NATIONAL TOURISM MONITORING PROGRAMME 2021-2025

ANNUAL RESULTS FOR 2021

KILLYKEEN FOREST PARK

for: **Fáilte Ireland**

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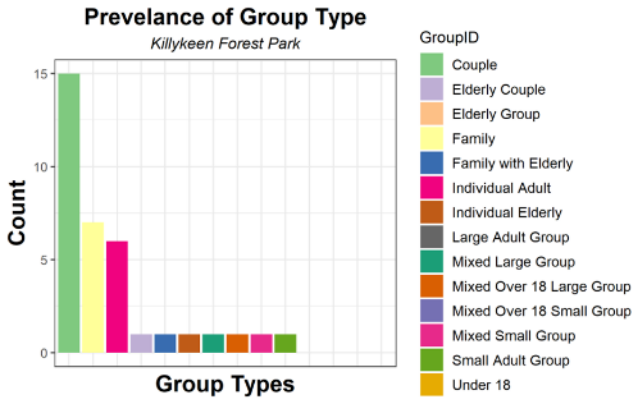
ECOLOGICAL HIGHLIGHTS

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.

VISITOR NUMBERS AND DWELL TIME

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



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 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.



1 Killykeen Forest Park

1.1 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 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.

1.2 Methods & Surveys

The following surveys were undertaken at Killykeen Forest Park:

1.2.1 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 7th of August 2021, with max temperatures reaching approximately 17.5° C, high levels of rainfall and low levels of wind on the day[1]. 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.

1.2.2 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.

[1] Weather data gathered from: https://www.met.ie/climate/available-data/historical-data

1.2.3 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.

1.3 Site Description of Killykeen Forest Park

Killykeen Forest Park (Figure 1.1), a Coillte managed site, hosts a 3km long loop walk that traverses the forest with views of Lough Oughter. The site is well-used is 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 1.1 Killykeen Forest Park

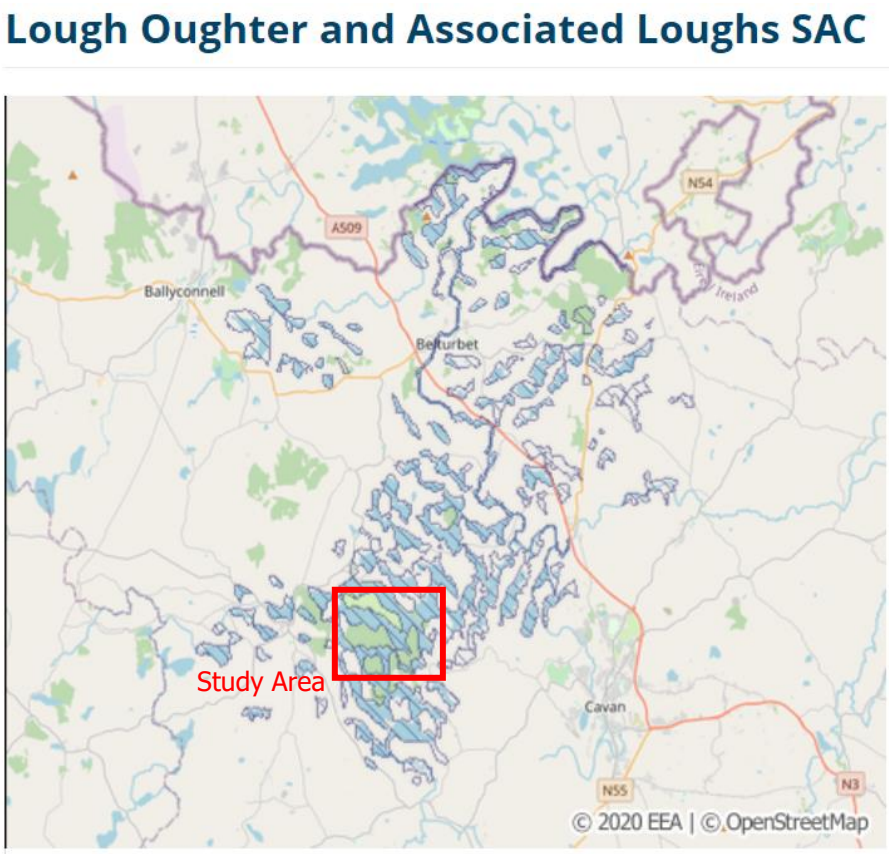


Figure 1.2 Study Area within Lough Oughter and Associated Loughs SACE

1.4 Pathways and Features Condition Results

1.4.1 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.

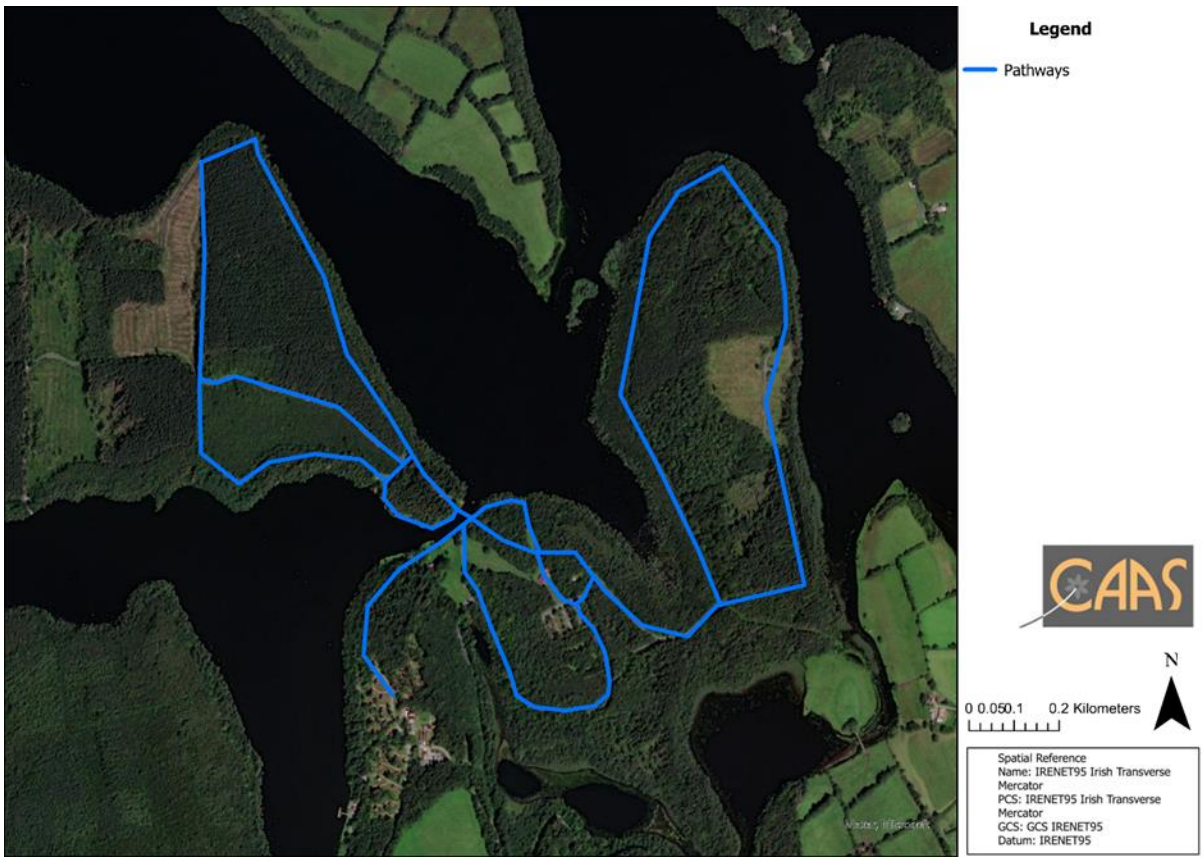


Figure 1.3 Pathways identified at Killykeen Forest Park

Figure 1.4 Pathway at Killykeen Forest Park

1.4.2 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 1.6). 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.

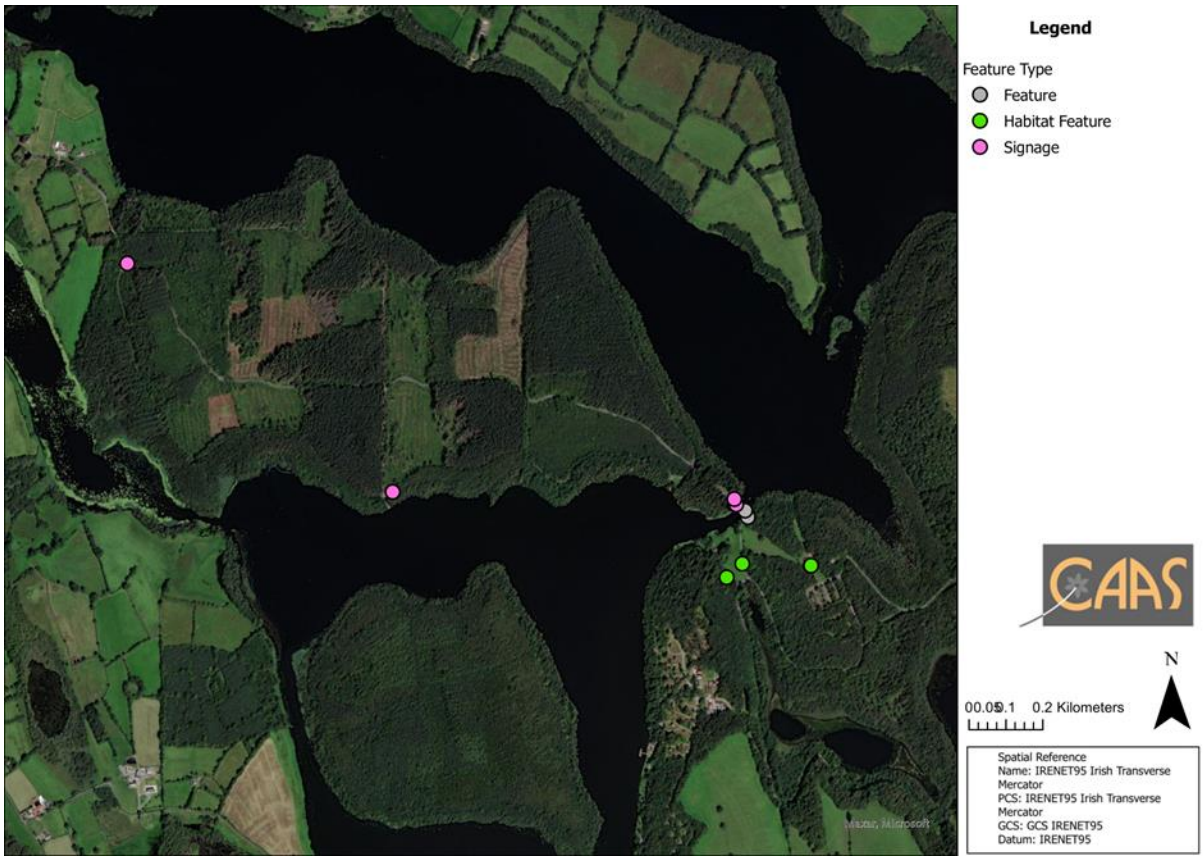


Figure 1.5 Features recorded at Killykeen Forest Park

Figure 1.6 Features at Killykeen Forest Park

1.4.3 Hazards

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

1.5 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

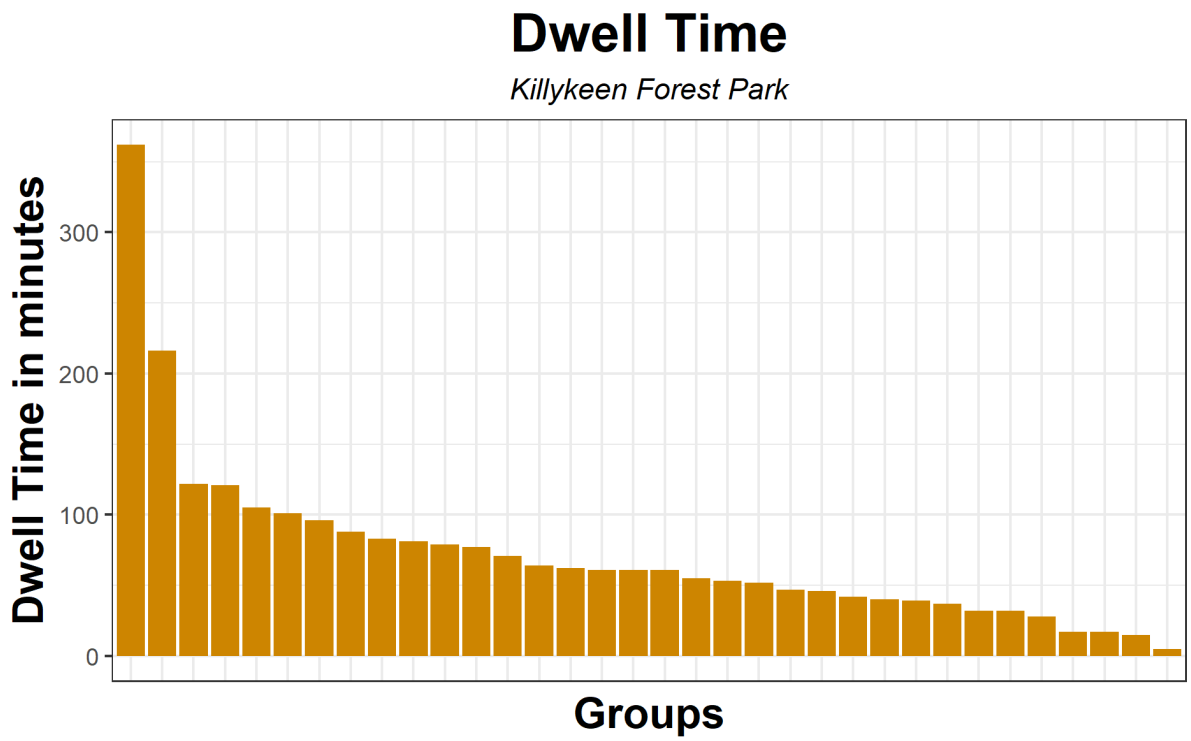


Figure 1.7 Duration of Time Spent at Killykeen Forest Park

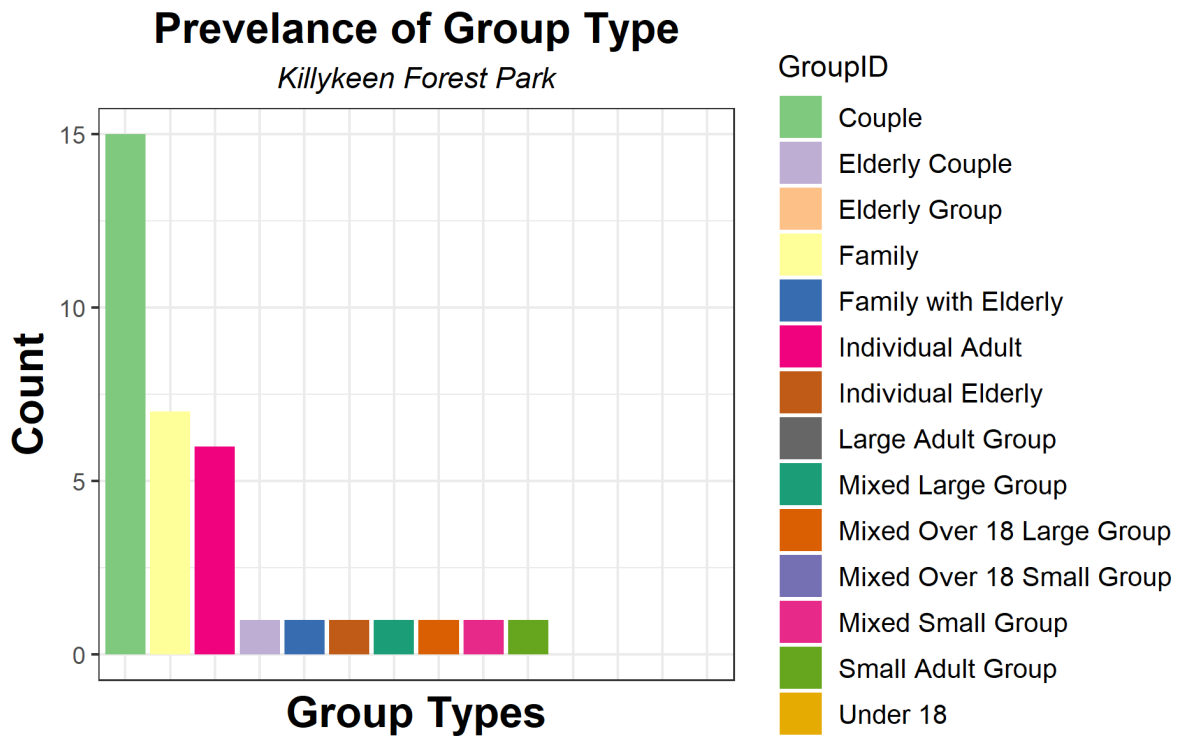


Figure 1.8 Groups of visitors that visited Killykeen Forest Park

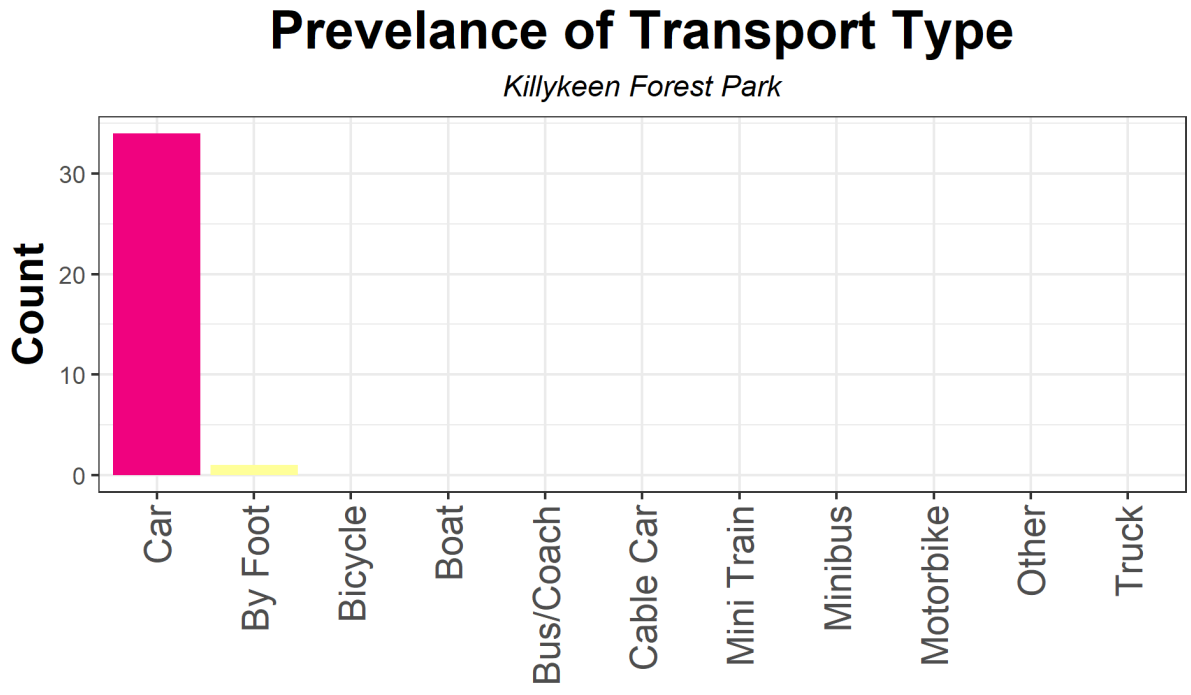


Figure 1.9 Mode of transport used to visit Killykeen Forest Park

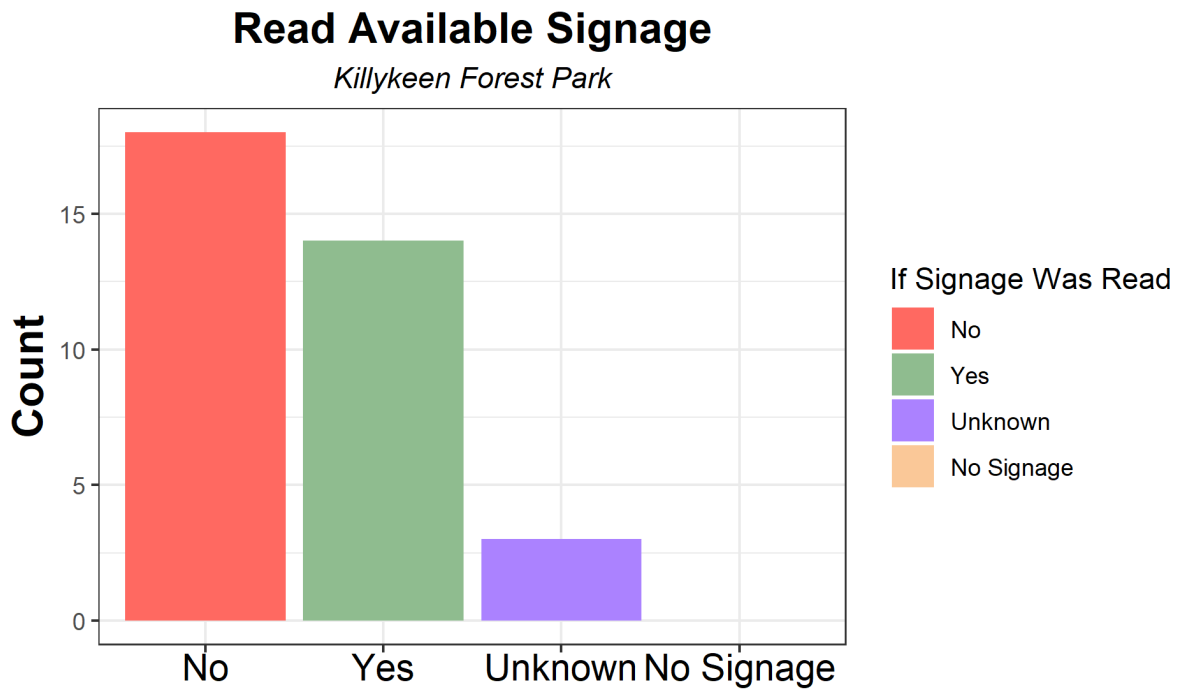


Figure 1.10 Use of Interpretive Material at Killykeen Forest Park

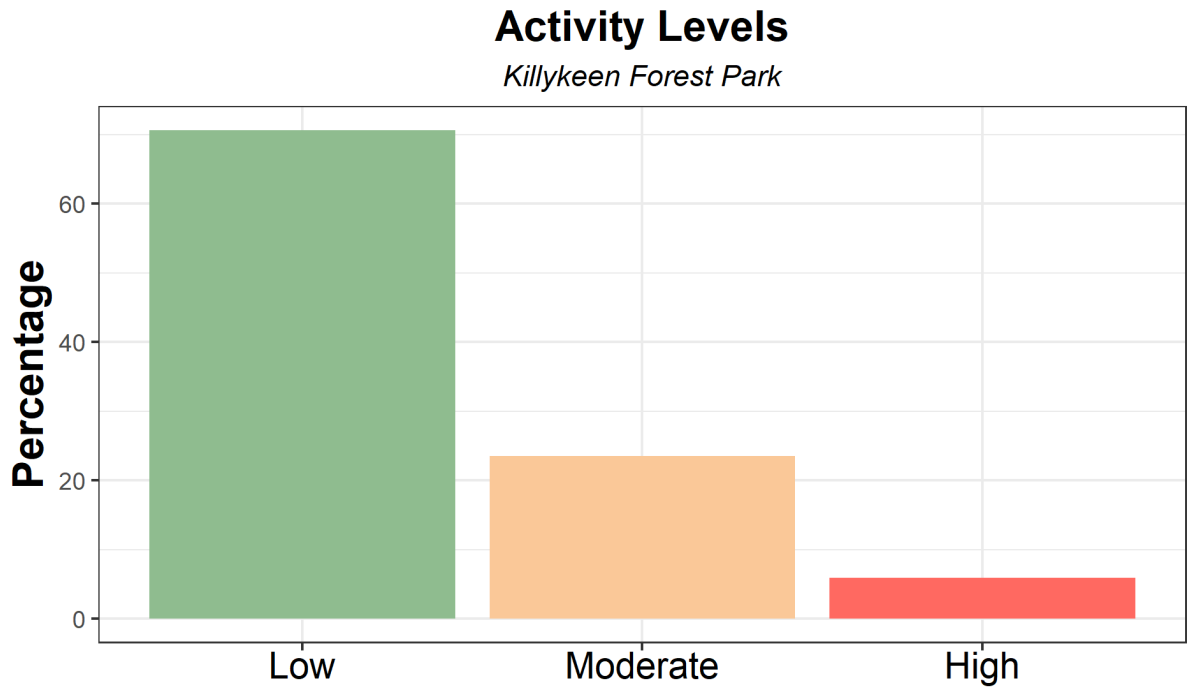


Figure 1.11 Categories of Activity Levels Observed at Killykeen Forest Park

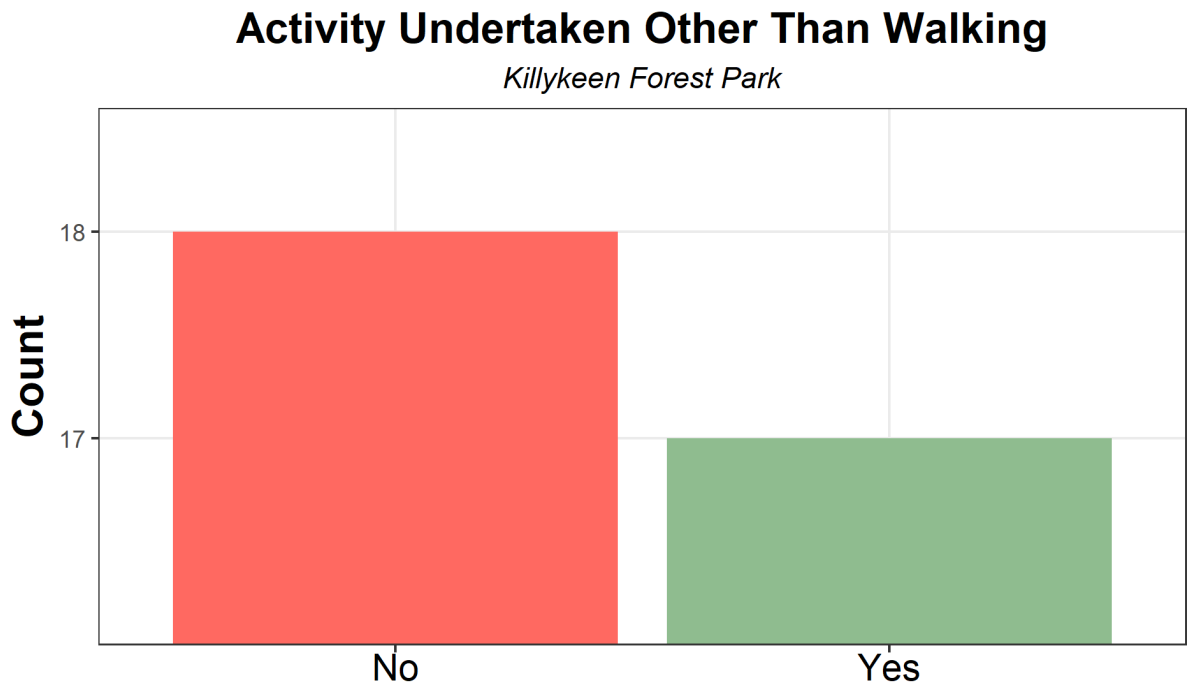


Figure 1.12 Activities undertaken other than walking

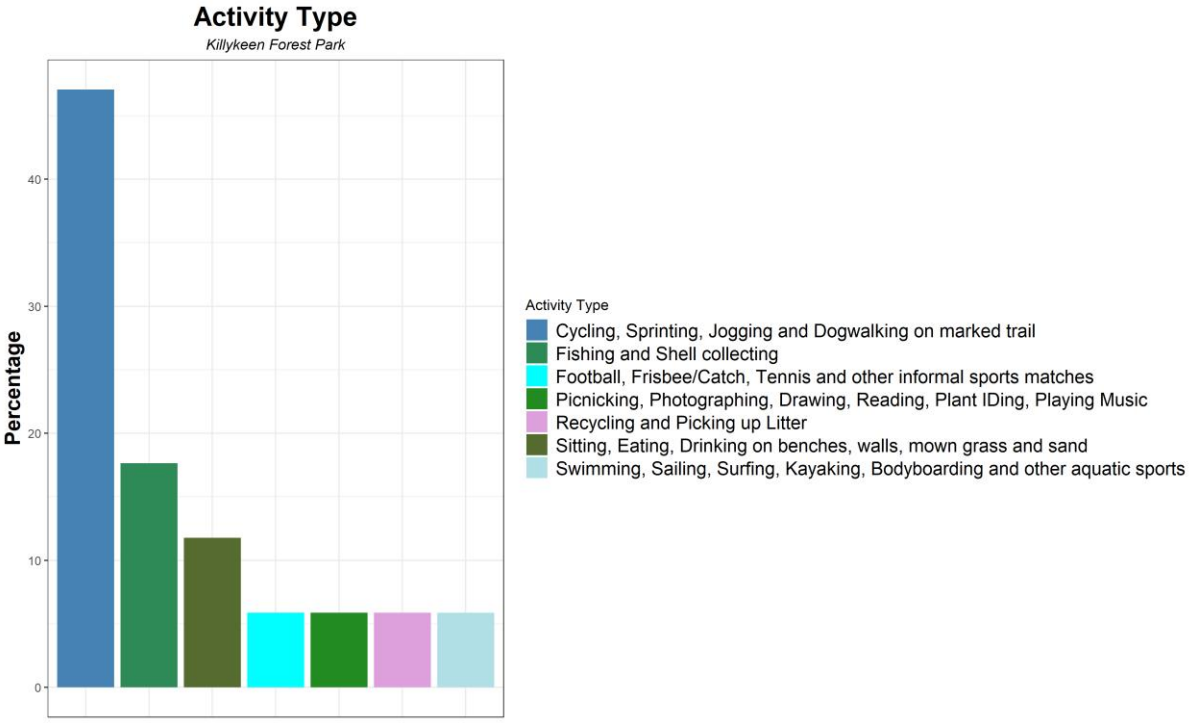


Figure 1.13 Range of Visitor Activities Observed at Killykeen Forest Park

Figure 1.14 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.

1.6 Ecological Monitoring Results

1.6.1 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 1.1 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 *(Anas penelope)* [A050], Whooper Swan *(Cygnus cygnus)* [A038], Great Crested Grebe *(Podiceps cristatus)* [A005]

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

1.6.2 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.

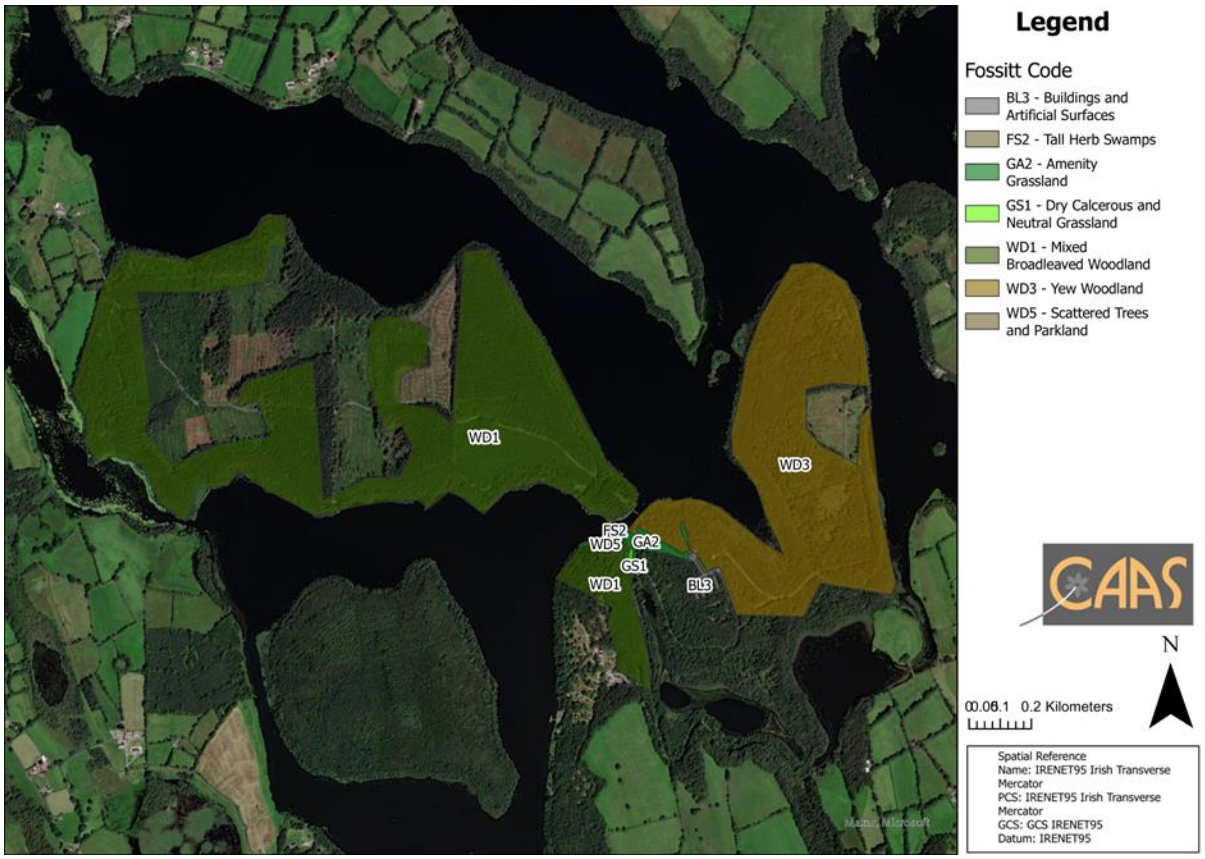


Figure 1.15 Habitats present at Killykeen Forest Park

1.6.3 Condition Assessment

There are a range of habitats present on site, the assessment of habitat condition identified that the overall habitat quality[2] 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.

1.6.4 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

[2] 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 1.2 Results of the breeding bird survey conducted at Killykeen Forest Park

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

1.6.5 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 1.3 List of mammals that have been recorded at NBDC Hectad H30

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

1.6.6 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 1.4 Locations of bats recorded at Killykeen Forest Park

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

Table 1.5 List of bats that have been recorded at NBDC Hectad H30

Taxonomic group	Common name	Scientific name	Record count
Terrestrial mammal	Brown Long-eared Bat	*Plecotus auritus*	29
Terrestrial mammal	Daubenton's Bat	*Myotis daubentonii*	5
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Terrestrial mammal	Nathusius's Pipistrelle	*Pipistrellus nathusii*	6
Terrestrial mammal	Natterer's Bat	*Myotis nattereri*	3
Terrestrial mammal	Pipistrelle	*Pipistrellus pipistrellus*	6
Terrestrial mammal	Soprano Pipistrelle	*Pipistrellus pygmaeus*	9

1.7 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.

Appendix I

Activities		
Category 1 Low Level		
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
Category 2 Medium Level		
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
Category 3 High Level		
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

Category 1 Low Impact		
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
Category 2 Medium Impact		
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
Category 3 Severe Impact		
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[3]. 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.

[3] 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.