

Appendix 6-2 Mammal Report



Mammal Survey Report

Proposed Carrownagowan Wind Farm



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1 INTRODUCTION

This report describes the Non-Volant Mammal Surveys undertaken for the proposed Carrownagowan Wind Farm development. Surveys were completed between July 2018, and October 2019. The site was revisited in early April 2020 following finalisation of the site layout.

The mammal surveys completed at the study area were spread across two survey years (2018, & 2019) covering the footprint of the proposed project. The surveys included initial ecology walkovers of the study area, which identified suitable habitats and breeding locations, deploying trail cameras at strategic locations within the wind farm, and targeted surveys within the wind farm.

2 METHODOLOGY

2.1 DESK STUDY AND DATA REQUEST

The desk study involved a comprehensive review of information and data available for the existing environment. The principal sources of information referred to during the desk review included:

- Ordnance Survey Ireland (OSI) aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS) online datasets and literature
- Review of available online information from the National Biodiversity Data Centre (NBDC)
- Review of incidental mammals sightings in McCarthy Keville O' Sullivan (MKO) Ornithological Reports for the site

A data request was sent to the NPWS requesting records from the Rare and Protected Species Database. A number of protected native mammal species have been recorded in the hectads overlapping the project. The following table lists the protected species recorded for the NPWS data request, and NBDC documented records.

Table 1. Desk Study Results

Species name	Common name	Level of protection	Hectads
<i>Lutra lutra</i>	Otter	Annex II & IV Wildlife Acts	R57, R58, R67 and R68
<i>Meles meles</i>	Badger	Wildlife Acts	R57, R58, R67 and R68
<i>Martes martes</i>	Pine marten	Annex V Wildlife Acts	R57, R58, R67 and R68
<i>Mustela erminea subsp. hibernica</i>	Stoat	Wildlife Acts	R57, R58, R67 and R68
<i>Sciurus vulgaris</i>	Red Squirrel	Wildlife Acts	R67
<i>Lepus timidus subsp. hibernicus</i>	Irish Mountain hare	Wildlife Acts	R67
<i>Erinaceus europaeus</i>	Hedgehog	Wildlife Acts	R58, R67 and R68
<i>Sorex minutus</i>	Pygmy Shrew	Wildlife Acts	R57, R67 and R68
<i>Cervus elaphus</i>	Red Deer	Wildlife Acts	R58 and R67

During 2017 and 2018 bird survey completed at the site by MKO the following mammal observations were made;

- Ten recorded observations of deer, including red deer and sika (within and outside the site).
- One recorded observation of badger outside the site, at Killokennedy.
- Two recorded observations of pine marten within the site.
- Three recorded observations of Irish mountain hare.

During public consultation carried out in March 2019, it was discussed that otter may be potentially using the area.

2.2 FIELD SURVEYS

During the ecology surveys habitat suitability for protected species was noted. Desk studies, ecology walkover surveys and information obtained during public consultations, identified target species, and informed the scope of the mammal surveys to be undertaken. Trail cameras were deployed at a number of suitable locations identified during ecology walkovers and previous ecology surveys. To supplement walkover and trail cameras, targeted transect surveys were undertaken within the areas identified as the most suitable or which had the most mammal activity.

The mammal surveys which included targeted walkovers of the study area, followed the methodology outlined in:

- Muir et al. (2013): The Mammal Society publication 'How to find and Identify Mammals'
- NRA (2009): Guidelines Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes)
- Bang & Dahlstrom 2004: Animal tracks and signs
- (SNH, 2003): Surveying for Badgers followed standard methodology as outlined in Scottish Natural Heritage 'Best Practice Badger Survey Guidance Note

2.2.1 Walkover surveys

Walkover surveys at the site focused on looking for evidence of mammal species, such as searching for trails, burrows, dens, resting places, droppings, scats for mammal species. Habitat suitability was noted. Where surveys were completed in conifer plantation, these usually followed deer trails, as they paved the way to get through the forest, all the time, watching out for evidence of mammals such as any direct sightings of species such as red squirrel, looking for dreys, or for evidence of feeding sites on the woodland floor for this species (feeding litter). The following table describes the walkover and target surveys undertaken in the study area.

Table 2. Description of mammal surveys

Date	Personnel	Survey/Location/Comments
18/07/2018	Caoimhin O'Neill, Muiréad Kelly, Fiona Mckenna, Deirdre O'Brien	Walkover survey, including checking for evidence of mammals.
29/08/2018	Caoimhin O'Neill Muiréad Kelly	Walkover survey, including checking for evidence of mammals.
29,30/08/2018	Ger Hayes Deirdre O'Brien	Targeted otter survey, at rivers and stream draining the site (inside and outside the site boundary).
13/02/2019	Caoimhin O'Neill Ger Hayes	Targeted badger survey, tracks-trails followed within the site boundary.

Date	Personnel	Survey/Location/Comments
22/03/2019	Caoimhin O'Neill	Targeted badger survey, tracks-trails followed within the site boundary.
07/09/2018	Caoimhin O'Neill	Walkover survey, including checking for evidence of mammals, including badger and pine marten.
21/04/2019	Caoimhin O'Neill	Walk over survey, including badger and pine marten at T1, T2, T9, Old, T12, T16, and SS-old T1, and pond at Quarry.
01/05/2019	Caoimhin O'Neill	Targeted mammal survey at turbine locations. Visited pond at unused quarry.
19/06/2019	Muiréad Kelly	Targeted otter survey at watercourse crossings along grid connection.
05/07/2019	Caoimhin O'Neill	Walkover survey at Borrow pits, pond at quarry.
20,22/09/2019	Fergus Doyle	Walkover survey at all new stream crossings.
05/09/2019	Caoimhin O'Neill Muiréad Kelly	Walkover survey at site infrastructure locations. Carried out in conjunction with bat surveys.
01/09/2019	Caoimhin O'Neill	Walk over survey at 3 locations where works are proposed along proposed haul route, including checking for evidence of mammals.
21/10/2019	Muiréad Kelly	Walkover survey at site infrastructure locations. Carried out in conjunction with bat surveys.
07, 26/04/2020	Caoimhin O'Neill	Targeted survey at turbine locations following lock down of turbines (Turbines that moved). Visited all turbines, checking for evidence of mammals including badger and pine marten

2.2.2 Trail cameras

To supplement walkover surveys, trail cameras were deployed at locations that were noted as suitable habitat and/or had evidence of mammal activity; including existing mammal trails. The following table describes the locations of wildlife cameras deployed. The camera locations are shown in Figure 4.

Table 3. Wildlife trail camera survey

Site	Date	GPS	Comments
1	13-12-2018 13-02-2019	X561333, Y677306	Mammal trail, on riparian, deployed adjacent to stream, with well-worn mammal trail, snuffle holes, pine marten droppings.
2	13-02-2019 – 22-03-2019	X559489, Y675817	Re-vegetated cutover bog. Deployed on existing mammal trail, well-worn mammal trail. Bogland and conifer edge in proximity of T1.
3	13-02-2019- 22-03-2019	X563137, Y677300	Existing well-worn mammal trail, between vegetated roadside mound on southern side of access track, leading into conifer on northern side.
4	13-02-2019 22-03-2019	X562284, Y678238	Existing mammal well-worn mammal trail, proximity of stream, wet grassland, and conifer plantation edge.
5	22-03-2019 21-04-2019	X561775, 677935	Existing mammal trail in wet grassland to the north of T17.

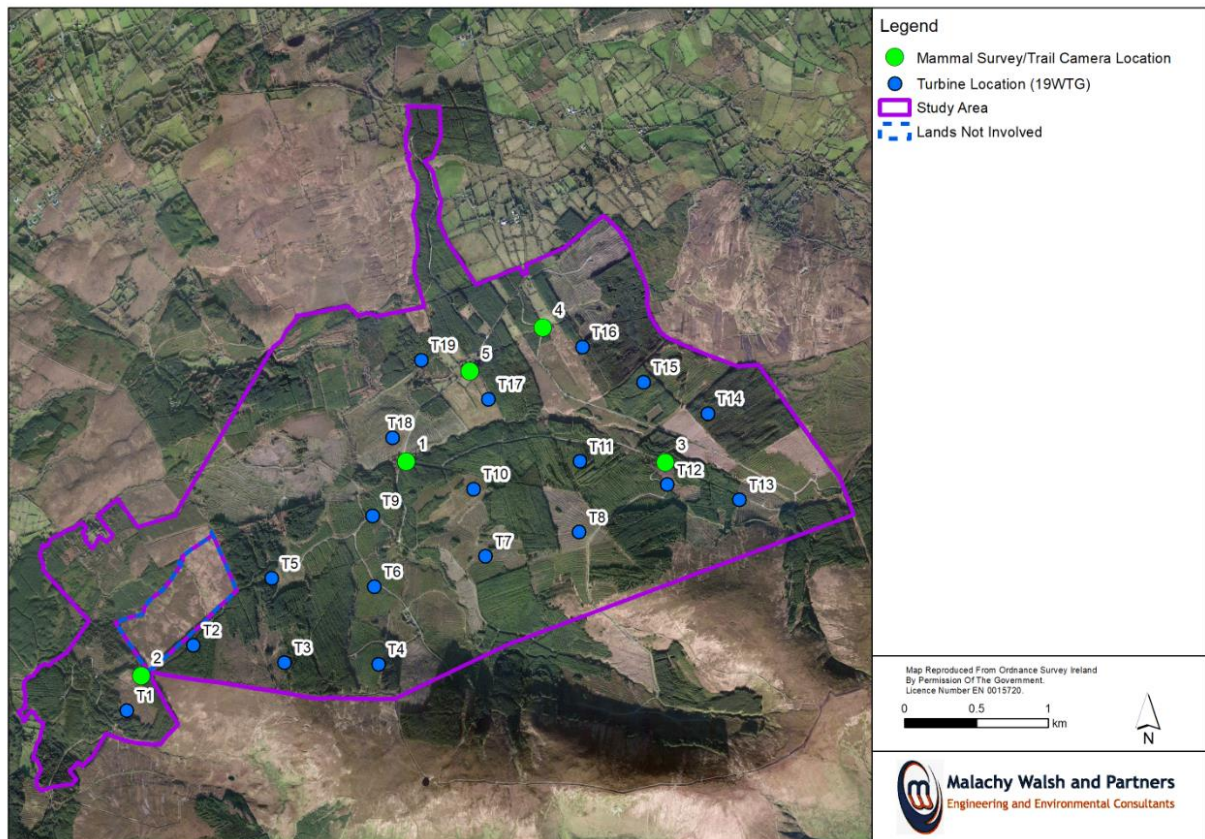


Figure 1. Wildlife trail camera locations

2.2.3 Target surveys

2.2.3.1 Badger

Targeted badger surveys were undertaken on the 14th of February, and the 22nd March 2019. These surveys focused on areas where badger activity had been previously recorded, during ecological surveys on site, and at locations where the wildlife cameras picked up badger activity. On these occasions forestry edge and grassland habitat were walked following clearly defined mammal trails, checking for evidence of badger. Transect 2 was chosen as peat surveyors identified badger activity at this location.

The following figure shows the targeted survey areas, where badger activity was detected, and the transect routes below focused on these areas. Figure 1 shows targeted badger surveys completed on the 14th February, and 22nd March 2019.

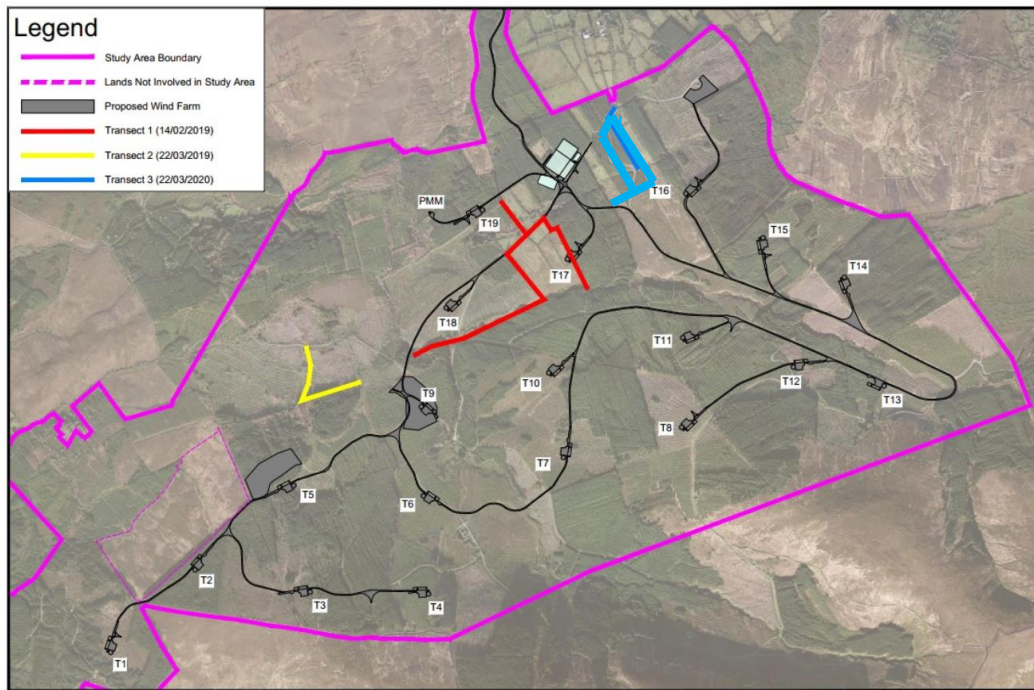


Figure 2. Badger surveys completed on 14-02-2019 & 22-03-2019

2.2.3.2 Otter

Targeted otter surveys focused on stream crossings within the proposed project site, and at stream crossings along the proposed grid route. Otter surveys were conducted at existing watercourse crossings within and adjacent the site on the on the 29th and 30th of August 2018. Proposed new stream crossings were visited on the 20th and 22nd of September 2019. Otter surveys at watercourse crossings along the proposed grid connection were carried out on the 18th July 2019. On the 19th of March 2020 stretches of the Coumnagun Stream and Owenogarney River were walked, checking for evidence of otter.

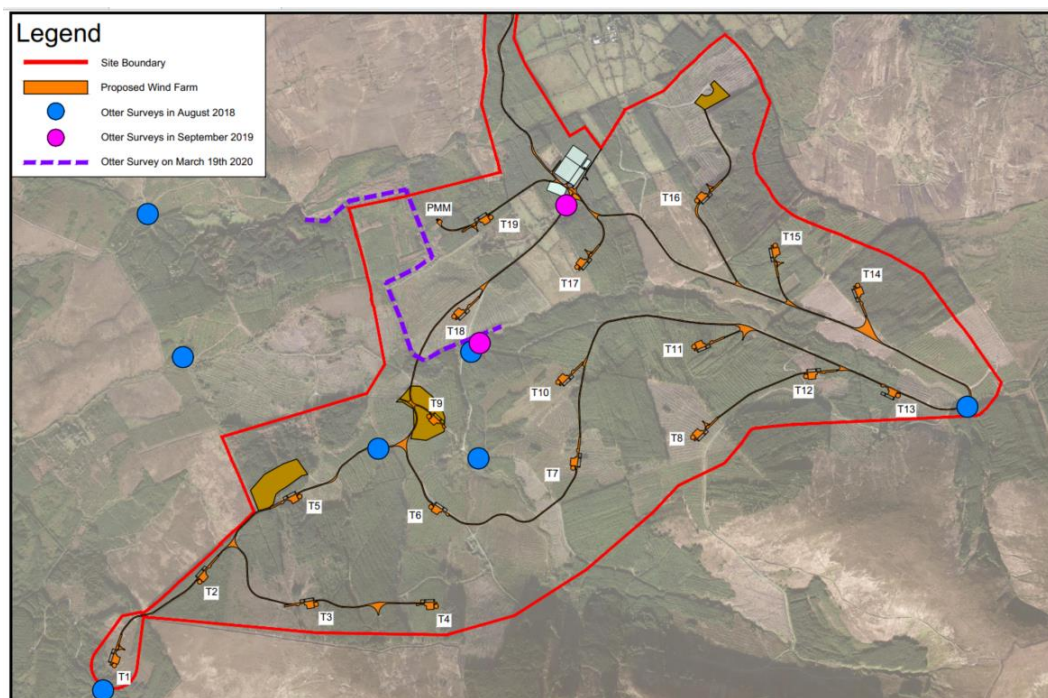


Figure 3. Otter surveys within and downstream of proposed wind farm site

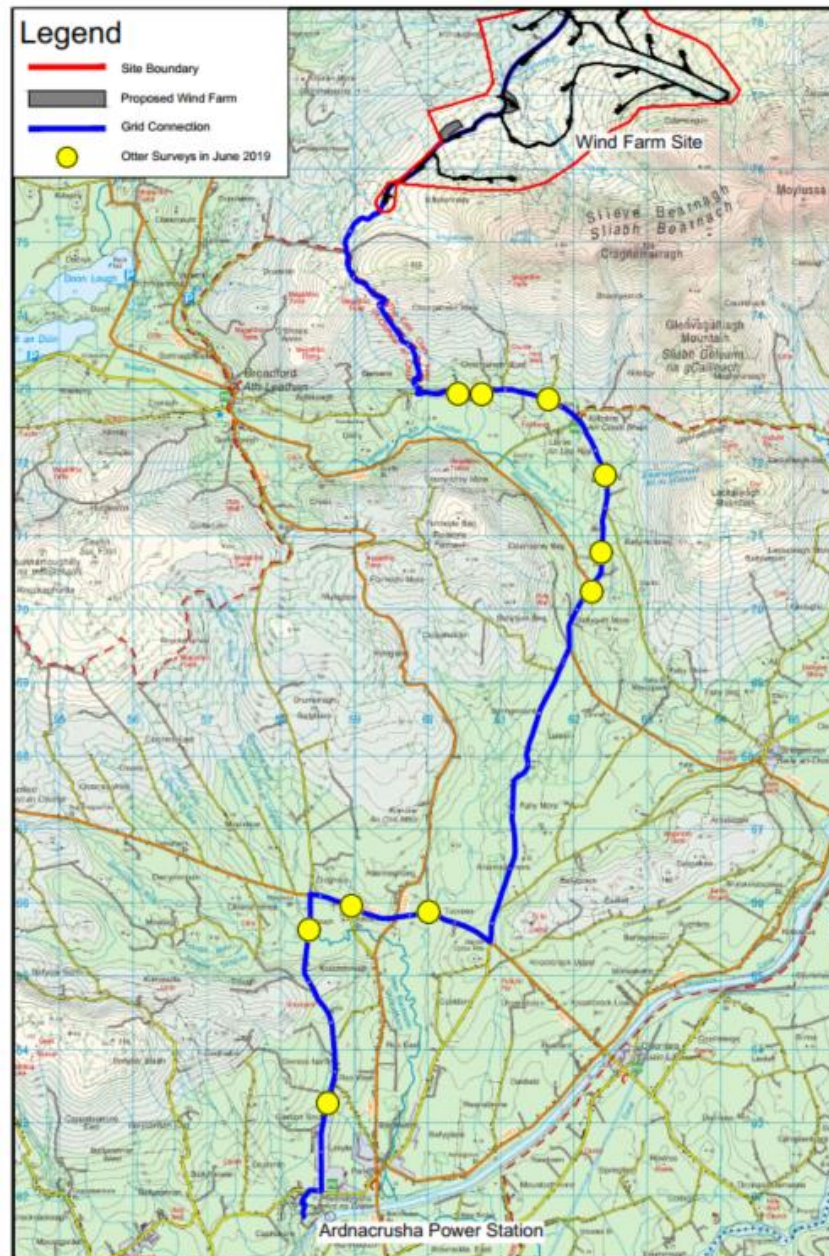


Figure 4. Otter surveys along proposed grid connection

2.2.3.3 Pine marten

Surveys included watching out for signs such as droppings, footprints, checking for tunnels and dens in conifer plantation, and checking piles of logs within the project footprint. Surveys included checking tree stumps, fallen trees, or boulders for droppings or other evidence of pine marten. Surveys also watched out for blocks of conifer that would have potentially higher value regarding any foraging and denning opportunities at the project site.

2.2.3.4 Red squirrel

Surveys included watching out for dreys and signs of activity in the conifer woodland, checking tree stumps, fallen trees, or boulders for evidence of feeding within the project footprint.

2.3 SURVEY CONSTRAINTS

The area of the site is vast covering c. 853 ha, which is mainly covered in conifer plantation. It is considered that this did not pose a significant constraint to the surveys, as the surveys were coordinated and focused on the footprint of the proposed project, and areas of potentially suitable habitat for protected mammal species.

Surveys in conifer plantation can pose a constraint, however, firebreaks and forestry clearings, in addition to forestry thinning provided by Coillte allowed access to site infrastructure.

3 RESULTS

3.1 WALKOVER SURVEYS

3.1.1 Irish mountain hare

Irish mountain hare was recorded infrequently at a number of locations throughout the site. The observations were in more open habitats including bogland and grassland.

Overall the conifer forest within the project site is not suitable for this species.

3.1.2 Irish stoat

During walkover surveys no breeding sites, or other evidence of this species were observed. The surveys included looking for evidence, such as droppings, dens, and burrows.

The project site is suitable for this species.

3.1.3 Pygmy shrew

While not observed walkovers identified that the habitats within the study area are suitable for pygmy shrew.

3.1.4 Hedgehog

The habitats in the study area are considered unsuitable for hedgehog.

3.1.5 Deer

The most commonly recorded species using the site was deer; Red deer and Sika deer. Evidence of this species using the site was recorded through visual observations, tracks and droppings throughout the site. While carrying out bat surveys in July 2019, a herd of c.8 red deer were observed in the bogland c.400m to the west of T2. The deer were observed for approximately 15 minutes before disappearing out of sight into the conifer plantation further to the southwest. A deer antler (considered to be red deer), was found during spring bat surveys on the existing Coillte access track, c.600m to the northeast of T5 (X560486, 677102).

The red deer present, are not native in origin, and are escapees brought in from Hungary (pers. comm. John Murphy (2019)). This was confirmed by NPWS. Sika Deer were observed on a number of occasions using the site, and the lands extending away from the site. While deploying the bat detector at T1 on the 5th September 2019, four Sika deer were flushed from the bog, and went out of site, into the conifer plantation further to the west. On the 7th of April 2020, two adult deer were observed foraging in wet grassland, c. 150m to the north of T17.

The following table outlines the overall results of walkover and targeted mammal surveys.

Table 4. Results of field surveys

Species	Date	GPS	Comments
Pine marten	30/08/2018	X560124, Y676381	Adult crossed Coillte access track between T1 & T2.
Hare	30/08/2018	X559488, Y675804	Hare flushed in bogland.
Red Squirrel	29/08/2018	X563081, Y677235	Flushed at edge of conifer/access track.
Pine marten	25/10/2018	X561041, Y679848	Lame front leg, crossed public road from farm yard, into poor conifer on the northern side of the road.
Red Fox	13/02/2019	X559943, Y676173	Female fox, crosses forestry access track between T1 and T2, heading south down into heath.
Hare	13/02/2019	X562296, Y678254	Flushed when deploying camera, wet grassland and heath mix
Pine marten	25/10/2018	X560505, 676975	Pine marten along transect leading up to old T17.
Red Squirrel	21/04/2018	X559708, Y679832	Crossed local road leading up to the site, out of sight into conifer on northern side of the road.
Red Deer	21/04/2019	X560486, Y677102	Red deer antler, found while deploying bat detectors.
Pine martin	21/04/2019	X560577, Y676974	Scat, observed while deploying bat detectors
Badger	05/06/2019	X564272, Y677121	While carrying out badger transects, encountered badger on Coillte access track c. 1km to the east of T13. Badger out of site in conifer top the north.
Red Deer	05/07/2019	X559477, Y676051	In conjunction with bat survey 7 red deer down in bogland moving northwest
Deer	01/09/2019	X561265, Y679797	Deer tracks and droppings in broadleaf in front of conifer plantation. Walkover survey along haul route.
Sika deer	05/09/2019	X559573, Y675562	Two deer flushed from the bog while deploying bat detectors.
Deer	05/09/2019	X563155, Y677135	Deer tracks and droppings, observed while deploying bat detectors.
Pine marten	05/09/2019	X562529, 678689	Dropping along transect at borrow-pit.
Pine marten	21/10/2019	561189, 675944	Dropping along transect in small clearing leading up to T4.
Pine marten	07/04/2020	X561531, Y678114	Transect at T19. Pine marten dropping in firebreak between two sections of mature forestry.
Deer	07/04/2020	X561874, Y677808	Visual observation of two Sika deer, flushed and out of sight into little ravine to the south
Pine marten	07/04/2020	X56299, 676543	Pine marten dropping along transect at T5

3.2 WILDLIFE TRAIL CAMERA SURVEY

The wildlife trail camera survey recorded pine marten, badger, fox, and deer. Pine marten were the most common species detected, followed by deer and badger. The majority of the activity was recorded at site 1 and site 4, where the cameras were deployed at existing trails in the proximity of streams. No mammal activity was recorded at Site 2, where the camera was deployed at an existing mammal trail at conifer edge, and cutover bog. No mammal activity was detected Site 3 where the camera was deployed at conifer edge, and access track. Site 5 was situated on wet grassland, and recorded deer.

Table 5: Results of trail camera survey

Site	Dates	Species Recorded	No of separate registrations
1	13-12-2018	Pine-marten (recorded on 6 nights)	25 separate registrations most activity was on the 14/12/18
	13-02-2019	Badger recorded on 2 nights	4

Site	Dates	Species Recorded	No of separate registrations
			Recorded on the 5 th and 6 th of February 2019
		Fox (recorded 1 night)	1
		Deer (recorded on 3 nights)	Recorded on the 21 st January 1 Recorded on the 19 th of December
2	13-02-2019 22-03-2019	No recordings of mammals	0
3	13-02-2019 22-03-2019	No recordings of mammals	0
4	13-02-2019 22-03-2019	Pine marten (recorded on 3 nights) Badger (recorded on 2 nights)	4 Recorded pine marten on the on the 9 th March 2 Recorded pine marten on the 10 th March
5	22-03-2019 21-04-2019	Deer (recorded on 1 nights)	3 Recorded deer on the 31 st March
		Unidentified mammal	1 The picture was blurred, not identifiable 18 th April 2019.

Photographic plates of Trail camera survey

	
Site 1, located at mammal trail crossing stream	Site 1 Pine marten (14/12/2018)
	
Badger at Site 1 05/02/2019	Deploying camera at Site 2

	
<p>Deploying camera at site 3</p>	<p>Mammal trail at Site 3</p>
	
<p>Deploying camera at Site 4</p>	<p>Pine marten recorded at Site 4 (9/3/2019)</p>
	
<p>Badger at Site 4 (10/03/2019)</p>	<p>Field fare at Site 5 (wet grassland) (05/04/2019)</p>
	
<p>Deer at Site 5</p>	

3.3 TARGET SURVEYS

3.3.1 Badger survey results

No badger setts were identified during surveys at the study area. Snuffle holes were recorded at GPS point: X561345 Y677315, along transect route 1. This location corresponds with site 1 of the wildlife trail camera survey. The wildlife camera at site 1 detected badger over two nights, with four separate registrations. On the 14th February 2019, transects were completed following the trail along the watercourse, to conifer plantation edge, and wet grassland heathland mix. The perimeter of the conifer plantation and the grassland was walked searching for signs of badger. The raised mound that occurs between the drain and conifer edge was checked for sett entrances, however none were found.

Badger was also detected at wildlife camera site 4. On the 22nd March 2019 a targeted badger survey was carried out along conifer plantation and wet grassland to the east. Mammal trails were followed, they did not divert into the conifer, but were a continuous, well defined trail around the margin of the field area.

The project site is suitable for this species and they are known to occur in the study area.

3.3.2 Otter survey results

No evidence of breeding or resting sites for otter were recorded at the study area. Nor was there evidence such of activity such as prints, sprints, or scats.

It is considered that the upper reaches of the watercourses present in the study area are not ideal for this species.

3.3.3 Pine marten

During walkover surveys evidence of pine marten included a number of visual observations, and droppings spread throughout the site. This species was observed crossing the existing access to the northeast of T2 in August 2018 (X560124, Y676381). An adult was observed crossing the local road leading up to the site, along the proposed Haul Route (X561041, Y679848), in October 2018. The animal had a lame front leg, limped across the road, and went out of sight into a stand of poor conifer plantation.

Pine marten were recorded at 2 of the 5 locations where wildlife cameras were deployed across the site. During targeted surveys in suitable habitat for this species, no breeding pine marten was recorded in these suitable areas.

The project site is suitable for this species and they are known to occur in the study area.

3.3.4 Red Squirrel

Red squirrel was recorded on a number of occasions within and outside the site boundary of the proposed development site. Evidence of this species using the site included a number of visual observations, where squirrel were flushed from access track and public road. In August 2018 a red squirrel was flushed on Coillte access track, and disappeared into conifer plantation, when flushed by the surveyor (X563081, Y677235). In April 2019, this species was observed crossing the local road leading up to the site, and entered conifer plantation on the northern side of the road. During

targeted transect surveys in suitable habitat such as conifer plantation, no breeding sites were observed.

The project site is suitable for this species and they are known to occur in the study area.

4 CONCLUSION

The non-volant mammal species recorded in the study area were pine marten, badger, red squirrel, Irish mountain hare, Red deer, Sika deer, and fox. The forestry and surrounding habitats provides suitable breeding and foraging habitat for all species recorded. While not observed during surveys, it is likely that pygmy shrew, and stoat may be using the site owing to the suitability of the habitats present. Pine marten and Irish Mountain hare are listed on Annex V of the EU habitats Directive. All species recorded, except for red fox, are protected in the Wildlife Acts, as are Pygmy shrew and stoat. While undertaking surveys in suitable habitats for these species, no breeding sites such as setts, holts, dens or dreys were observed in the project footprint.

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