructure pathways which were seen to have slight damage at the road side.



**Figure 15.3 Pathways identified at Loop Head**

#### 15.4.2 Features Condition

Other than the lighthouse at Loop Head itself, there are not many features on this site. There is also a car park on site which is used by visitors. In regards to signage, there are multiple signs which warn visitors of potentially dangerous unprotected cliff edges along with a small number of signs that provide information on the area along with a sign that designates Loop Head as part of the Wild Atlantic Way (Figure 15.5).



**Figure 15.4 Features recorded at Loop Head**



**Figure 15.5 Features at Loop Head**

**15.4.3 Hazards**

No direct hazards were recorded at Loop Head during the hazard mapping. However, it is noted that there are points on site where there are unprotected cliff edges, which could be deemed as a hazard but were not mapped.

**15.5 Visitor Characterisation Survey**

The visitor monitoring surveys resulted in a total of 124 visitors (which represent 43 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being car. The average dwell time for the site was 27 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Cycling

Activity Type
Photographing
Dog walking (off lead)
Dog walking (on lead)
Jogging
Picnicking
Sitting
Sprinting

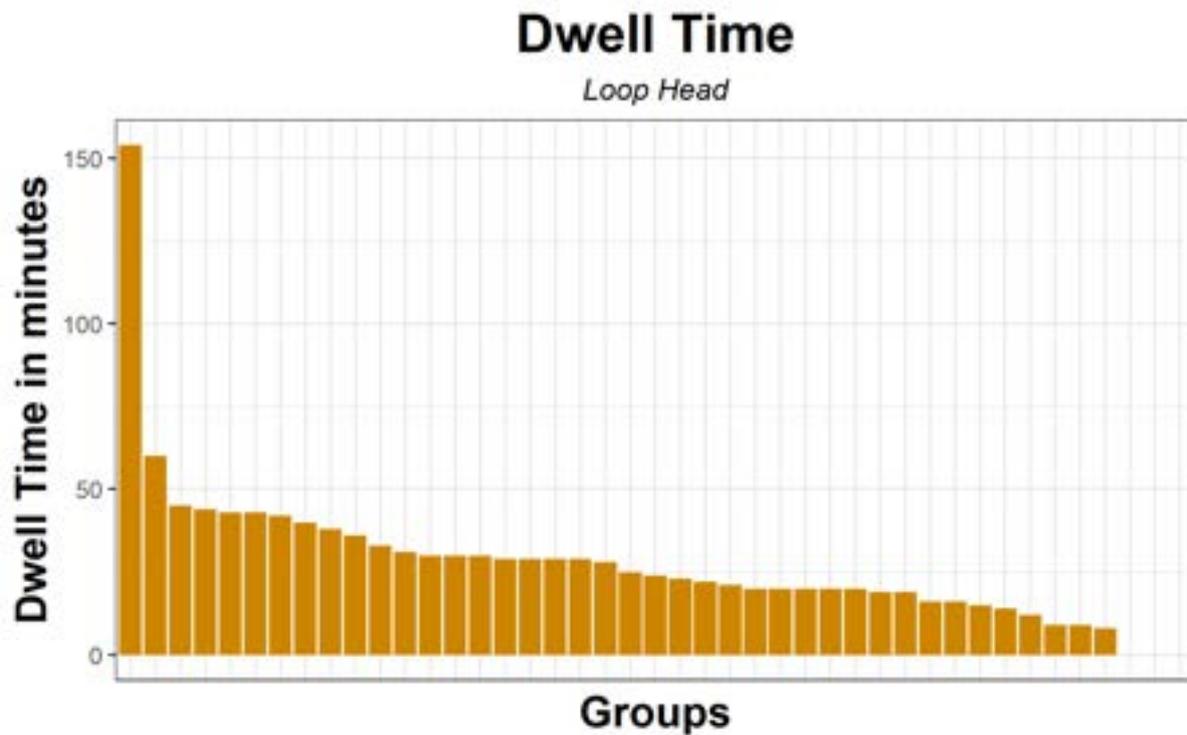
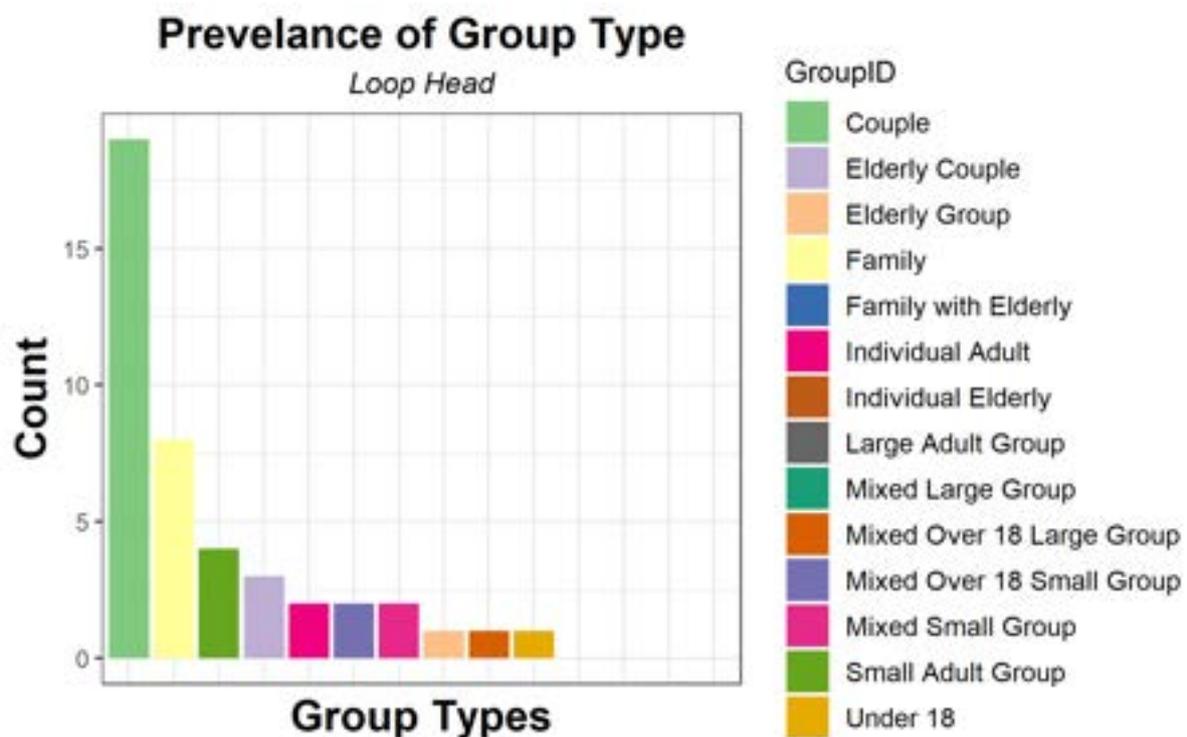
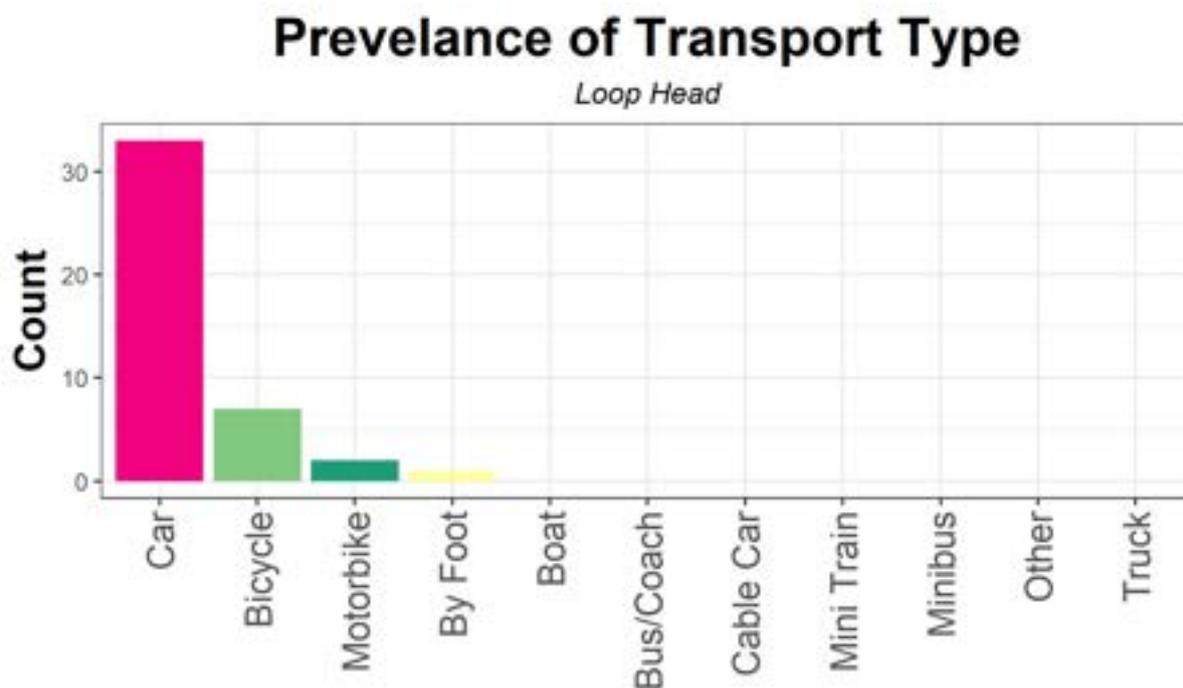


Figure 15.6 Duration of Time Spent at Loop Head

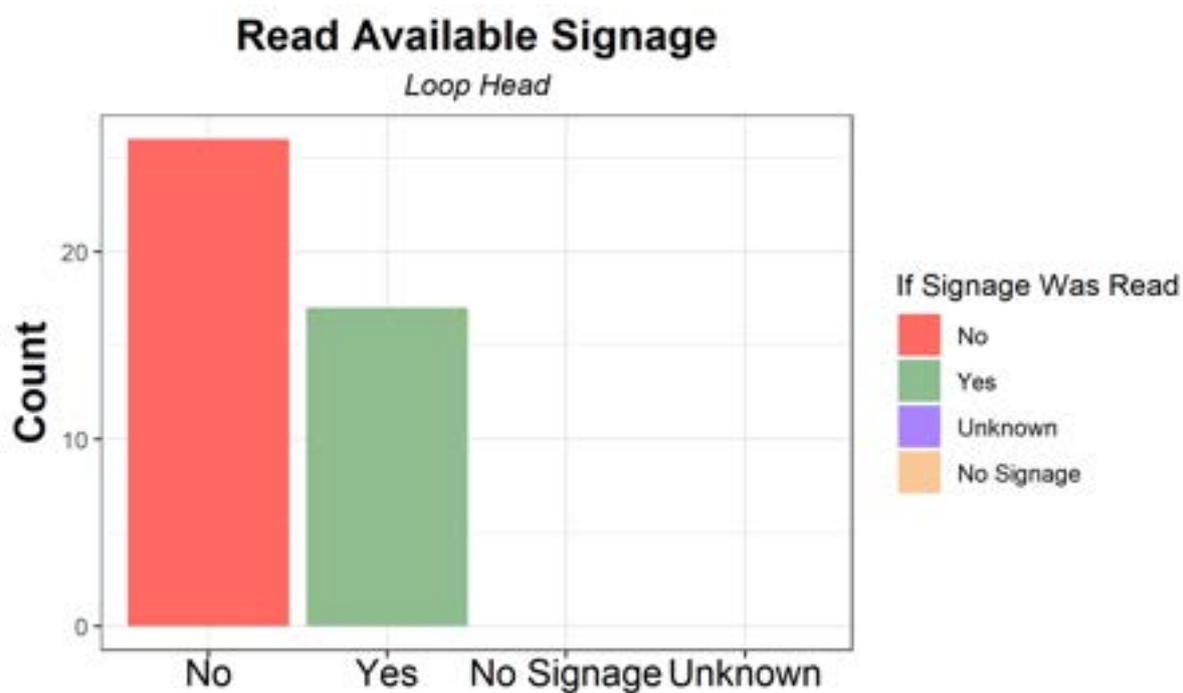


- GroupID
- Couple
- Elderly Couple
- Elderly Group
- Family
- Family with Elderly
- Individual Adult
- Individual Elderly
- Large Adult Group
- Mixed Large Group
- Mixed Over 18 Large Group
- Mixed Over 18 Small Group
- Mixed Small Group
- Small Adult Group
- Under 18

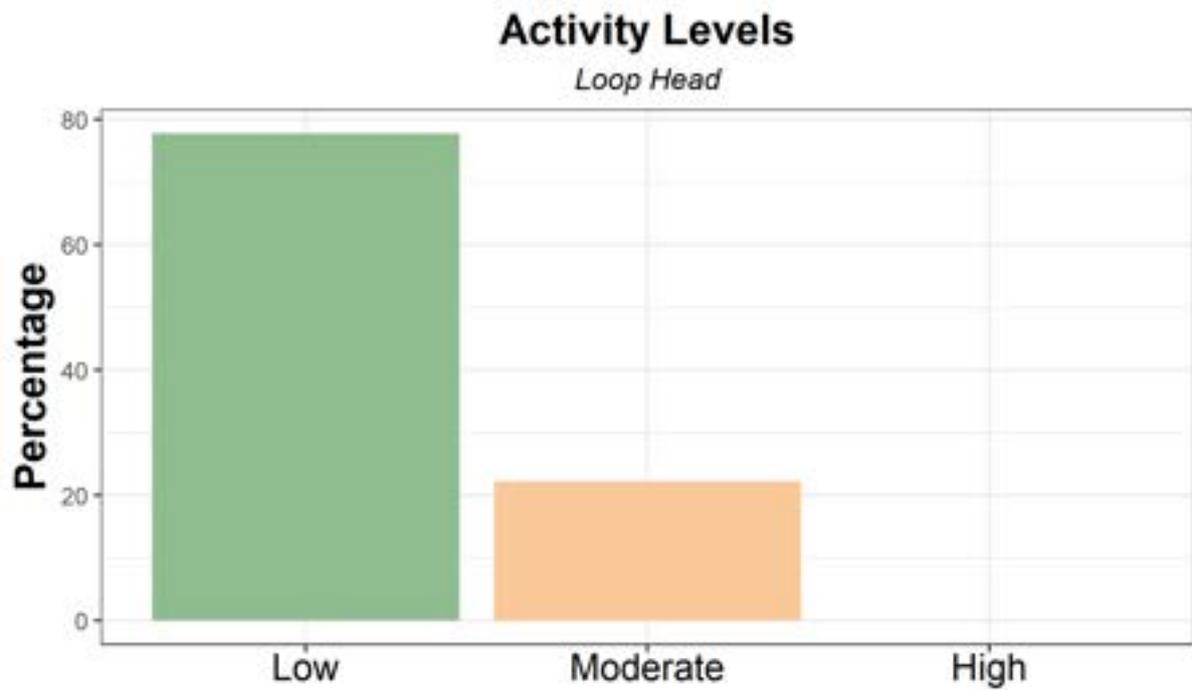
**Figure 13.2 Groups of visitors that visited Loop Head**



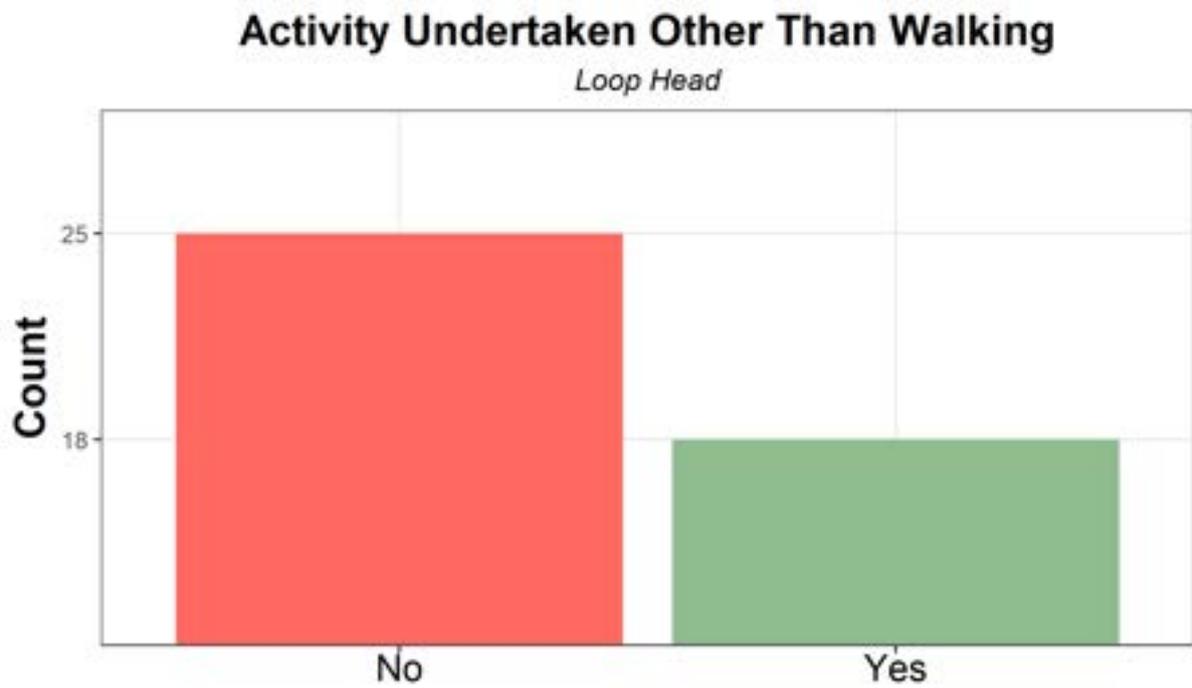
**Figure 15.7 Mode of transport used to visit Loop Head**



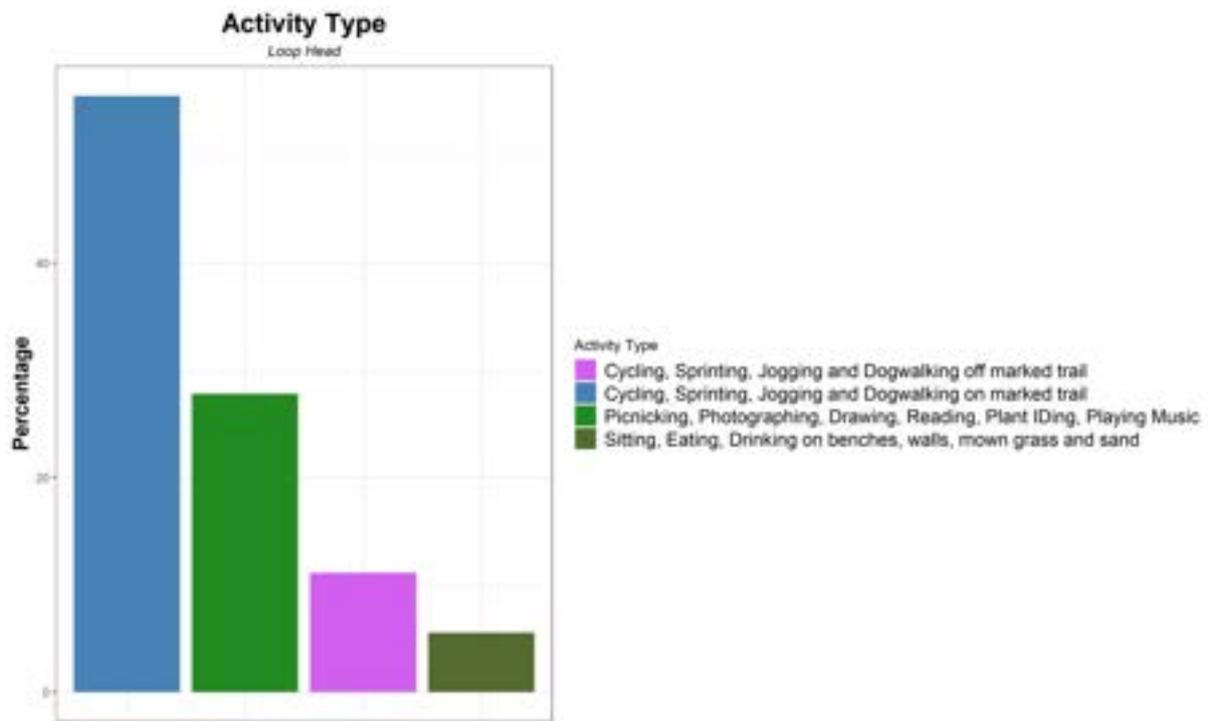
**Figure 15.8 Use of Interpretive Material at Loop Head**



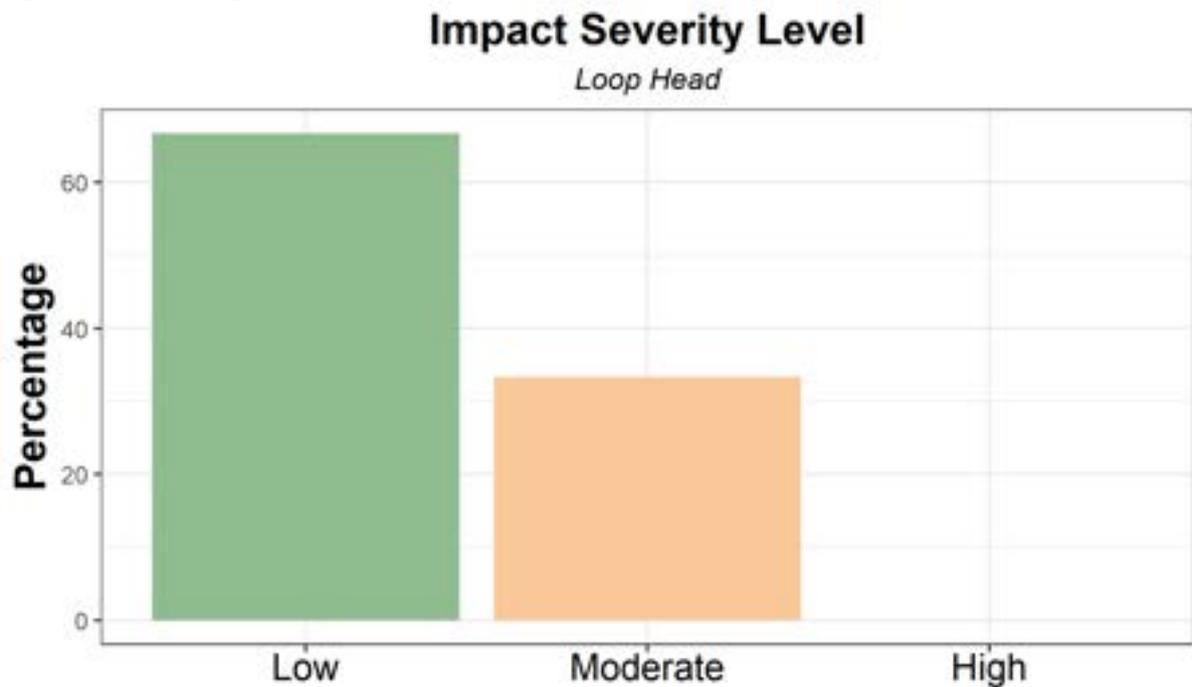
**Figure 15.9 Categories of Activity Levels Observed at Loop Head**



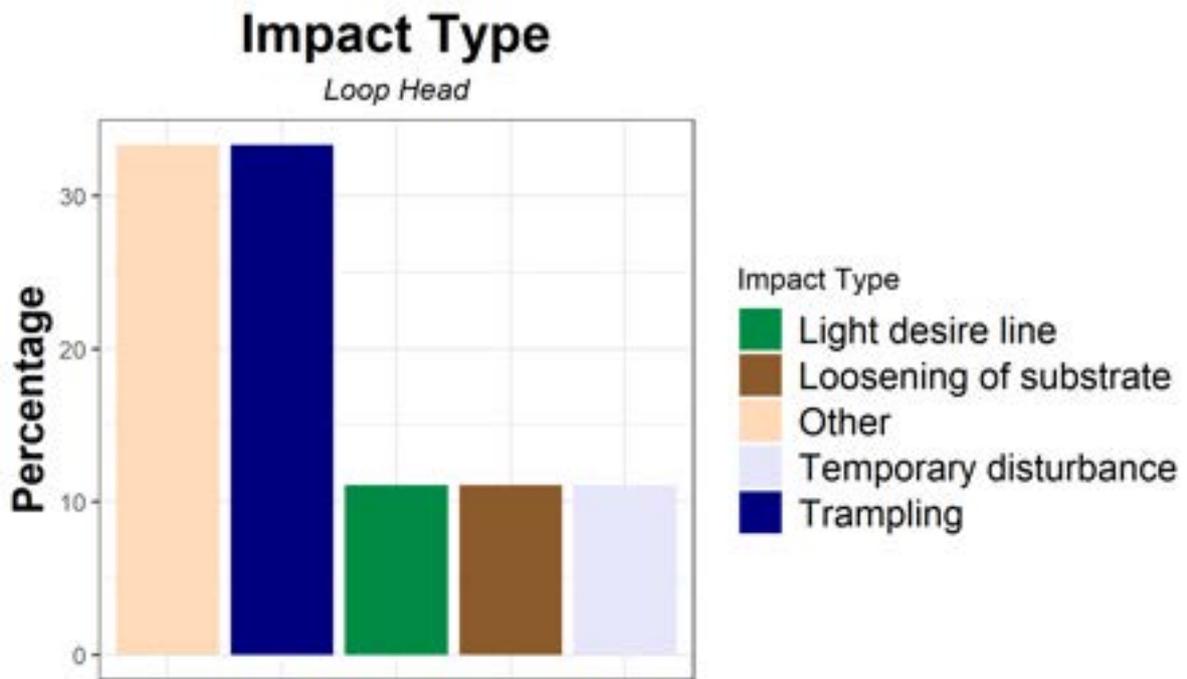
**Figure 15.10 Activities undertaken other than walking**



**Figure 15.11 Range of Visitor Activities Observed at Loop Head**



**Figure 15.12 Categories of Environmental Impact Levels Observed at Loop Head as a result of Visitor Activities**



**Figure 15.13 Range of Environmental Impacts Observed at Loop Head**



**Figure 15.14 Visitor movement patterns at Loop Head**

Of the 43 groups recorded on site 42% of them undertook activities other than walking. These activities (identified above) resulted in 9 impacts being observed on site during the survey. Thus, 50% of activities on site resulted in impacts on the environment. The impact severity levels varied with 67% of the impacts being low, 33% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Light desire line	1
Loosening of substrate	1
Other	3
Temporary disturbance	1
Trampling	3

## 15.6 Ecological Monitoring Results

### 15.6.1 Ecological Constraints

The species and habitats within 2km of Loop Head are known to be sensitive to aquaculture, pollution, hydrological changes, overgrazing and land use management.

**Table 15.1 Designated sites within 2km of Loop Head and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000045]	Loop Head pNHA	0.01	pNHA	
[002165]	Lower River Shannon SAC	0.01	SAC	Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260], Atlantic salt meadows ( <i>Glaucopuccinellietalia maritima</i> ) [1330], Freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) [1029], Large shallow inlets and bays [1160], Estuaries [1130], Sea lamprey ( <i>Petromyzon marinus</i> ) [1095], Coastal lagoons [1150], Sandbanks which are slightly covered by sea water all the time [1110], Atlantic salmon ( <i>Salmo salar</i> ) [1106], Bottlenose dolphin ( <i>Tursiops truncatus</i> ) [1349], Otter ( <i>Lutra lutra</i> ) [1355], Reefs [1170], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0], Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonising mud and sand [1310], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410], River lamprey ( <i>Lampetra fluviatilis</i> ) [1099], Perennial vegetation of stony banks [1220], Brook lamprey ( <i>Lampetra planeri</i> ) [1096], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> ) [6410], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
[004119]	Loop Head SPA	0.13	SPA	Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Guillemot ( <i>Uria aalge</i> ) [A199]

### 15.6.2 Habitat Descriptions

The majority of the habitat at Loop is taken up by dry calcareous and neutral grassland (Fossitt Code GS1), which provide ample habitat for the Special Conservation Interest species for which the SPA, Loop Head, is designated to forage. As Loop Head is a coastal area it also contains coastal habitats such as dry siliceous heath (Fossitt Code HH1), which border the dry and calcareous grassland in the area, siliceous scree and loose rock (Fossitt Code ER3) and sea stacks and islets (Fossitt Code CS2), which make up the direct coastal habitat of the area.

There is a disperse and uncontrolled trail network across the site – there is a set of desire lines where visitors track over the site which are forming a network of parallel trails.



**Figure 15.15 Habitats present at Loop Head**

### 15.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>32</sup> following the assessment scale was "4" which means the majority of the habitats have a localised negative impact, requiring intervention to allow full recovery. There were 14 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of damage were identified to be walking by visitors.

### 15.6.4 Mammals on Site

No mammals were recorded on site at Loop Head. Due to the coastal location of Loop Head, the NBDC data shows the overwhelmingly majority of species that were recorded were marine mammals, with an extraordinary large number of grey seals being observed and a large number of bottle-nosed dolphins also being observed. With regard to terrestrial mammals, the NBDC data shows far less species being recorded compared to marine mammals with badgers and hares being the most commonly recorded species.

**Table 15.2 List of mammals that have been recorded at NBDC Hectads Q64 & Q74**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	110
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	15
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	14
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	549
Marine mammal	Humpback Whale	<i>Megaptera novaeangliae</i>	1
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	16
Marine mammal	Walrus	<i>Odobenus rosmarus</i>	1
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	19
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	1
Terrestrial mammal	Feral Goat	<i>Capra hircus</i>	1
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	5

<sup>32</sup> This value was calculated using the methods set out in Appendix II

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	1
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1

### 15.6.5 Wintering Bird Survey

Fulmars and Kittiwakes are the main breeding species on the northern tip of Loop Head and Dermot and Grania's Rock, a sea stack separated from the mainland only by a narrow chasm. A few hundred meters east the cliffs at Bullaunnaleama host colonies of Guillemots, Razorbills, Kittiwakes and a few stray Fulmars. However, there is limited wintering activity at the site.

**Table 15.3 Results of the wintering bird survey conducted at Loop Head**

Common name	Scientific name	Record count
Herring Gull	<i>Larus argentatus</i>	7

**Table 15.4 List of wintering birds that have been recorded at NBDC Hectads Q64 & Q74**

Taxonomic group	Common name	Scientific name	Record count
Bird	Alcidae	<i>Alcidae</i>	5
Bird	American Golden Plover	<i>Pluvialis dominica</i>	8
Bird	American Herring Gull	<i>Larus smithsonianus</i>	1
Bird	Arctic Skua	<i>Stercorarius parasiticus</i>	3
Bird	Arctic Tern	<i>Sterna paradisaea</i>	3
Bird	Atlantic Puffin	<i>Fratercula arctica</i>	2
Bird	Balearic Shearwater	<i>Puffinus mauretanicus</i>	3
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	1
Bird	Black-headed Gull	<i>Larus ridibundus</i>	12
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	122
Bird	Black-tailed Godwit	<i>Limosa limosa</i>	2
Bird	Black Guillemot	<i>Cepphus grylle</i>	2
Bird	Blue-winged Teal	<i>Anas discors</i>	1
Bird	Branta hutchinsii	<i>Branta hutchinsii</i>	1
Bird	Common Greenshank	<i>Tringa nebularia</i>	3
Bird	Common Guillemot	<i>Uria aalge</i>	130
Bird	Common Moorhen	<i>Gallinula chloropus</i>	4
Bird	Common Redshank	<i>Tringa totanus</i>	8
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	5
Bird	Common Scoter	<i>Melanitta nigra</i>	4
Bird	Common Shelduck	<i>Tadorna tadorna</i>	1
Bird	Common Snipe	<i>Gallinago gallinago</i>	15
Bird	Cory's Shearwater	<i>Calonectris diomedea</i>	3
Bird	Dunlin	<i>Calidris alpina</i>	4
Bird	Eurasian Curlew	<i>Numenius arquata</i>	20
Bird	Eurasian Dotterel	<i>Charadrius morinellus</i>	5
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	14
Bird	Eurasian Teal	<i>Anas crecca</i>	5
Bird	Eurasian Wigeon	<i>Anas penelope</i>	2
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	3
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	8
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	26
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	13
Bird	Fea's Petrel	<i>Pterodroma feae</i>	1
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	6
Bird	Great Black-backed Gull	<i>Larus marinus</i>	36
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	10
Bird	Great Northern Diver	<i>Gavia immer</i>	5
Bird	Great Shearwater	<i>Puffinus gravis</i>	2
Bird	Great Skua	<i>Stercorarius skua</i>	2
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	1

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Green Sandpiper	<i>Tringa ochropus</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	12
Bird	Grey Plover	<i>Pluvialis squatarola</i>	4
Bird	Herring Gull	<i>Larus argentatus</i>	31
Bird	Iceland Gull	<i>Larus glaucoides</i>	5
Bird	Jack Snipe	<i>Lymnocyptes minimus</i>	4
Bird	Kumlien's Iceland Gull	<i>Larus glaucoides subsp. kumlieni</i>	1
Bird	Larus	<i>Larus</i>	3
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	21
Bird	Lesser Yellowlegs	<i>Tringa flavipes</i>	2
Bird	Little Auk	<i>Alle alle</i>	1
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	1
Bird	Little Gull	<i>Larus minutus</i>	2
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	1
Bird	Long-tailed Skua	<i>Stercorarius longicaudus</i>	1
Bird	Macaronesian Shearwater	<i>Puffinus baroli</i>	1
Bird	Mallard	<i>Anas platyrhynchos</i>	11
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	72
Bird	Mediterranean Gull	<i>Larus melanocephalus</i>	5
Bird	Mew Gull	<i>Larus canus</i>	11
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	108
Bird	Northern Gannet	<i>Morus bassanus</i>	86
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	10
Bird	Pied-billed Grebe	<i>Podilymbus podiceps</i>	1
Bird	Pink-footed Goose	<i>Anser brachyrhynchus</i>	1
Bird	Pomarine Skua	<i>Stercorarius pomarinus</i>	2
Bird	Razorbill	<i>Alca torda</i>	45
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	1
Bird	Red-throated Diver	<i>Gavia stellata</i>	2
Bird	Red Knot	<i>Calidris canutus</i>	3
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	15
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	6
Bird	Sabine's Gull	<i>Larus sabini</i>	3
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	3
Bird	Sooty Shearwater	<i>Puffinus griseus</i>	5
Bird	Spotted Crake	<i>Porzana porzana</i>	3
Bird	Spotted Redshank	<i>Tringa erythropus</i>	1
Bird	Spotted Sandpiper	<i>Actitis macularius</i>	1
Bird	Twite	<i>Carduelis flavirostris</i>	2
Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	1
Bird	Water Rail	<i>Rallus aquaticus</i>	3
Bird	Whimbrel	<i>Numenius phaeopus</i>	2
Bird	Wilson's Phalarope	<i>Phalaropus tricolor</i>	1
Bird	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	1

## 15.7 Recommendations

- Vehicular access to the heathlands beyond the carpark should be managed– there is evidence that the vegetated habitats are used as an overspill carpark which the site is full.
- Trail network management should be explored; trail marking and stabilisation as one option or the use of a dynamic trail management system which could alleviate the pressures which are occurring.
- Habitat management strategies could be developed for the site to increase the floral diversity of the grass and heathland habitats on site.
- Introduce signage with respect to the resident population of breeding guillemots.

## Lough Key Forest Park – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Lough Key is a known stronghold of the red squirrel which is a protected species. Pine marten are also known to have strong populations at the site.

The diversity of habitats presents on site such as broadleaf woodland, the lake, grassland patches, marshy areas etc. provide ample resources for a number of bat species.



### KEY RECOMMENDATIONS

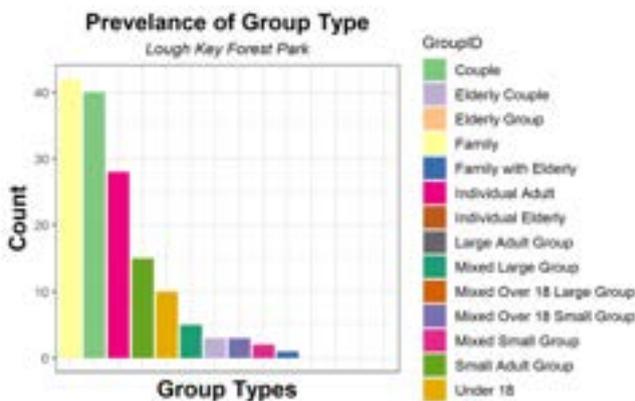
- A stronger litter management process is needed for the site as the majority of impacts were littering. More bins are needed to alleviate the littering pressures.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- 80% of all activities undertaken were considered to be low level activities such as dog walking, jogging and picnicking.
- Over 40% of all observable impacts by visitors was noted to be littering.
- Most of the visitors to the site stayed for at least 53 minutes –given the nature of the site itself as a forested area.
- Majority of visitors did not read signage that was available on site.

### VISITOR NUMBERS AND DWELL TIME

- 426 people visited the site over 8 hours
- Average dwell time of 53 minutes



### Highlights:

- Strong populations of red squirrel and pine marten.
- High levels of littering noted, and controls should be implemented.
- Long site dwell time of at least 53 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.



## 16 Lough Key Forest Park

### 16.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning through to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 16.2 Methods & Surveys

The following surveys were undertaken at Lough Key Forest Park:

### 16.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Lough Key Forest Park was undertaken on the 11<sup>th</sup> of July 2021, with max temperatures reaching approximately 15.9° C, low to moderate levels of rainfall and low levels of wind on the day<sup>33</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 16.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>33</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 16.2.3 Other Surveys

Additional sample surveys were undertaken at Lough Key Forest Park to identify the species presence of breeding birds, wintering birds, mammals and bats. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 16.3 Site Description of Lough Key Forest Park

Lough Key Forest Park (Figure 16.1), a Coillte managed site, is a perfect example of a scenic forested visitor attraction in Boyle, County Roscommon. It contains many activities including ziplining and various walks and trails along with water activities within Lough Key itself. As the area is a forested area and located directly south of Lough Key, it contains a wide range of habitats that support local wildlife such as broadleaved woodland, mixed broadleaved/conifer woodland, reed and large sedge swamps and mesotrophic lakes.



**Figure 16.1** Lough Key Forest Park

## 16.4 Pathways and Features Condition Results

### 16.4.1 Pathway Condition

The paths at Lough Key Forest Park consist mainly of soft infrastructure pathways, with a small amount of hard infrastructure paths, with heavy levels of compaction seen throughout Lough Key Forest Park. Damage was noted along the pathways due to trampling by walkers and the presence of rhododendron across Lough Key Forest Park.



**Figure 16.2 Pathways identified at Lough Key Forest Park**



**Figure 16.3 Pathway in Lough Key Forest Park**

#### **16.4.2 Features Condition**

There are numerous signs within Lough Key Forest Park that relate to the activities that can be undertaken in the park itself, including multiple signs relating to orienteering that takes place within the park. There are also a number of trail markers throughout the park that show the designated pathways throughout the site.

To properly accommodate the activities available within Lough Key Forest Park, there is a car park, set down area for shuttle buses along with many benches and tables (Figure 16.5). There are also wooden features that relate to the activity park within the site along with cycle paths and a canoe rental centre for Lough Key itself (Figure 16.5).



**Figure 16.4 Features recorded at Lough Key Forest Park**



**Figure 16.5 Features at Lough Key Forest Park**

### 16.4.3 Hazards

Few hazards were observed at Lough Key Forest Park. However, an unprotected broken barrier was noted along the edge of Lough Key itself.



**Figure 16.6 Hazards recorded at Lough Key Forest Park**



**Figure 16.7 Broken barrier at Lough Key Forest Park**

## 16.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 426 visitors (which represent 149 group observations). The site is most popular amongst the Family group with the dominant mode of transport being by foot. The average dwell time for the site was 53 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Littering
Picnicking
Jogging
Powered Movement Through Water (Boat, Jetski etc)
Sailing
Cycling
Dog walking (off lead)
Dog walking (on lead)
Sitting
Coffee
Football
Camping
Kayaking
Adventure Centre
BBQing
Climbing
Flying drone
Photographing
SUP Boarding
Swimming
Working
Ziplining
Basketball
Bird feeding
Birdwatching
Buying food
Damage to side road
Exploring off trail
Fishing
Lighting Campfire
Moving picnic bench
Mowing
Outdoor gym
Playing basketball
Reading
Rowing
Sports Match (informal)
Sprinting

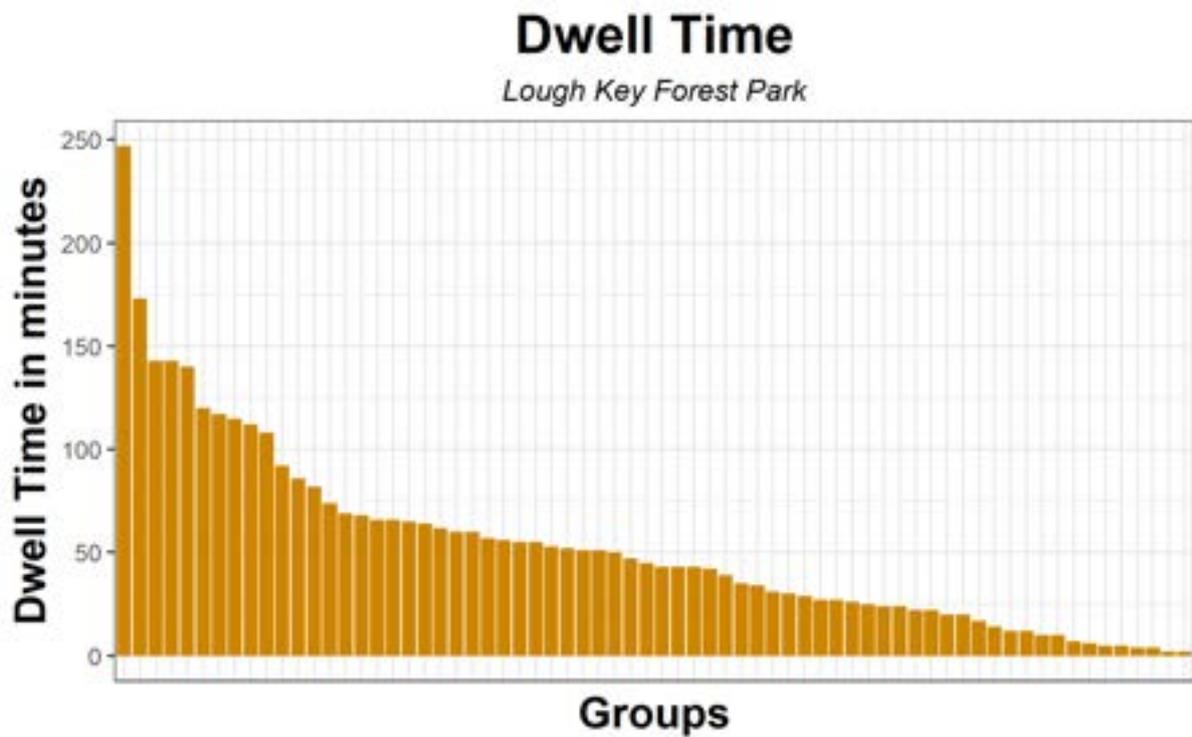


Figure 16.8 Duration of Time Spent at Lough Key Forest Park

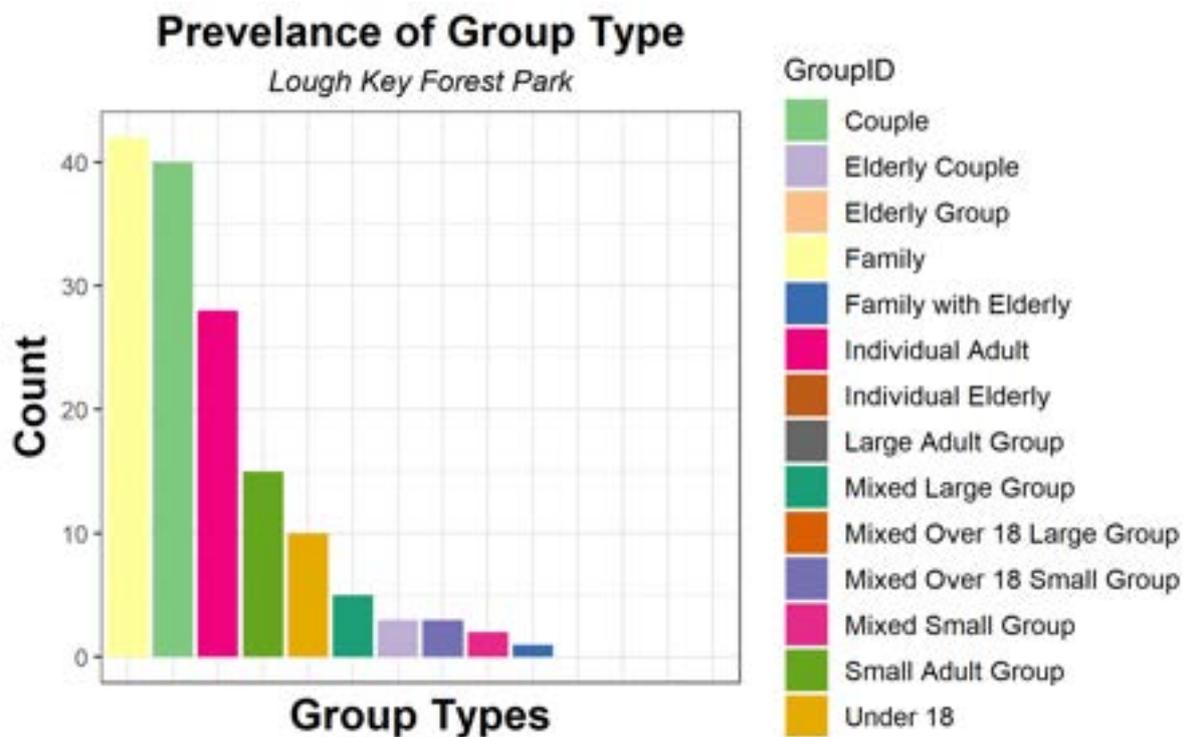
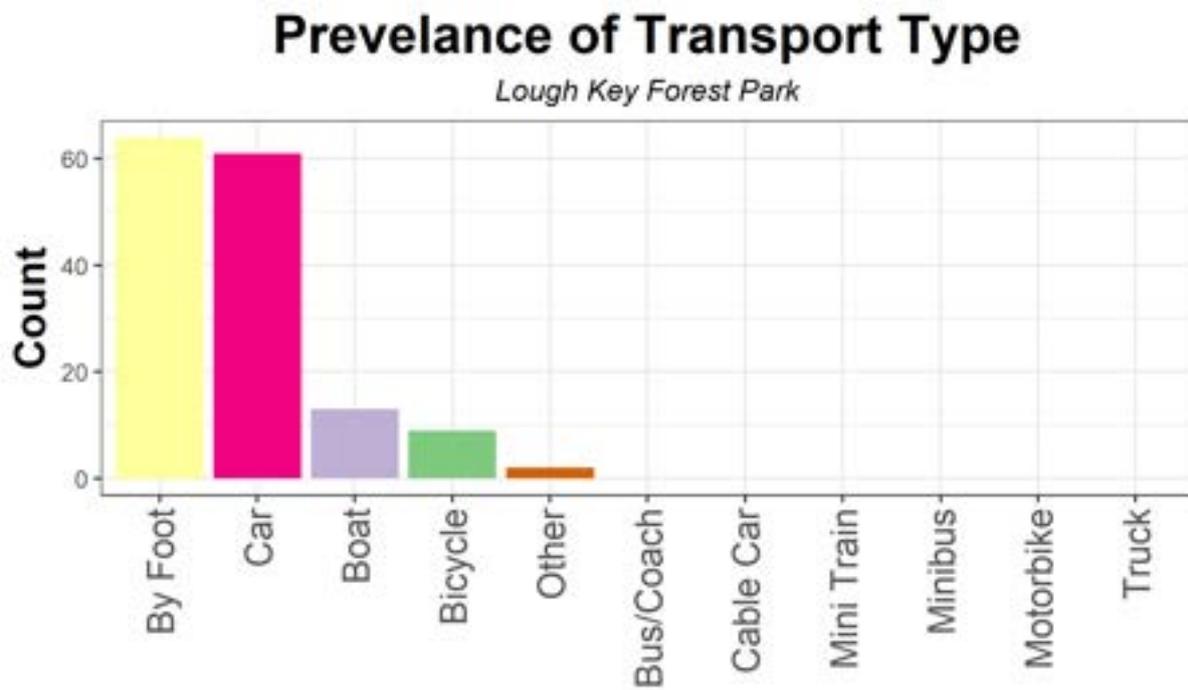
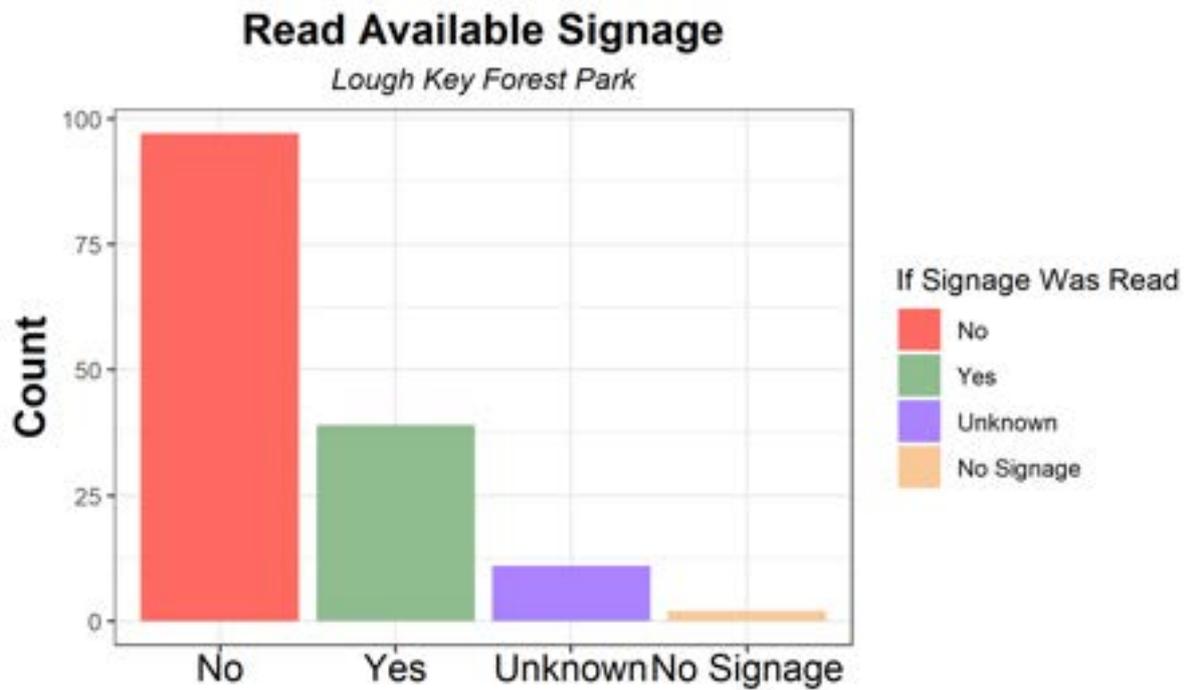


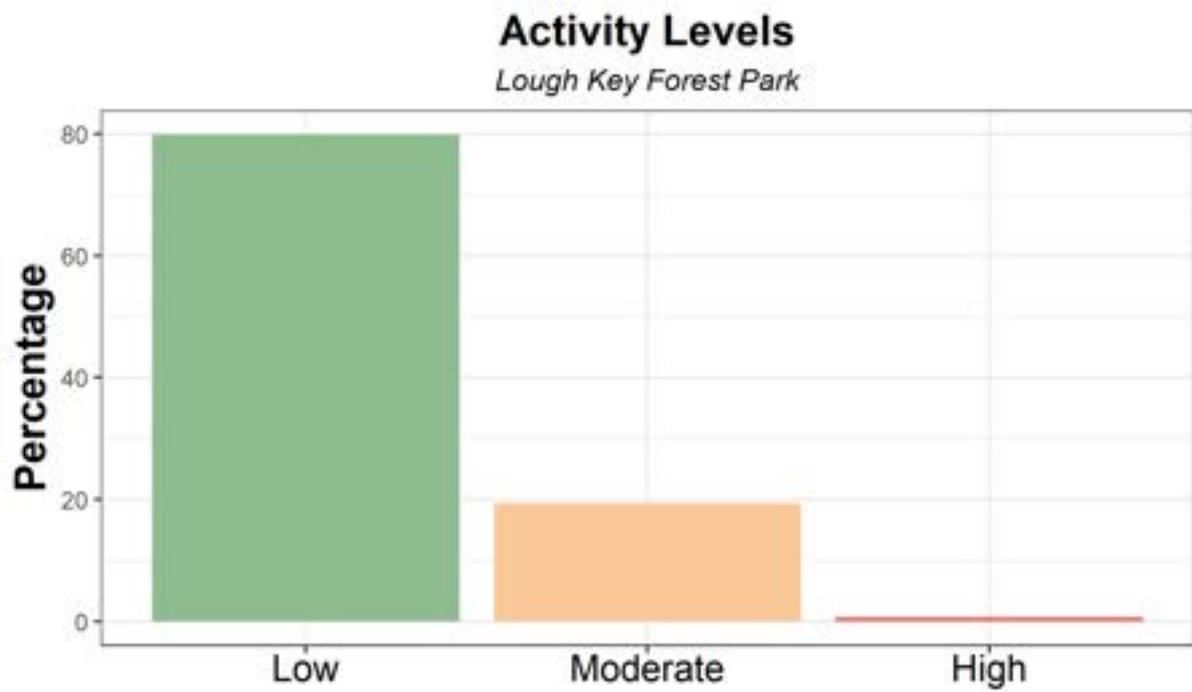
Figure 16.9 Groups of visitors that visited Lough Key Forest Park



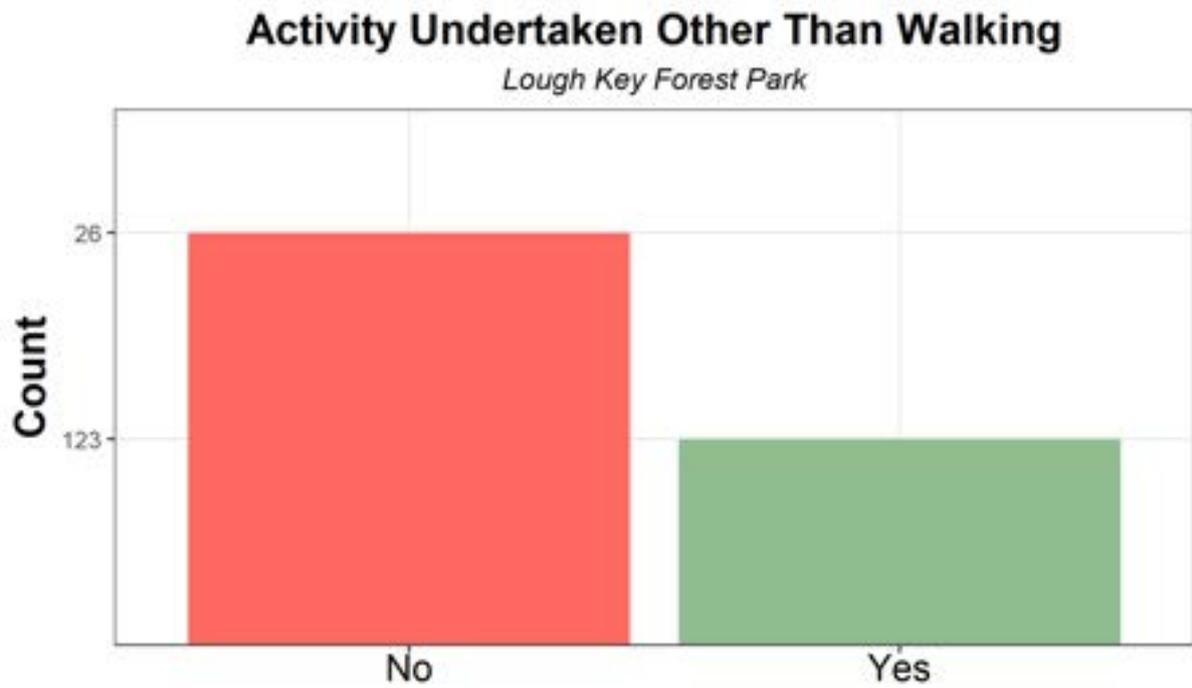
**Figure 16.10** Mode of transport used to visit Lough Key Forest Park



**Figure 16.11** Use of Interpretive Material at Lough Key Forest Park



**Figure 16.12 Categories of Activity Levels Observed at Lough Key Forest Park**



**Figure 16.13 Activities undertaken other than walking**

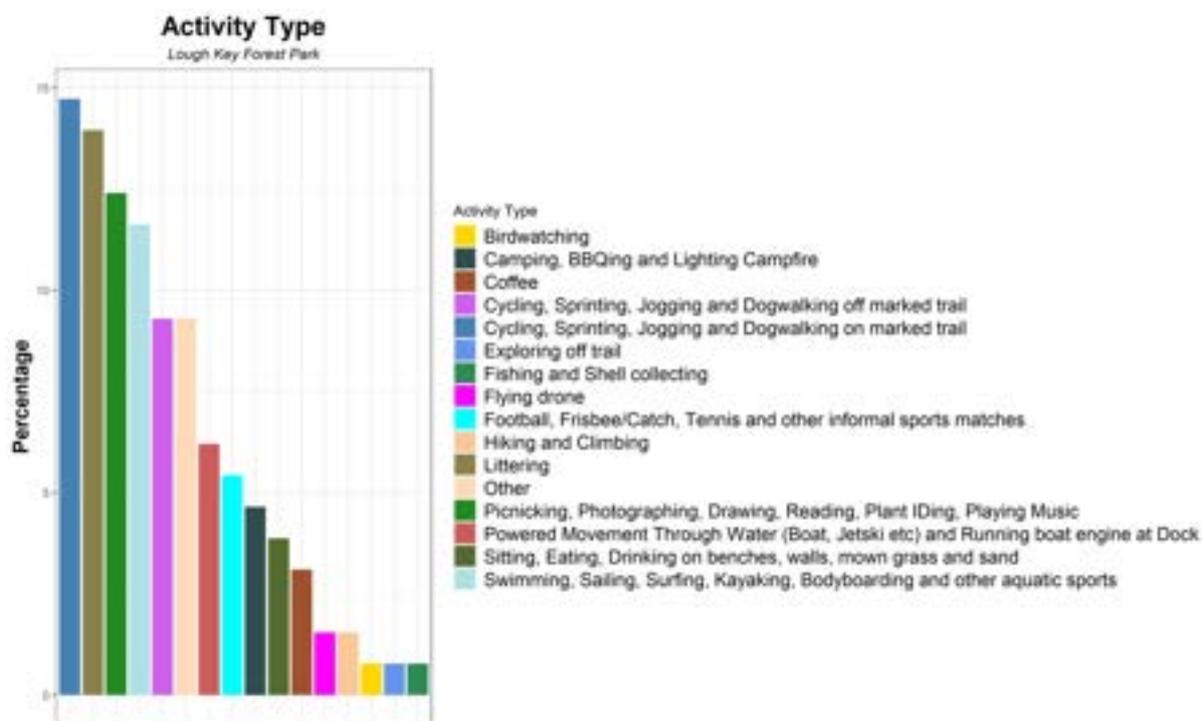


Figure 16.14 Range of Visitor Activities Observed at Lough Key Forest Park

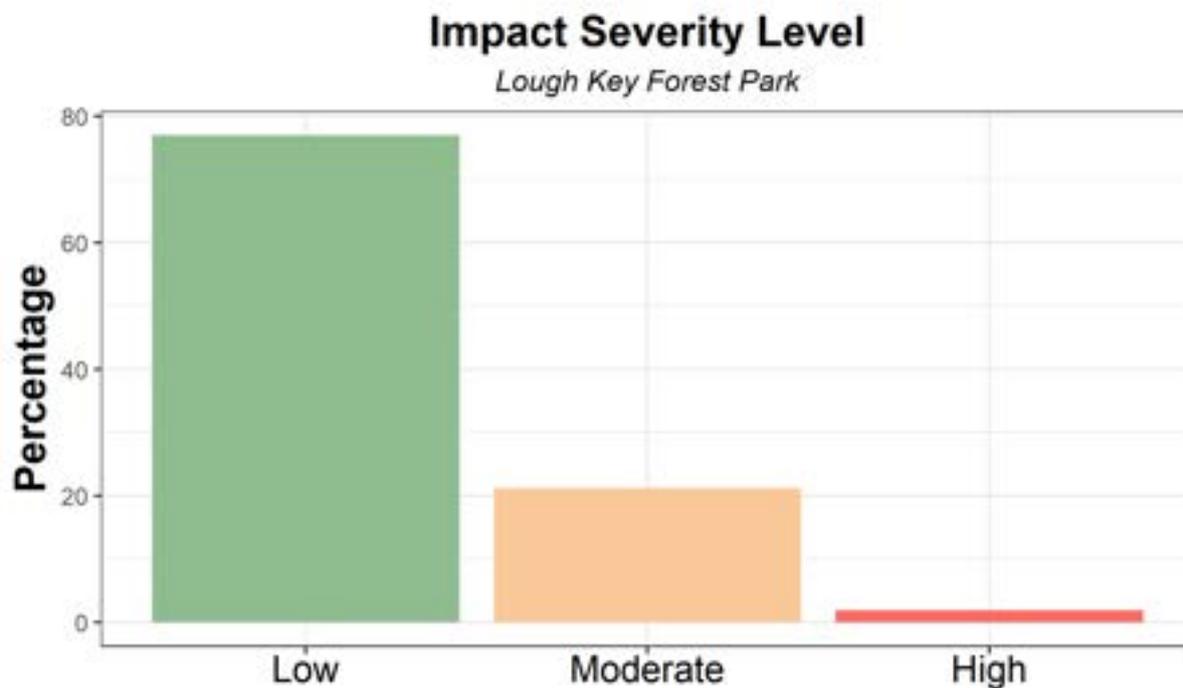
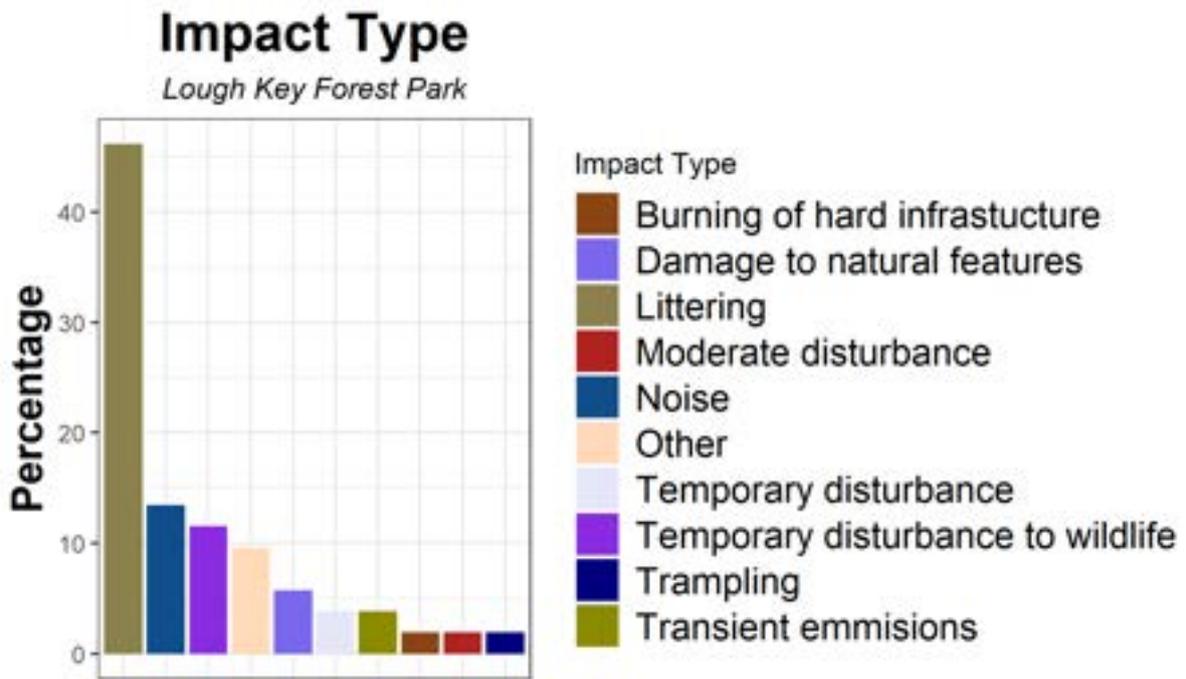


Figure 16.15 Categories of Environmental Impact Levels Observed at Lough Key Forest Park as a result of Visitor Activities



**Figure 16.16 Range of Environmental Impacts Observed at Lough Key Forest Park**



**Figure 16.17 Visitor movement patterns at Lough Key Forest Park**

Of the 149 groups recorded on site 83% of them undertook activities other than walking. These activities (identified above) resulted in 52 impacts being observed on site during the survey. Thus, 40% of activities on site resulted in impacts on the environment. The impact severity levels varied with 77% of the impacts being low, 21% of impacts being moderate, and 2% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Burning of hard infrastructure	1
Damage to natural features	3
Littering	24
Moderate disturbance	1
Noise	7
Other	5
Temporary disturbance	2
Temporary disturbance to wildlife	6
Trampling	1
Transient emissions	2

## 16.6 Ecological Monitoring Results

### 16.6.1 Ecological Constraints

There are no EU sites designated within 2km of Lough Key Forest Park, however there are two designated proposed Natural Heritage Areas (pNHAs) with 2km of Lough Key Forest Park.

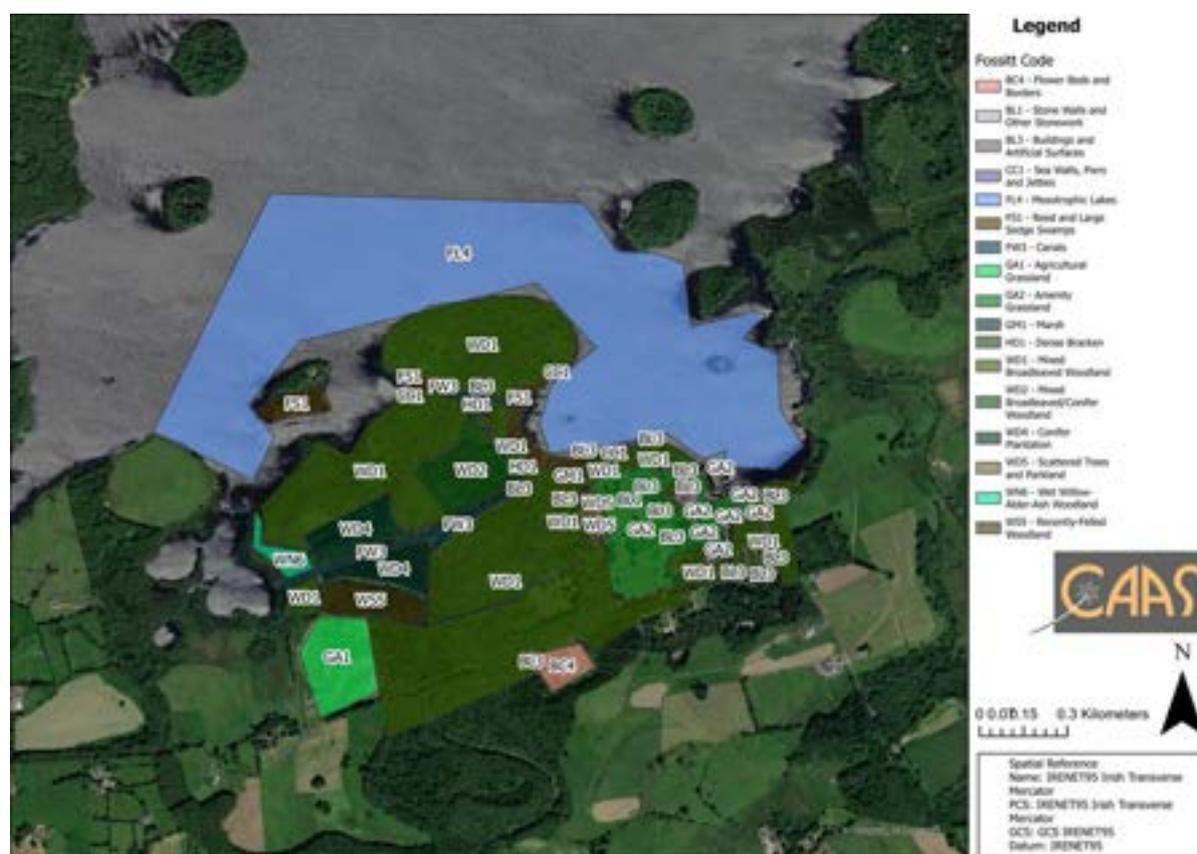
**Table 16.1 Designated sites within 2km of Lough Key Forest Park and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001633]	Drumman's Island (Lough Key) pNHA	0.77	pNHA	
[001636]	Fin Lough (Roscommon) pNHA	1.53	pNHA	

### 16.6.2 Habitat Descriptions

There are a wide variety of habitats at Lough Key Forest Park, with the majority of the area being covered by woodland habitats, specifically mixed broadleaved woodland (Fossitt Code WD1) along with smaller sections of conifer plantations (Fossitt Code WD4) and wet willow-alder-ash woodland (Fossitt Code WN6). As Lough Key is situated in the area, there are also lakeside habitats within Lough Key Forest Park, Lough Key itself is designated as a mesotrophic lake (Fossitt Code FL4) which leads to areas of marshes (Fossitt Code GM1) and reed and large sedge swamps (Fossitt Code FS1).

The visitor monitoring results show that visitors have a high rate of path fidelity on site and the management practices control visitor movements well.



**Figure 16.18 Habitats present at Lough Key Forest Park**

### 16.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>34</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 42 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be visitor movements around the lake causing disturbance effects to semi domesticated duck species, littering and deliberate damage.

### 16.6.4 Breeding Bird Survey

Lough Key Forest Park contains a variety of passerine and wader birds, in large part to both the woodland and lakeside habitat of the site. Due to the lakeside habitat, the most common species that was recorded at Lough Key Forest Park were mallards with black-headed gulls and mute swans also being observed. Other birds which were observed in high numbers were blackbirds, blackcaps and song thrushes.

**Table 16.2 Results of the breeding bird survey conducted at Lough Key Forest Park**

Common Name	Scientific Name	List Status	Number Recorded
Blackbird	<i>Turdus merula</i>	Green	11
Blackcap	<i>Sylvia atricapilla</i>	Green	10
Black-headed Gull	<i>Larus ridibundus</i>	Amber	6
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	2
Chaffinch	<i>Fringilla coelebs</i>	Green	2
Coal Tit	<i>Parus ater</i>	Green	1
Dunnock	<i>Prunella modularis</i>	Green	2
Goldcrest	<i>Regulus regulus</i>	Amber	6
Great Crested Grebe	<i>Podiceps cristatus</i>	Amber	3
Great Tit	<i>Parus major</i>	Green	2
Hooded Crow	<i>Corvus cornix</i>	Green	2

<sup>34</sup> This value was calculated using the methods set out in Appendix II

Common Name	Scientific Name	List Status	Number Recorded
House Martin	<i>Delichon urbicum</i>	Amber	4
Jackdaw	<i>Corvus monedula</i>	Green	25
Lesser Black-backed Gull	<i>Larus fuscus</i>	Amber	2
Maggie	<i>Pica pica</i>	Green	1
Mallard	<i>Anas platyrhynchos</i>	Amber	35
Mistle Thrush	<i>Turdus viscivorus</i>	Green	7
Mute Swan	<i>Cygnus olor</i>	Amber	7
Pied Wagtail	<i>Motacilla alba yarrelli</i>	Green	2
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	1
Robin	<i>Erithacus rubecula</i>	Green	9
Song Thrush	<i>Turdus philomelos</i>	Green	14
Swallow	<i>Hirundo rustica</i>	Amber	5
Woodpigeon	<i>Columba palumbus</i>	Green	13
Wren	<i>Troglodytes troglodytes</i>	Green	10

### 16.6.5 Mammals on Site

Red squirrel was observed on site during the survey and there was evidence (scat samples) of pine marten recorded at Lough Key Forest Park. Moreover, the NBDC data shows that there are a large number of terrestrial mammals in the area, this is helped by the woodland habitat and surrounding habitat, of Lough Key Forest Park leading to high observations of species such as red squirrels and badgers, along with other species such as pine martens, foxes, hedgehogs and various bat species.

**Table 16.3 List of mammals that have been recorded at NBDC Hectad G80**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	3
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	9
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	1
Terrestrial mammal	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	49
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	62
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	1
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	50
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	2
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	1
Terrestrial mammal	Fallow Deer	<i>Dama dama</i>	11
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	4
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	2
Terrestrial mammal	Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	4
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	6
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	25
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	10
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	9
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	10
Terrestrial mammal	Whiskered/Brandt's Bat	<i>Myotis mystacinus/brandtii</i>	1
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	2

### 16.6.6 Wintering Bird Survey

The site had a large mallard population present during the winter survey – there was minimal bird activity beyond the common duck species.

**Table 16.4 Results of the wintering bird survey conducted at Lough Key Forest Park**

Common name	Scientific name	Record count
Black-headed Gull	<i>Larus ridibundus</i>	7
Common Coot	<i>Fulica atra</i>	3
Mallard	<i>Anas platyrhynchos</i>	17

Common name	Scientific name	Record count
Grey Heron	<i>Ardea cinerea</i>	3

**Table 16.5 List of wintering birds that have been recorded at NBDC Hectad G80**

Taxonomic group	Common name	Scientific name	Record count
bird	Black-headed Gull	<i>Larus ridibundus</i>	22
bird	Common Coot	<i>Fulica atra</i>	10
bird	Common Goldeneye	<i>Bucephala clangula</i>	4
bird	Common Kingfisher	<i>Alcedo atthis</i>	6
bird	Common Moorhen	<i>Gallinula chloropus</i>	18
bird	Common Pochard	<i>Aythya ferina</i>	8
bird	Common Redshank	<i>Tringa totanus</i>	1
bird	Common Sandpiper	<i>Actitis hypoleucos</i>	2
bird	Common Snipe	<i>Gallinago gallinago</i>	12
bird	Common Tern	<i>Sterna hirundo</i>	10
bird	Eurasian Curlew	<i>Numenius arquata</i>	13
bird	Eurasian Teal	<i>Anas crecca</i>	6
bird	Eurasian Wigeon	<i>Anas penelope</i>	5
bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	10
bird	Great Cormorant	<i>Phalacrocorax carbo</i>	9
bird	Great Crested Grebe	<i>Podiceps cristatus</i>	14
bird	Grey Heron	<i>Ardea cinerea</i>	15
bird	Herring Gull	<i>Larus argentatus</i>	1
bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	5
bird	Little Grebe	<i>Tachybaptus ruficollis</i>	20
bird	Mallard	<i>Anas platyrhynchos</i>	27
bird	Mew Gull	<i>Larus canus</i>	8
bird	Mute Swan	<i>Cygnus olor</i>	26
bird	Northern Lapwing	<i>Vanellus vanellus</i>	9
bird	Red-breasted Merganser	<i>Mergus serrator</i>	1
bird	Ringed Plover	<i>Charadrius hiaticula</i>	4
bird	Tufted Duck	<i>Aythya fuligula</i>	9
bird	Water Rail	<i>Rallus aquaticus</i>	1
bird	White-throated Dipper	<i>Cinclus cinclus</i>	7
bird	Whooper Swan	<i>Cygnus cygnus</i>	7

**16.6.7 Bat Survey**

The site has a range of habitats with high suitability for bats. Relatively low number of bats were recorded during the survey – however, there are records of all of the Irish species of bats being present on site.

**Table 16.6 Bats recorded at Lough Key Forest Park**

Common name	Scientific name	Record count
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	8
Daubenton's Bat	<i>Myotis daubentonii</i>	11
Natterer's Bat	<i>Myotis nattereri</i>	6
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	9

**Table 16.7 List of bats that have been recorded at NBDC Hectad G80**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	9
Terrestrial mammal	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	49
Terrestrial mammal	Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	4
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	6
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	9

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Terrestrial mammal	Whiskered/Brandt's Bat	<i>Myotis mystacinus/brandtii</i>	1

### 16.7 Recommendations

- A stronger litter management process is needed for the site as the majority of impacts were littering. More bins are needed to alleviate the littering pressures.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

## Malahide – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

The estuary is an important wintering bird site and holds an internationally important population of Brent Goose and nationally important populations of a further 15 species.



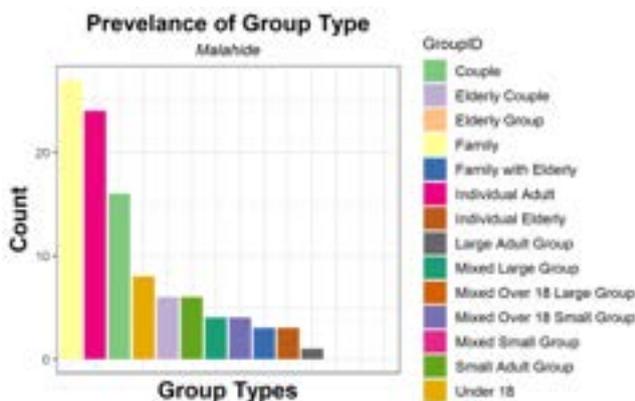
The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as 'the island'. The outer estuary drains almost completely at low tide, exposing sand and mud flats. There is a large bed of Eelgrass (*Dwarf Eelgrass, Zostera noltii, and Narrow-leaved Eelgrass, Z. angustifolia*) in the north section of the outer estuary, along with Beaked Tasselweed (*Ruppia maritima*) and extensive mats of green algae (*Enteromorpha spp., Ulva lactuca*). Common Cord-grass (*Spartina anglica*) is also widespread in this sheltered part of the estuary.

### KEY RECOMMENDATIONS

- A visitor management strategy for the site is required – to include trail network interventions within the dune system where damage is evident.
- A litter management plan is required for the site to alleviate pressures related to litter impacts.
- Dog walking off leads is a known issue for the protected bird species of the host SPA and the data identifies this as an impact occurring on site. Consideration should be given to ecological conflict resolution processes such as the appointment of a warden or the promotion of environmentally responsible behaviour.
- Dune restoration works should be established at the site.

### VISITOR NUMBERS AND DWELL TIME

- 375 people visited the site over 8 hours
- Average dwell time of 52 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 60% of all activities undertaken were considered to be low level activities such as photography, jogging and picnicking.
- Nearly 40% of all observable impacts by visitors was noted to be trampling of dunes and vegetation with over 10% pertaining to damage of natural features.
- Most of the visitors to the site stayed for at least 52 minutes –given the nature of the site itself as a relatively urban area.
- Majority of visitors did not read signage that was available on site.



## 17 Malahide

### 17.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 17.2 Methods & Surveys

The following surveys were undertaken at Malahide:

### 17.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Malahide was undertaken on the 18<sup>th</sup> of June 2021, with max temperatures reaching approximately 16° C, no rainfall and low levels of wind on the day<sup>35</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 17.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>35</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 17.2.3 Other Surveys

Additional sample surveys were undertaken at Malahide to identify the species presence of wintering birds. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

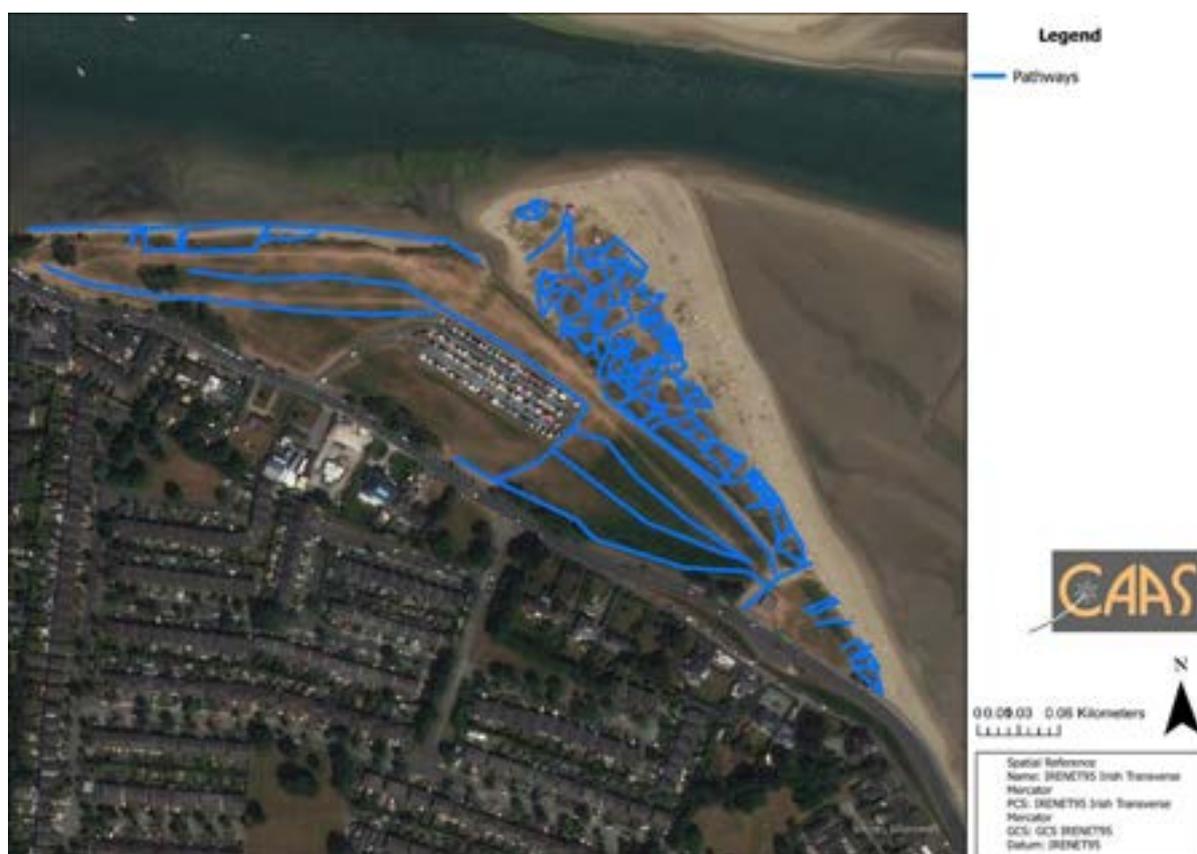
### 17.3 Site Description of Malahide

Malahide is a coastal town just north of Dublin city, situated in Fingal. While quite urban, is located along the Malahide Estuary and thus adjoins both Malahide Estuary SAC and SPA. Malahide also is home to the Malahide Castle and Gardens, which is primarily used for leisure activities. It contains habitats such as sand shores and mud shores along with dry meadows and grassy verges.



**Figure 17.1 Malahide**





**Figure 17.3 Pathways identified at Malahide**



**Figure 17.4 Pathways at Malahide**

#### 17.4.2 Features Condition

As would be expected of a coastal visitor area such as Malahide, there are various amenities and features on site that accommodate visitors such as benches, toilets, coffee trucks and a lifeguard area for water related leisure activities. Due to the urban nature of Malahide, there are also a large number of bins within the area. Along with this there are a large number of signs that call for no littering along with providing rules to be followed when visiting the beach area (Figure 17.6). There are also a small number of wildlife and nature information signs that show the importance of Malahide estuary.

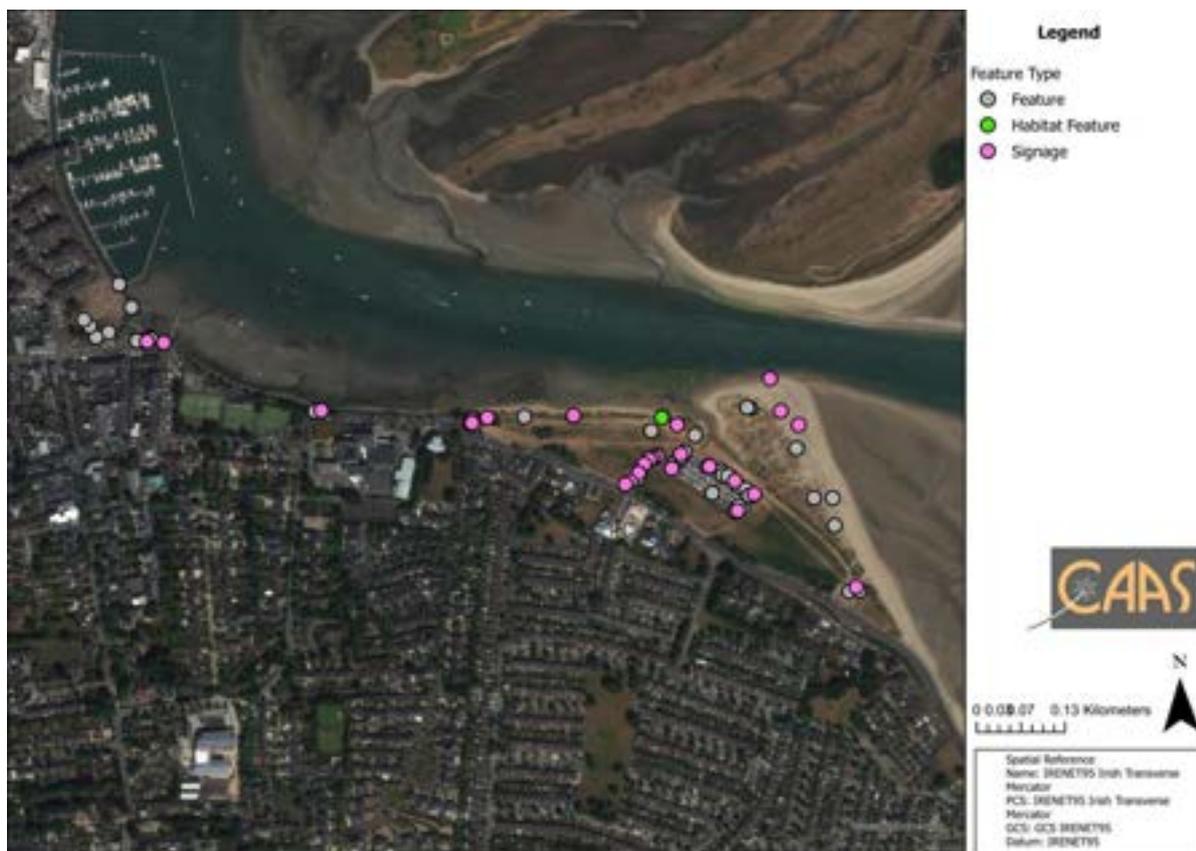


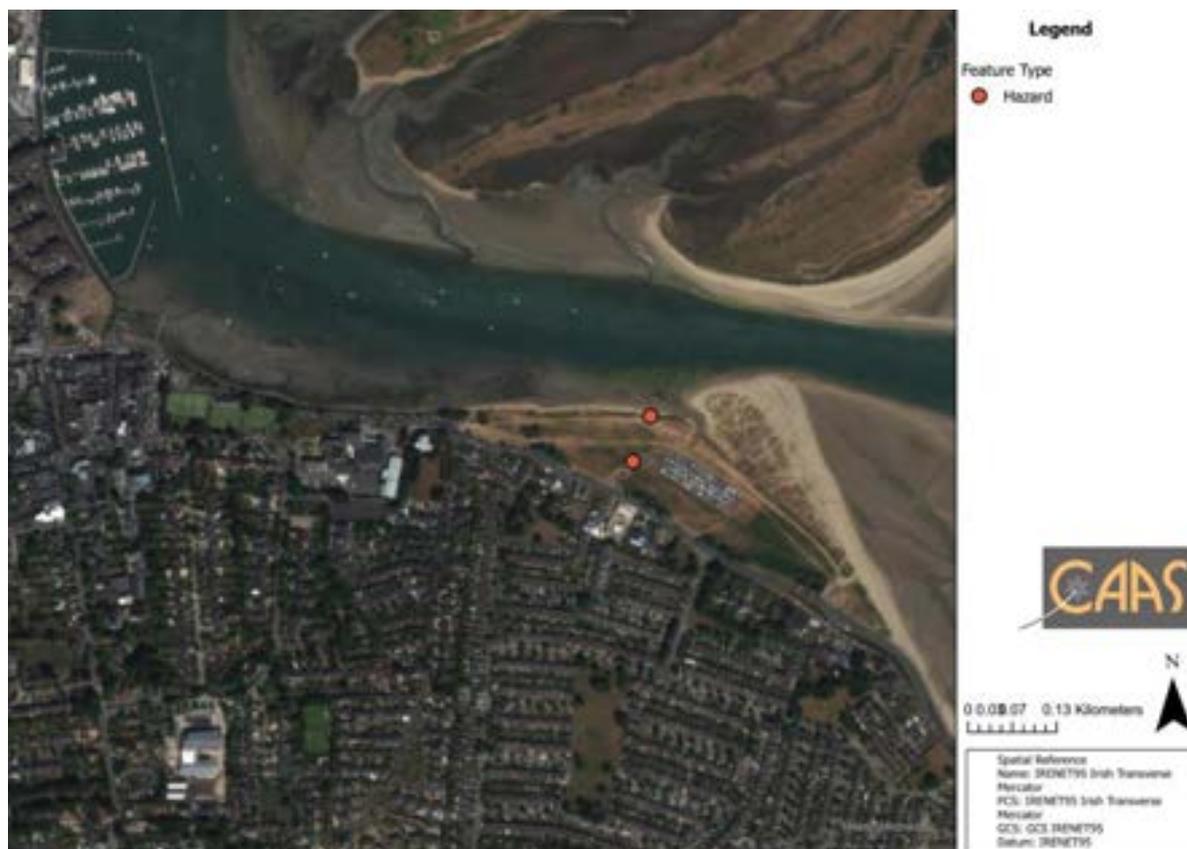
Figure 17.5 Features recorded at Malahide



Figure 17.6 Features at Malahide

### 17.4.3 Hazards

Erosion, dumping, desire lines and unrestricted camping were all found at Malahide, along with a small number of burned areas.



**Figure 17.7 Hazards recorded at Malahide**

### 17.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 375 visitors (which represent 102 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 52 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Picnicking
Dog walking (on lead)
Dog walking (off lead)
Sitting
Building sand castles
Exploring off trail
Jogging
Off road driving
Recycling
Camping
Cycling
Drawing
Football
Nappy changing on mat
Photographing
Playing Music
Sailing
Sports Match (informal)

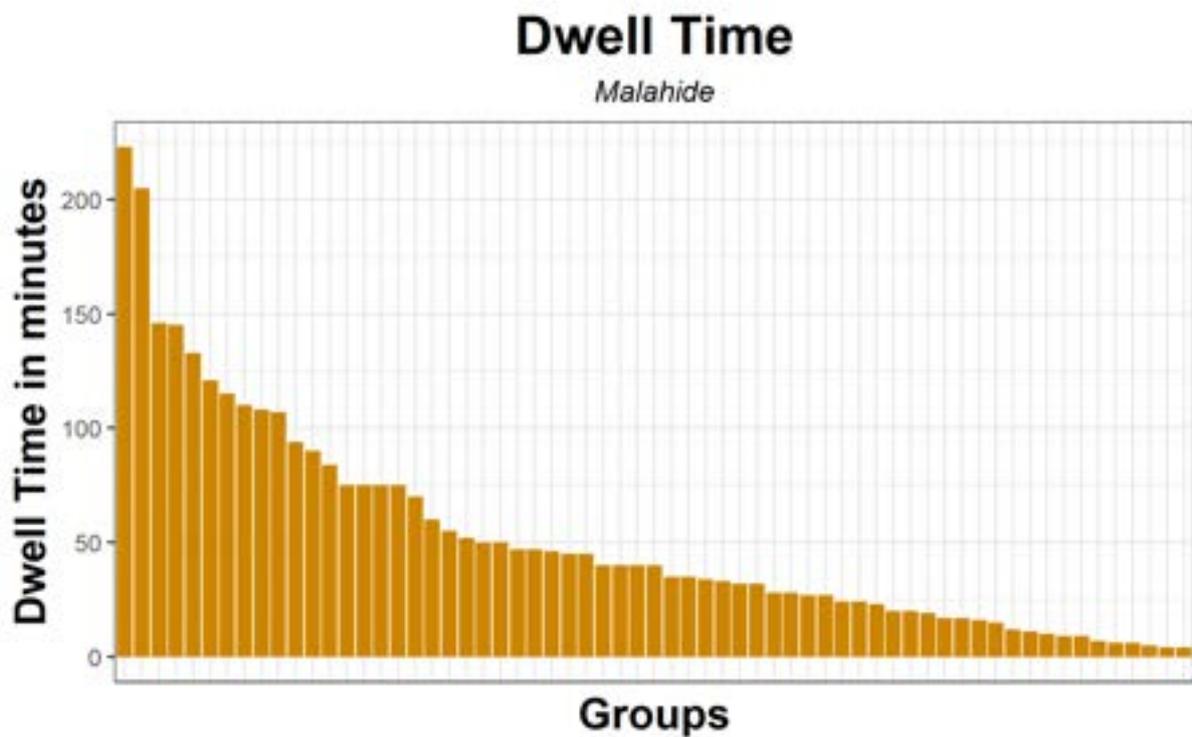


Figure 17.8 Duration of Time Spent at Malahide

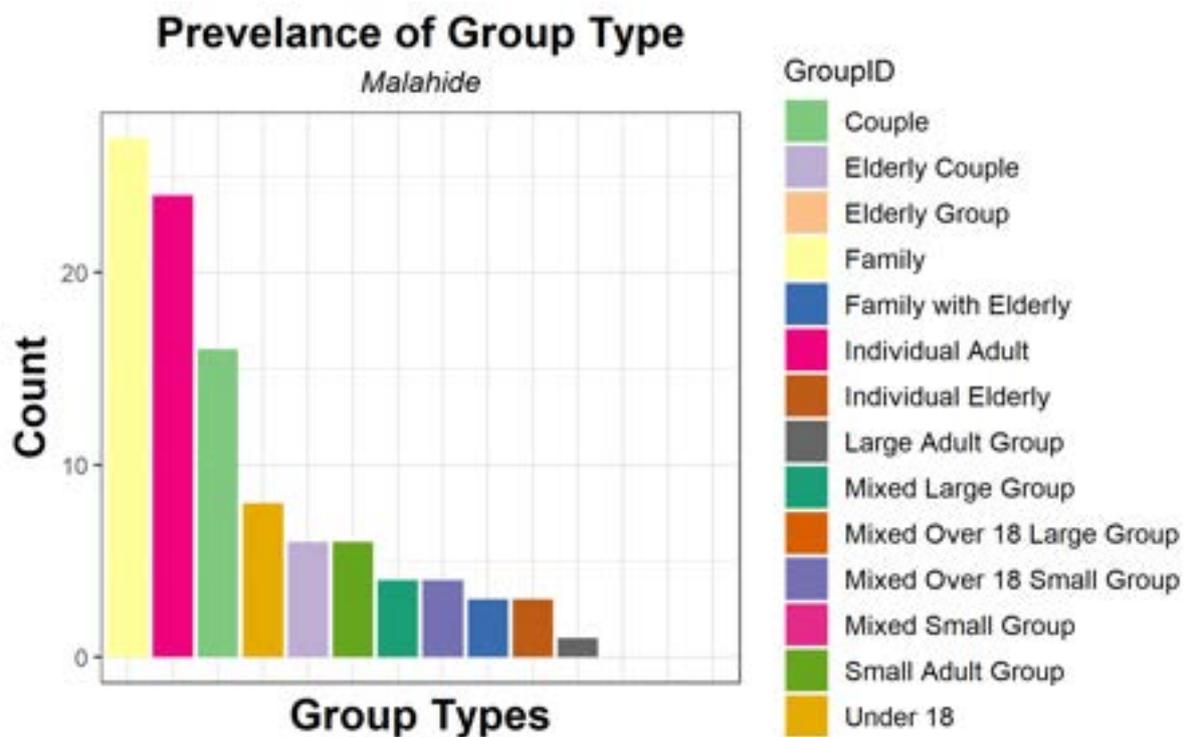
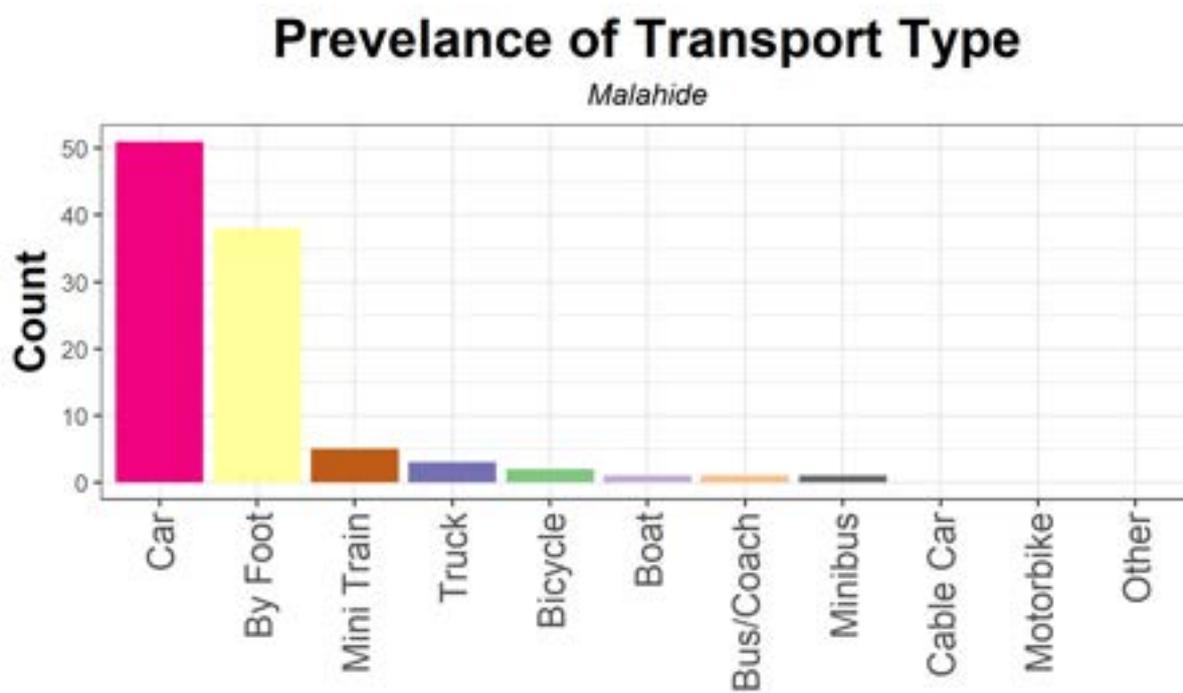
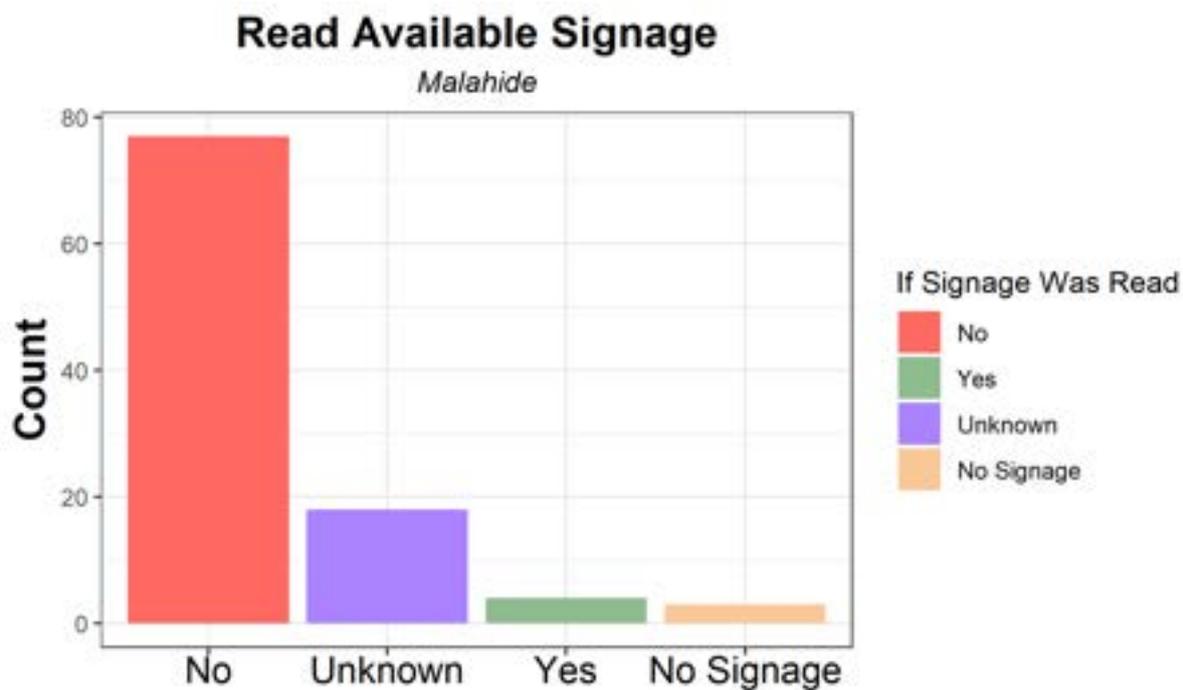


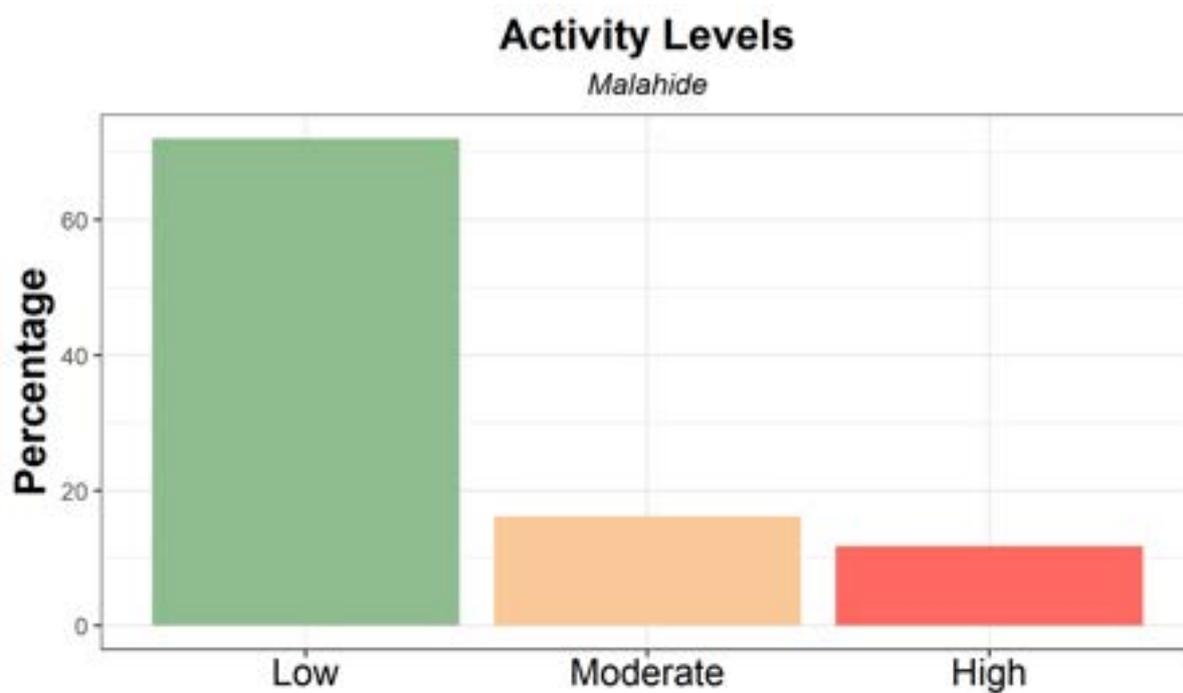
Figure 17.9 Groups of visitors that visited Malahide



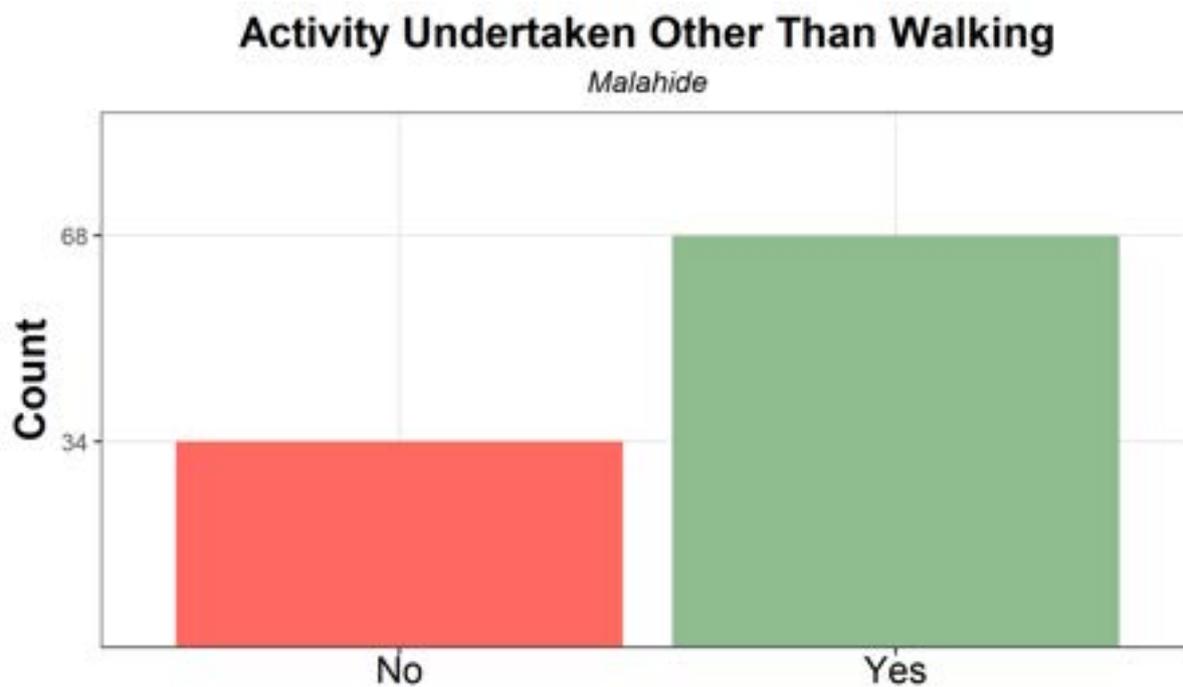
**Figure 17.10 Mode of transport used to visit Malahide**



**Figure 17.11 Use of Interpretive Material at Malahide**



**Figure 17.12 Categories of Activity Levels Observed at Malahide**



**Figure 17.13 Activities undertaken other than walking**

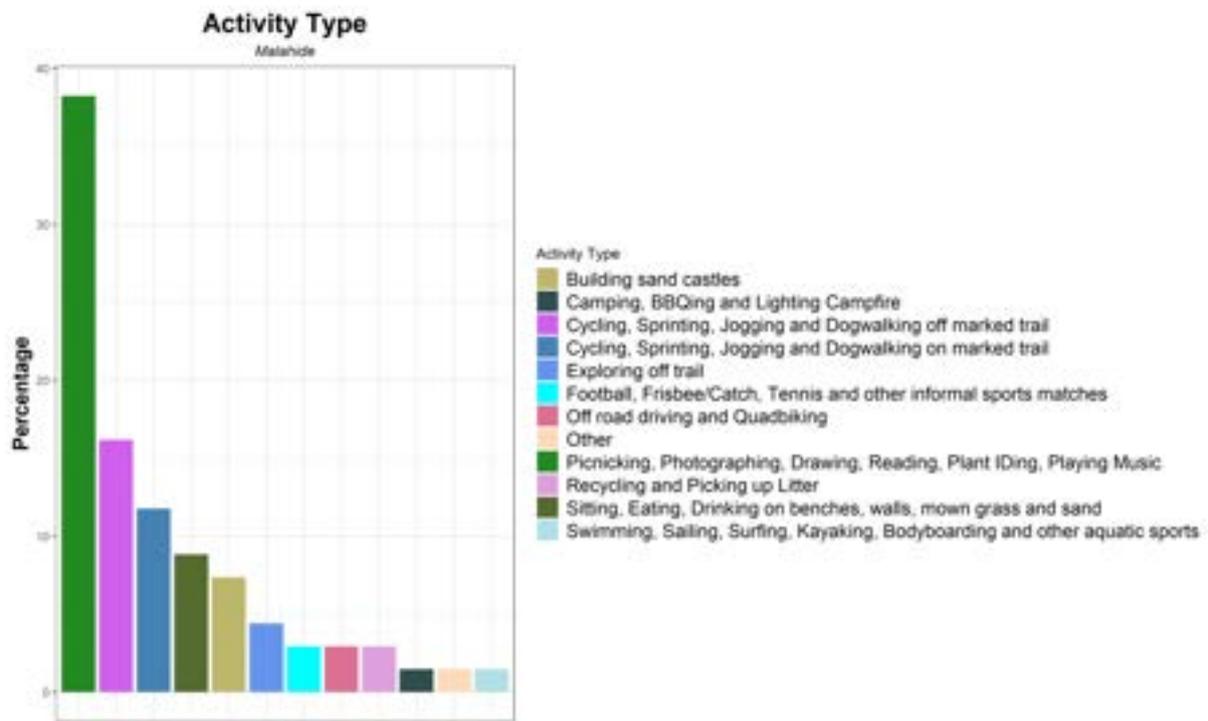


Figure 17.14 Range of Visitor Activities Observed at Malahide

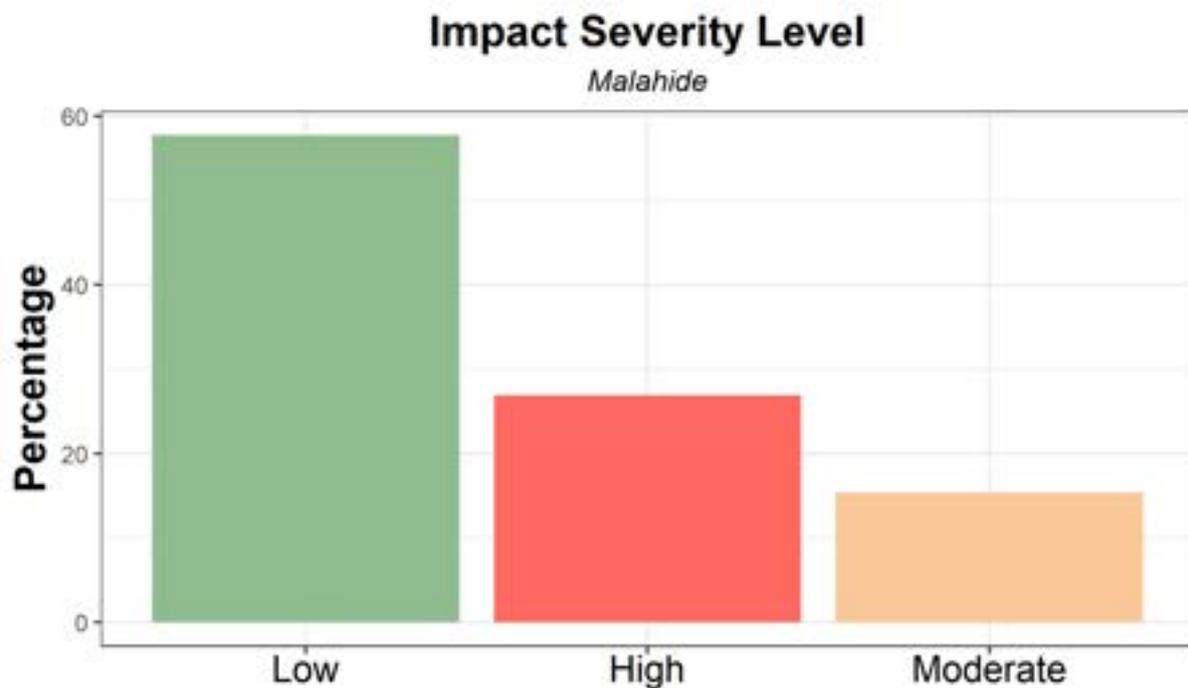


Figure 17.15 Categories of Environmental Impact Levels Observed at Malahide as a result of Visitor Activities

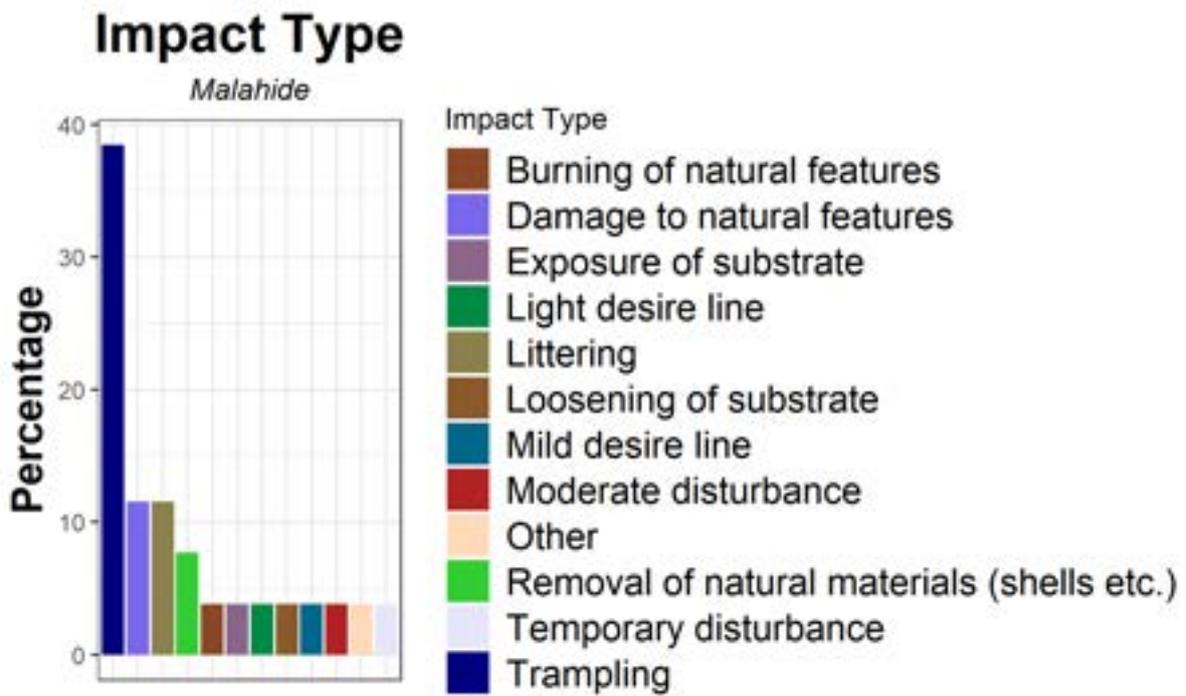


Figure 17.16 Range of Environmental Impacts Observed at Malahide

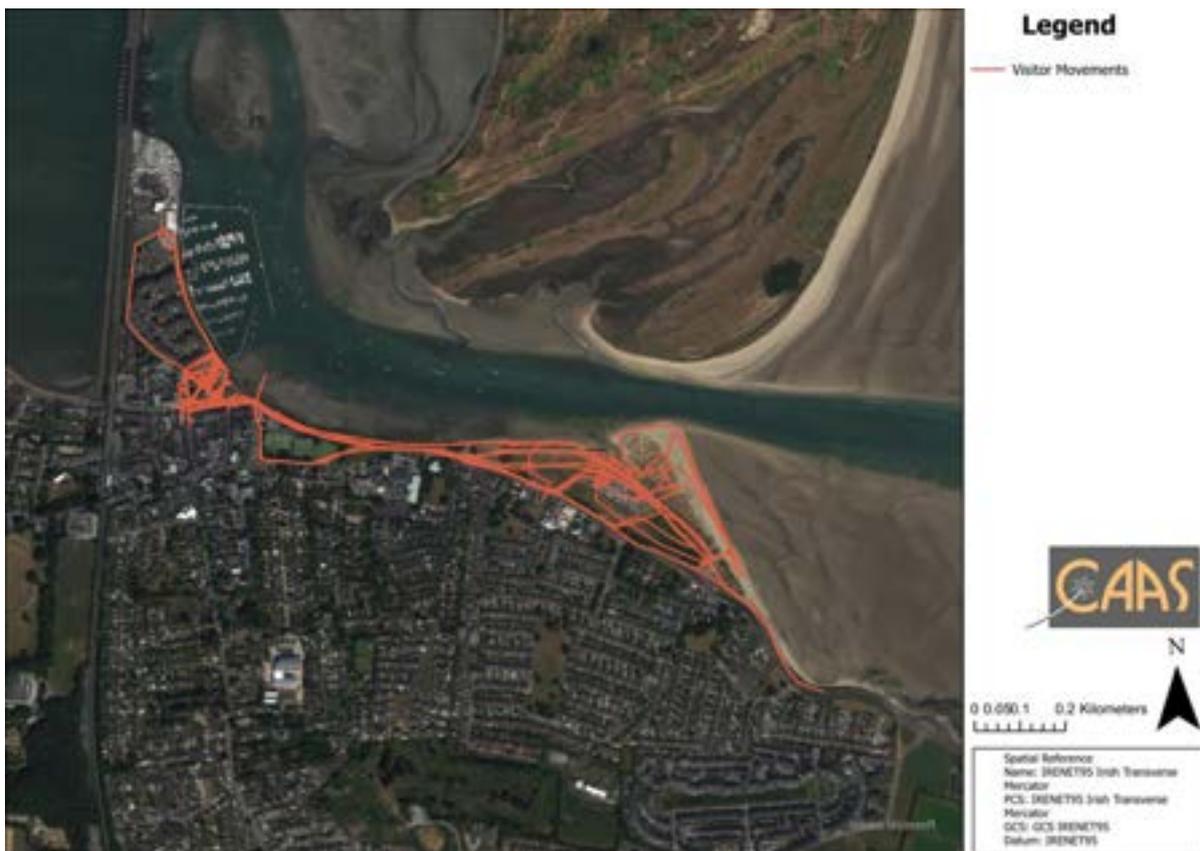


Figure 17.17 Visitor movement patterns at Malahide

Of the 102 groups recorded on site 67% of them undertook activities other than walking. These activities (identified above) resulted in 26 impacts being observed on site during the survey. Thus, 38% of activities on site resulted in impacts on the environment. The impact severity levels varied with 58% of the impacts being low, 15% of impacts being moderate, and 27% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Burning of natural features	1
Damage to natural features	3
Exposure of substrate	1
Light desire line	1
Littering	3
Loosening of substrate	1
Mild desire line	1
Moderate disturbance	1
Other	1
Removal of natural materials (shells etc.)	2
Temporary disturbance	1
Trampling	10

## 17.6 Ecological Monitoring Results

### 17.6.1 Ecological Constraints

The species and habitats within 2km of Malahide are sensitive to hydrological changes, invasive species, land use management, pollution, anthropogenic disturbance and overgrazing.

**Table 17.1 Designated sites within 2km of Malahide and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000205]	Malahide Estuary SAC	0.01	SAC	Salicornia and other annuals colonising mud and sand [1310], Mudflats and sandflats not covered by seawater at low tide [1140], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410], Fixed coastal dunes with herbaceous vegetation - grey dunes [2130], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120]
[000205]	Malahide Estuary pNHA	0.02	pNHA	
[004025]	Malahide Estuary SPA	0.02	SPA	Pintail ( <i>Anas acuta</i> ) [A054], Knot ( <i>Calidris canutus</i> ) [A143], Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156], Shelduck ( <i>Tadorna tadorna</i> ) [A048], Dunlin ( <i>Calidris alpina</i> ) [A149], Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069], Goldeneye ( <i>Bucephala clangula</i> ) [A067], Grey Plover ( <i>Pluvialis squatarola</i> ) [A141], Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130], Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Redshank ( <i>Tringa totanus</i> ) [A162], Wetland and Waterbirds [A999], Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157], Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]

### 17.6.2 Habitat Descriptions

The habitats of Malahide are typical of an urban, coastal area. The majority of Malahide itself is made up of buildings and artificial surfaces (Fossitt Code BL3) with patches of amenity grassland (Fossitt Code GA2) and scattered tress and parkland (Fossitt Code WD5). Malahide Estuary is an estuary (Fossitt Code MW4), designated as an SAC, is located at Malahide and therefore there are coastal habitats such as marram dunes (Fossitt Code CD2) which align with the Annex I habitat for which the SAC is designated (Fixed coastal dunes with herbaceous vegetation – grey dunes [2130]).

The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as 'the Island'. The outer estuary drains almost completely at low tide, exposing sand and mud flats. There is a large bed of Eelgrass (*Dwarf Eelgrass, Zostera noltii, and Narrow-leaved Eelgrass, Z. angustifolia*) in the north section of the outer estuary, along with Beaked Tasselweed (*Ruppia maritima*) and extensive mats of

green algae (*Enteromorpha spp.*, *Ulva lactuca*). Common Cord-grass (*Spartina anglica*) is also widespread in this sheltered part of the estuary.

Damage to the dunes from visitor movements is evident, there is an extensive trail network in the dune system with considerable levels of substrate exposure.



**Figure 17.18 Habitats present at Malahide**

### 17.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>36</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 9 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be erosion from walkers and pollution.

### 17.6.4 Wintering Bird Survey

Mute Swans, Oystercatchers, Redshanks, Greenshanks and Herring Gulls were all observed on site during the survey work. Malahide estuary is resident to a range of protected species such as the light bellied brent gress which are known to forage in the estuary itself daily.

The estuary is an important wintering bird site and holds an internationally important population of Brent Goose and internationally important populations of a further 15 species.

**Table 17.2 Results of the wintering bird survey conducted at Malahide**

Common name	Scientific name	Record count
Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	36
Common Greenshank	<i>Tringa nebularia</i>	12
Mute Swan	<i>Cygnus olor</i>	2
Herring Gull	<i>Larus argentatus</i>	10

<sup>36</sup> This value was calculated using the methods set out in Appendix II

**Table 17.3 List of wintering birds that have been recorded at NBDC Hectad O24**

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Alcidae	<i>Alcidae</i>	1
Bird	American Bittern	<i>Botaurus lentiginosus</i>	1
Bird	American Golden Plover	<i>Pluvialis dominica</i>	2
Bird	Arctic Tern	<i>Sterna paradisaea</i>	6
Bird	Atlantic Puffin	<i>Fratercula arctica</i>	10
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	10
Bird	Black Brant	<i>Branta bernicla subsp. nigricans</i>	4
Bird	Black Guillemot	<i>Cephus grylle</i>	15
Bird	Black-headed Gull	<i>Larus ridibundus</i>	31
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	44
Bird	Black-necked Grebe	<i>Podiceps nigricollis</i>	1
Bird	Black-tailed Godwit	<i>Limosa limosa</i>	15
Bird	Black-throated Diver	<i>Gavia arctica</i>	2
Bird	Bonaparte's Gull	<i>Larus philadelphia</i>	1
Bird	Branta bernicla subsp. hrota	<i>Branta bernicla subsp. hrota</i>	14
Bird	Brent Goose	<i>Branta bernicla</i>	28
Bird	Canada Goose	<i>Branta canadensis</i>	1
Bird	Caspian Tern	<i>Hydroprogne caspia</i>	1
Bird	Common Coot	<i>Fulica atra</i>	6
Bird	Common Eider	<i>Somateria mollissima</i>	1
Bird	Common Goldeneye	<i>Bucephala clangula</i>	9
Bird	Common Greenshank	<i>Tringa nebularia</i>	12
Bird	Common Guillemot	<i>Uria aalge</i>	24
Bird	Common Kingfisher	<i>Alcedo atthis</i>	8
Bird	Common Moorhen	<i>Gallinula chloropus</i>	26
Bird	Common Pochard	<i>Aythya ferina</i>	6
Bird	Common Redshank	<i>Tringa totanus</i>	25
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	3
Bird	Common Scoter	<i>Melanitta nigra</i>	11
Bird	Common Shelduck	<i>Tadorna tadorna</i>	36
Bird	Common Snipe	<i>Gallinago gallinago</i>	15
Bird	Common Tern	<i>Sterna hirundo</i>	3
Bird	Curlew Sandpiper	<i>Calidris ferruginea</i>	1
Bird	Dunlin	<i>Calidris alpina</i>	14
Bird	Eurasian Curlew	<i>Numenius arquata</i>	29
Bird	Eurasian Dotterel	<i>Charadrius morinellus</i>	1
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	38
Bird	Eurasian Spoonbill	<i>Platalea leucorodia</i>	1
Bird	Eurasian Teal	<i>Anas crecca</i>	17
Bird	Eurasian Wigeon	<i>Anas penelope</i>	18
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	2
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	8
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	29
Bird	Ferruginous Duck	<i>Aythya nyroca</i>	1
Bird	Forster's Tern	<i>Sterna forsteri</i>	1
Bird	Gadwall	<i>Anas strepera</i>	2
Bird	Gavia	<i>Gavia</i>	1
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	1
Bird	Glossy Ibis	<i>Plegadis falcinellus</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	32
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	31
Bird	Great Crested Grebe	<i>Podiceps cristatus</i>	13
Bird	Great Northern Diver	<i>Gavia immer</i>	7
Bird	Greater Scaup	<i>Aythya marila</i>	3
Bird	Green Sandpiper	<i>Tringa ochropus</i>	2
Bird	Grey Heron	<i>Ardea cinerea</i>	31
Bird	Grey Plover	<i>Pluvialis squatarola</i>	8

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Greylag Goose	<i>Anser anser</i>	2
Bird	Herring Gull	<i>Larus argentatus</i>	42
Bird	Jack Snipe	<i>Lymnocyptes minimus</i>	3
Bird	Kentish Plover	<i>Charadrius alexandrinus</i>	1
Bird	Larus	<i>Larus</i>	2
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	21
Bird	Little Auk	<i>Alle alle</i>	1
Bird	Little Egret	<i>Egretta garzetta</i>	22
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	14
Bird	Little Gull	<i>Larus minutus</i>	4
Bird	Little Stint	<i>Calidris minuta</i>	1
Bird	Little Tern	<i>Sternula albifrons</i>	3
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	3
Bird	Long-tailed Tit	<i>Aegithalos caudatus</i>	21
Bird	Mallard	<i>Anas platyrhynchos</i>	38
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	4
Bird	Mediterranean Gull	<i>Larus melanocephalus</i>	6
Bird	Mew Gull	<i>Larus canus</i>	24
Bird	Mute Swan	<i>Cygnus olor</i>	24
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	13
Bird	Northern Gannet	<i>Morus bassanus</i>	32
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	18
Bird	Northern Pintail	<i>Anas acuta</i>	9
Bird	Northern Shoveler	<i>Anas clypeata</i>	6
Bird	Phalacrocoracidae	<i>Phalacrocoracidae</i>	17
Bird	Pied Avocet	<i>Recurvirostra avosetta</i>	1
Bird	Pink-footed Goose	<i>Anser brachyrhynchus</i>	2
Bird	Purple Sandpiper	<i>Calidris maritima</i>	2
Bird	Razorbill	<i>Alca torda</i>	16
Bird	Red Knot	<i>Calidris canutus</i>	9
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	9
Bird	Red-necked Grebe	<i>Podiceps grisegena</i>	1
Bird	Red-throated Diver	<i>Gavia stellata</i>	8
Bird	Ring-billed Gull	<i>Larus delawarensis</i>	2
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	19
Bird	Roseate Tern	<i>Sterna dougallii</i>	1
Bird	Ruddy Duck	<i>Oxyura jamaicensis</i>	1
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	15
Bird	Ruff	<i>Philomachus pugnax</i>	3
Bird	Sanderling	<i>Calidris alba</i>	11
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	5
Bird	Slavonian Grebe	<i>Podiceps auritus</i>	3
Bird	Spotted Redshank	<i>Tringa erythropus</i>	1
Bird	Stone-curlew	<i>Burhinus oediconemus</i>	1
Bird	Surf Scoter	<i>Melanitta perspicillata</i>	1
Bird	Tufted Duck	<i>Aythya fuligula</i>	5
Bird	Velvet Scoter	<i>Melanitta fusca</i>	2
Bird	Water Rail	<i>Rallus aquaticus</i>	3
Bird	Whimbrel	<i>Numenius phaeopus</i>	2
Bird	Whooper Swan	<i>Cygnus cygnus</i>	6

### 17.7 Recommendations

- A visitor management strategy for the site is required – to include trail network interventions within the dune system where damage is evident.
- A litter management plan is required for the site to alleviate pressures related to litter impacts.
- Dog walking off leads is a known issue for the protected bird species of the host SPA and the data identifies this as an impact occurring on site. Consideration should be given to ecological

- conflict resolution processes such as the appointment of a warden or the promotion of environmentally responsible behaviour.
- Dune restoration works should be established at the site.

## Malin Head – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

Ireland’s most northerly point is an important observation site for wildlife – including migrating birds, basking sharks and whales. The site also has important historic features.



There is a breeding population of corncrakes to the north east of the site that is currently being monitored by the NPWS.

### KEY RECOMMENDATIONS

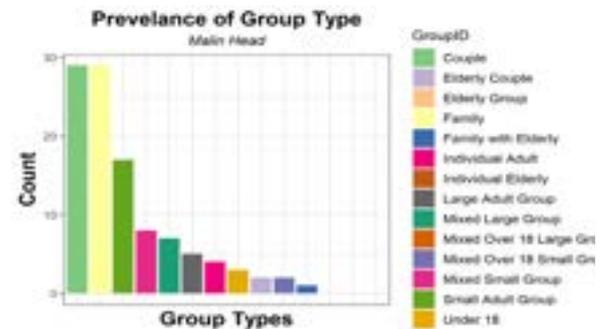
- A visitor management plan is needed to control visitor movement damage at the site.
- A Traffic and parking strategy needs to be devised to address and prevent incursions onto protected habitats.
- Habitat restoration and long-term habitat management should be explored to support the enhancement of biodiversity.
- Community engagement and environmental awareness protocols should be explored for the site to support positive environmental behaviours on site.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 80% of all activities undertaken were considered to be low level activities such as picnicking and exploring off trail.
- The majority of impacts observed on site were deemed to be low level impacts, with 50% of impacts consisting of light desire lines.
- Most of the visitors to the site stayed for at least 27 minutes –given the nature of the site itself.
- Majority of visitors read signage that was available on site.

### VISITOR NUMBERS AND DWELL TIME

- 390 people visited the site over 8 hours
- Average dwell time of 27 minutes



### Highlights:

- Path management system is needed
- Carparking control measures are needed.
- Site dwell time of at least 27 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.



## 18 Malin Head

### 18.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 18.2 Methods & Surveys

The following surveys were undertaken at Malin Head:

### 18.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Malin Head was undertaken on the 27<sup>th</sup> of June 2021, with max temperatures reaching approximately 14.4° C, no rainfall and low levels of wind on the day<sup>37</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 18.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>37</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 18.2.3 Other Surveys

Additional sample surveys were undertaken at Malin Head to identify the species presence of mammals. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

### 18.3 Site Description of Malin Head

Malin Head itself is used for various forms of recreation such as beach walks and fishing. Along with being encompassed by the North Inishowen Coast SAC, it holds habitats such as stretches of montane heath and rare flowers due to the landscape of the area.



**Figure 18.1 Malin Head**

## North Inishowen Coast SAC



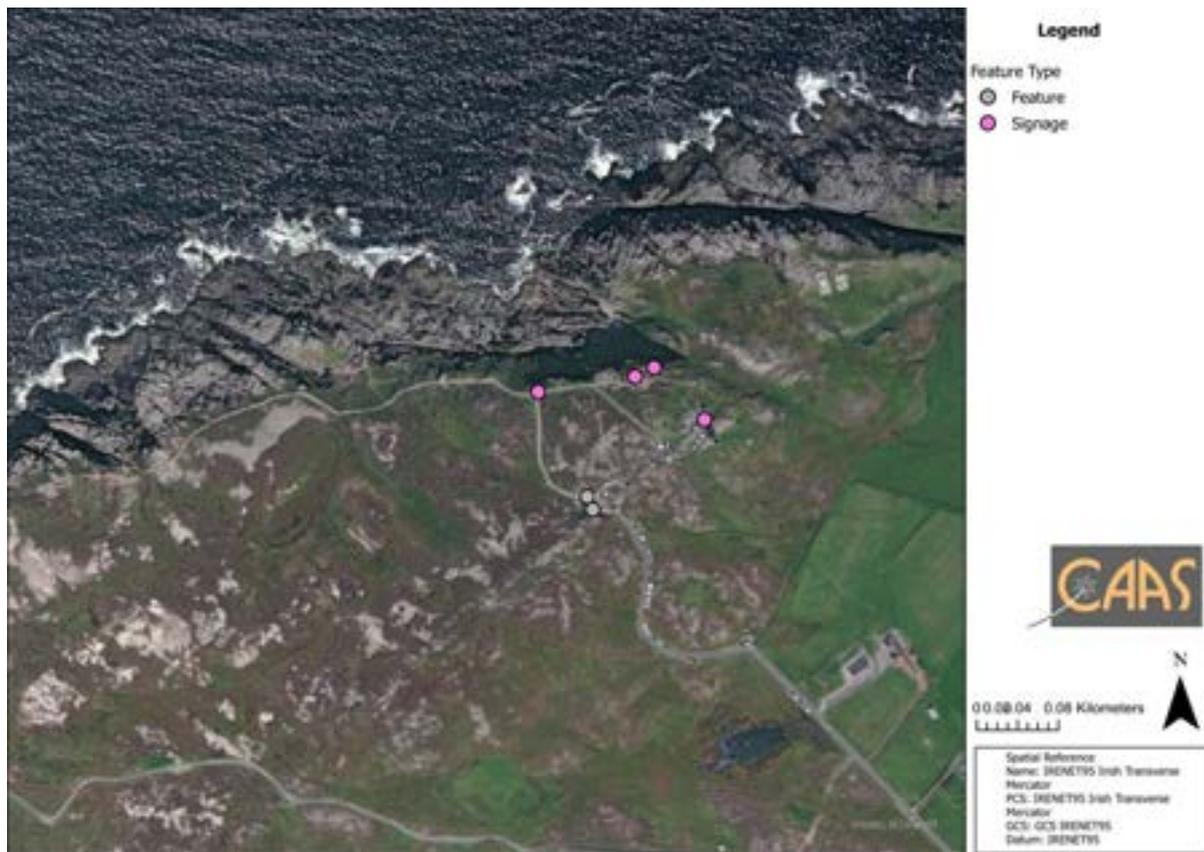
**Figure 18.2 Study Area within North Inishowen Coast SAC**

### 18.4 Pathways and Features Condition Results

#### 18.4.1 Pathway Condition

The pathways at Malin Head are mainly made up of managed pathways of even width with a small section of hard infrastructure pathways. These managed pathways all show heavy signs of compaction with some signs of erosion due to walkers. There are also multiple desire lines and eroded pathways at Malin Head which all show signs of heavy compaction and erosion due to various levels of walking.





**Figure 18.5 Features recorded at Malin Head**



**Figure 18.6 Features at Malin Head**

**18.4.3 Hazards**

The hazard mapping at Malin Head identified few hazards, one of which, a broken fence which leads to an unsafe area (Figure 18.8).



**Figure 18.7 Hazards recorded at Malin Head**

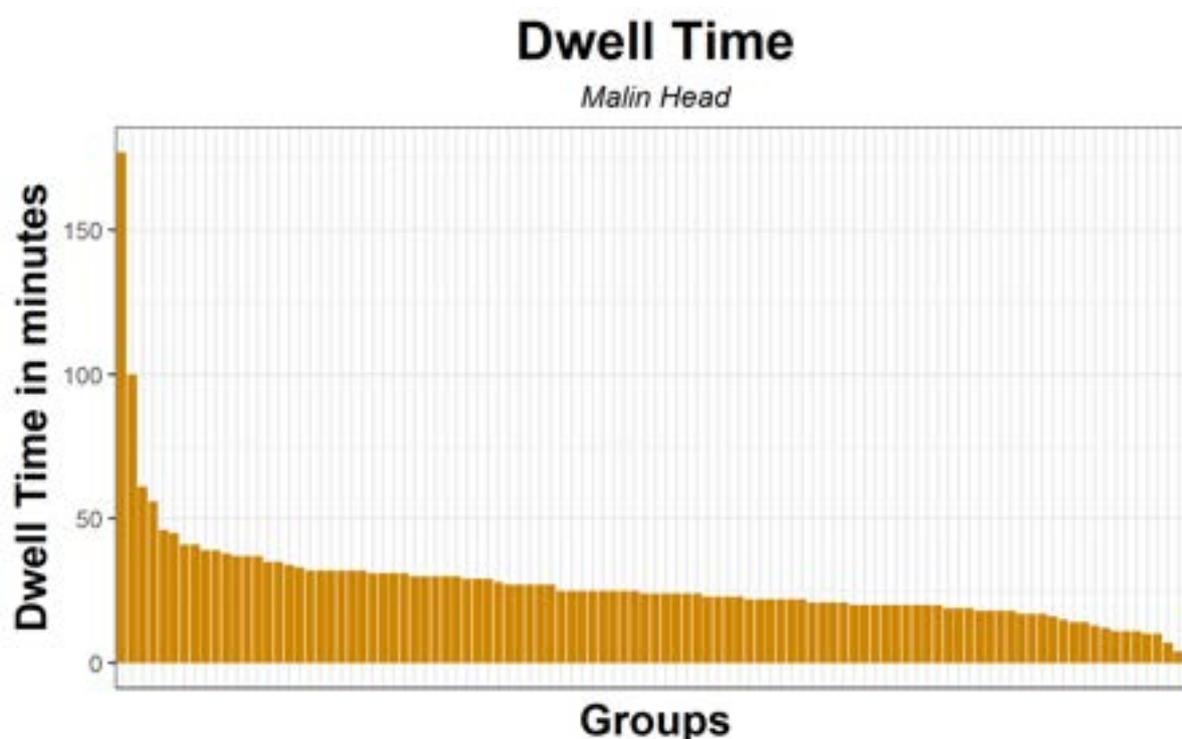


**Figure 18.8 Hazard at Malin Head**

### 18.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 390 visitors (which represent 107 group observations). The site is most popular amongst the Couple Family group with the dominant mode of transport being car. The average dwell time for the site was 27 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Exploring off trail
Photographing
Picnicking
Sitting
Climbing
Cycling
Dog walking (on lead)
Quadbiking/ Scrambling
Flying drone
Public urination



**Figure 18.9 Duration of Time Spent at Malin Head**

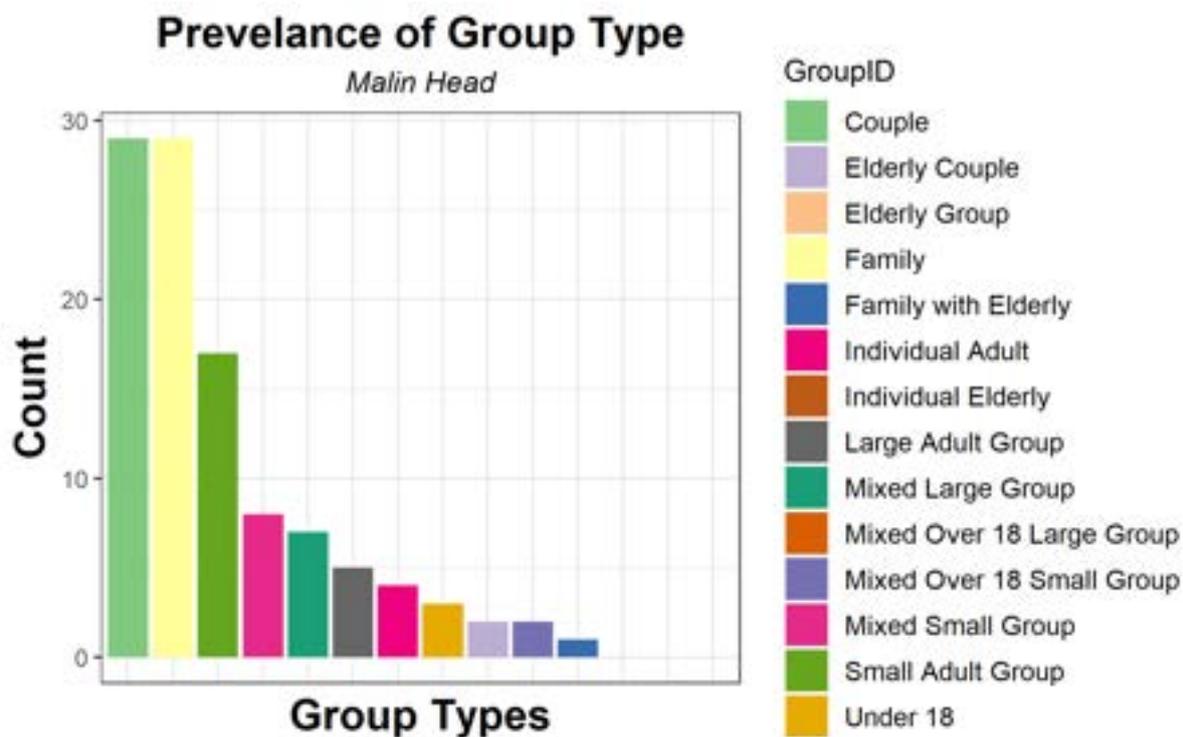


Figure 18.10 Groups of visitors that visited Malin Head

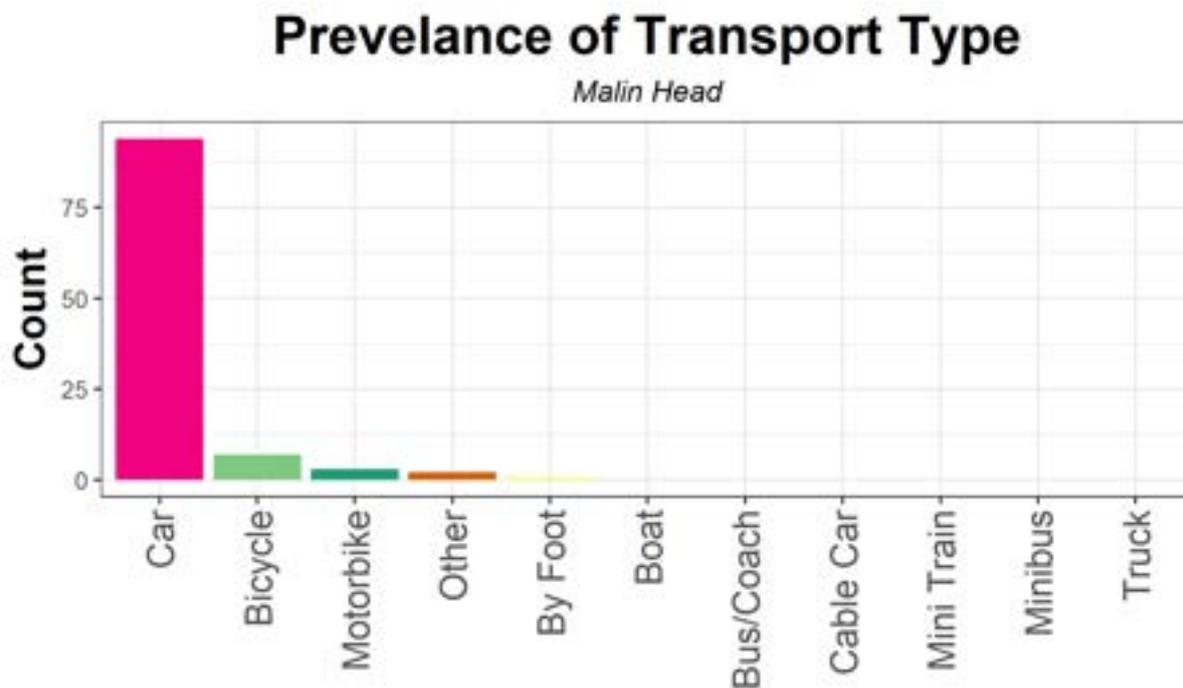
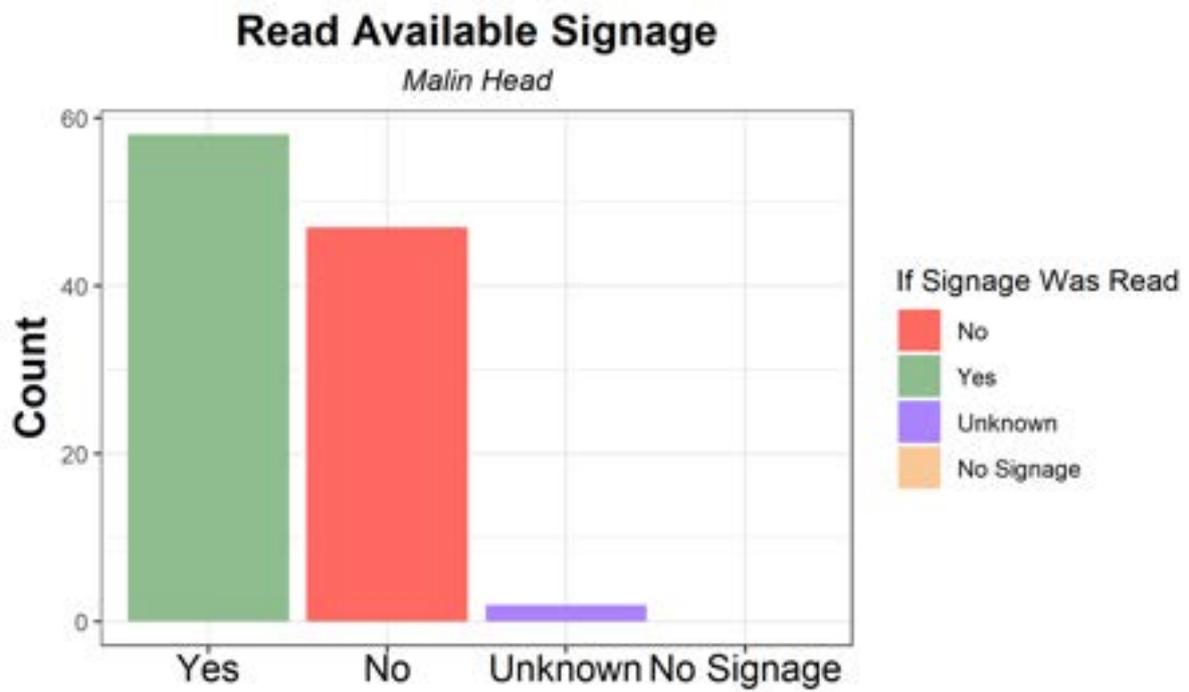
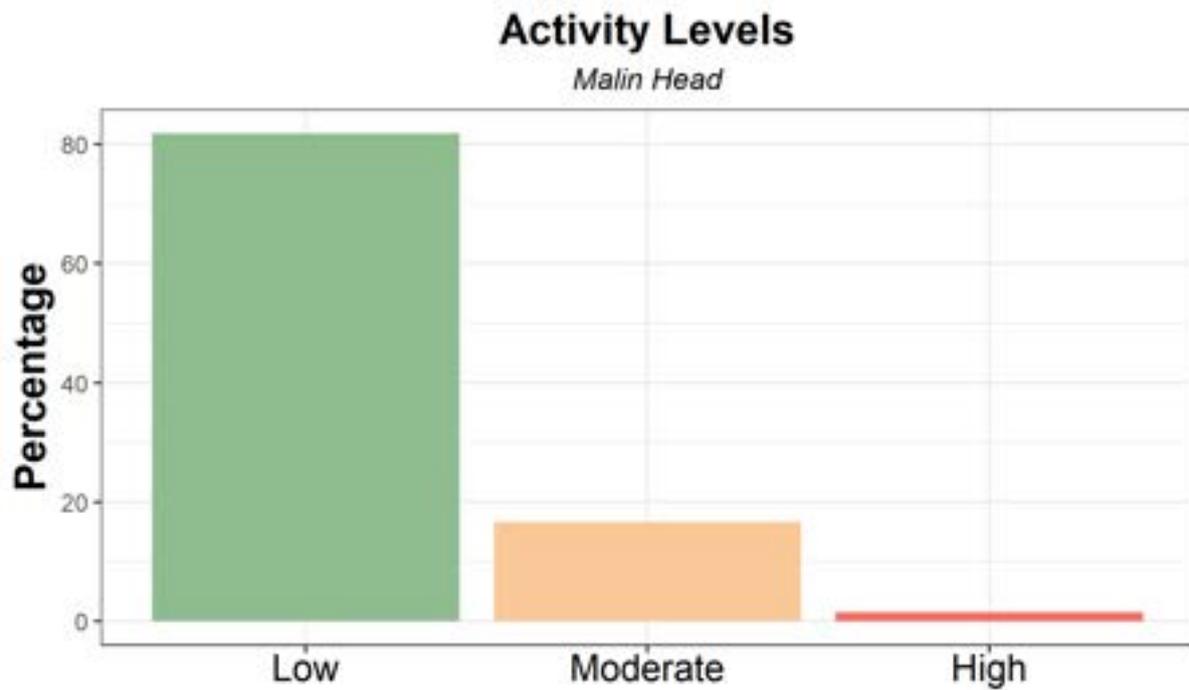


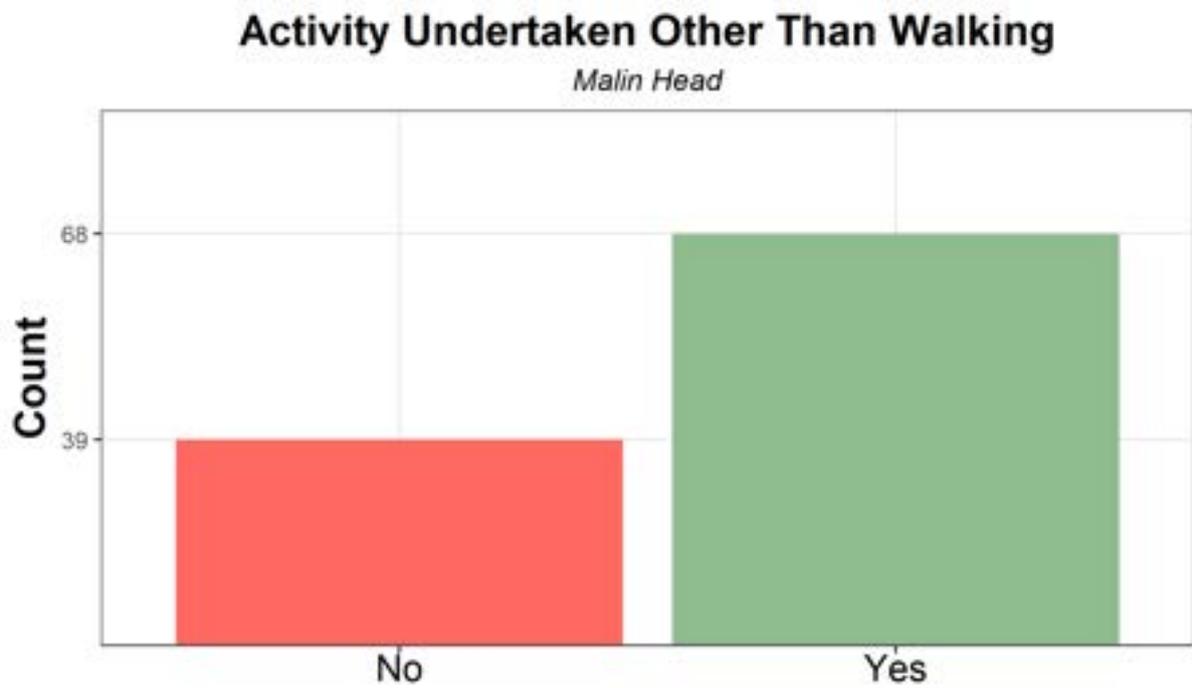
Figure 18.11 Mode of transport used to visit Malin Head



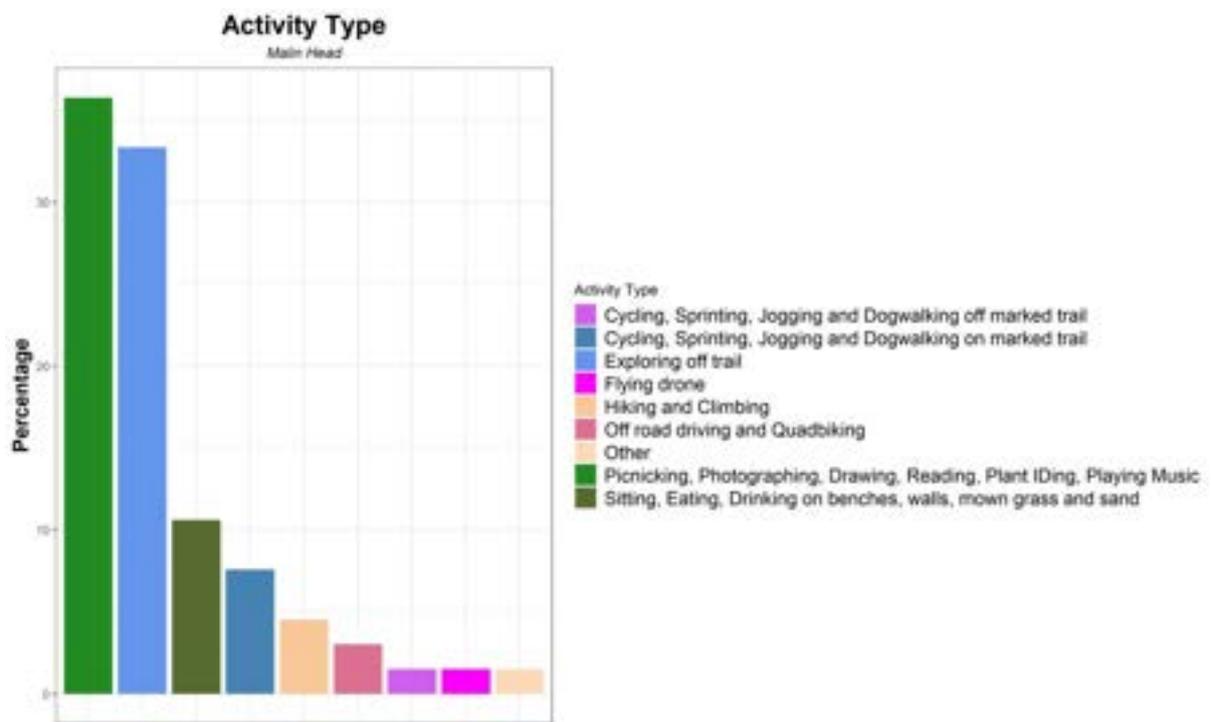
**Figure 18.12 Use of Interpretive Material at Malin Head**



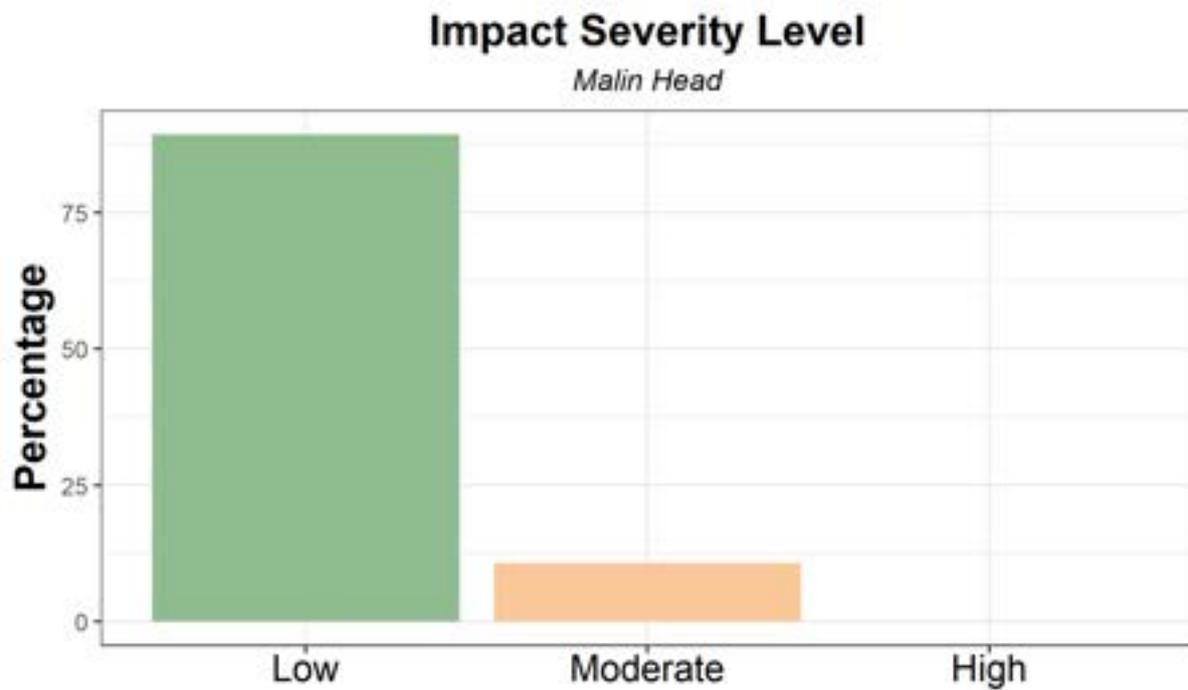
**Figure 18.13 Categories of Activity Levels Observed at Malin Head**



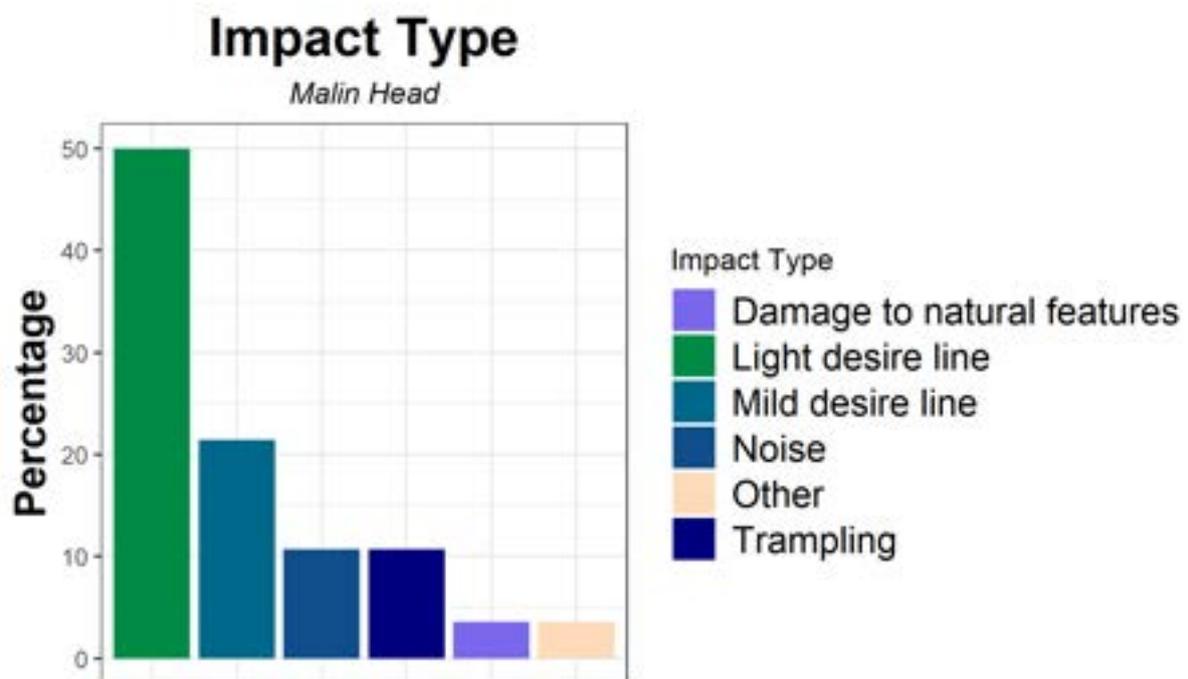
**Figure 18.14** Activities undertaken other than walking



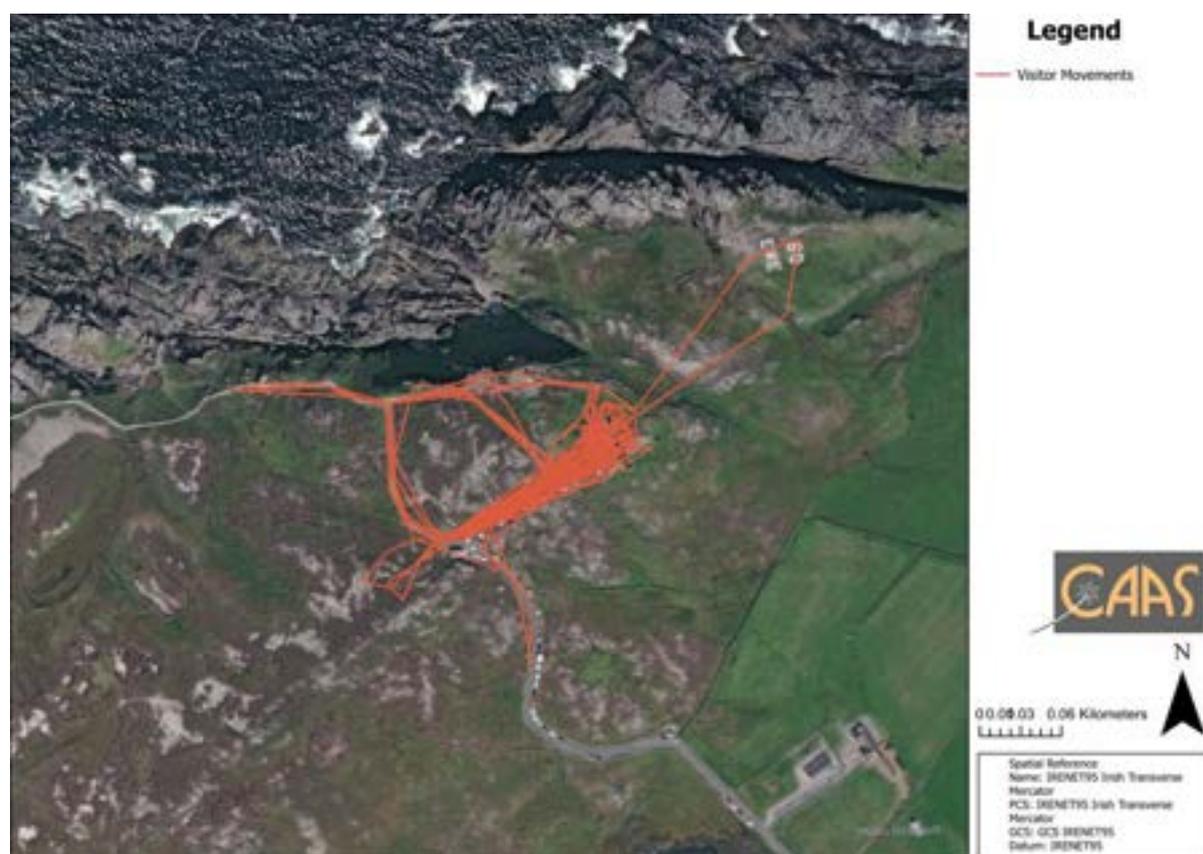
**Figure 18.15** Range of Visitor Activities Observed at Malin Head



**Figure 18.16 Categories of Environmental Impact Levels Observed at Malin Head as a result of Visitor Activities**



**Figure 18.17 Range of Environmental Impacts Observed at Malin Head**



**Figure 18.18 Visitor movement patterns at Malin Head**

Of the 107 groups recorded on site 64% of them undertook activities other than walking. These activities (identified above) resulted in 28 impacts being observed on site during the survey. Thus, 42% of activities on site resulted in impacts on the environment. The impact severity levels varied with 89% of the impacts being low, 11% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Damage to natural features	1
Light desire line	14
Mild desire line	6
Noise	3
Other	1
Trampling	3

## 18.6 Ecological Monitoring Results

### 18.6.1 Ecological Constraints

The species and habitats within 2km of Malin Head are known to be sensitive to pollution, hydrological changes, overgrazing and land use management.

**Table 18.1 Designated sites within 2km of Malin Head and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002012]	North Inishowen Coast pNHA	0.00	pNHA	

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002012]	North Inishowen Coast SAC	0.00	SAC	Machairs * in Ireland [21A0], Otter ( <i>Lutra lutra</i> ) [1355], European dry heaths [4030], Narrow-mouthed whorl snail ( <i>Vertigo angustior</i> ) [1014], Fixed coastal dunes with herbaceous vegetation - grey dunes [2130], Mudflats and sandflats not covered by seawater at low tide [1140], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]
[004146]	Malin Head SPA	1.97	SPA	Corncrake ( <i>Crex crex</i> ) [A122]

### 18.6.2 Habitat Descriptions

Malin Head is mainly made up of one habitat, dry siliceous heath (Fossitt Code HH1). This habitat provides ample foraging area for special conservation interests for which the SPA, Malin Head, is designated (Corncrake (*Crex crex*)) and is typical of an elevated coastal area.

There is widespread damage to the protected habitat as a direct result of tourism through trampling, staying off the designated tracks and overflow parking on the protected habitat (particularly along the roadside edge where cars pull 2 wheels onto the heathland to ensure they are out of the way of other cars).



**Figure 18.19 Habitats present at Malin Head**

### 18.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>38</sup> following the assessment scale was "3" which means the majority of the habitats have a widespread degree of negative impact, but slight and capable of rapid recovery. There were 17 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the

<sup>38</sup> This value was calculated using the methods set out in Appendix II

damage were identified to be vehicles, camping and walking by visitors.

#### 18.6.4 Mammals on Site

No mammals were recorded on site at Malin Head. As the NBDC data shows, the majority of mammal species in the area are marine mammals due to Malin Head's location on the north coast of Ireland, with the most common species observed in the area being bottle-nosed dolphins. However, a variety of terrestrial mammals have been observed in the area, albeit in small numbers with species such as otter and hare being recorded.

**Table 18.2 List of mammals that have been recorded at NBDC Hectads C35 & C45**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	50
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	3
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	3
Marine mammal	Common Seal	<i>Phoca vitulina</i>	2
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	2
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	5
Marine mammal	Long-finned Pilot Whale	<i>Globicephala melas</i>	2
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	3
Marine mammal	Risso's Dolphin	<i>Grampus griseus</i>	2
Marine mammal	Sperm Whale	<i>Physeter macrocephalus</i>	2
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	2
Marine mammal	True's Beaked Whale	<i>Mesoplodon mirus</i>	1
Marine mammal	White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	1
Terrestrial mammal	American Mink	<i>Mustela vison</i>	1
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	1
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	6
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	1
Terrestrial mammal	Feral Goat	<i>Capra hircus</i>	2
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	3
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Red Deer	<i>Cervus elaphus</i>	1
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	2
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	1

#### 18.7 Recommendations

- A visitor management plan is needed to control visitor movement damage at the site.
- A Traffic and parking strategy needs to be devised to address and prevent incursions onto protected habitats.
- Habitat restoration and long-term habitat management should be explored to support the enhancement of biodiversity.
- Community engagement and environmental awareness protocols should be explored for the site to support positive environmental behaviours on site.

## Mount Congreve – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

The site is largely managed habitats, as such there are a high abundance of pollination resources. There are large expanses of mature treelines and the site is adjoined by the Suir River. Therefore, the site has high potential to support diverse and abundant mammal populations including bat species.



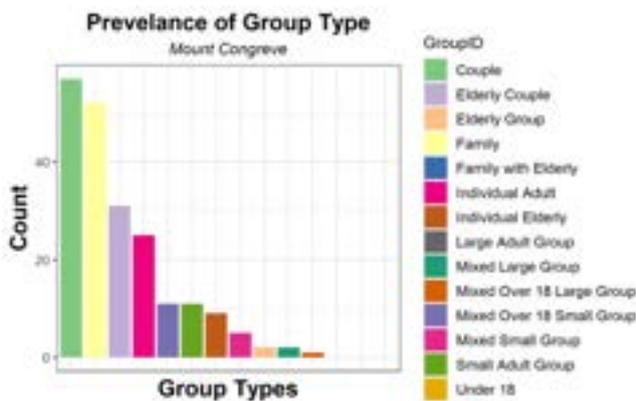
Red squirrels are resident within the site and there appears to be a healthy population around the site.

### KEY RECOMMENDATIONS

- An invasive mammal survey should be conducted for the site as there are four invasive species suspected of being present; namely American Mink, Bank Vole, Grey Squirrel and Greater White-toothed Shrew.
- Invertebrate resources such as dead wood piles and standing deadwood should be implemented to support invertebrate populations as a resource for mammals such as bats and hedgehogs.

### VISITOR NUMBERS AND DWELL TIME

- 494 people visited the site over 8 hours
- Average dwell time of 22 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- All activities recorded by visitors were deemed to be of low level such as Plant IDing and exploring off trail.
- The only impact observed on site was trampling of vegetation by visitors.
- Most of the visitors to the site stayed for at least 22 minutes –given the nature of the site itself as a managed garden area.
- Majority of visitors traversed along the designated pathways on site.



## 19 Mount Congreve

### 19.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations - can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have

sustainable benefits for the site, the visitor and the natural environment.

To date, the Wild Atlantic Way Environmental Monitoring Programme has allowed us to sample and monitor the behaviour & movement of over 26,000 visitors, identifying where there were stresses on the environment or potential future risks as well as good and bad practices.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation). Following on from the WAW monitoring data and in refining the methodology as a result, we aim to: understand what activities cause which impact; and, what are the factors which influence these activity choices by visitors?

The aim is to build on the knowledge gathered by the 2015-2019 programme. This will be used in combination with a continued engagement and exchange of knowledge with site managers, to tailor monitoring requirements, and enhance the programme outcomes, for each site chosen nationally for the new 2021-2025 programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
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These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 19.2 Methods & Surveys

The following surveys were undertaken at Mount Congreve:

### 19.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Mount Congreve was undertaken on the 29<sup>th</sup> of August 2021, with max temperatures reaching approximately 21.6° C, no rainfall and low levels of wind on the day<sup>39</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 19.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

<sup>39</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

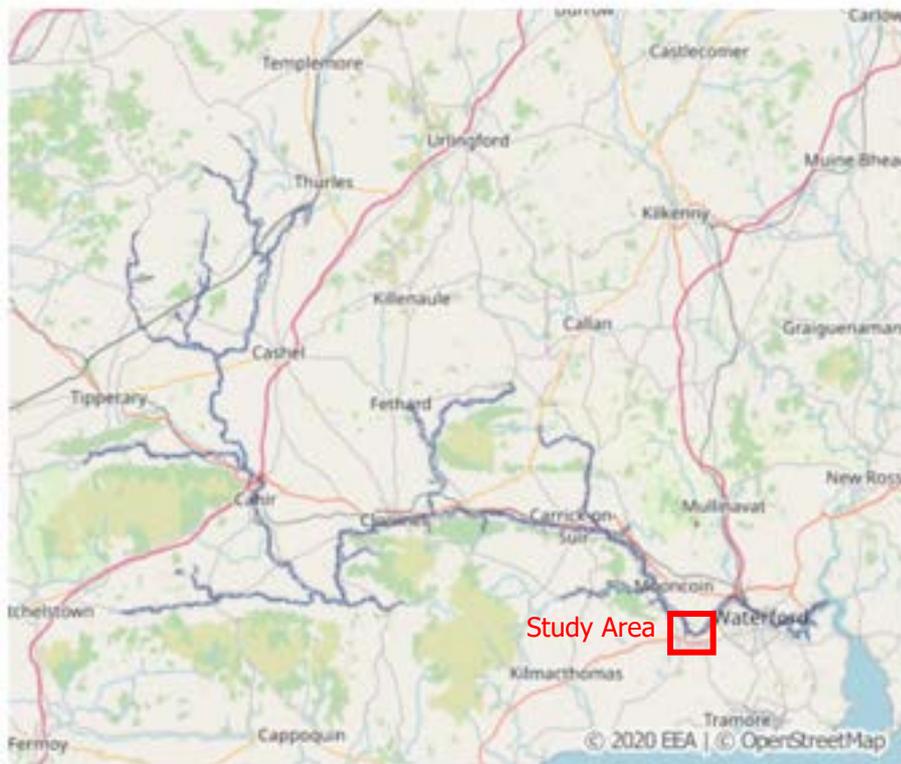
### 19.3 Site Description of Mount Congreve

Mount Congreve Estate and Gardens is situated in Kilmeaden, County Waterford, along the river Suir and such, the Lower River Suir SAC. It is a notable garden that offers 16km, of pathways around the estate, which is used for leisure activities. The habitats within Mount Congreve consists of range of horticultural land and marshes along with other habitats.



**Figure 19.1 Mount Congreve**

## Lower River Suir SAC

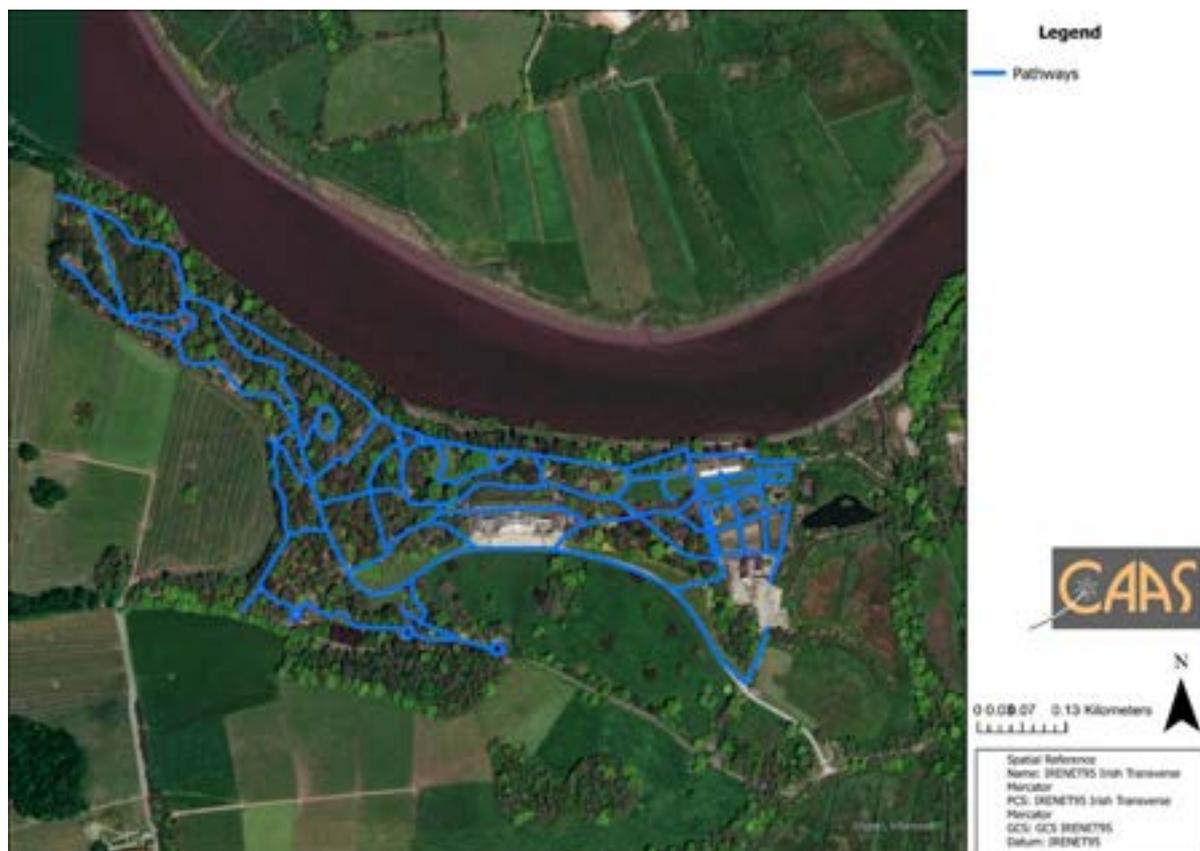


**Figure 19.2 Study Area within Lower River Suir SAC**

### 19.4 Pathways and Features Condition Results

#### 19.4.1 Pathway Condition

Mount Congreve, is a heavily managed area with paths that consist of managed and soft infrastructure pathways. The pathways that make up the trails at Mount Congreve are of similar width and composition. There is little evidence of damage or erosion along the pathways.



**Figure 19.3 Pathways identified at Mount Congreve**



**Figure 19.4 Pathways at Mount Congreve**

#### **19.4.2 Features Condition**

As a managed garden estate, Mount Congreve contains a large number of features unique to the area. These include Mount Congreve house, a glasshouse, various buildings (Figure 19.6) used for the maintenance and upkeep of the site and a number of garden and stone features which are placed along Mount Congreve and its paths. Along with this, there are also a number of benches and similar sit-down areas within Mount Congreve (Figure 19.6). There's also a number of signs and signage which

show trail maps and provide directions to different areas of Mount Congreve itself (Figure 19.6).



**Figure 19.5 Features recorded at Mount Congreve**



**Figure 19.6 Features at Mount Congreve**

### 19.4.3 Hazards

Only one hazard was identified during the hazard mapping at Mount Congreve, a broken fence was noted which would potentially lead visitors to an unsafe area of the site (Figure 19.8).



**Figure 19.7 Hazards recorded at Mount Congreve**

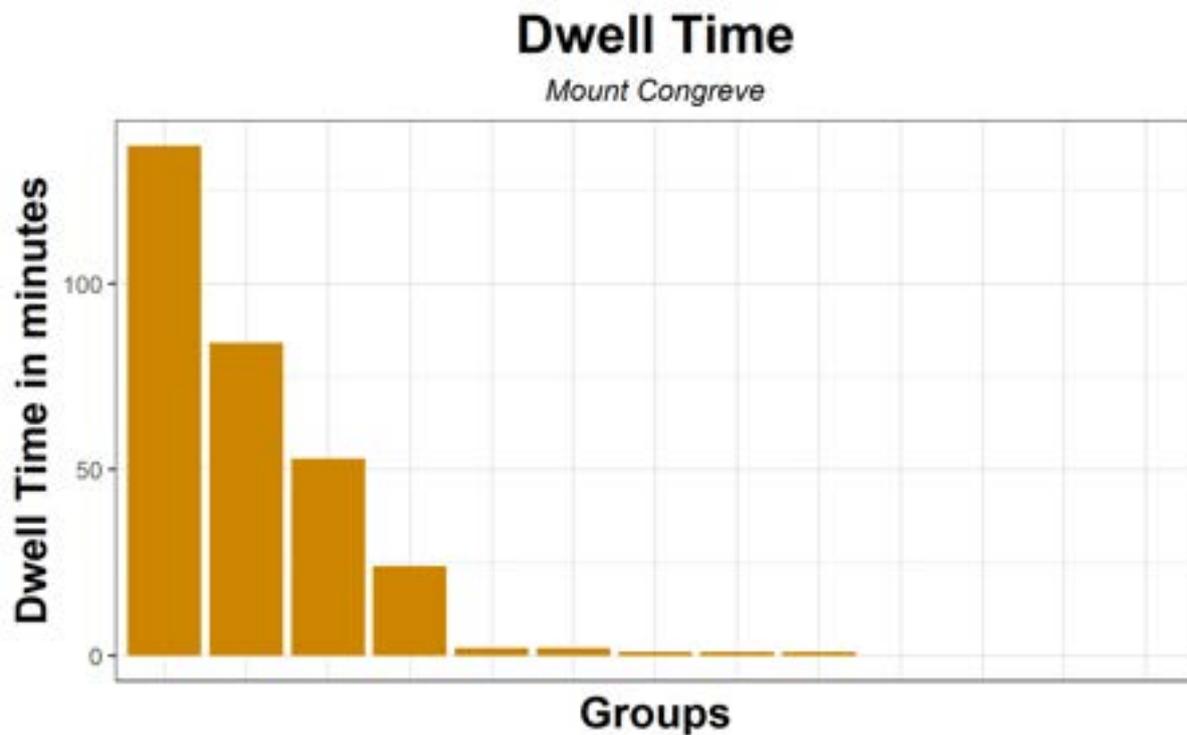


**Figure 19.8 Broken fence at Mount Congreve**

### 19.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 494 visitors (which represent 206 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being car. The average dwell time for the site was 22 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Plant ID
Exploring off trail
Kids nature trail
Sitting



**Figure 19.9 Duration of Time Spent at Mount Congreve**

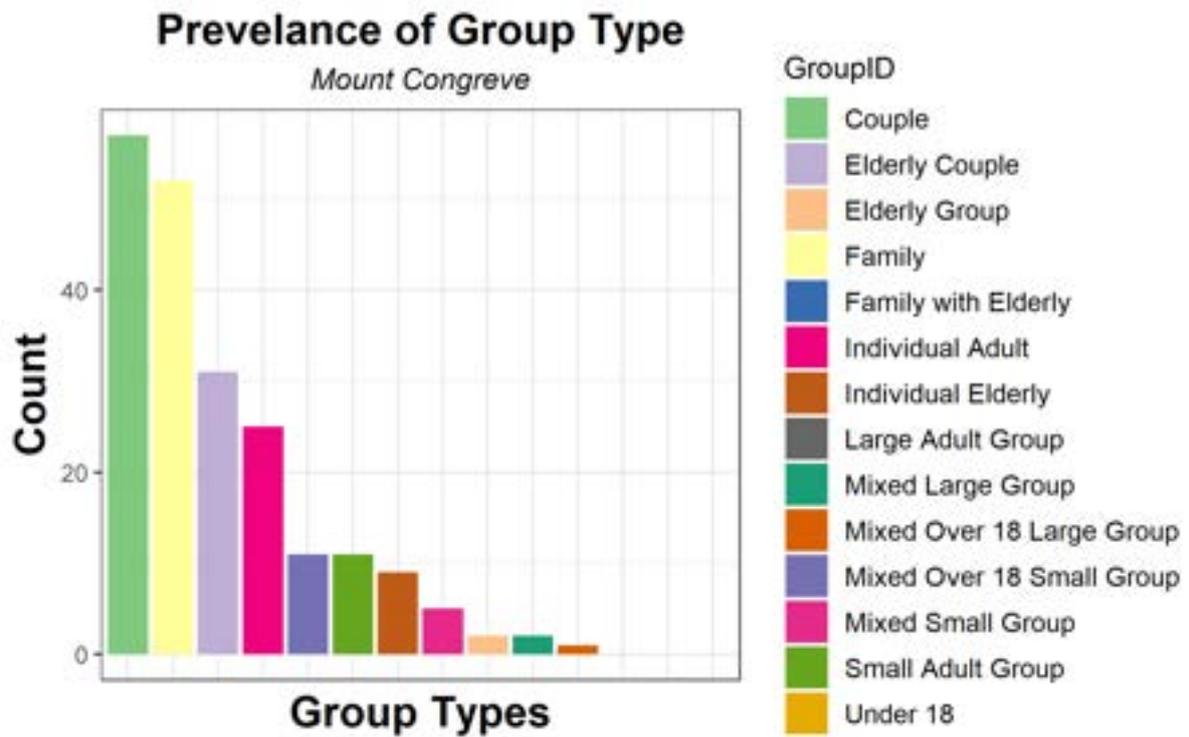


Figure 19.10 Groups of visitors that visited Mount Congreve

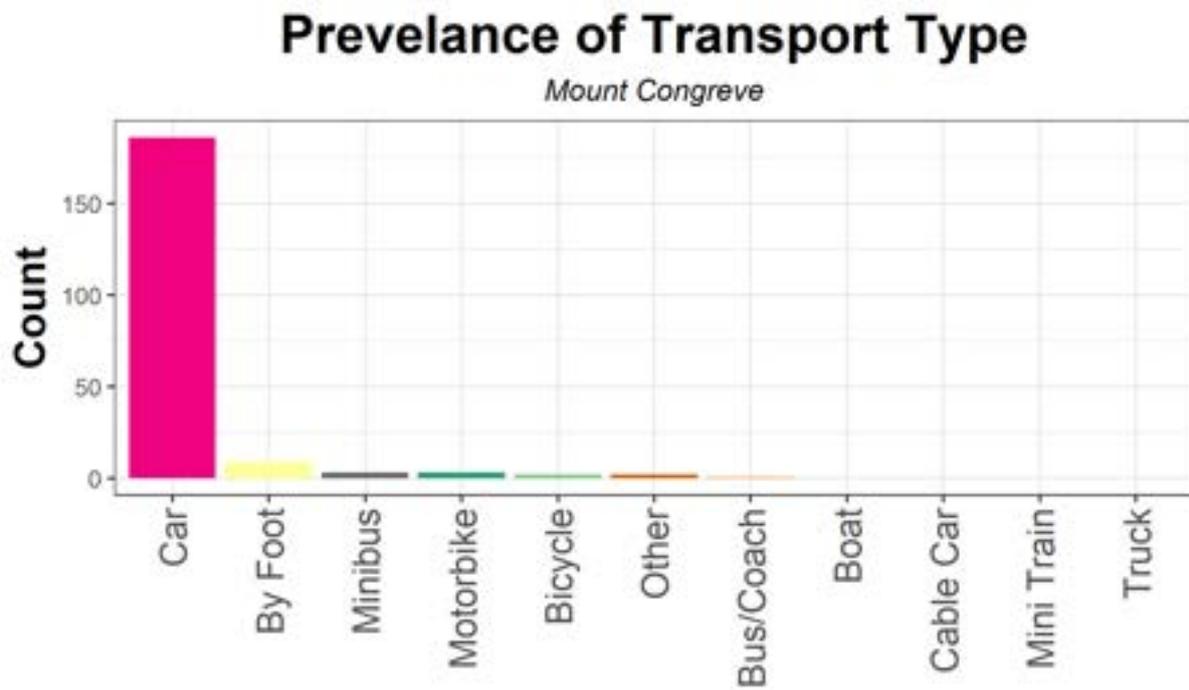
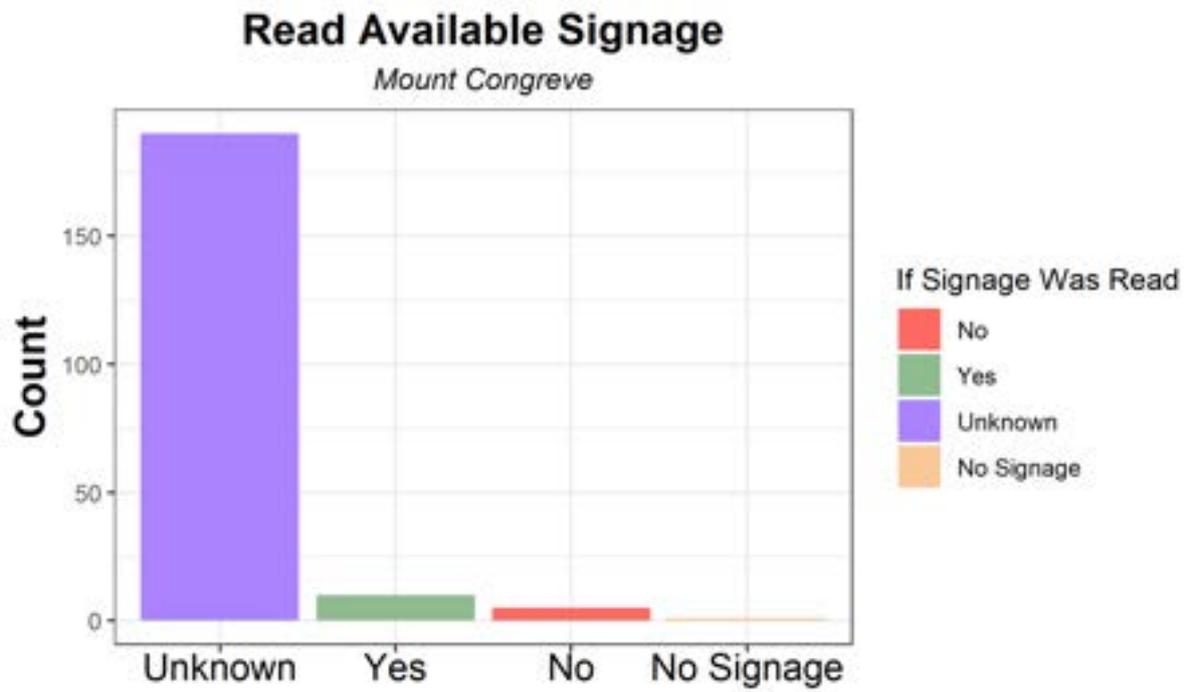
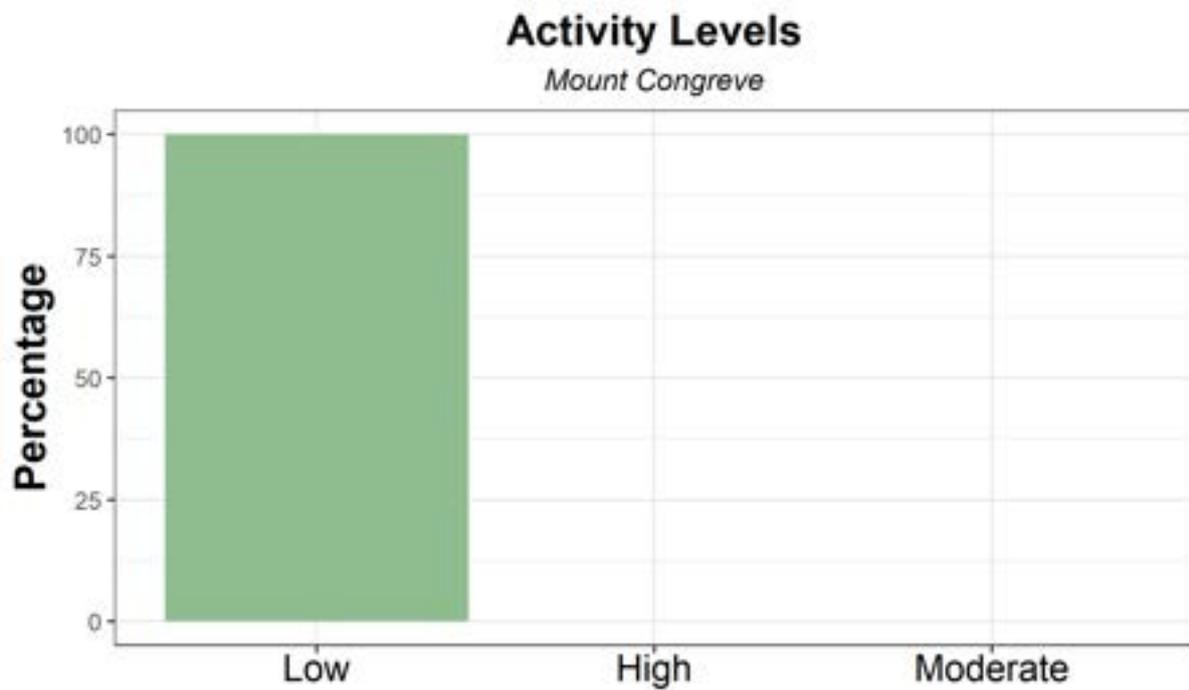


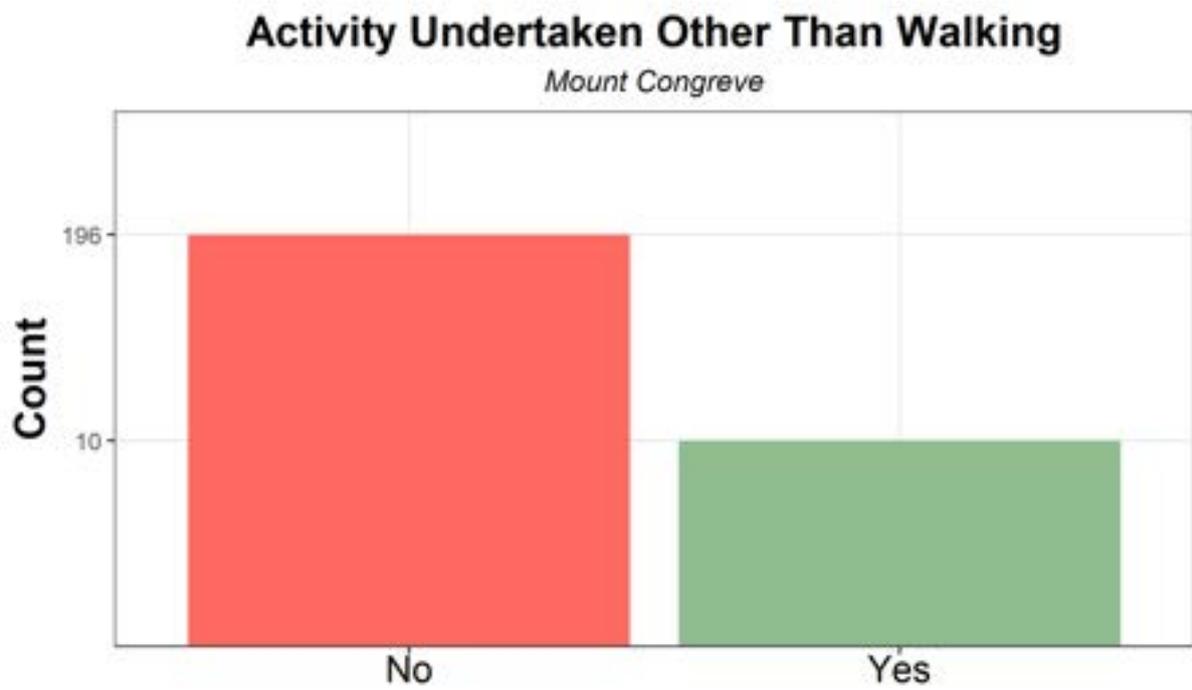
Figure 19.11 Mode of transport used to visit Mount Congreve



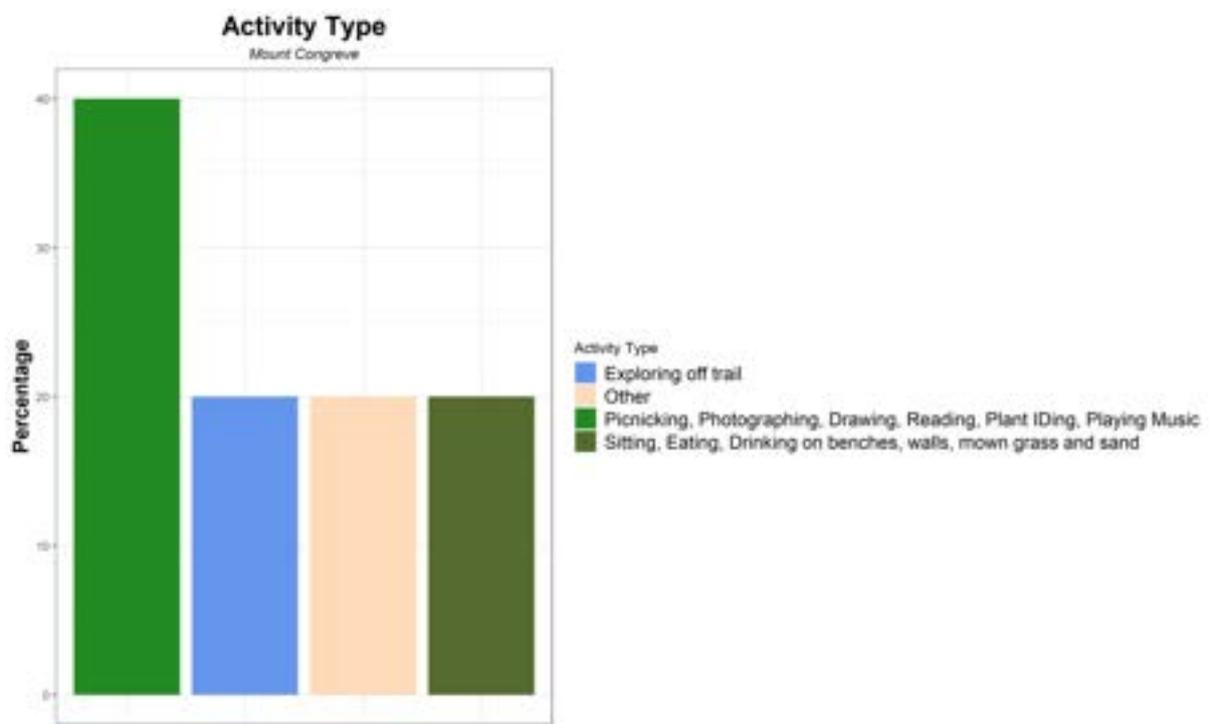
**Figure 19.12 Use of Interpretive Material at Mount Congreve**



**Figure 19.13 Categories of Activity Levels Observed at Mount Congreve**



**Figure 19.14** Activities undertaken other than walking



**Figure 19.15** Range of Visitor Activities Observed at Mount Congreve

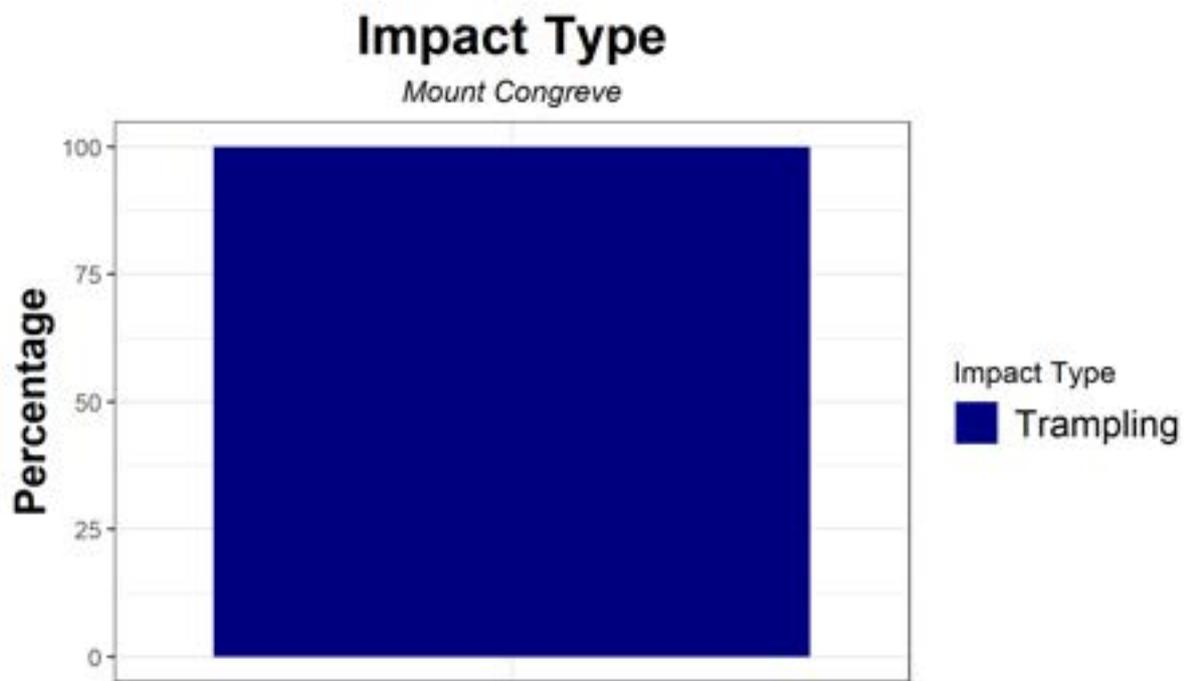


Figure 19.16 Range of Environmental Impacts Observed at Mount Congreve

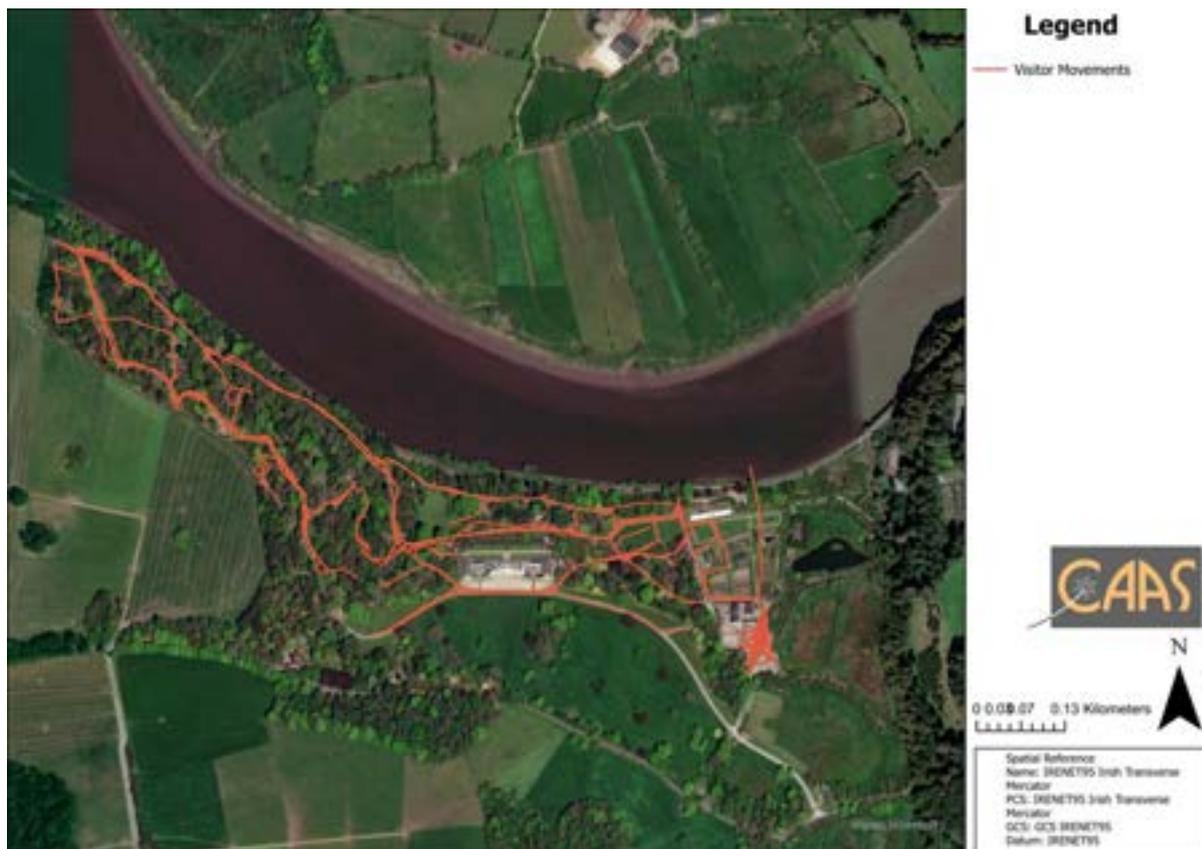


Figure 19.17 Visitor movement patterns at Mount Congreve

Of the 206 groups recorded on site 5% of them undertook activities other than walking. These activities (identified above) resulted in no observable impacts on the environment. There was 1 count of trampling but this was someone moving tracking through the bushes for an unknown reason.

Impact Type	Count
Trampling	1

## 19.6 Ecological Monitoring Results

### 19.6.1 Ecological Constraints

The habitats and species 2km around Mount Congreve are sensitive to land use management, hydrological changes, pollution and invasive species.

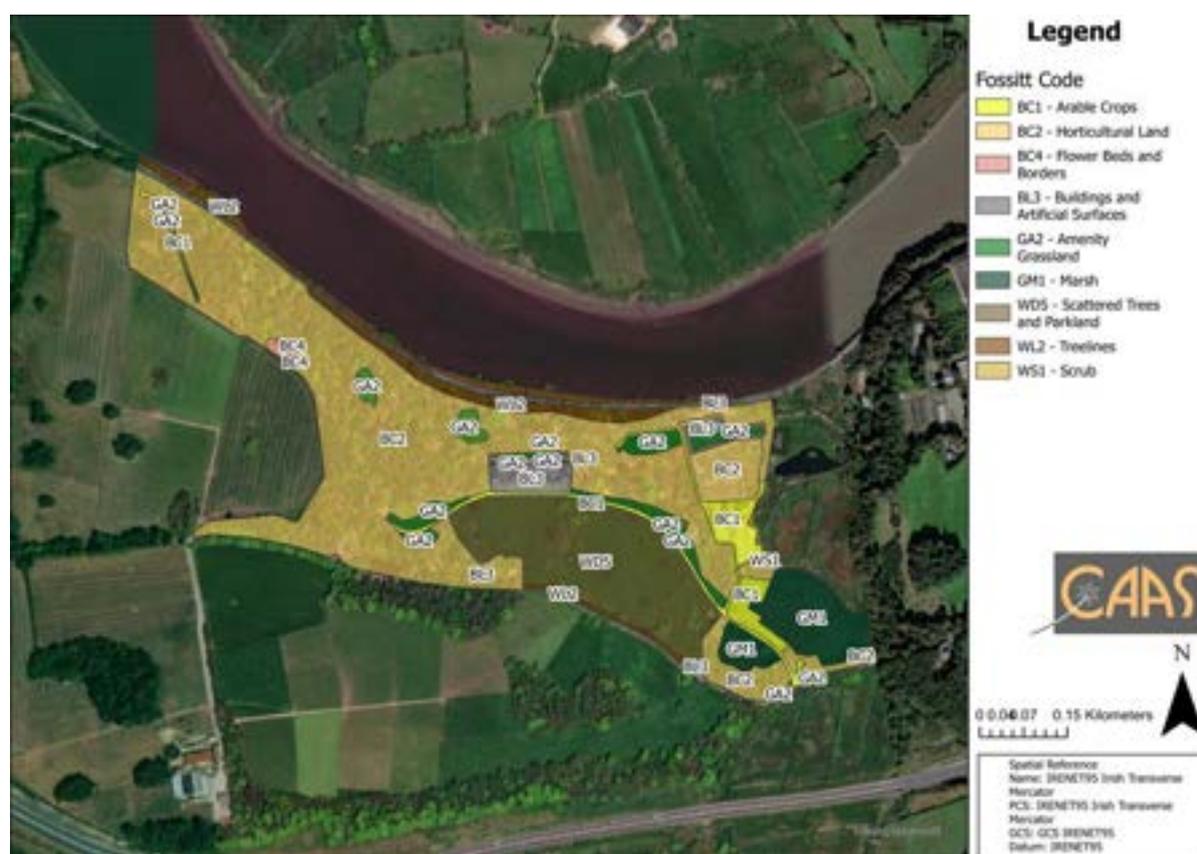
**Table 19.1 Designated sites within 2km of Mount Congreve and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[002137]	Lower River Suir SAC	0.28	SAC	Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260], Brook lamprey ( <i>Lampetra planeri</i> ) [1096], <i>Taxus baccata</i> woods of the British Isles [91J0], Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0], River lamprey ( <i>Lampetra fluviatilis</i> ) [1099], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410], Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0], White-clawed crayfish ( <i>Austropotamobius pallipes</i> ) [1092], Atlantic salmon ( <i>Salmo salar</i> ) [1106], Otter ( <i>Lutra lutra</i> ) [1355], Sea lamprey ( <i>Petromyzon marinus</i> ) [1095], Twaite shad ( <i>Alosa fallax</i> ) [1103], Freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) [1029]

### 19.6.2 Habitat Descriptions

Mount Congreve is heavily managed and thus the habitats at Mount Congreve represent this. The majority of Mount Congreve is made up of horticultural land (Fossitt Code BC2) with sections of other managed habitats such as amenity grassland (Fossitt Code GA2) and flower beds and borders (Fossitt Code BC4). Mount Congreve is situated on the River Suir, which is designated as an SAC, and has habitats such as marsh (Fossitt Code GM1) which represent this.

This is a well-managed site that has permanent on site staff ensuring the grounds are well maintained.



**Figure 19.18 Habitats present at Mount Congreve**

### 19.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>40</sup> following the assessment scale was "4" which means the majority of the habitats have a localised negative impact, requiring intervention to allow full recovery. There were 0 recorded incidents of damage to habitats occurring off the marked paths on site.

### 19.6.4 Mammals on Site

No mammals were recorded at Mount Congreve. The NBDC data shows a number of marine mammals despite Mount Congreve not being a coastal location. This is due to one of the hectads that Mount Congreve lies in also takes up part of the coastline of Waterford County.

The terrestrial mammals observed in Mount Congreve, from the NBDC data, shows species which would be expected of areas that contain similar habitats to those of Mount Congreve. Otters, badgers, rabbits, hedgehogs and pipistrelles were all recorded in high numbers.

**Table 19.2 List of terrestrial mammals that have been recorded at NBDC Hectads S51 & S50**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	8
Terrestrial mammal	Bank Vole	<i>Myodes glareolus</i>	12
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	22
Terrestrial mammal	Brown Rat	<i>Rattus norvegicus</i>	36
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	34
Terrestrial mammal	Eastern Grey Squirrel	<i>Sciurus carolinensis</i>	11
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	168
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	3
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	64
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	121

<sup>40</sup> This value was calculated using the methods set out in Appendix II

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	111
Terrestrial mammal	Fallow Deer	<i>Dama dama</i>	1
Terrestrial mammal	Feral Ferret	<i>Mustela furo</i>	2
Terrestrial mammal	Feral Goat	<i>Capra hircus</i>	2
Terrestrial mammal	Greater White-toothed Shrew	<i>Crocidura russula</i>	5
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	16
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	11
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	20
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	7
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	8
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	62
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	50
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	25
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	74
Terrestrial mammal	Whiskered Bat	<i>Myotis mystacinus</i>	3

### 19.7 Recommendations

- An invasive mammal survey should be conducted for the site as there are four invasive species suspected of being present; namely American Mink, Bank Vole, Grey Squirrel and Greater White-toothed Shrew. However, live capture techniques should be used for any control measures to avoid the use of rodenticides which could result in bioaccumulation.
- Invertebrate resources such as dead wood piles and standing deadwood should be implemented to support invertebrate populations as a resource for mammals such as bats and hedgehogs.
- Bat boxes should be installed to increase the site usage by bats and all lighting should be kept to a minimum.

## Portumna Forest Park – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

There is a white-tailed eagle which is resident in the area – the site has a bird hide positioned with a good view of the nest used by the breeding pair.



Portumna Forest Park is home to one of the more elusive mammals in Ireland, the pine marten, and is protected under the Wildlife Act.

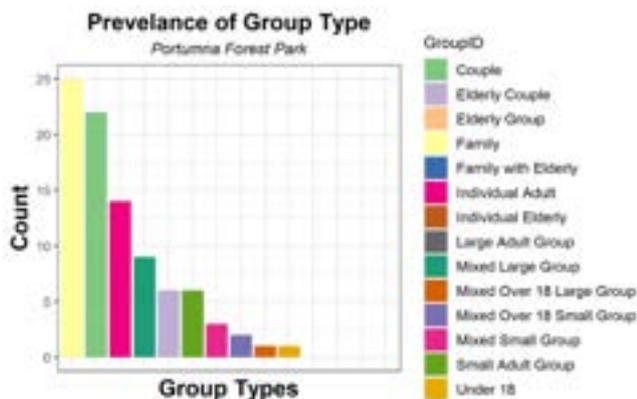
Among other mammals such as squirrels and bats, the site is also home to a number of bird species like swallows, swifts and mallards thanks to the habitats in the area.

### KEY RECOMMENDATIONS

- Management practices to support strong invertebrate populations should be explored as a foraging resource for bats on site. This could include stabilising standing dead wood (for safety) while leaving them upright. Placing piles of various sizes of deadwood along the woodland edge. Construction of banks and berms for invertebrate nesting and basking etc.
- Increasing roost availability through the installation of bat boxes – and potentially a bespoke lesser horseshoe bat roost structures accompanied by an attraction protocol if the species is confirmed to be present.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

### VISITOR NUMBERS AND DWELL TIME

- 284 people visited the site over 8 hours
- Average dwell time of 53 minutes



### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 80% of activities recorded by visitors were deemed to be of low level such as picnicking and dog walking.
- No observable impacts were recorded on site.
- Most of the visitors to the site stayed for at least 53 minutes –given the nature of the site itself as a woodland park.
- Majority of visitors did not read available signage on site.



## 20 Portumna Forest Park

### 20.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations; a map of all sites for the 2021 – 2025 programme can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, surveys for birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to make recommendations where appropriate

for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

The Wild Atlantic Way Environmental Monitoring Programme allowed us to monitor the behaviour & movement of over 26,000 visitors, identify where there were stresses on the environment or potential future risks as well as good and bad practice.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation).

It is hoped that we can build on the learnings of this previous programme and by engaging with site managers, to knowledge share, can enhance the information that we gather for each site chosen nationally for this new programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendation to be identified and shared with the relevant stakeholders to support progressive management practices.

## 20.2 Methods & Surveys

The following surveys were undertaken at Portumna Forest Park:

### 20.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Portumna Forest Park was undertaken on the 22<sup>nd</sup> of August 2021, with max temperatures reaching approximately 20.7° C, no rainfall and low levels of wind on the day<sup>41</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 20.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>41</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 20.2.3 Other Surveys

Additional sample surveys were undertaken to identify the species presence of breeding birds, mammals and bats. This information can inform potential management actions related to amenity services such as lighting which could conflict with sensitive species on site.

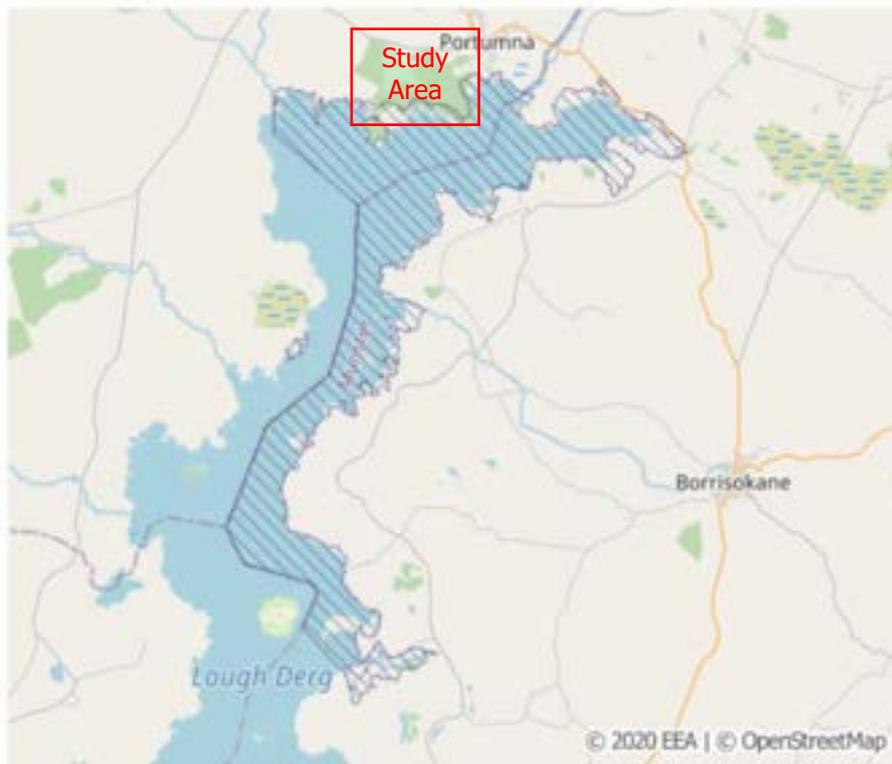
### 20.3 Site Description of Portumna Forest Park

Portumna Forest Park, a Coillte managed site, hosts a peaceful forest walk which leads to a calming, far-reaching view of Lough Derg in south eastern County Galway, close to the town of Portumna. The park itself offers multiple different walking trails available for leisure activities. As Portumna Forest Park borders Lough Derg, it also borders the Lough Derg, North-east Shannon SAC and Lough Derg (Shannon) SPA and hosts forested habitats such as mixed broadleaved/conifer woodland and yew woodland.



**Figure 20.1 Portumna Forest Park**

## Lough Derg, North-East Shore SAC

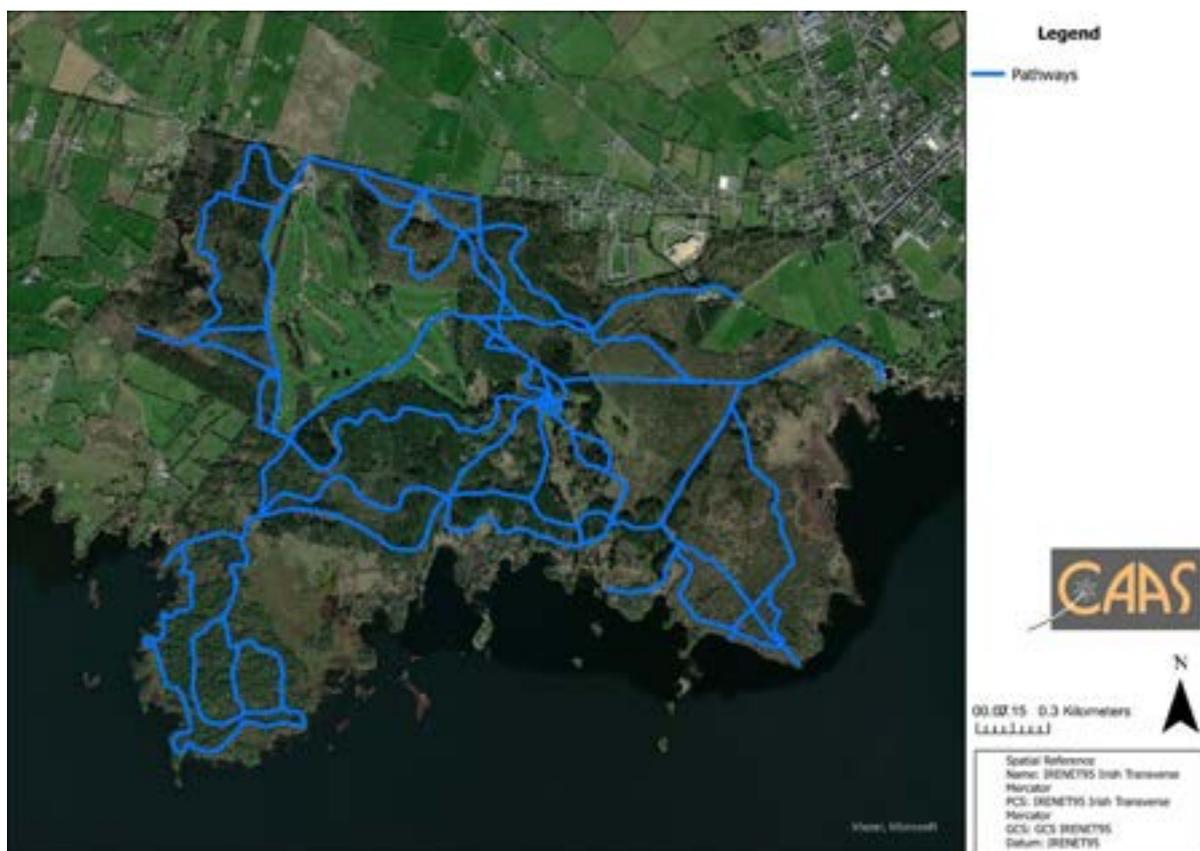


**Figure 20.2 Study Area within Lough Derg, North-East Shore SAC**

### **20.4 Pathways and Features Condition Results**

#### **20.4.1 Pathway Condition**

The paths at Portumna Forest Park consist of a range of types and sized of managed and soft trails and pathways (Figure 20.4). There is little evidence of damage or erosion along the pathways.



**Figure 20.3 Pathways identified at Portumna Forest Park**



**Figure 20.4 Pathways at Portumna Forest Park**

**20.4.2 Features Condition**

There are trail maps and small signs which designate trees dotted around Portumna. Along with these there are numerous trail markers which guide visitors through the designated trails and pathways.



**Figure 20.5 Features recorded at Portumna Forest Park**



**Figure 20.6 Features at Portumna Forest Park**

### 20.4.3 Hazards

No hazards were recorded at Portumna Forest Park.

### 20.5 Visitor Characterisation Survey

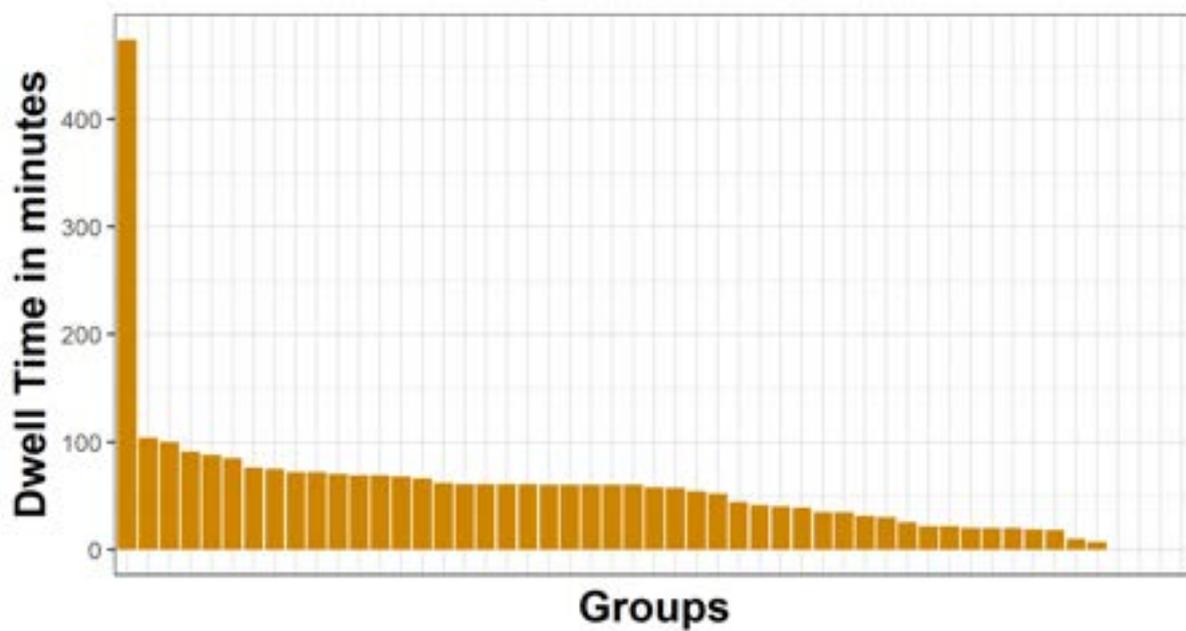
The visitor monitoring surveys resulted in a total of 284 visitors (which represent 89 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 53 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Picnicking
Dog walking (on lead)
Cycling

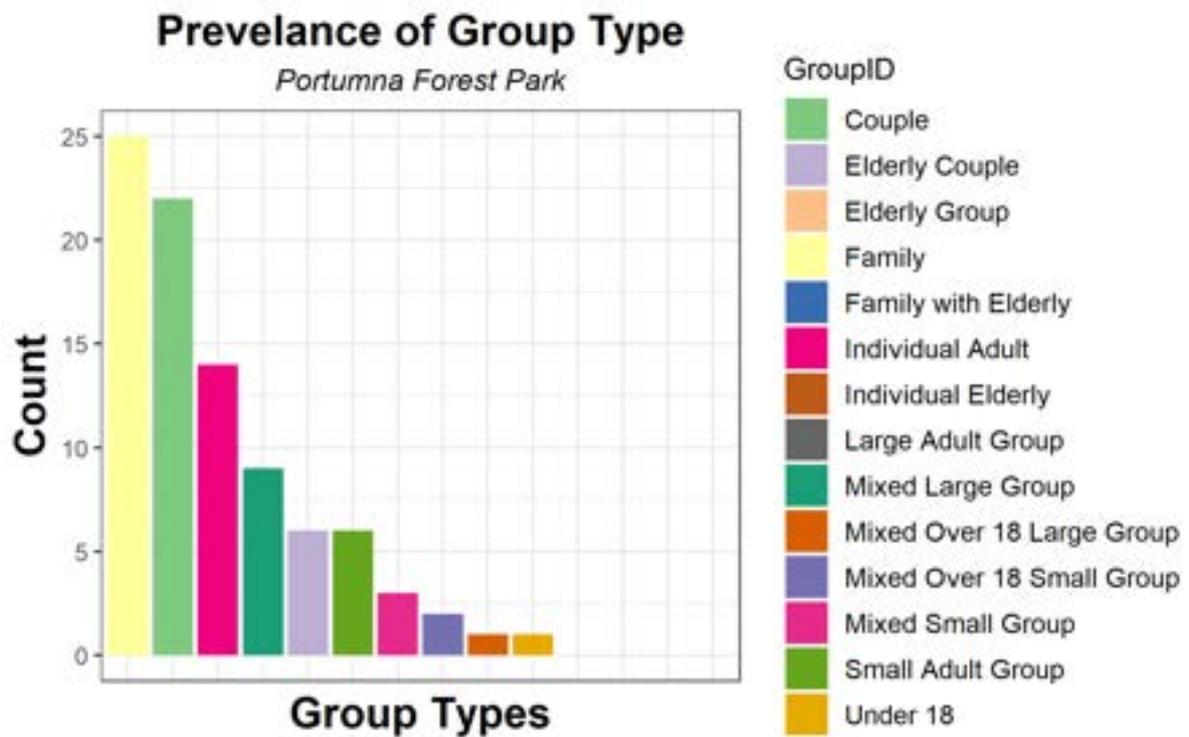
Activity Type
Coffee
Dog walking (off lead)
Sitting
Reading
Jogging
Birdwatching
Drinking
Flower picking
Photographing
Smoking

## Dwell Time

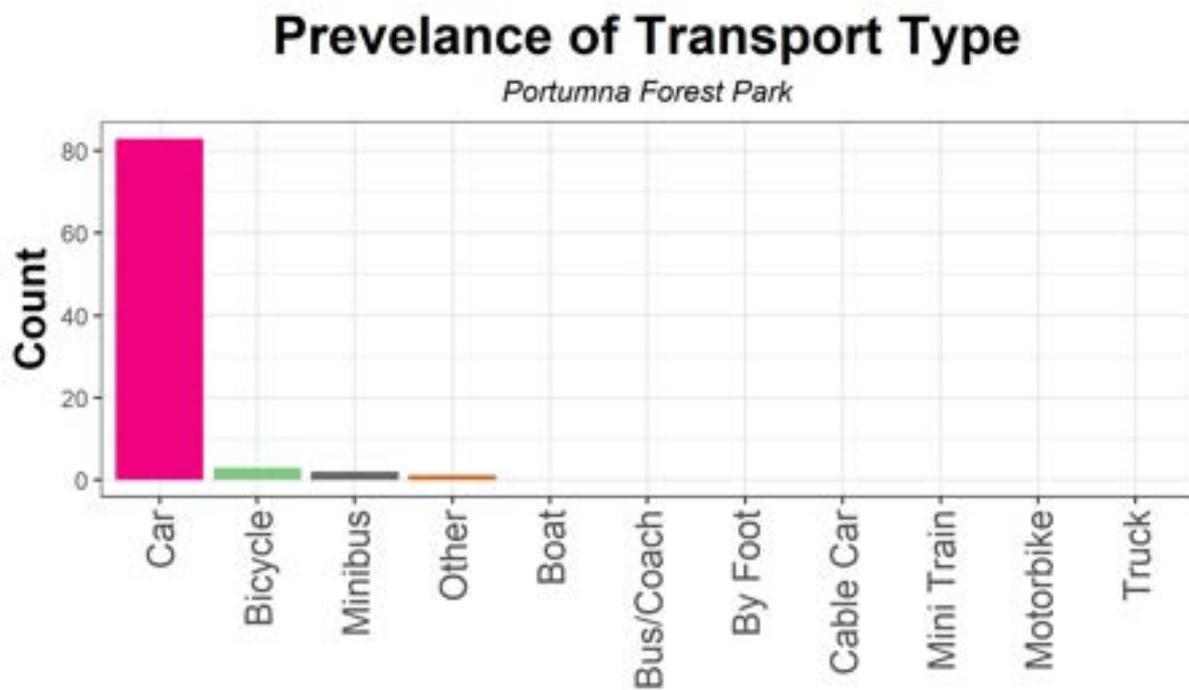
*Portumna Forest Park*



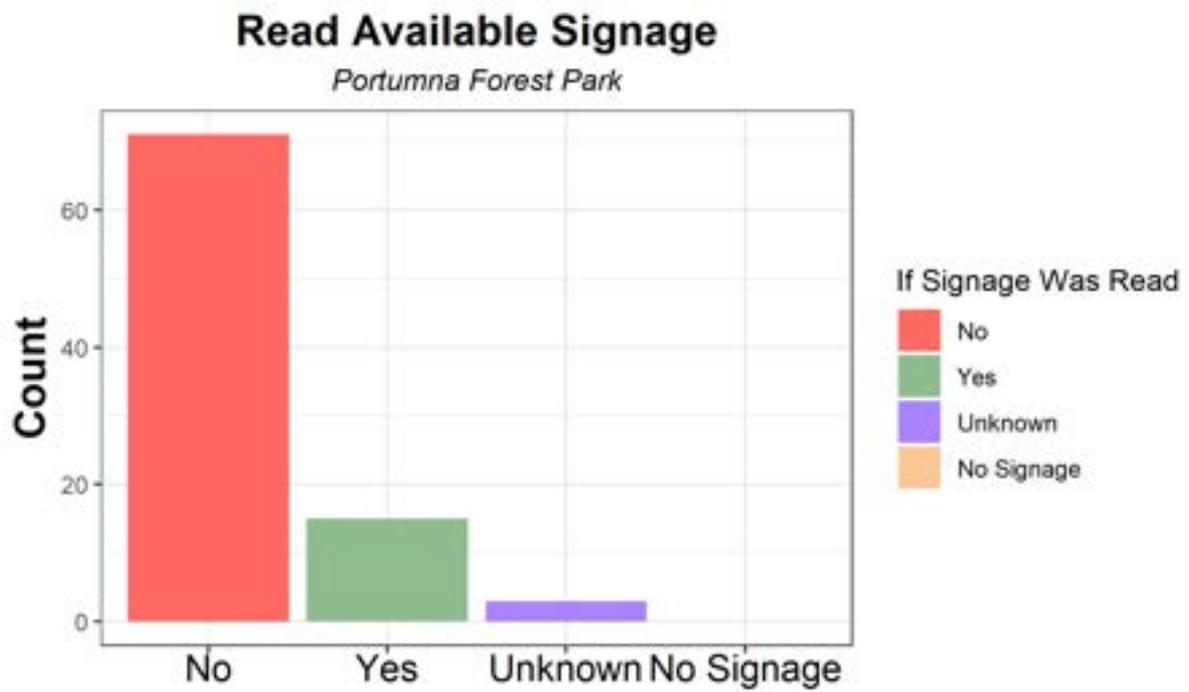
**Figure 20.7 Duration of Time Spent at Portumna Forest Park**



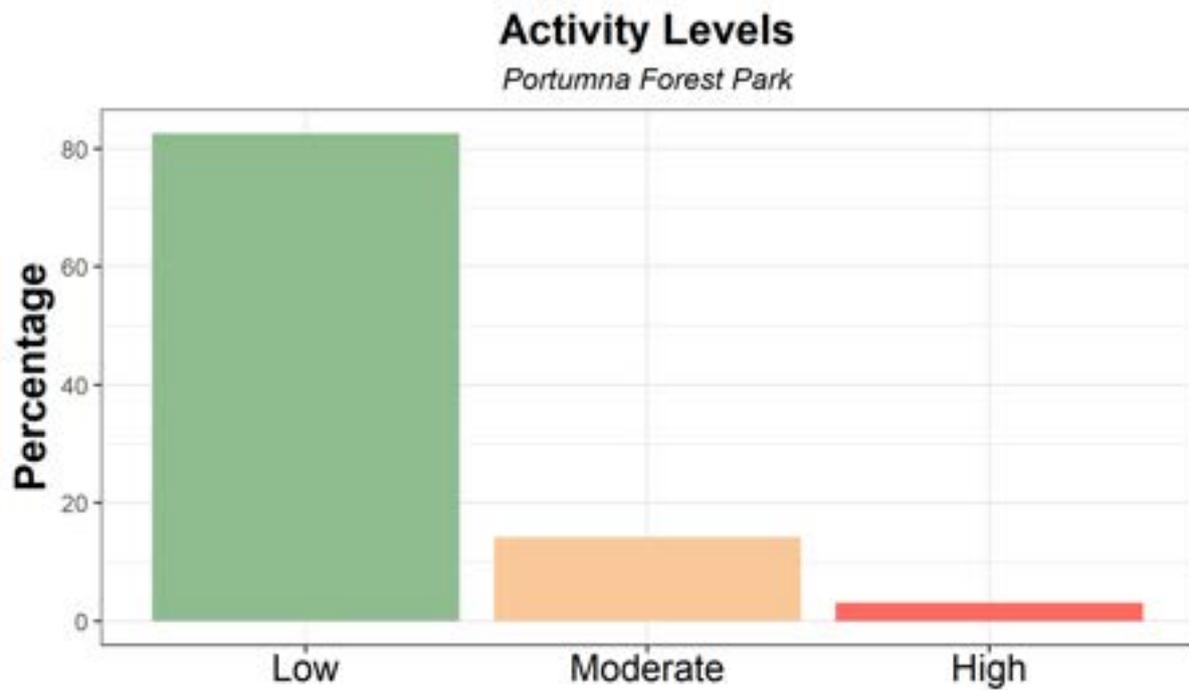
**Figure 20.8** Groups of visitors that visited Portumna Forest Park



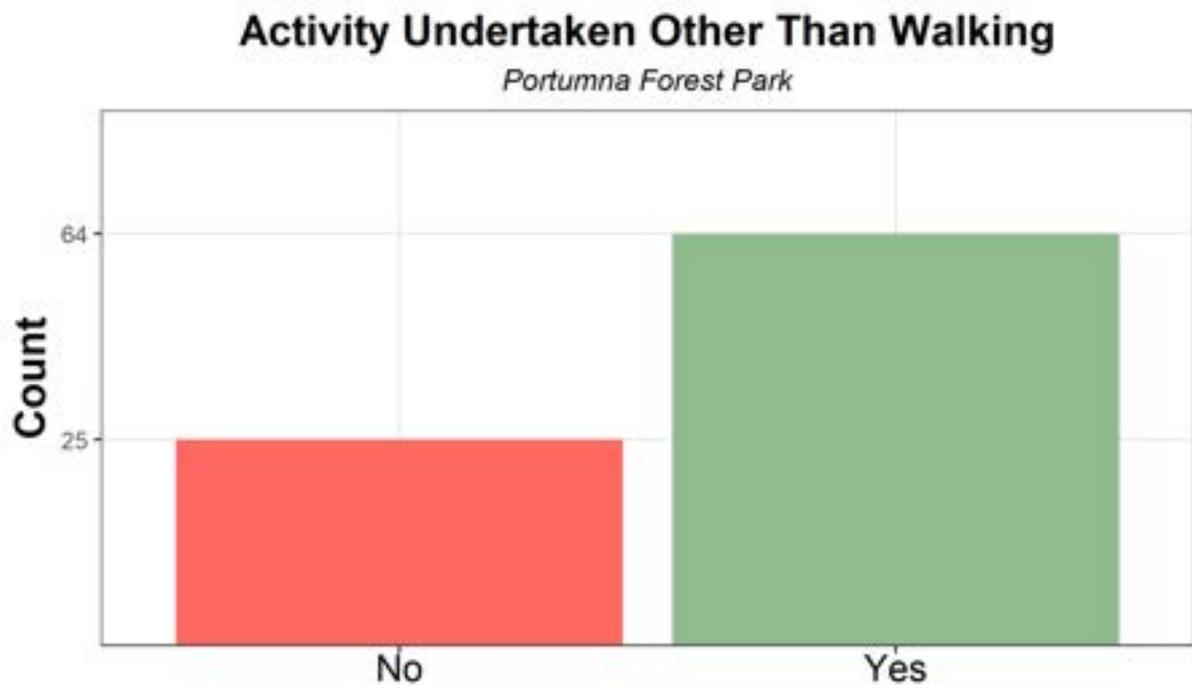
**Figure 20.9** Mode of transport used to visit Portumna Forest Park



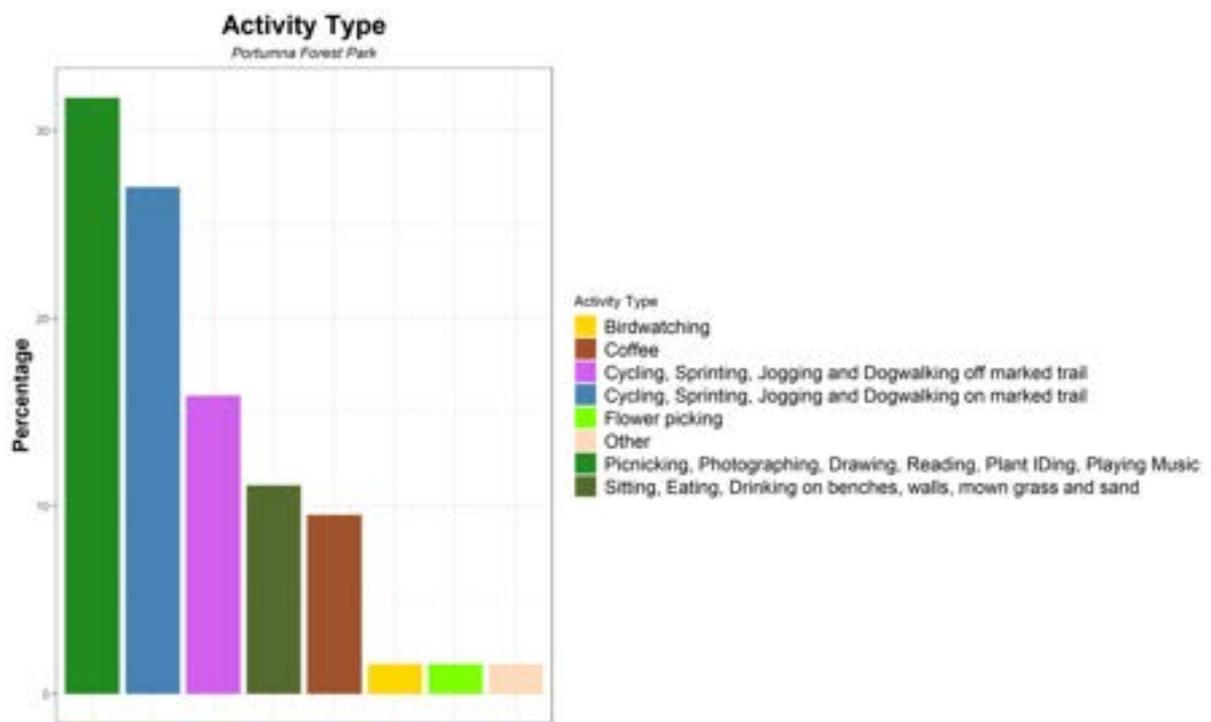
**Figure 20.10 Use of Interpretive Material at Portumna Forest Park**



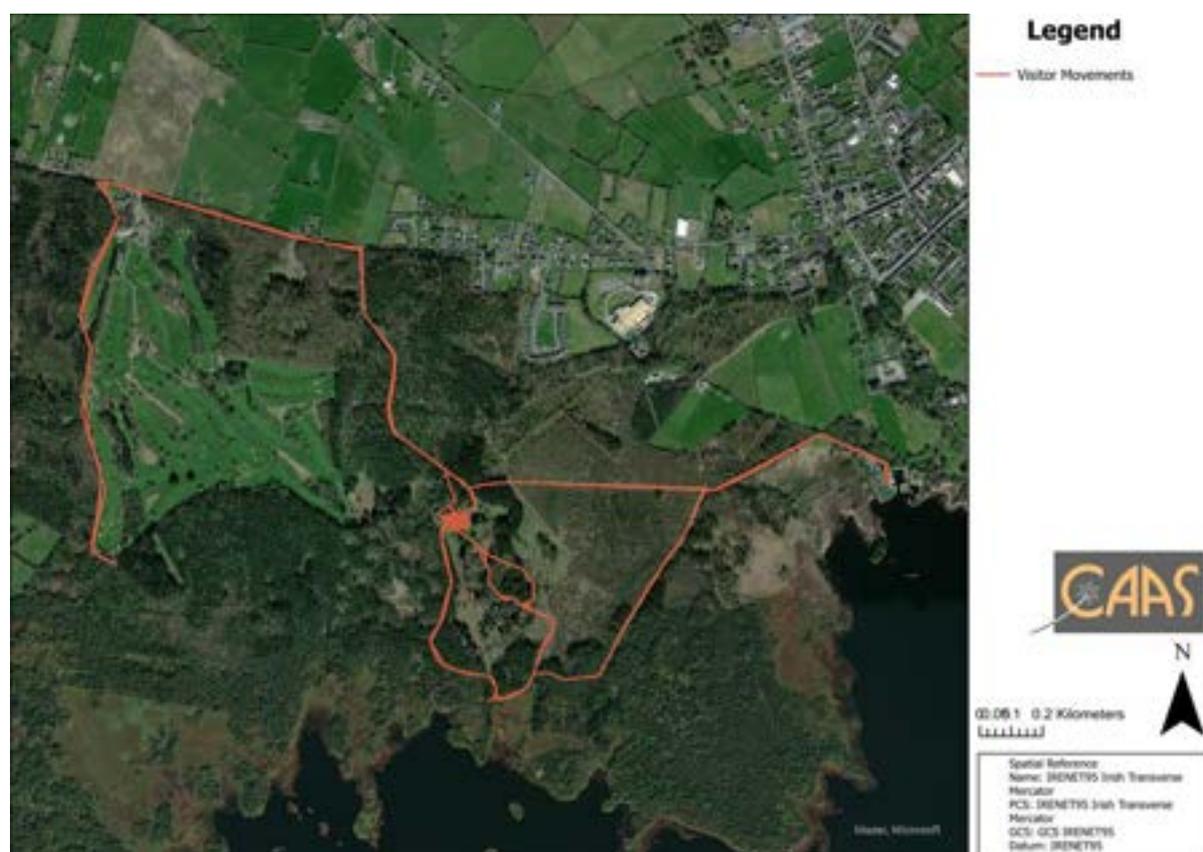
**Figure 20.11 Categories of Activity Levels Observed at Portumna Forest Park**



**Figure 20.12** Activities undertaken other than walking



**Figure 20.13** Range of Visitor Activities Observed at Portumna Forest Park



**Figure 20.14 Visitor movement patterns at Portumna Forest Park**

Of the 89 sample groups recorded on site, 72% of them undertook activities other than walking. These activities (identified above) resulted in no observable impact on the environment.

## 20.6 Ecological Monitoring Results

### 20.6.1 Ecological Constraints

Habitats within 2km of Portumna Forest Park are known to be sensitive to hydrological changes, land use management, overgrazing, alien species while the species that use these habitats are sensitive to aquaculture, pollution, invasive species, land use management, hunting and hydrological changes.

**Table 20.1 Designated sites within 2km of Portumna Forest Park and relevant ecological receptors**

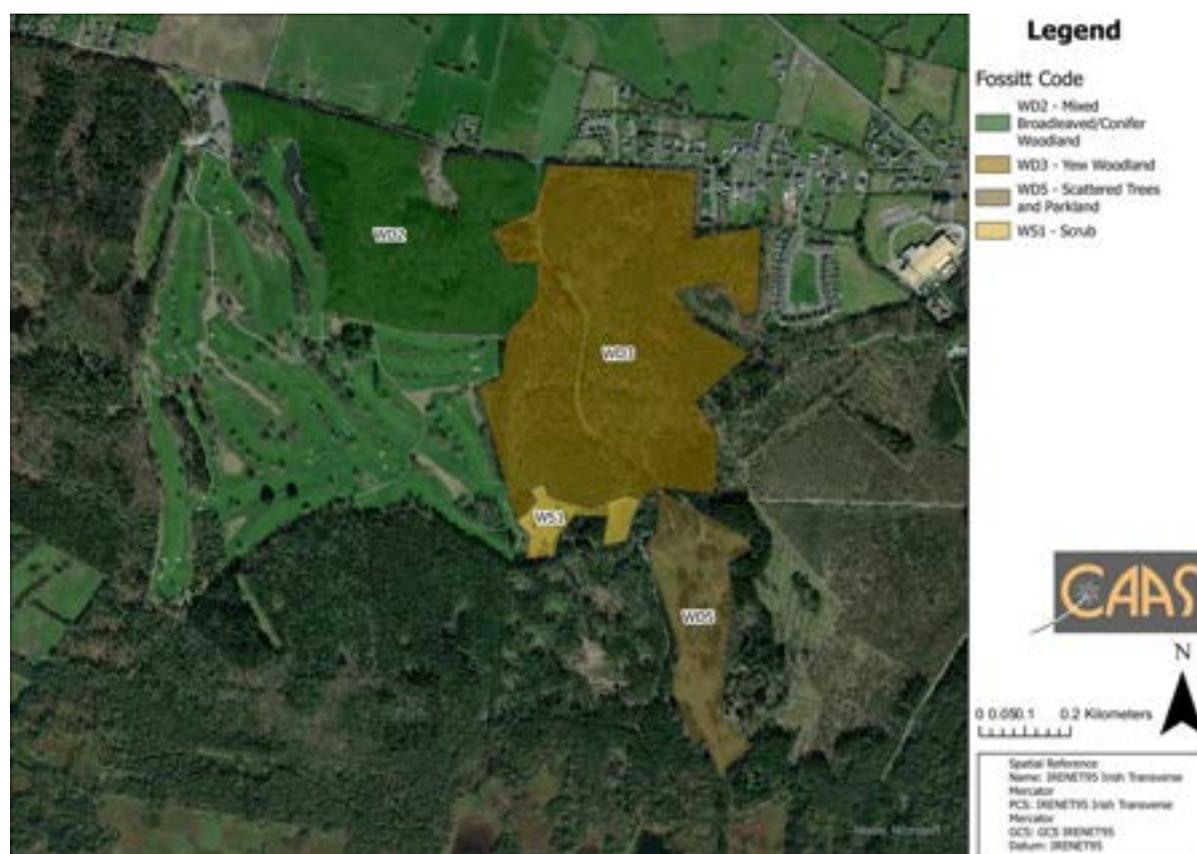
Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000011]	Lough Derg pNHA	0.01	pNHA	
[004058]	Lough Derg (Shannon) SPA	0.04	SPA	Tufted Duck ( <i>Aythya fuligula</i> ) [A061], Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Goldeneye ( <i>Bucephala clangula</i> ) [A067], Wetland and Waterbirds [A999], Common tern ( <i>Sterna hirundo</i> ) [A193]
[002241]	Lough Derg, North-East Shore SAC	0.05	SAC	Limestone pavements [8240], Alkaline fens [7230], <i>Taxus baccata</i> woods of the British Isles [91J0], Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210], Juniperus communis formations on heaths or calcareous grasslands [5130], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000216]	River Shannon Callows SAC	0.57	SAC	Otter ( <i>Lutra lutra</i> ) [1355], Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0], Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i> ) [6510], Molinia meadows on calcareous, peaty or clayey-silt-laden soils ( <i>Molinion caeruleae</i> ) [6410], Limestone pavements [8240], Alkaline fens [7230]
[004096]	Middle Shannon Callows SPA	0.57	SPA	Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156], Whooper Swan ( <i>Cygnus cygnus</i> ) [A038], Golden Plover ( <i>Pluvialis apricaria</i> ) [A140], Wigeon ( <i>Anas penelope</i> ) [A050], Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179], Corncrake ( <i>Crex crex</i> ) [A122], Wetland and Waterbirds [A999], Lapwing ( <i>Vanellus vanellus</i> ) [A142]
[000216]	River Shannon Callows pNHA	1.12	pNHA	

### 20.6.2 Habitat Descriptions

Portumna Forest Park contains mainly various woodland habitats with the majority of the area being covered by mixed broadleaved/conifer woodland (Fossitt Code WD2) and yew woodland (Fossitt Code WD3). There are also other, more managed, habitats such as scattered trees and parkland (Fossitt Code WD5).

The site is well managed with a network of trails. There are no obvious impacts from tourism on the natural features of the site.



**Figure 20.15 Habitats present at Portumna Forest Park**

### 20.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>42</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 0 recorded incidents of damage to habitats occurring off the marked paths on site.

### 20.6.4 Breeding Bird Survey

Due to the woodland habitat of Portumna Forest Park and its proximity to Lough Derg, both passerines and waders were recorded in the area. A large number of mallards were recorded along with a small number of gull species and herons. Swallows and swifts were also recorded in high numbers along with other birds such as blackbirds, chaffinches and robins.

**Table 20.2 Results of the breeding bird survey conducted at Portumna Forest Park**

Common Name	Scientific Name	List Status	Number Recorded
Blackbird	<i>Turdus merula</i>	Green	9
Blackcap	<i>Sylvia atricapilla</i>	Green	8
Black-headed Gull	<i>Larus ridibundus</i>	Amber	2
Blue Tit	<i>Cyanistes caeruleus</i>	Green	3
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	4
Buzzard	<i>Buteo buteo</i>	Green	1
Chaffinch	<i>Fringilla coelebs</i>	Green	9
Chiffchaff	<i>Phylloscopus collybita</i>	Green	7
Coal Tit	<i>Parus ater</i>	Green	2
Coot	<i>Fulica atra</i>	Amber	1
Cormorant	<i>Phalacrocorax carbo</i>	Amber	6
Duncock	<i>Prunella modularis</i>	Green	1
Goldcrest	<i>Regulus regulus</i>	Amber	4
Goldfinch	<i>Carduelis carduelis</i>	Green	4

<sup>42</sup> This value was calculated using the methods set out in Appendix II

Common Name	Scientific Name	List Status	Number Recorded
Great Black-backed Gull	<i>Larus marinus</i>	Green	2
Great Crested Grebe	<i>Podiceps cristatus</i>	Amber	1
Grey Heron	<i>Ardea cinerea</i>	Green	2
House Martin	<i>Delichon urbicum</i>	Amber	4
Jackdaw	<i>Corvus monedula</i>	Green	9
Little Grebe	<i>Tachybaptus ruficollis</i>	Green	1
Magpie	<i>Pica pica</i>	Green	1
Mallard	<i>Anas platyrhynchos</i>	Amber	47
Mistle Thrush	<i>Turdus viscivorus</i>	Green	4
Mute Swan	<i>Cygnus olor</i>	Amber	4
Pied Wagtail	<i>Motacilla alba yarrelli</i>	Green	7
Reed Bunting	<i>Emberiza schoeniclus</i>	Green	1
Robin	<i>Erithacus rubecula</i>	Green	7
Rook	<i>Corvus frugilegus</i>	Green	5
Siskin	<i>Spinus spinus</i>	Green	5
Song Thrush	<i>Turdus philomelos</i>	Green	5
Spotted Flycatcher	<i>Muscicapa striata</i>	Amber	2
Starling	<i>Sturnus vulgaris</i>	Amber	4
Stonechat	<i>Saxicola torquatus</i>	Green	1
Swallow	<i>Hirundo rustica</i>	Amber	19
Swift	<i>Apus apus</i>	Red	12
Treecreeper	<i>Certhia familiaris</i>	Green	1
Water Rail	<i>Rallus aquaticus</i>	Green	1
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	1
Woodpigeon	<i>Columba palumbus</i>	Green	6
Wren	<i>Troglodytes troglodytes</i>	Green	9

### 20.6.5 Mammals on Site

Badger, otter and pine marten scat samples were observed on site. Additionally, there was evidence of foraging red squirrels seen. Portumna Forest Park. The NBDC data shows that due to the habitat in the surrounding area, there are various different species of terrestrial mammals that have been observed and spotted in the area. Badgers, squirrels and different bat species have been recorded in high numbers in the area along with more uncommon species such as stoats and pygmy shrews.

**Table 20.3 List of mammals that have been recorded at NBDC Hectad M80**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	American Mink	<i>Mustela vison</i>	2
Terrestrial mammal	Bank Vole	<i>Myodes glareolus</i>	2
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	5
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	5
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	31
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	1
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	40
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	5
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	1
Terrestrial mammal	Fallow Deer	<i>Dama dama</i>	8
Terrestrial mammal	Greater White-toothed Shrew	<i>Crocidura russula</i>	3
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	1
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	16
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	4
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	17
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	27
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	4
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	15
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	3
Terrestrial mammal	Whiskered Bat	<i>Myotis mystacinus</i>	1

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

### 20.6.6 Wintering Bird Survey

There were a range of wading species of birds observed on site. The resident white-tailed eagle was not observed during the survey but it is known to be present year-round.

**Table 20.4 Results of the wintering bird survey conducted at Portumna Forest Park**

Common name	Scientific name	Record count
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	2
Common Gull	<i>Larus canus</i>	4
Cormorant	<i>Phalacrocorax carbo</i>	3
Grey Heron	<i>Ardea cinerea</i>	1
Lesser Black-backed Gull	<i>Larus fuscus</i>	1
Little Egret	<i>Egretta garzetta</i>	17
Mallard	<i>Anas platyrhynchos</i>	15

**Table 20.5 List of wintering birds that have been recorded at NBDC Hectad M80**

Taxonomic group	Common name	Scientific name	Record count
Bird	Arctic Tern	<i>Sterna paradisaea</i>	1
Bird	Black-headed Gull	<i>Larus ridibundus</i>	15
Bird	Blue-winged Teal	<i>Anas discors</i>	1
Bird	Common Coot	<i>Fulica atra</i>	17
Bird	Common Goldeneye	<i>Bucephala clangula</i>	3
Bird	Common Kingfisher	<i>Alcedo atthis</i>	5
Bird	Common Moorhen	<i>Gallinula chloropus</i>	18
Bird	Common Pochard	<i>Aythya ferina</i>	2
Bird	Common Redshank	<i>Tringa totanus</i>	8
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	4
Bird	Common Snipe	<i>Gallinago gallinago</i>	12
Bird	Common Tern	<i>Sterna hirundo</i>	2
Bird	Eurasian Curlew	<i>Numenius arquata</i>	8
Bird	Eurasian Jackdaw	<i>Corvus monedula</i>	25
Bird	Eurasian Teal	<i>Anas crecca</i>	3
Bird	Eurasian Wigeon	<i>Anas penelope</i>	2
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	5
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	1
Bird	Gadwall	<i>Anas strepera</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	2
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	16
Bird	Great Crested Grebe	<i>Podiceps cristatus</i>	12
Bird	Greater Scaup	<i>Aythya marila</i>	2
Bird	Greater White-fronted Goose	<i>Anser albifrons</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	11
Bird	Greylag Goose	<i>Anser anser</i>	2
Bird	Herring Gull	<i>Larus argentatus</i>	1
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	5
Bird	Little Egret	<i>Egretta garzetta</i>	1
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	13
Bird	Mallard	<i>Anas platyrhynchos</i>	20
Bird	Mew Gull	<i>Larus canus</i>	4
Bird	Mute Swan	<i>Cygnus olor</i>	16
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	12
Bird	Northern Pintail	<i>Anas acuta</i>	1
Bird	Northern Shoveler	<i>Anas clypeata</i>	2
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	1
Bird	Tufted Duck	<i>Aythya fuligula</i>	13
Bird	Water Rail	<i>Rallus aquaticus</i>	11

Taxonomic group	Common name	Scientific name	Record count
Bird	Whooper Swan	<i>Cygnus cygnus</i>	1

### 20.6.7 Bat Survey

It is expected that further monitoring will result in high abundances of bats as the habitat on site is highly suited. Particularly with regard to complex woodland edge habitats and riparian areas.

**Table 20.6 Locations of bats recorded at Portumna Forest Park**

Common name	Scientific name	Record count
Brown Long-eared Bat	<i>Plecotus auritus</i>	6
Daubenton's Bat	<i>Myotis daubentonii</i>	6
Lesser Noctule	<i>Nyctalus leisleri</i>	2
Natterer's Bat	<i>Myotis nattereri</i>	2
Pipistrelle	<i>Pipistrellus pipistrellus</i>	15

**Table 20.7 List of bats that have been recorded at NBDC Hectad M80**

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	5
Terrestrial mammal	Daubenton's Bat	<i>Myotis daubentonii</i>	5
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	16
Terrestrial mammal	Natterer's Bat	<i>Myotis nattereri</i>	4
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	27
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	15
Terrestrial mammal	Whiskered Bat	<i>Myotis mystacinus</i>	1

### 20.7 Recommendations

- Management practices to support strong invertebrate populations should be explored as a foraging resource for bats on site. This could include stabilising standing dead wood (for safety) while leaving them upright. Placing piles of various sizes of deadwood along the woodland edge. Construction of banks and berms for invertebrate nesting and basking etc.
- The site is well managed and ecologically diverse – there is an opportunity for higher rates of direct engagement at the site through biodiversity or nature related education events.
- Increased signage related to biodiversity which is interactive in nature could increase visitor experiences at the site.

## Sliabh Liag – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

The site contains heathland habitat which is protected under the EU Habitats Directive. Heathland is an important habitat for carbon storage and provides habitat for special conservation interest species like Peregrine falcon (*Falco peregrinus*) [A103], which the area is designated for as West Donegal Coast SPA.



The coast of Sliabh Liag has seen a multitude of whale and dolphin visitors including bottle nosed dolphins, minke whales and even a sighting of a killer whale.

### KEY RECOMMENDATIONS

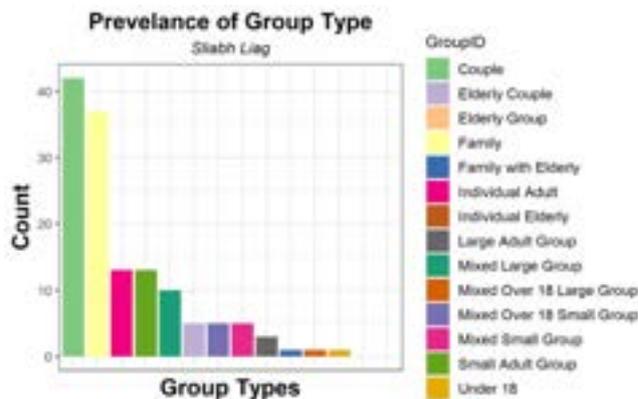
- Where possible education should be used as a management tool.
- Seasonal communication projects should be set up.
- The existing successful management and protection systems should be extended.

### VISITOR INTERACTION & MANAGEMENT

- Very high quality and extensive system of paths and erosion control.
- New transportation hub, car parks, ranger station and upgraded road access.
- Visitor interactions on site well controlled with strong management practices in place.
- Over 60% of activities recorded by visitors were deemed to be of low level such as photography, exploring off trail and dog walking.
- Impacts observed on site include damage to natural features (erosion) and trampling of vegetation.
- Most of the visitors to the site stayed for at least 66 minutes – given the nature of the site itself as a mountainous area.
- Majority of visitors read available signage on site.

### VISITOR NUMBERS AND DWELL TIME

- 460 people visited the site over 8 hours
- Average dwell time of 66 minutes



### Highlights:

- Path management system is needed
- Long site dwell time of at least 66 minutes.
- Opportunities for on-site nature communication officer – or nature-based education events at this high value high volume site

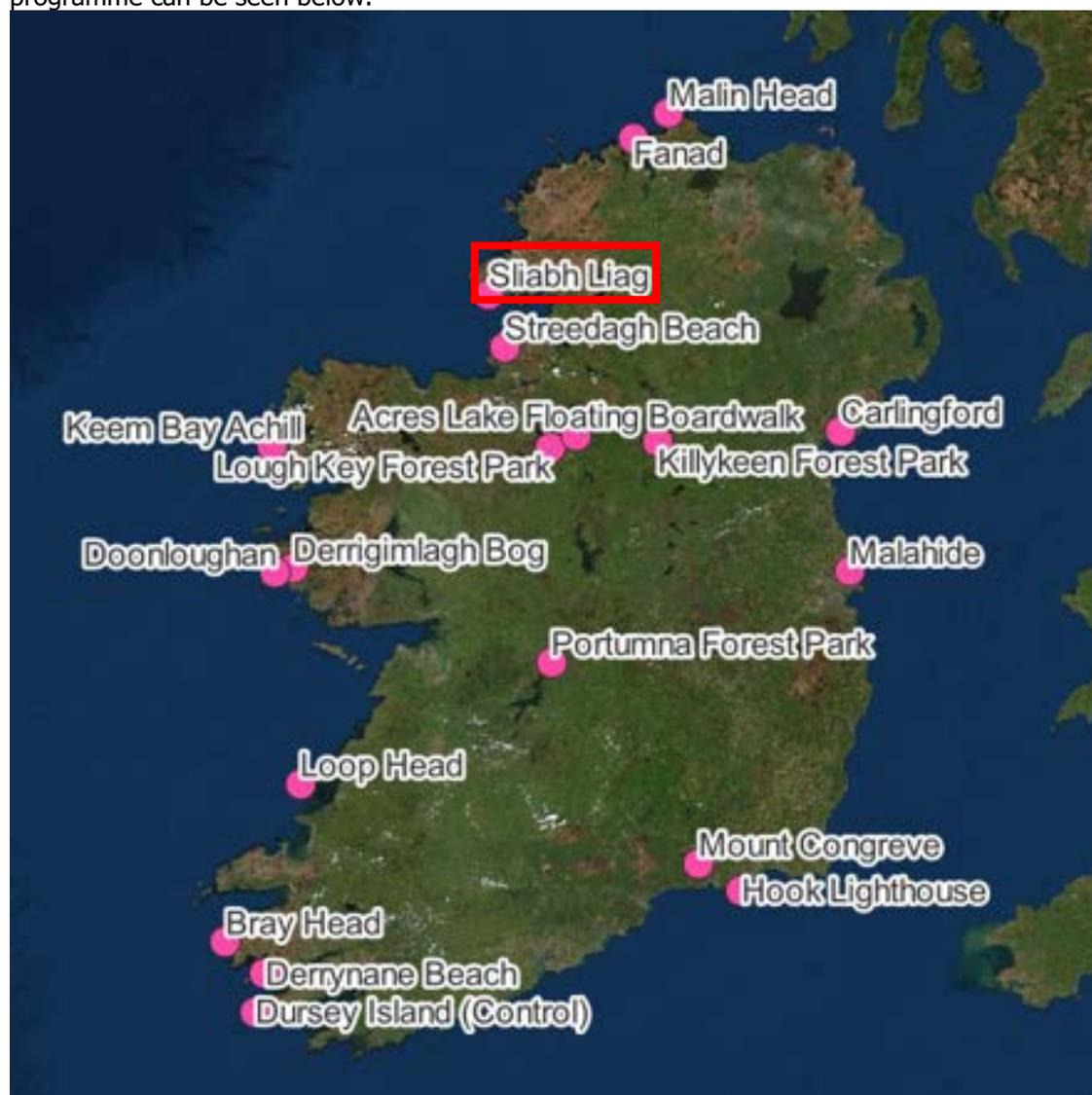


## 21 Sliabh Liag

### 21.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Ireland's regional areas; The Wild Atlantic Way, Ireland's Hidden Heartlands, Ireland's Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations; a map of all sites for the 2021 – 2025 programme can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, and the presence of birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

To date, the Wild Atlantic Way Environmental Monitoring Programme has allowed us to sample and monitor the behaviour & movement of over 26,000 visitors, identifying where there were stresses on the environment or potential future risks as well as good and bad practices.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation). Following on from the WAW monitoring data and in refining the methodology as a result, we aim to: understand what activities cause which impact; and, what are the factors which influence these activity choices by visitors?

The aim is to build on the knowledge gathered by the 2015-2019 programme. This will be used in combination with a continued engagement and exchange of knowledge with site managers, to tailor monitoring requirements, and enhance the programme outcomes, for each site chosen nationally for the new 2021-2025 programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

## 21.2 Methods & Surveys

The following surveys were undertaken at Sliabh Liag:

### 21.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Sliabh Liag was undertaken on the 26<sup>th</sup> of August 2021, with max temperatures reaching approximately 21.2° C, no rainfall and low levels of wind on the day<sup>43</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of as many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 21.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

### 21.2.3 Other Surveys

Additional sample surveys were undertaken to give an indication of the presence of wintering birds. This information can inform potential management actions related to amenity services such as lighting which could conflict with protected species on site and their sensitivities.

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<sup>43</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 21.3 Site Description of Sliabh Liag

The cliffs of Sliabh Liag<sup>44</sup> offer panoramic views of the Atlantic Ocean, along with views of the Sligo Mountains to the south of Sliabh Liag. They are the second highest cliffs in Ireland. Sliabh Liag is located close to the village of Carrick in south western Donegal. The site includes World War 2 'Éire' sign at the next to the viewing point car park. As a coastal cliff location, Sliabh Liag has habitats such as dry siliceous heath, wet heath and a dystrophic lake, and is also completely inside both the Slieve League SAC and the West Donegal Coast SPA.



**Figure 21.1 Sliabh Liag**

<sup>44</sup> The name 'Sliabh Liag' is used throughout - except when referencing official site designation for SPA & SAC's which refer to 'Slieve League'.

## Slieve League SAC



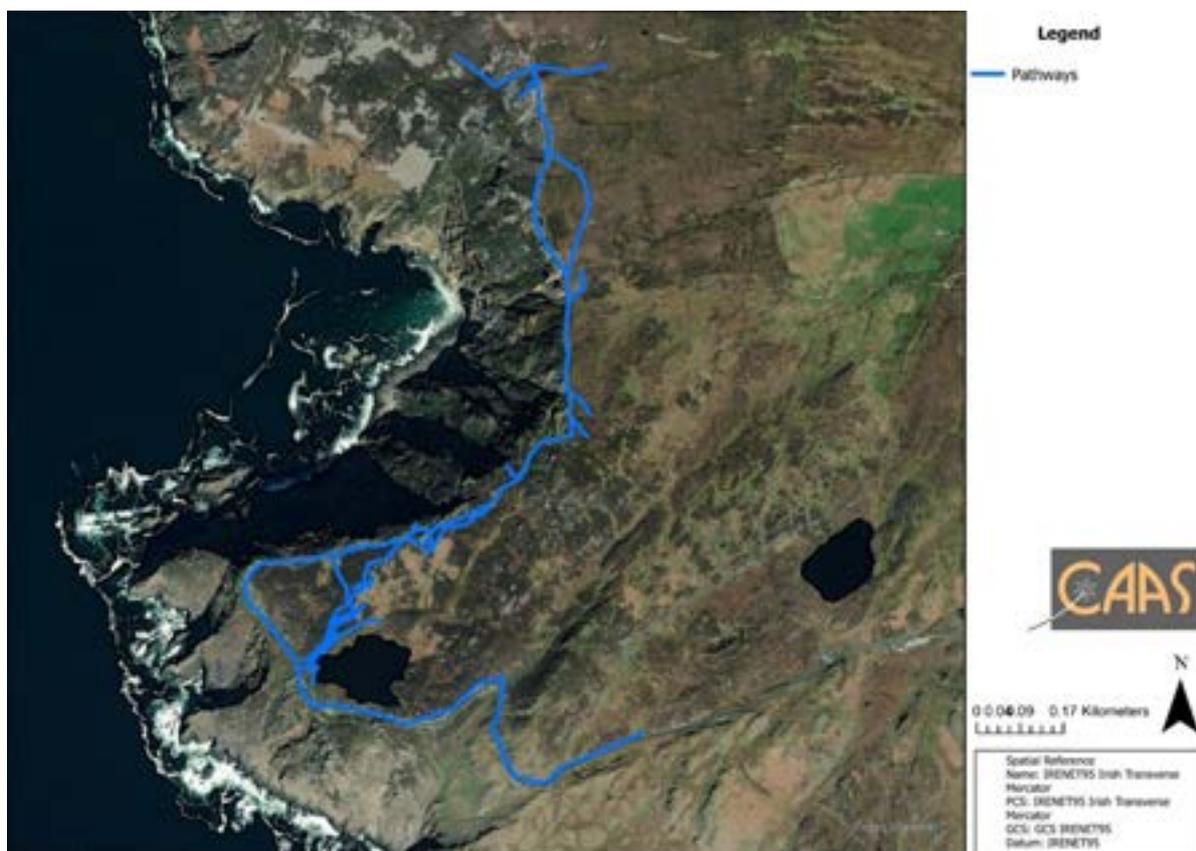
**Figure 21.2 Study Area within Slieve League SAC**

### 21.4 Pathways and Features Condition Results

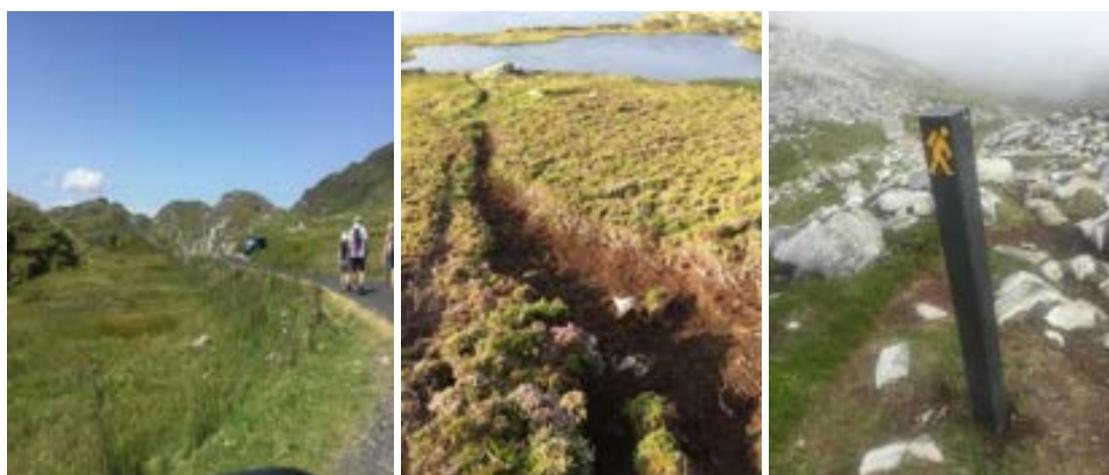
#### 21.4.1 Pathway Condition

The main paths at Sliabh Liag are largely composed of reinforced pathways of varied width and type. These range from high quality engineered and surfaced paths and steps to areas of eroded trails – particularly in elevated and cliff-top areas. There are some break out paths from these surfaced pathways. There is evidence of trampling along these pathways along with grazing.

This is a well-managed site – the installation of stone paving and steps along the trail provides a clear direction of travel and sit well within the landscape providing high quality erosion protection. In places, the path width is wider than the infrastructure provided due to high volumes of visitors.



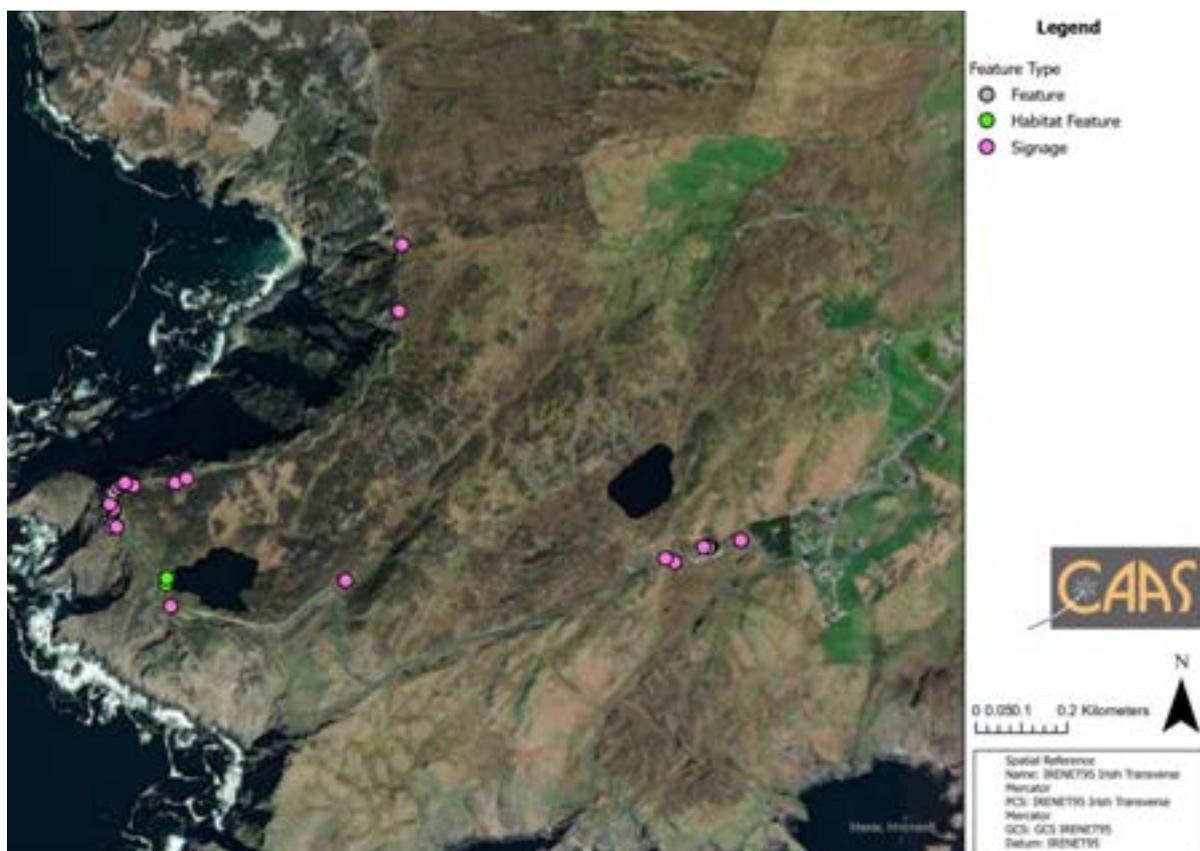
**Figure 21.3 Pathways identified at Sliabh Liag**



**Figure 21.4 Pathways at Sliabh Liag**

**21.4.2 Features Condition**

Sliabh Liag contains various amenities such as a car parks, toilets, bins, benches and areas to get coffee. Along with this there is a wide variety of signage on site including historical and wildlife information signs, trail maps and postings that mark these trails. Also, there are warning signs for dangerous cliffs and a number of no littering signs.



**Figure 21.5 Features recorded at Sliabh Liag**



**Figure 21.6 Features at Sliabh Liag**

**21.4.3 Hazards**

At Sliabh Liag it was noted that there are a number of areas where no cliff warnings are provided at potentially dangerous areas. As well as this, littering was also noted.



**Figure 21.7 Hazards recorded at Sliabh Liag**



**Figure 21.8 Unprotected cliff edge at Sliabh Liag**

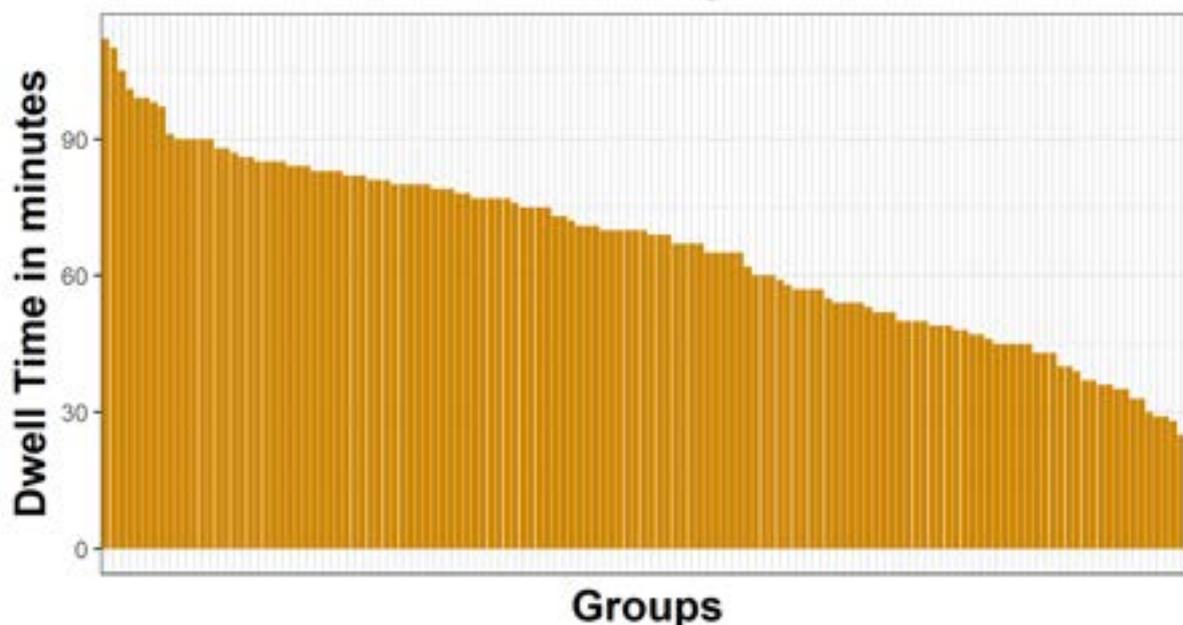
### 21.5 Visitor Characterisation Survey

The visitor monitoring surveys resulted in a total of 460 visitors (which represent 136 group observations). The site is most popular amongst the Couple group with the dominant mode of transport being car. The average dwell time for the site was 66 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Photographing
Exploring off trail
Cycling
Dog walking (on lead)
Picnicking
Climbing
Flying drone
Jogging

### Dwell Time

*Sliabh Liag*



**Figure 21.9 Duration of Time Spent at Sliabh Liag**

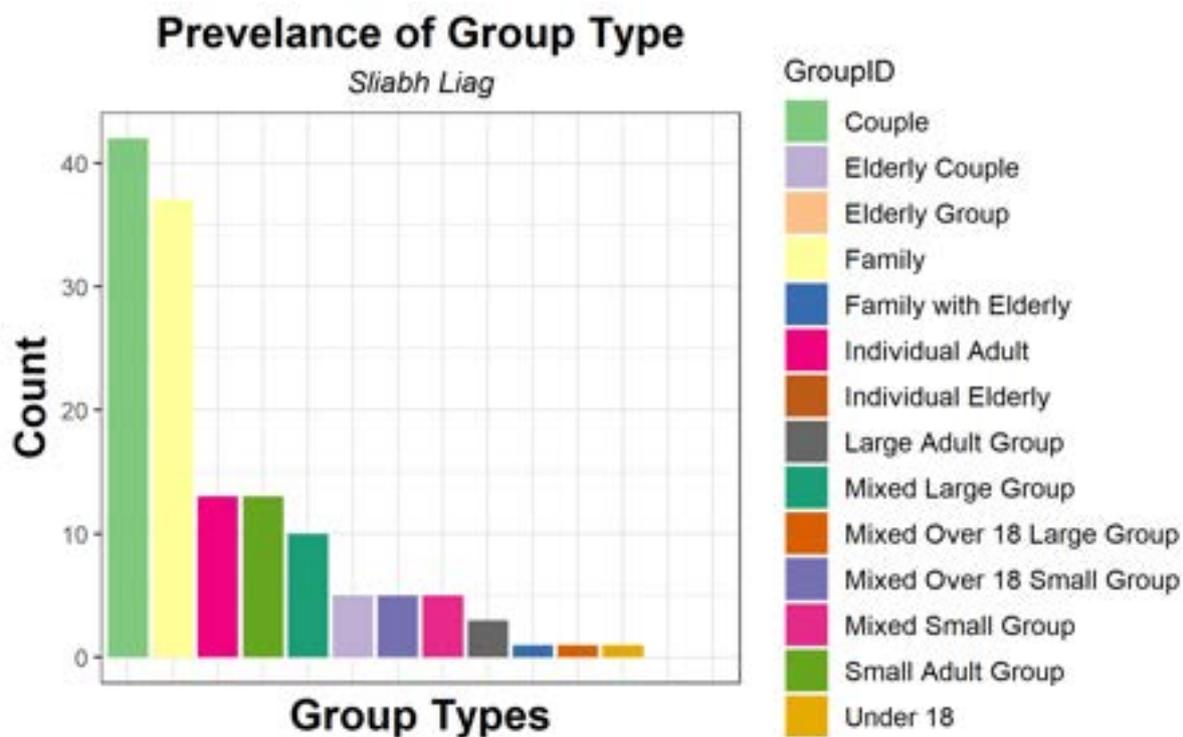


Figure 21.10 Groups of visitors that visited Sliabh Liag

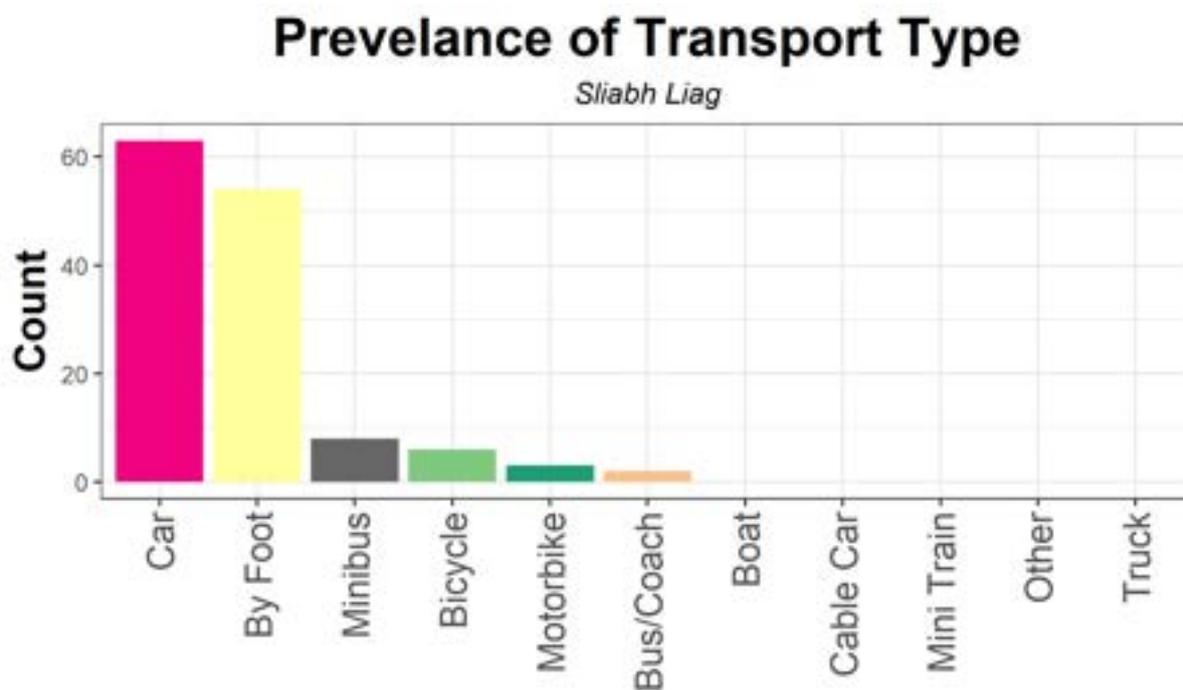
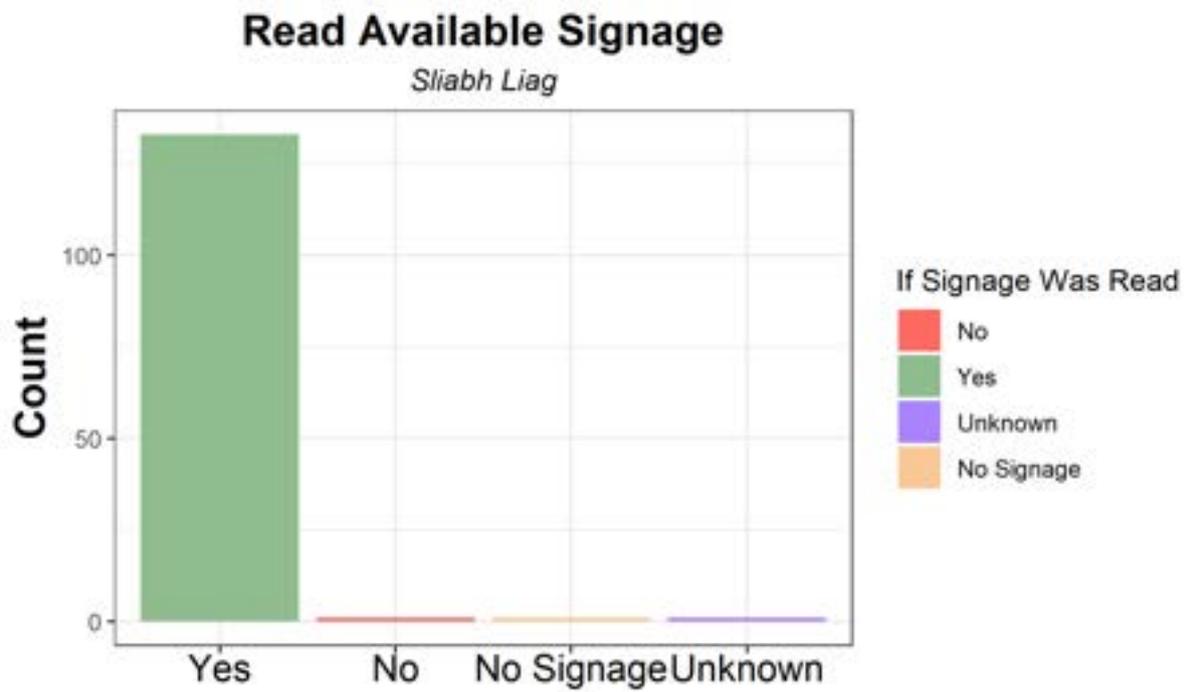
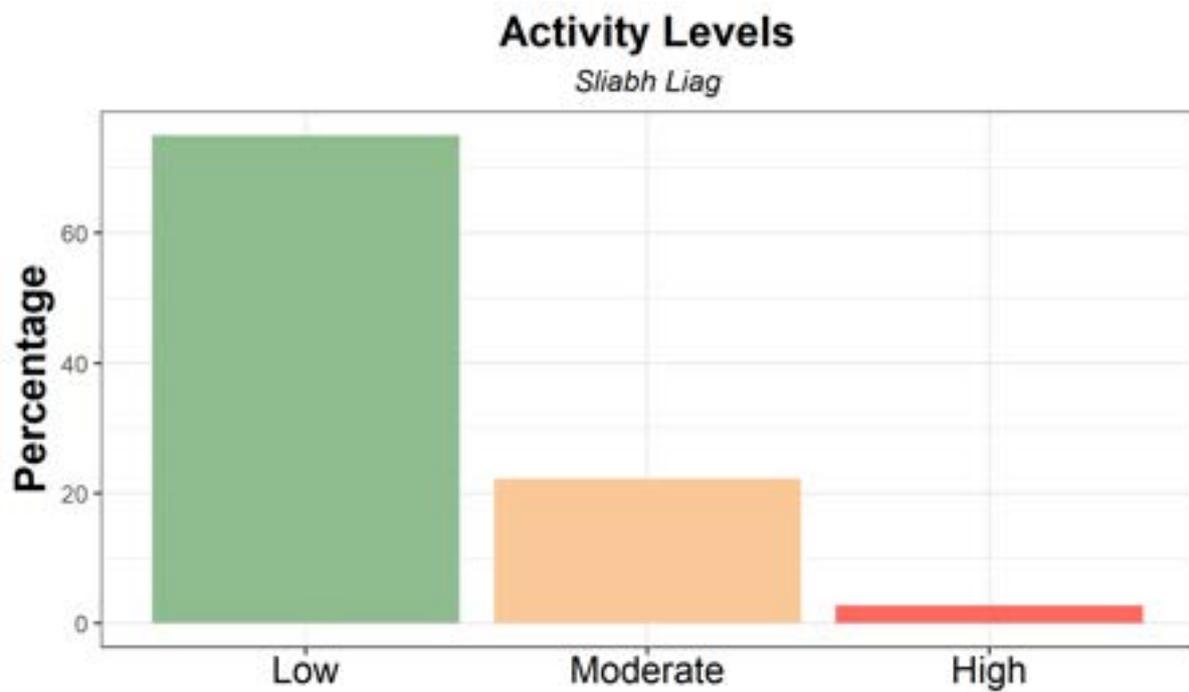


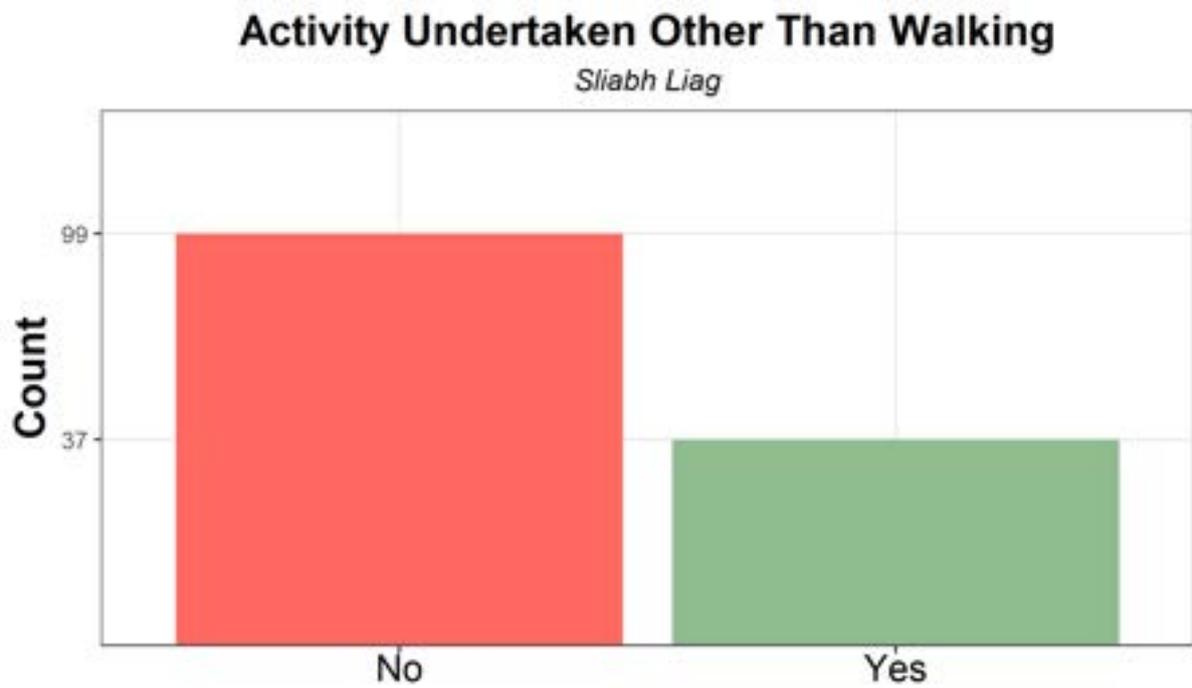
Figure 21.11 Mode of transport used to visit Sliabh Liag



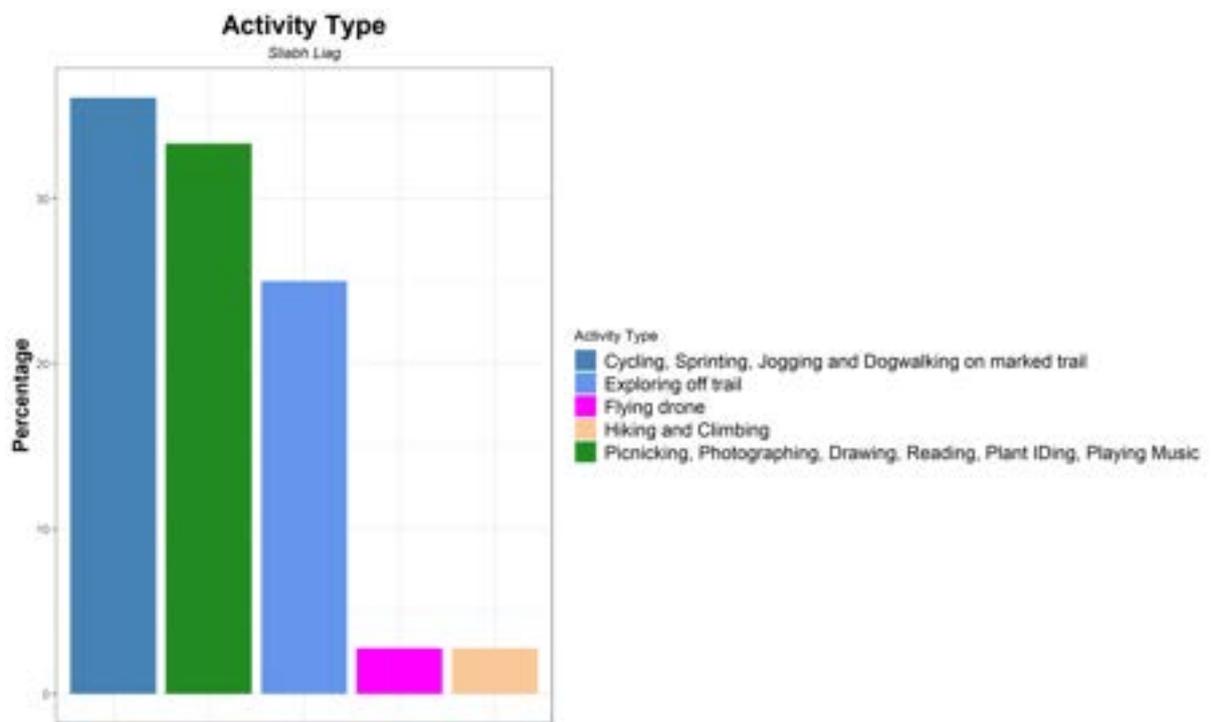
**Figure 21.12 Use of Interpretive Material at Sliabh Liag**



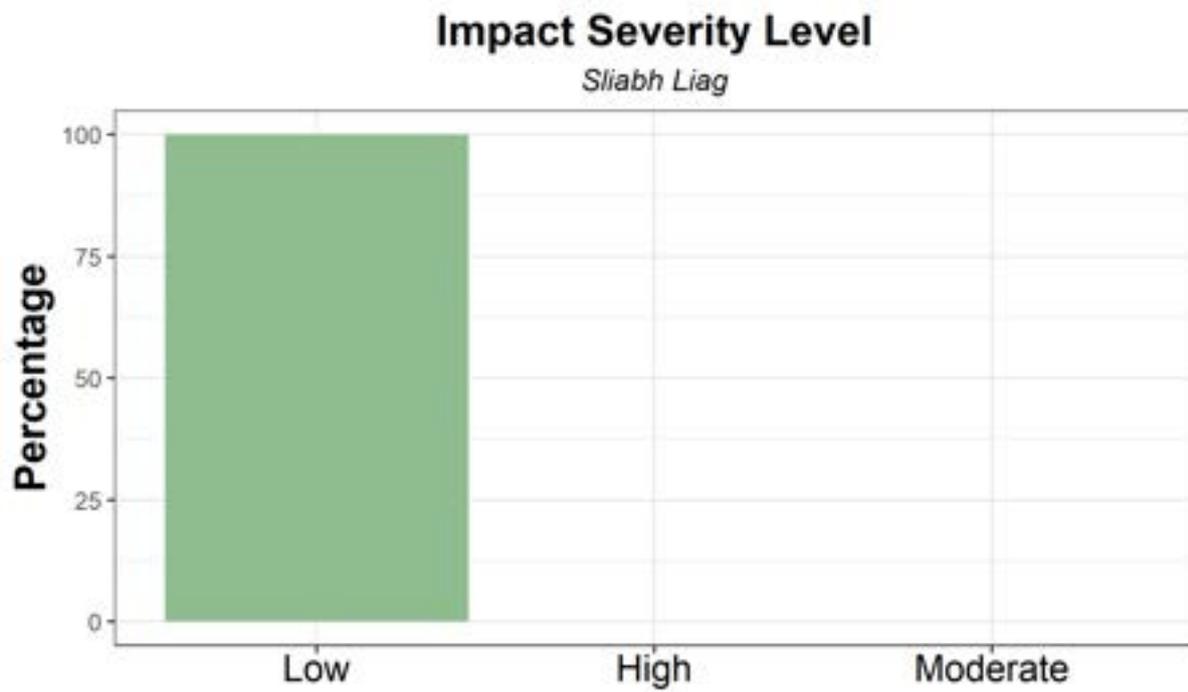
**Figure 21.13 Categories of Activity Levels Observed at Sliabh Liag**



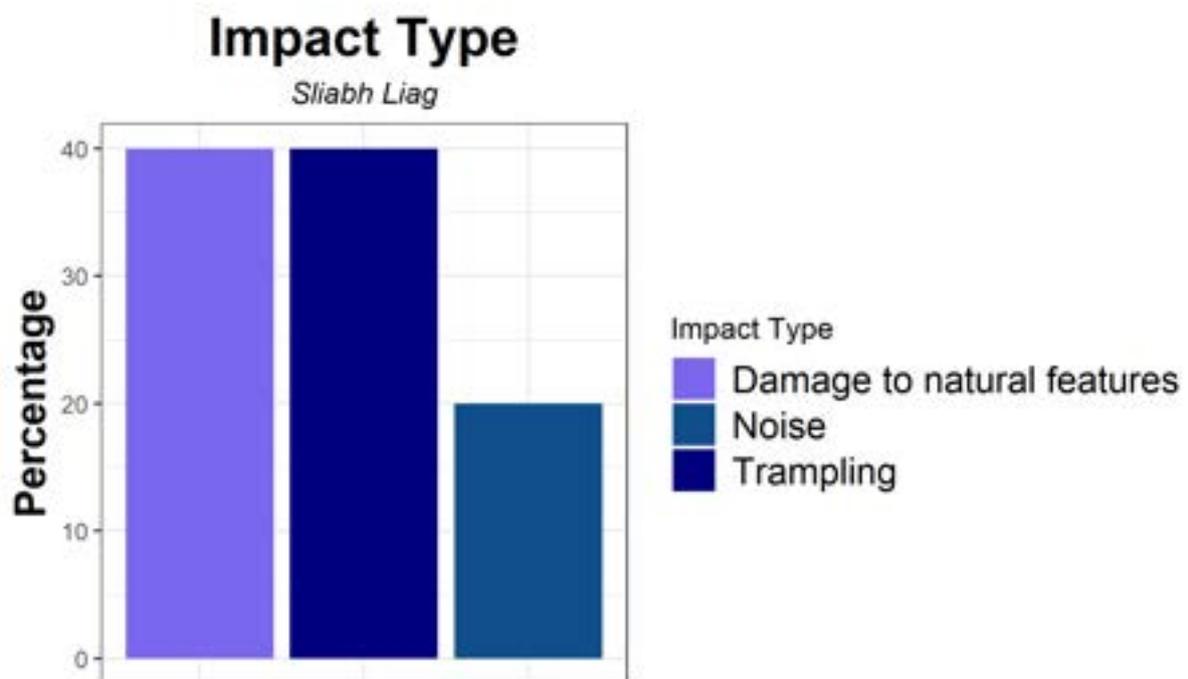
**Figure 19.6 Activities undertaken other than walking**



**Figure 21.14 Range of Visitor Activities Observed at Sliabh Liag**



**Figure 21.15 Categories of Environmental Impact Levels Observed at Sliabh Liag as a result of Visitor Activities**



**Figure 21.16 Range of Environmental Impacts Observed at Sliabh Liag**



**Figure 21.17 Visitor movement patterns at Sliabh Liag**

Of the 136 groups recorded on site 27% of them undertook activities other than walking. These activities (identified above) resulted in 5 impacts being observed on site during the survey. Thus, 14% of activities on site resulted in impacts on the environment. The impact severity levels varied with 100% of the impacts being low, 0% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Damage to natural features	2
Noise	1
Trampling	2

## 21.6 Ecological Monitoring Results

### 21.6.1 Ecological Constraints

The sensitive habitats and species within 2km of Sliabh Liag are known to be sensitive to aquaculture, pollution, hunting, land use management, hydrological changes and overgrazing.

**Table 21.1 Designated sites within 2km of Sliabh Liag and relevant ecological receptors**

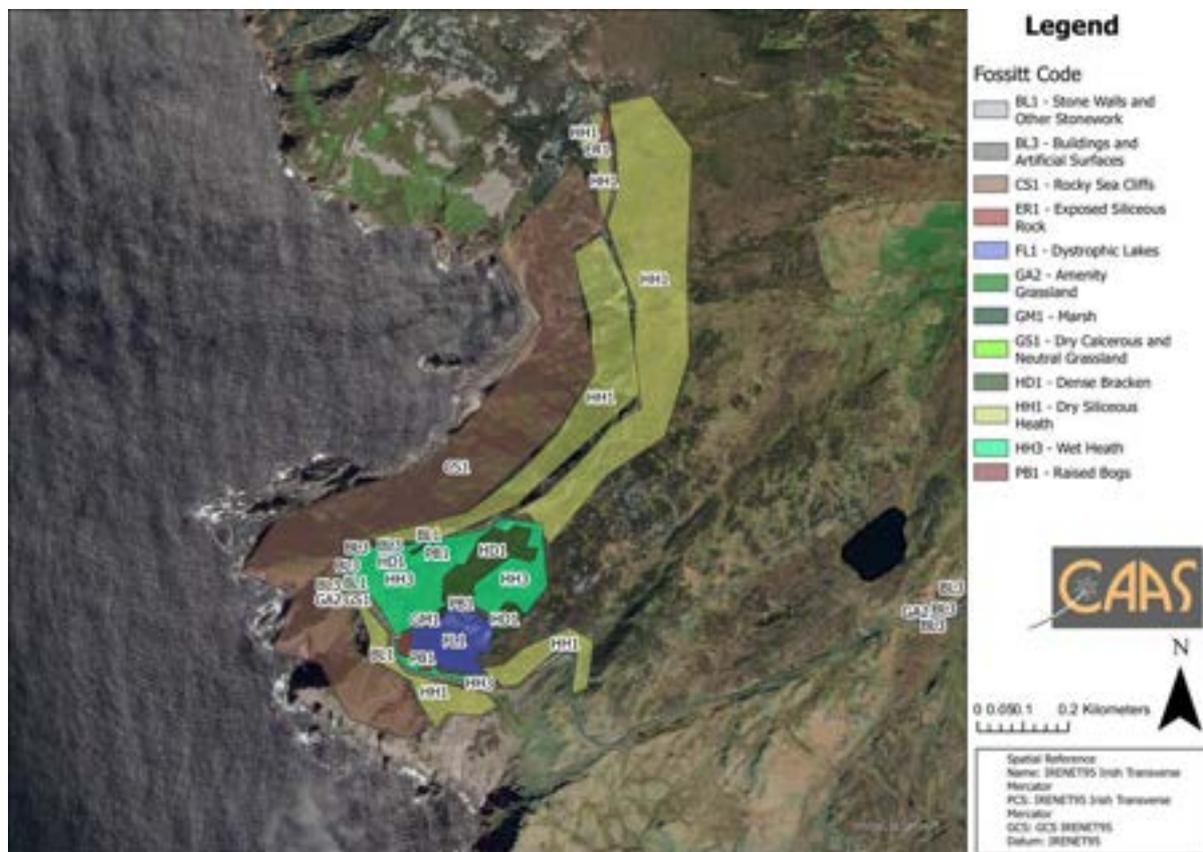
Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000189]	Slieve League pNHA	0	pNHA	

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[000189]	Slieve League SAC	0	SAC	European dry heaths [4030], Blanket bogs * if active bog [7130], Alpine and Boreal heaths [4060], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Calcareous rocky slopes with chasmophytic vegetation [8210], Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> ) [8110], Siliceous rocky slopes with chasmophytic vegetation [8220], Reefs [1170], Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010], Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
[004150]	West Donegal Coast SPA	0	SPA	Kittiwake ( <i>Rissa tridactyla</i> ) [A188], Fulmar ( <i>Fulmarus glacialis</i> ) [A009], Shag ( <i>Phalacrocorax aristotelis</i> ) [A018], Cormorant ( <i>Phalacrocorax carbo</i> ) [A017], Peregrine falcon ( <i>Falco peregrinus</i> ) [A103], Razorbill ( <i>Alca torda</i> ) [A200], Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346], Herring Gull ( <i>Larus argentatus</i> ) [A184]

**21.6.2 Habitat Descriptions**

Sliabh Liag contains a variety of habitats which represent the elevated coastal location of the site itself. The majority of the site is made up of dry siliceous heath (Fossitt Code HH1) and rocky sea cliffs (Fossitt Code CS1) with a patch of exposed siliceous rock (Fossitt Code ER1), which align with the Annex I habitat for which the SAC, Slieve League, is designated (Siliceous rocky slopes with chasmophytic vegetation [8220]). Sliabh Liag also contains a dystrophic lake (Fossitt Code FL1) and associated wetland habitats like wet heath (Fossitt Code HH3), marsh (Fossitt Code GM1) and raised bogs (Fossitt Code PB1).

The visitor movement patterns are predominantly associated with the pathways and tracks. There is evidence of erosion along the margins of the paths with break out areas evident at key vantage points – moreover, there are paths through the protected habitat evident.



**Figure 21.18 Habitats present at Sliabh Liag**

### 21.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>45</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 11 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be from trampling and grazing by sheep and hiking.

The causes of the damage were identified to be smaller unstructured trails; this results in trampling related issues. Additionally, sheep grazing practices are having impacts on the habitat quality at the site.

### 21.6.4 Mammals on Site

No mammals were recorded on site at Sliabh Liag. As expected of a coastal area, the NBDC data shows that the majority of mammal species observed in the area are marine mammals with bottle-nose dolphins being the most commonly seen species. A small number of terrestrial species were observed in the area with otters and hares being the most common.

**Table 21.2 List of mammals that have been recorded at NBDC Hectad G57**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	21
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	5
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	2
Marine mammal	Common Seal	<i>Phoca vitulina</i>	1
Marine mammal	Fin Whale	<i>Balaenoptera physalus</i>	1
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	3
Marine mammal	Killer Whale	<i>Orcinus orca</i>	1
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	3
Marine mammal	Phocidae	<i>Phocidae</i>	1
Terrestrial mammal	American Mink	<i>Mustela vison</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	7
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	1
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	4
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	1
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	1
Terrestrial mammal	Red Deer	<i>Cervus elaphus</i>	1

### 21.6.5 Wintering Bird Survey

Peregrine falcon were recorded foraging on site during the winter bird surveys.

**Table 21.3 List of wintering birds that have been recorded at NBDC Hectad G57**

Taxonomic group	Common name	Scientific name	Record count
Bird	Black Guillemot	<i>Cephus grylle</i>	11
Bird	Black-headed Gull	<i>Larus ridibundus</i>	4
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	12
Bird	Common Eider	<i>Somateria mollissima</i>	2
Bird	Common Greenshank	<i>Tringa nebularia</i>	2
Bird	Common Guillemot	<i>Uria aalge</i>	7
Bird	Common Redshank	<i>Tringa totanus</i>	2
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	4
Bird	Common Snipe	<i>Gallinago gallinago</i>	3
Bird	Eurasian Curlew	<i>Numenius arquata</i>	5
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	7
Bird	Eurasian Teal	<i>Anas crecca</i>	1
Bird	Eurasian Woodcock	<i>Scolopax rusticola</i>	1
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	5
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	2
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	20

<sup>45</sup> This value was calculated using the methods set out in Appendix II

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	9
Bird	Great Crested Grebe	<i>Podiceps cristatus</i>	1
Bird	Great Northern Diver	<i>Gavia immer</i>	2
Bird	Great Skua	<i>Stercorarius skua</i>	1
Bird	Grey Heron	<i>Ardea cinerea</i>	5
Bird	Herring Gull	<i>Larus argentatus</i>	15
Bird	Ivory Gull	<i>Pagophila eburnea</i>	1
Bird	Kumlien's Iceland Gull	<i>Larus glaucooides subsp. kumlieni</i>	1
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	8
Bird	Mallard	<i>Anas platyrhynchos</i>	10
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	21
Bird	Mew Gull	<i>Larus canus</i>	3
Bird	Mute Swan	<i>Cygnus olor</i>	1
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	28
Bird	Northern Gannet	<i>Morus bassanus</i>	39
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	1
Bird	Razorbill	<i>Alca torda</i>	3
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	4
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	1
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	4

### 21.7 Recommendations

This is a well-managed very large site that defies generalisations because of the many levels of varied use and management – the installation of stone paving and steps along the trail provides a clear direction of travel and sit well within the landscape providing erosion protection. In places, the path width is wider than the infrastructure provided due to high volumes of visitor.

Where breakout points or off-path trails are formed, then the existing successful management and protection systems should be extended. Placing temporary barriers with light touch signage explaining the importance of remaining on the designated trail is fundamental.

Given the high volume of visitors at the site and the high nature value of the habitats and surrounding landscape – it is recommended that seasonal communication projects be set up. This can be facilitated through an on-site warden, walking tours, set events such as annual bio blitzes etc.

## Streedagh Beach – Interesting Finds

### ECOLOGICAL HIGHLIGHTS

All of the designated features of the Streedagh Point SAC are present on site. Namely, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330], Narrow-mouthed whorl snail (*Vertigo angustior*) [1014], Perennial vegetation of stony banks [1220], Mudflats and sandflats not covered by seawater at low tide [1140], Shifting dunes along the shoreline with *Ammophila arenaria* - white dunes [2120], Mediterranean salt meadows (*Juncetalia maritimi*) [1410]

The protection of these habitats is paramount.



Great northern diver (*Gavia immer*), Golden plover (*Pluvialis apricaria*), Bar-tailed godwit (*Limosa lapponica*) and Curlew (*Numenius arquata*) are known to winter at this beach.

### KEY RECOMMENDATIONS

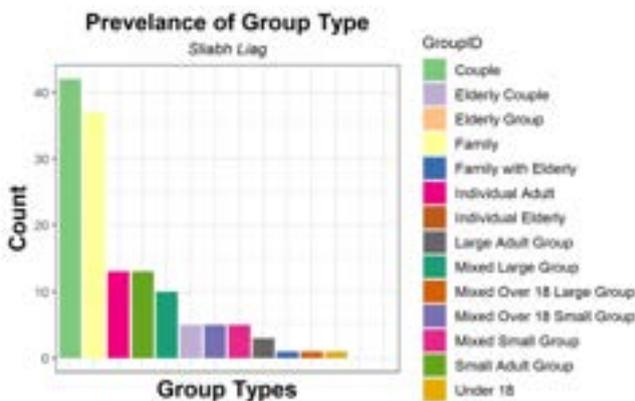
- The density of trails is extremely high – but all habitats off trail are relatively undisturbed. Efforts should be made to consolidate the trails on site. A dynamic path management system could alleviate the pressures which are occurring along with a habitat restoration plan for closed trails.
- Existing dune parking management system is ineffective, with movable barriers.
- Engaging interpretive material is required to increase visitor awareness of the importance of dunes and the damage to habitats caused by extensive trail networks.

### VISITOR INTERACTION & MANAGEMENT

- Visitor interactions on site well controlled with strong management practices in place.
- Over 75% of activities recorded by visitors were deemed to be of low level such as swimming and dog walking.
- Impacts observed on site include desire lines and erosion.
- Most of the visitors to the site stayed for at least 44 minutes –given the nature of the site itself as a beach.
- All visitors did not read available signage on site.

### VISITOR NUMBERS AND DWELL TIME

- 156 people visited the site over 8 hours
- Average dwell time of 44 minutes



### Highlights:

- Dune management system is needed
- Camping control measures are needed.
- Long site dwell time of at least 44 minutes.
- Site signage is limited – missed opportunity for wildlife and habitats.



## 22 Streedagh Beach

### 22.1 Purpose & Outputs of the Programme

Building on the success of the Wild Atlantic Way (WAW) environmental monitoring programme which ran from 2015-2019 – Fáilte Ireland has decided to expand the programme to a national level. The programme will monitor 19 individual sites located in all of Fáilte Irelands regional areas; The Wild Atlantic Way, Irelands Hidden Heartlands, Irelands Ancient East and Dublin. The programme will run for 5 years from 2021-2025.

The sites that are included in the programme vary in type from inland forest parks, to coastal sites, to privately owned attractions and diverse urban locations; a map of all sites for the 2021 – 2025 programme can be seen below.



The purpose of the programme is as follows:

- To gain more insight from an environmental perspective as to what is happening at a variety of sites where we encourage visitors to frequent,
- To gather information (visitor behaviour, movement, path and trail conditions, and the presence of birds, flora etc) for each site over the course of 5 years,
- To understand if there are observable trends and/or observable variations amongst site types over a 5-year period,
- To note good & bad practice at sites in order to;
- Make recommendations where appropriate for site management which is intended will have sustainable benefits for the site, the visitor and the natural environment.

To date, the Wild Atlantic Way Environmental Monitoring Programme has allowed us to sample and monitor the behaviour & movement of over 26,000 visitors, identifying where there were stresses on the environment or potential future risks as well as good and bad practices.

This culminated in our ability to make useful recommendations to site owners and managers and ultimately to develop a practical set of Guidelines for Visitor management (from Planning thorough to Site Operation). Following on from the WAW monitoring data and in refining the methodology as a result, we aim to: understand what activities cause which impact; and, what are the factors which influence these activity choices by visitors?

The aim is to build on the knowledge gathered by the 2015-2019 programme. This will be used in combination with a continued engagement and exchange of knowledge with site managers, to tailor monitoring requirements, and enhance the programme outcomes, for each site chosen nationally for the new 2021-2025 programme.

The key areas of focus within the data being gathered is to answer the following questions:

- How do the learning outcomes from the WAW monitoring compare when using repeat measures at fixed locations over a long period? Hence, what are the predictors of impact occurrence and severity?
- Following on from the WAW monitoring data – with the refined methods we aim to understand what activities cause which impact; and what are the factors which influence these activity choices in visitors?
- Understanding visitor movement patterns with respect to ranging behaviours – i.e., is there a distance threshold where impacts are less severe or negligible?
- Undertake pathway condition assessments to understand the relative sensitivities or tolerances of path types to visitor movements – taking note of habitat type and visitor numbers/load capacity.

These questions will be answered upon completion of the full suite of surveys and data collected annually over the course of the monitoring programme. However, each year will have annual interim reports to enable emerging findings and management recommendations to be identified and shared with the relevant stakeholders, in order to support progressive and informed management practices

## 22.2 Methods & Surveys

The following surveys were undertaken at Streedagh Beach:

### 22.2.1 Visitor Characterisation Survey

Visitor characterisation surveys were undertaken at each of the monitoring sites during the weekend period between June-August. The survey at Streedagh Beach was undertaken on the 9<sup>th</sup> of July 2021, with max temperatures reaching approximately 21.6° C, with very little to no rainfall and low levels of wind on the day<sup>46</sup>. These surveys followed an 8-hour time period recording samples of visitor behaviour of an many visitors on site as possible. Visitor movement patterns, demographic data and activities undertaken were recorded for all sampled visitors. Where activities had associated impacts, these were also recorded and the relevant severity was recorded using the same coding system as with the WAW monitoring (see Appendix I for details). It is important to note that the visitor characterisation surveys are indiscriminate between visitors and local amenity use.

### 22.2.2 Ecological & Path Assessments

In addition to the visitor movement and behavioural records an ecological assessment and path network assessment was undertaken at each site. This consisted of mapping all tracks and trails – with records of hazards, notable damage etc. In addition to this, all habitats were mapped according to the Fossitt Habitat coding system while information on bird populations was gathered from National Biodiversity Centre Data.

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<sup>46</sup> Weather data gathered from: <https://www.met.ie/climate/available-data/historical-data>

### 22.2.3 Other Surveys

Additional sample surveys were undertaken to give an indication of the presence of wintering birds. This information can inform potential management actions related to amenity services such as lighting which could conflict with protected species on site and their sensitivities.

### 22.3 Site Description of Streedagh Beach

Streedagh Beach in northern County Sligo, is around 3km long. It contains a wide range of important habitats such as a calcareous spring, marram dunes, fixed dunes and lower salt marshes and as such, is within the Streedagh Point Dunes SAC. It also has important historical association with the Spanish Armada as well as two nearby megalithic tombs. The remains of a 14th Century Spanish Armada ship still mostly buried at the far end of the strand is visible at very low tide.



Figure 22.1 Streedagh Beach

## Streedagh Point Dunes SAC



**Figure 22.2 Study Area within Streedagh Point Dunes SAC**

### 22.4 Pathways and Features Condition Results

#### 22.4.1 Pathway Condition

Most of the main paths at Streedagh Beach are confined to an area within 250m of the paved road access point and the loosely organised – but unedged parking area that intrudes at busy times onto muddy sand and saltmarsh areas. There is occasional and slight evidence of paths or trails for remaining 2km of the beach length.

There are various degrees of pathways formation which show various levels of compaction and damage caused by walkers and vehicles in this restricted area.



**Figure 22.3 Pathways identified at Streedagh Beach**



**Figure 22.4 Pathways at Streedagh Beach**

**22.4.2 Features Condition**

Streedagh Beach contains features that would be expected of a coastal visitor area such as a lifeguard hut along with toilets and carpark surfaced with unbound material. The beach also has signage related to beach safety and warnings of strong currents. Along with these, it also has information signage such as historical information and a general information board as well as signage that designates the area as a Special Area of Conservation, with barriers that prevent cars from entering dunes, and as part of the Wild Atlantic Way (Figure 22.6).



**Figure 22.5 Features recorded at Streedagh Beach**



**Figure 22.6 Features at Streedagh Beach**

### 22.4.3 Hazards

No hazards were noted or recorded at Streedagh Beach during hazard mapping.

### 22.5 Visitor Characterisation Survey

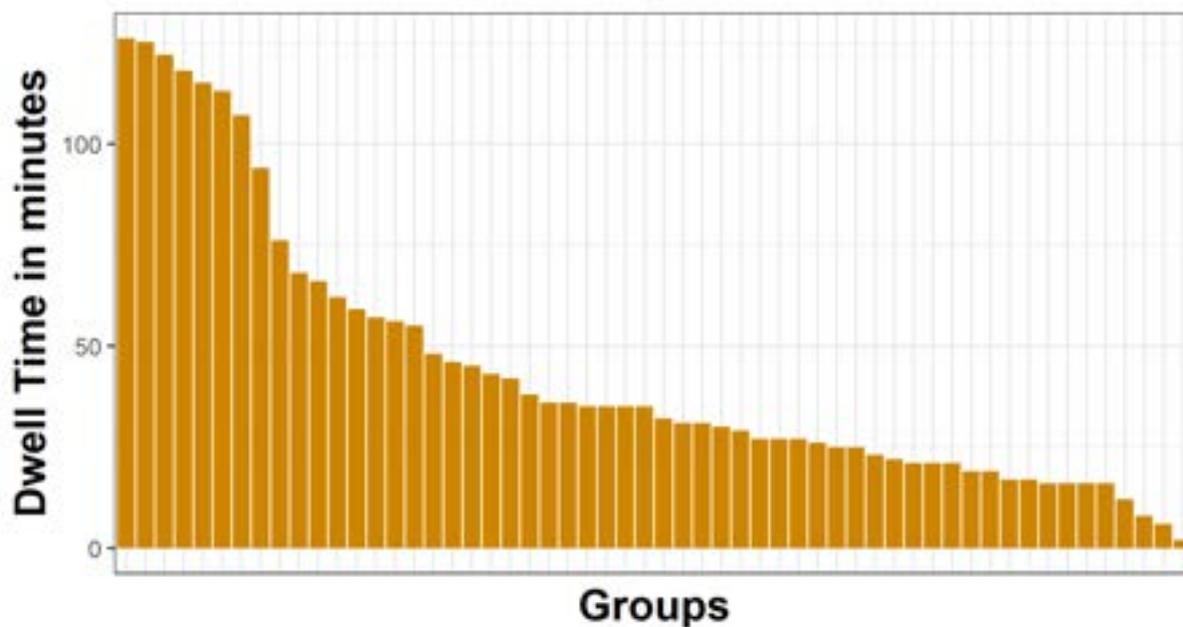
The visitor monitoring surveys resulted in a total of 156 visitors (which represent 65 group observations). The site is most popular amongst the Family group with the dominant mode of transport being car. The average dwell time for the site was 44 minutes; with the following activities undertaken during the survey (listed in order of occurrence rate):

Activity Type
Swimming
Dog walking (off lead)
Jogging
Photographing

Activity Type
Surfing
Picnicking
Dog walking (on lead)
Frisbee/ Catch
Off road driving
Bodyboarding
Building sand castles
Digging
Horse-riding
Hurling
Local farmer checking cows
Shell collecting
Sitting
Yoga

## Dwell Time

*Streedagh Beach*



**Figure 22.7 Duration of Time Spent at Streedagh Beach**

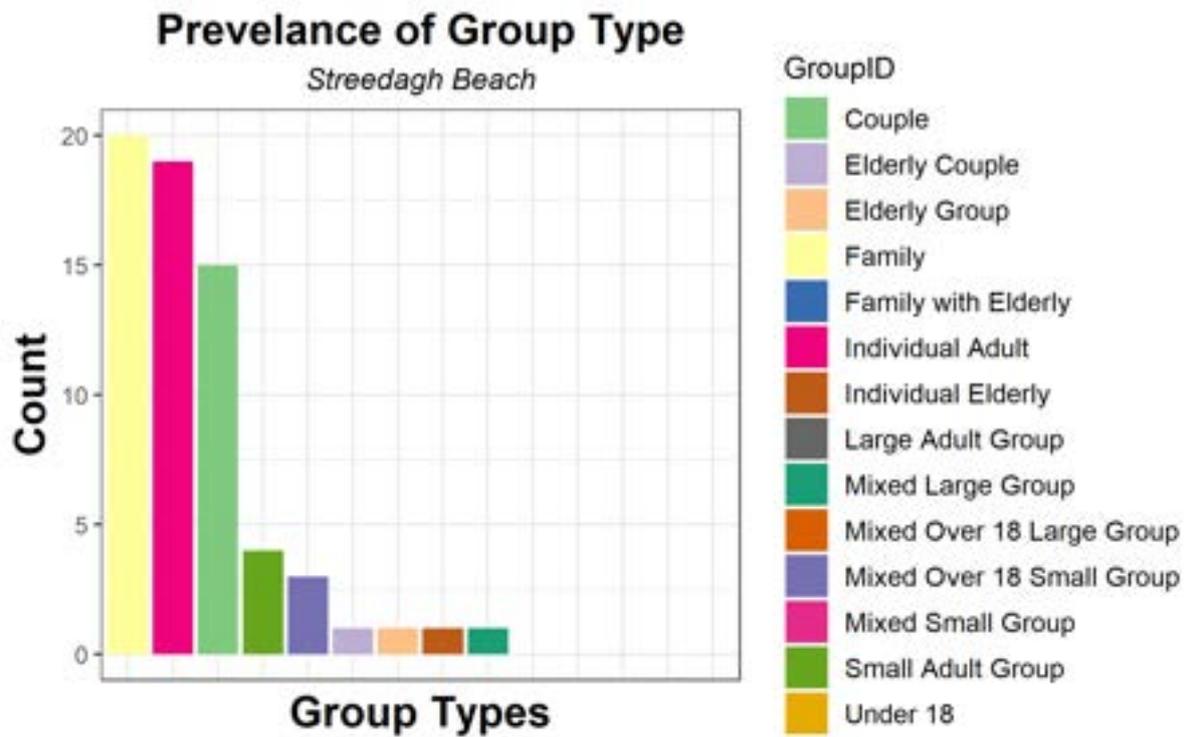


Figure 22.8 Groups of visitors that visited Streedagh Beach

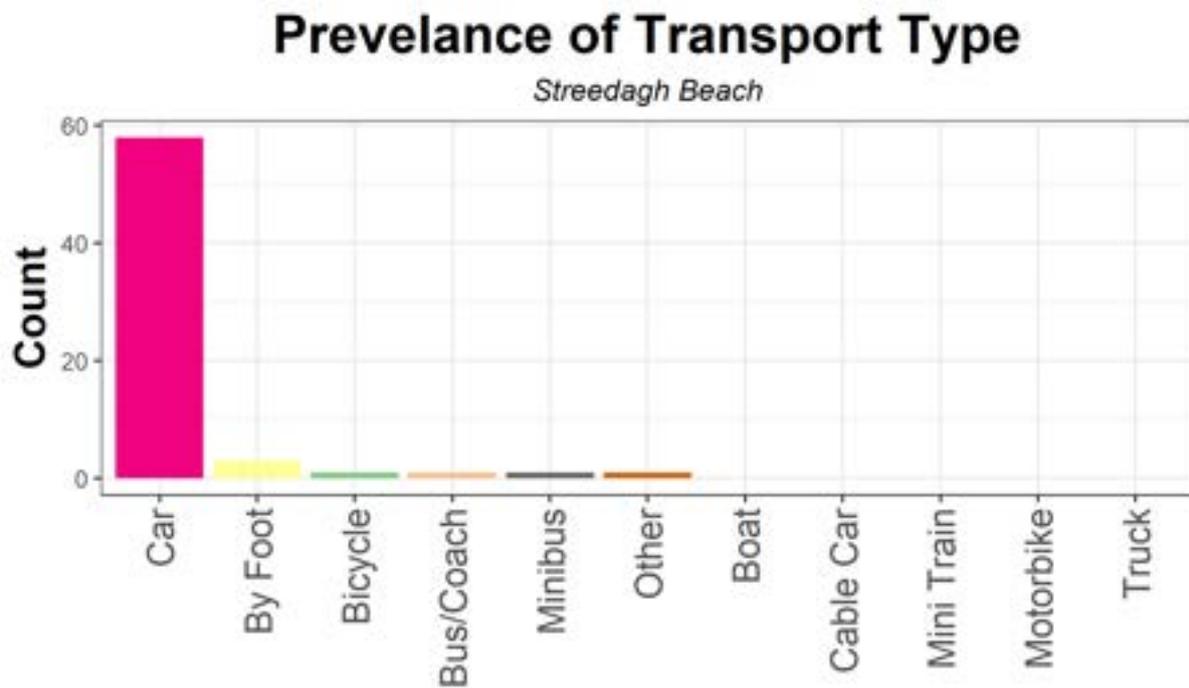
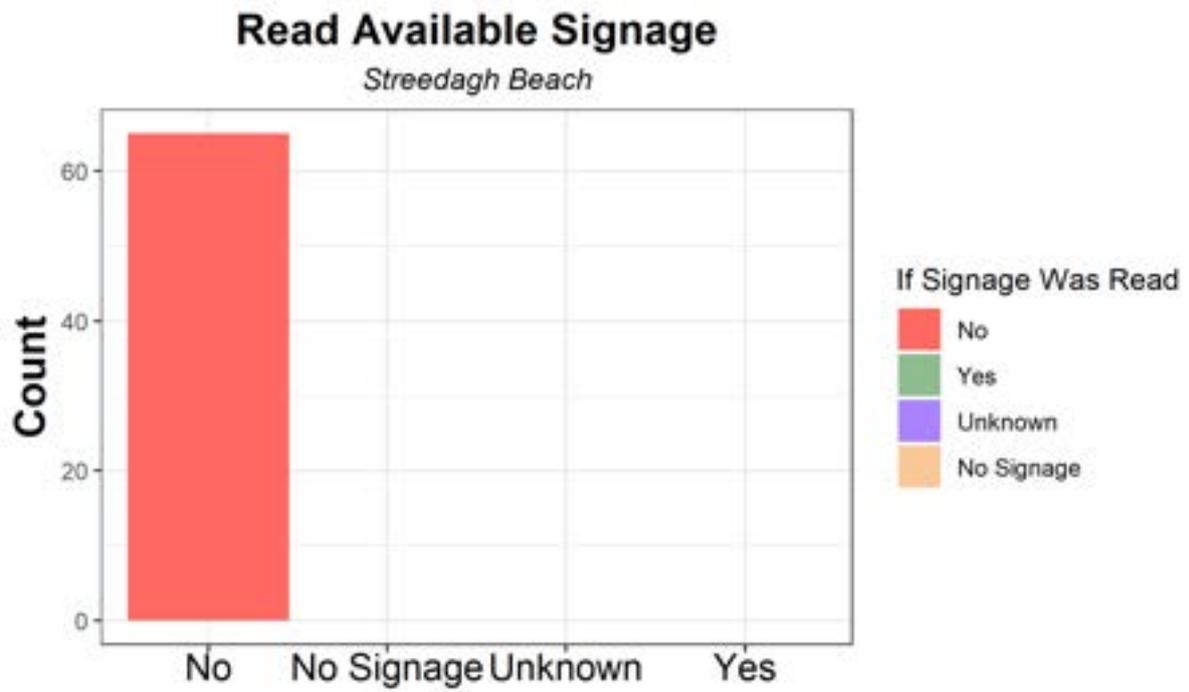
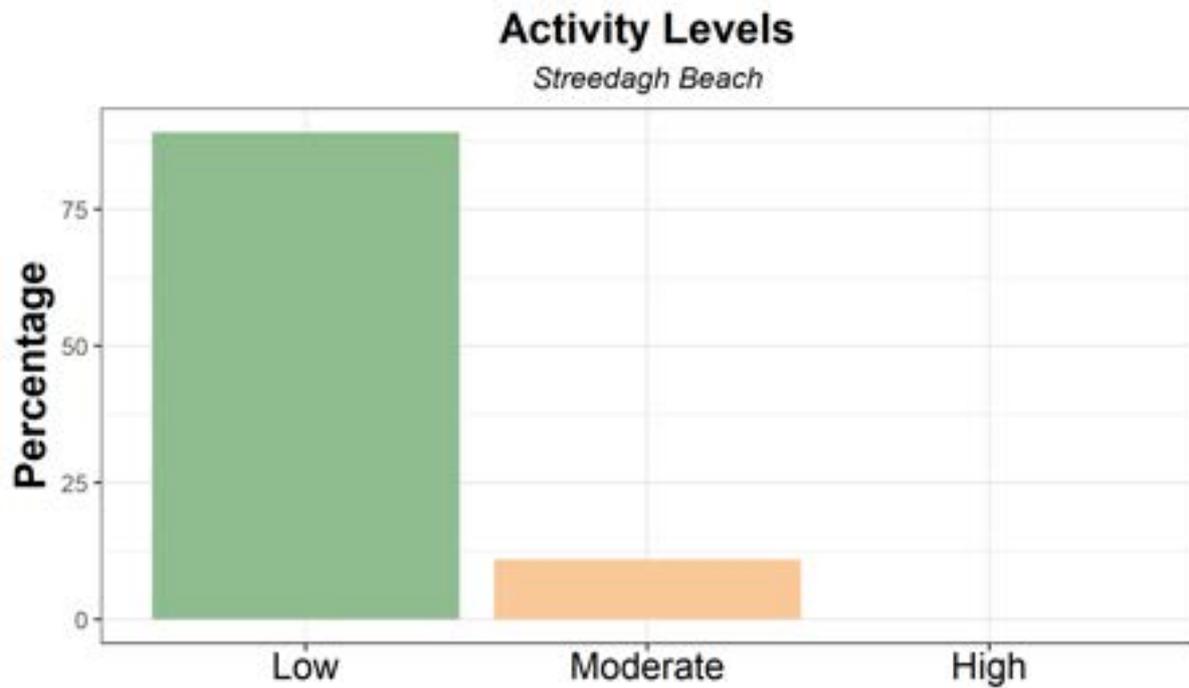


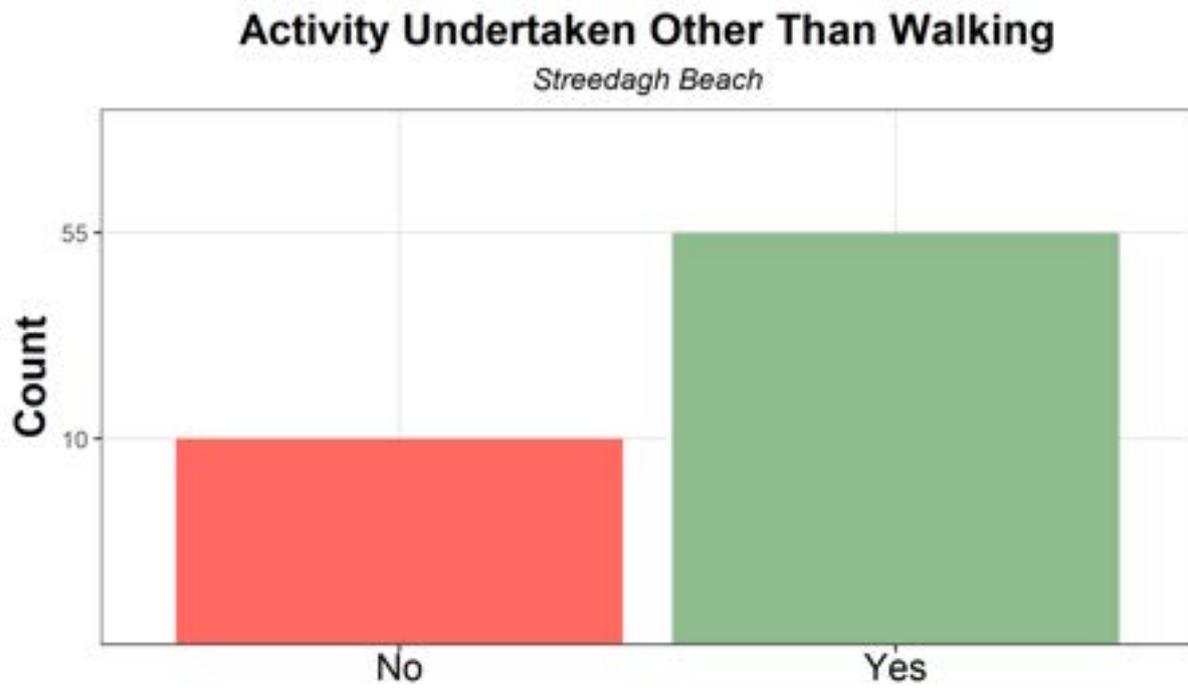
Figure 22.9 Mode of transport used to visit Streedagh Beach



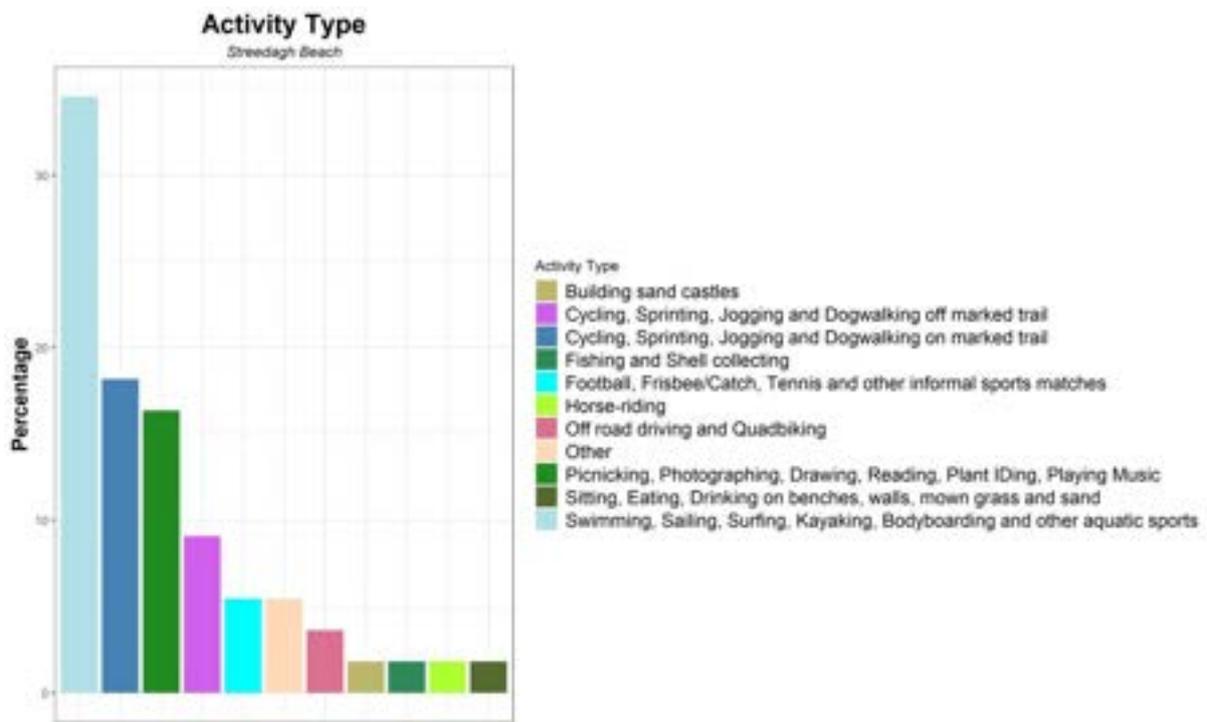
**Figure 22.10 Use of Interpretive Material at Streedagh Beach**



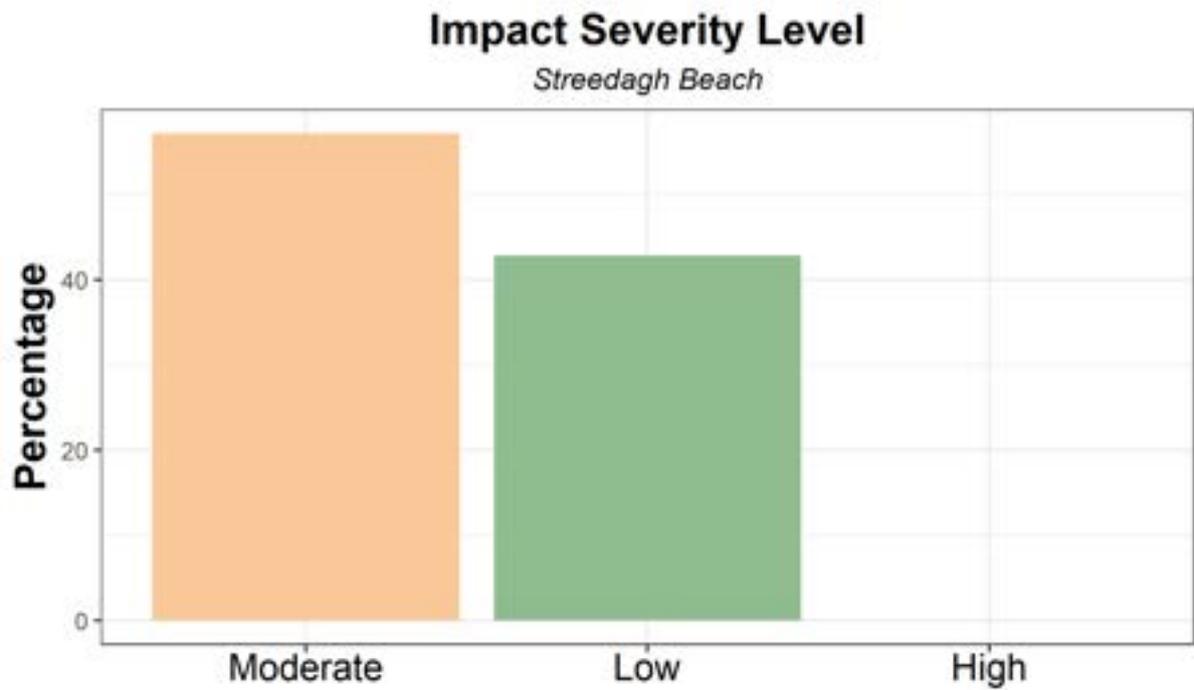
**Figure 22.11 Categories of Activity Levels Observed at Streedagh Beach**



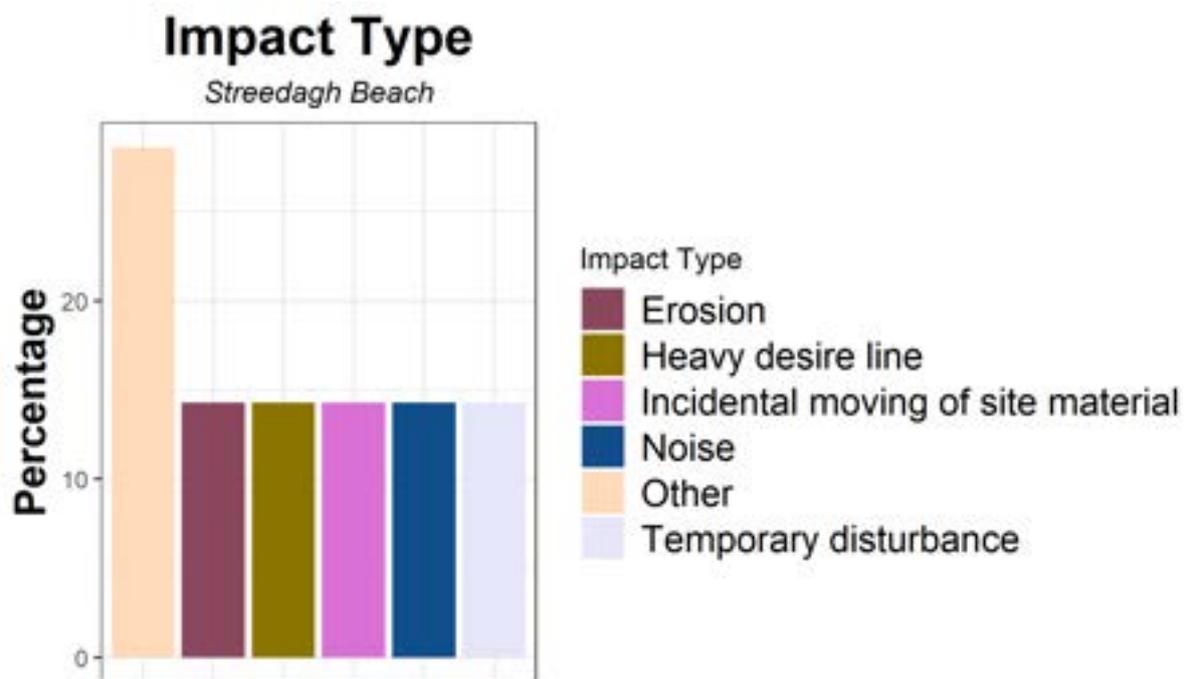
**Figure 22.12 Activities undertaken other than walking**



**Figure 22.13 Range of Visitor Activities Observed at Streedagh Beach**



**Figure 22.14 Categories of Environmental Impact Levels Observed at Streedagh Beach as a result of Visitor Activities**



**Figure 22.15 Range of Environmental Impacts Observed at Streedagh Beach**



**Figure 22.16 Visitor movement patterns at Streedagh Beach**

Of the 65 groups recorded on site 85% of them undertook activities other than walking. These activities resulted in 7 impacts being observed on site during the survey. Thus, 13% of activities on site resulted in impacts on the environment. The impact severity levels varied with 43% of the impacts being low, 57% of impacts being moderate, and 0% of impacts being high severity. The impacts identified for the site were:

Impact Type	Count
Erosion	1
Heavy desire line	1
Incidental moving of site material	1
Noise	1
Other	2
Temporary disturbance	1

## 22.6 Ecological Monitoring Results

### 22.6.1 Ecological Constraints

The sensitive species and habitats of the designated sites within 2km of Streedagh Beach are sensitive to hydrological changes, land use management and overgrazing.

**Table 22.1 Designated sites within 2km of Streedagh Beach and relevant ecological receptors**

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001680]	Streedagh Point Dunes pNHA	0	pNHA	na

Site Code	Site Name	Distance (km)	Site Type	Qualifying Feature
[001680]	Streedagh Point Dunes SAC	0	SAC	Fixed coastal dunes with herbaceous vegetation - grey dunes [2130], Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330], Narrow-mouthed whorl snail ( <i>Vertigo angustior</i> ) [1014], Perennial vegetation of stony banks [1220], Mudflats and sandflats not covered by seawater at low tide [1140], Shifting dunes along the shoreline with <i>Ammophila arenaria</i> - white dunes [2120], Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]

### 22.6.2 Habitat Descriptions

The majority of the habitats at this site consist of sand shores (Fossitt Code LS2) and infralittoral muddy sands (Fossitt Code SS2). Streedagh Beach also contains marram dunes (Fossitt Code CD2) and fixed dunes (Fossitt Code CD3) which align with the Annex I habitat for which the SAC, Streedagh Point Dunes, is designated (Fixed coastal dunes with herbaceous vegetation – grey dunes [2130]).

There is an extensive network of trails through the dunes which have locally exhibit erosion and exposed sand. The density of trails is extremely high but localised – but all habitats off-trail are relatively undisturbed.



**Figure 22.17 Habitats present at Streedagh Beach**

### 22.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality<sup>47</sup> following the assessment scale was "1" which means the majority of the habitats have no evidence of any negative impact on the habitats or other ecological features. There were 63 recorded incidents of damage to habitats occurring off the marked paths on site. The causes of the damage were identified to be walkers, agriculture, vehicles and camping.

<sup>47</sup> This value was calculated using the methods set out in Appendix II

### 22.6.4 Mammals on Site

The NBDC data shows that the most of the mammal species within the area of Streedagh Beach are marine mammals. Common seals, grey seal and bottle-nosed dolphins were the most commonly observed marine mammal species in the area while in regards to terrestrial mammals, there were also numbers of hares, badgers, otters and foxes that were observed and recorded in the area.

**Table 22.2 List of mammals that have been recorded at NBDC Hectad G65**

Taxonomic group	Common name	Scientific name	Record count
Marine mammal	Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	14
Marine mammal	Common Dolphin	<i>Delphinus delphis</i>	3
Marine mammal	Common Porpoise	<i>Phocoena phocoena</i>	9
Marine mammal	Common Seal	<i>Phoca vitulina</i>	38
Marine mammal	Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>	2
Marine mammal	Grey Seal	<i>Halichoerus grypus</i>	13
Marine mammal	Minke Whale	<i>Balaenoptera acutorostrata</i>	2
Marine mammal	Phocidae	<i>Phocidae</i>	1
Marine mammal	Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>	1
Marine mammal	Sperm Whale	<i>Physeter macrocephalus</i>	1
Marine mammal	Striped Dolphin	<i>Stenella coeruleoalba</i>	1
Marine mammal	White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	1
Terrestrial mammal	American Mink	<i>Mustela vison</i>	1
Terrestrial mammal	Brown Long-eared Bat	<i>Plecotus auritus</i>	1
Terrestrial mammal	Eurasian Badger	<i>Meles meles</i>	8
Terrestrial mammal	Eurasian Pygmy Shrew	<i>Sorex minutus</i>	1
Terrestrial mammal	Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	1
Terrestrial mammal	European Otter	<i>Lutra lutra</i>	8
Terrestrial mammal	European Rabbit	<i>Oryctolagus cuniculus</i>	7
Terrestrial mammal	Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	12
Terrestrial mammal	Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	5
Terrestrial mammal	Lesser Noctule	<i>Nyctalus leisleri</i>	3
Terrestrial mammal	Pine Marten	<i>Martes martes</i>	4
Terrestrial mammal	Pipistrelle	<i>Pipistrellus pipistrellus</i>	2
Terrestrial mammal	Red Fox	<i>Vulpes vulpes</i>	9
Terrestrial mammal	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	5
Terrestrial mammal	West European Hedgehog	<i>Erinaceus europaeus</i>	1
Terrestrial mammal	Wolf	<i>Canis lupus</i>	1
Terrestrial mammal	Wood Mouse	<i>Apodemus sylvaticus</i>	1

### 22.6.5 Wintering Bird Survey

Great northern diver (*Gavia immer*), Golden plover (*Pluvialis apricaria*), Bar-tailed godwit (*Limosa lapponica*) and Curlew (*Numenius arquata*) are known to winter at this beach.

**Table 22.3 Results of the wintering bird survey conducted at Streedagh Beach**

Common name	Scientific name	Record count
Eurasian Curlew	<i>Numenius arquata</i>	6
Great Northern Diver	<i>Gavia immer</i>	1
Bar-tailed Godwit	<i>Limosa lapponica</i>	6
Golden plover	<i>Pluvialis apricaria</i>	15

**Table 22.4 List of wintering birds that have been recorded at NBDC Hectad G65**

Taxonomic group	Common name	Scientific name	Record count
Bird	Arctic Tern	<i>Sterna paradisaea</i>	1
Bird	Barnacle Goose	<i>Branta leucopsis</i>	4
Bird	Bar-tailed Godwit	<i>Limosa lapponica</i>	7
Bird	Black Guillemot	<i>Cephus grylle</i>	6
Bird	Black-headed Gull	<i>Larus ridibundus</i>	6
Bird	Black-legged Kittiwake	<i>Rissa tridactyla</i>	9

<b>Taxonomic group</b>	<b>Common name</b>	<b>Scientific name</b>	<b>Record count</b>
Bird	Black-tailed Godwit	<i>Limosa limosa</i>	1
Bird	Branta bernicla subsp. hrota	<i>Branta bernicla subsp. hrota</i>	5
Bird	Brent Goose	<i>Branta bernicla</i>	7
Bird	Common Eider	<i>Somateria mollissima</i>	7
Bird	Common Greenshank	<i>Tringa nebularia</i>	7
Bird	Common Guillemot	<i>Uria aalge</i>	1
Bird	Common Redshank	<i>Tringa totanus</i>	10
Bird	Common Sandpiper	<i>Actitis hypoleucos</i>	1
Bird	Common Scoter	<i>Melanitta nigra</i>	4
Bird	Common Shelduck	<i>Tadorna tadorna</i>	5
Bird	Common Snipe	<i>Gallinago gallinago</i>	3
Bird	Common Tern	<i>Sterna hirundo</i>	1
Bird	Dunlin	<i>Calidris alpina</i>	10
Bird	Eurasian Curlew	<i>Numenius arquata</i>	14
Bird	Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	15
Bird	Eurasian Teal	<i>Anas crecca</i>	2
Bird	Eurasian Wigeon	<i>Anas penelope</i>	4
Bird	European Golden Plover	<i>Pluvialis apricaria</i>	2
Bird	European Shag	<i>Phalacrocorax aristotelis</i>	20
Bird	European Storm-petrel	<i>Hydrobates pelagicus</i>	4
Bird	Glaucous Gull	<i>Larus hyperboreus</i>	1
Bird	Great Black-backed Gull	<i>Larus marinus</i>	10
Bird	Great Cormorant	<i>Phalacrocorax carbo</i>	8
Bird	Great Egret	<i>Ardea alba</i>	1
Bird	Great Northern Diver	<i>Gavia immer</i>	7
Bird	Great Skua	<i>Stercorarius skua</i>	1
Bird	Great Tit	<i>Parus major</i>	9
Bird	Grey Heron	<i>Ardea cinerea</i>	8
Bird	Grey Plover	<i>Pluvialis squatarola</i>	4
Bird	Herring Gull	<i>Larus argentatus</i>	14
Bird	Lesser Black-backed Gull	<i>Larus fuscus</i>	3
Bird	Little Egret	<i>Egretta garzetta</i>	1
Bird	Little Grebe	<i>Tachybaptus ruficollis</i>	3
Bird	Long-tailed Duck	<i>Clangula hyemalis</i>	5
Bird	Mallard	<i>Anas platyrhynchos</i>	9
Bird	Manx Shearwater	<i>Puffinus puffinus</i>	26
Bird	Merlin	<i>Falco columbarius</i>	1
Bird	Mew Gull	<i>Larus canus</i>	11
Bird	Mute Swan	<i>Cygnus olor</i>	5
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	42
Bird	Northern Gannet	<i>Morus bassanus</i>	16
Bird	Northern Lapwing	<i>Vanellus vanellus</i>	7
Bird	Purple Sandpiper	<i>Calidris maritima</i>	1
Bird	Razorbill	<i>Alca torda</i>	2
Bird	Red Knot	<i>Calidris canutus</i>	2
Bird	Red-breasted Merganser	<i>Mergus serrator</i>	9
Bird	Red-throated Diver	<i>Gavia stellata</i>	3
Bird	Ringed Plover	<i>Charadrius hiaticula</i>	16
Bird	Ruddy Turnstone	<i>Arenaria interpres</i>	7
Bird	Sanderling	<i>Calidris alba</i>	6
Bird	Sandwich Tern	<i>Sterna sandvicensis</i>	3
Bird	White-throated Dipper	<i>Cinclus cinclus</i>	3
Bird	Whooper Swan	<i>Cygnus cygnus</i>	1

**22.7 Recommendations**

- The density of trails is extremely high, if very localised, but all other habitats off-trail are relatively undisturbed. Efforts should be made to consolidate the trails on site.
- A dynamic path management system could alleviate the pressures which are occurring along with a habitat restoration plan for closed trails in highly affected areas.
- There should be an examination of how to improve the existing parking management system which appears to be ineffective due to movable barriers.
- Engaging interpretive material is required to increase visitor awareness of the importance of dunes and the damage to habitats caused by extensive trail networks.

## Appendix I

<b>Activities</b>		
<b>Category 1 Low Level</b>		
Walking, running or cycling on paths, marked trails or hard surfaces		LA 1
Walking, running, cycling or playing in mown grass, managed grassland or level sand		LA 2
Sitting on benches, walls, mown grass, sand		LA 3
Swimming, sailing, surfing, kayaking in water		LA 4
Resting, reading, looking, picnicking, sightseeing, painting, photographing		LA 5
Vehicular movement on roads and parking areas		LA 6
Watching nature in hedges, woods, streams, pools and intertidal areas		LA 7
<b>Category 2 Medium Level</b>		
Powered movement through water		MA 1
Any movement leaving an existing trail or marked path		MA 2
Any movement leaving a trail through leafy vegetation		MA 3
Any movement leaving a trail through woody vegetation		MA 4
Climbing on walls, loose stones, sand, soil etc.		MA 5
Fishing		MA 6
<b>Category 3 High Level</b>		
Walking through wet/muddy soil		HA 1
Scrambling on steep or loose slopes		HA 2
Off road vehicular movement		HA 3
Disturbance of wildlife		HA 4
Deliberate building or moving or knocking site materials - parts of monuments, walls, stones, sand etc.		HA 5
Picking herbaceous vegetation		HA 6

Appendix I Activity and impact code index used for recording visitor behaviours on site

<b>Category 1 Low Impact</b>		
No identifiable effect		LIE 1
Desire lines or trails visible on grass and leafy vegetation		LIE 2
Temporary disturbance (including chasing and feeding) of insects, fish, amphibian, reptiles, insects, birds and mammals		LIE 3
Temporary change of character - due to the appearance or nature of activities (noise, crowds, etc.)		LIE 4
General/light littering		LIE 5
<b>Category 2 Medium Impact</b>		
Desire lines or tracks visible outside of existing trail or marked path		MIE 1
Trampling of herbaceous vegetation		MIE 2
Damage to woody vegetation		MIE 3
Incidentally moving or knocking site materials - parts of monuments, walls, stones, sand, rooted vegetation, flora, fauna etc.		MIE 4
Addition/alteration of site features, transient emissions, noise		MIE 5
Transient disturbance, emissions, noise		MIE 6
Disturbance of wildlife		MIE 7
<b>Category 3 Severe Impact</b>		
Direct interference with site material - parts of monuments, walls, stones, sand, rooted vegetation, flora, fauna etc.		SIE 1
Removal of material - parts of monuments, walls, stones, sand, rooted vegetation, flora, fauna etc.		SIE 2
Vandalism or graffiti		SIE 3
Destruction of structures, vegetation or fauna		SIE 4
Heavy littering or dumping quantities of waste		SIE 5
Burning materials or lighting a fire		SIE 6
Injuring, killing or taking wildlife		SIE 7

## Appendix II

### Habitat Condition Assessment Methodology

A rating scale has been designed for this monitoring programme as a standardised, repeatable measurement for assessing habitat condition across all sites<sup>48</sup>. For the purposes of this monitoring programme, habitat condition is assessed at every site by the surveyor examining four core criteria:

1. The extent to which habitat degradation (due to human activity), if any, is observed;
2. If habitat degradation is observed, the degree to which the impact is localised or widespread;
3. The potential ability for the habitat to recover (related to scale of degradation); and,
4. The requirement for intervention (related to the degree of the previous 3 elements).

For these assessments the term ‘degradation’ is taken to mean any change that reduces the long-term viability habitats and its qualifying interests [flora and fauna]. Degradation can include readily visible evidence of factors such as surface erosion or compaction, vegetation loss, crowd disturbance [noise], disturbance by pets, littering, burning or pollution.

Based on these four criteria, each site is walked along transects established by the principal pathways that are used for visitor access and movement through each site. At 100 metres intervals along the selected pathways, an assessment of habitat condition is made, using an established rating scale of 1 to 5; 1 being no impact and 5 being high impact. Each rating is then translated into a condition assessment, as displayed in Table II - 1 below.

These ratings are gathered for each site, and are then grouped; from which the mode is taken (i.e., the rating that occurs most frequently). This then recorded and reported as the resultant overall rating of the assessed habitat condition assessment for each site.

**Table II-1 Habitat rating scale and condition assessment**

Scale	Condition
1	No evidence of any habitat degradation observed.
2	Localised habitat degradation, but slight and capable of rapid recovery.
3	Widespread habitat degradation, but slight and capable of rapid recovery.
4	Localised habitat degradation, requiring intervention to allow full recovery.
5	Widespread habitat degradation, requiring intervention to allow full recovery.

<sup>48</sup> Note: Where possible, the same surveyor is used across multiple sites – but in some instances, different surveyors survey different sites. This can lead to a human variation in the assigning of the rating scale for impact. However, there will be sufficient repetition of the data through the several years of the monitoring programme to account for any variations in human interpretation on this scale.