

Balliemeanoch Pumped Storage Hydro

Environmental Impact Assessment
Report

Volume 5: Appendices
Appendix 6.4: Mammals

ILI (Borders PSH) Ltd

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Quality Information

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1.Introduction

This appendix accompanies *Chapter 6 Terrestrial Ecology* of the EIA (*Volume 2: Main Report*). It describes in detail the desk study and field survey carried out to establish baseline conditions in the zone of influence (Zol) of the Development with respect to protected and notable mammals (with the exception of bats, which are separately addressed in *Appendix 6.5: Bats (Volume 5: Appendices)*).

This appendix is supported by the following figures located within Volume 3 Figures:

- Figure 6.7 Mammal survey areas and camera trap locations;
- Figure 6.8 Otter survey results and incidental records;
- Figure 6.9 Water vole survey results and incidental records;
- Figure 6.10 Pine marten, badger and red squirrel survey results and incidental records.

The following protected and notable mammal species were subject to targeted field surveys:

- Otter *Lutra lutra*;
- Water vole *Arvicola amphibius*;
- Badger *Meles meles*;
- Pine marten *Martes martes*;
- Wildcat *Felis sylvestris*.

Additionally, observations of red squirrel *Sciurus vulgaris*, and any other notable mammals such as mountain hare *Lepus timidus*, were recorded during surveys for the above species and also incidentally during other ecological surveys. The general suitability of the Development Site for all relevant mammals was also assessed.

Throughout this appendix, species are given their common and scientific names when first referred to and their common names only thereafter. All distances are cited as the shortest distance 'as the crow flies', unless otherwise specified. Locations are given as Ordnance Survey Grid References (OSGR).

2. Legislative and Planning Policy Context

2.1. Relevant Legislation

2.1.1. Otter

Otters are strictly protected through listing on Schedule 2 of The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), commonly referred to as the 'Habitats Regulations'. It is an offence to deliberately or recklessly:

- Capture, injure or kill an otter;
- Harass an otter or group of otters;
- Disturb an otter while it is occupying a structure or place used for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access to a breeding site or resting place, or otherwise deny an otter use of a breeding site or resting place;
- Disturb an otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and/or,
- Damage or destroy an otter breeding site or resting place, whether or not this is done deliberately or recklessly, and whether or not it is occupied by otter at the time.

Under the Nature Conservation (Scotland) Act 2004, public bodies in Scotland have a duty to further the conservation of biodiversity. The Scottish Biodiversity List (SBL) is a list of habitats, plants and animals that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. The purpose of the SBL is to identify habitats and species that are of highest priority for biodiversity conservation, thereby helping public bodies to carry out their biodiversity duty. The otter is listed on the SBL, and consequently public bodies should have regard to otter when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.1.2. Water vole

Water voles receive partial protection in Scotland under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the 'WCA'). This protects water vole burrows and places of shelter/protection used by water voles. It is an offence to intentionally or recklessly:

- Damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection; and/or,
- Disturb a water vole while it is using any such place of shelter or protection.

Water vole is listed on the SBL, and consequently public bodies should have regard to water vole when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.1.3. Badger

Badgers are protected in the UK under the Protection of Badgers Act 1992 (as amended). Badgers receive dedicated protection due to a long history of persecution and this prohibits activities not applicable to other protected species. Offences under the Protection of Badgers Act include:

- Wilfully taking, injuring or killing a badger;
- Cruelty to a badger; and,
- Intentional or reckless interference with a badger sett.

2.1.4. Pine marten

Pine martens are fully protected under Schedules 5 of the WCA. Offences include to intentionally or recklessly:

- Kill, injure or take a pine marten;
- Damage, destroy or obstruct access to a nest or den – i.e. any structure or place which such an animal uses for shelter or protection; and/or

- Disturb such an animal when it is occupying a nest or den for shelter or protection (except when it is inside a dwelling house).

Pine marten is listed on the SBL, and consequently public bodies should have regard to pine marten when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.1.5. Wildcat

Wildcats are strictly protected through listing on Schedule 2 of the Habitats Regulations. It is an offence to deliberately or recklessly:

- Capture, injure, kill or harass a wildcat;
- Disturb a wildcat in a den or any other structure or place it uses for shelter or protection;
- Disturb a wildcat while it is rearing or otherwise caring for its young;
- Obstruct access to a den or other structure or place wildcats use for shelter or protection or otherwise deny the animal use of that place;
- Disturb a wildcat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species; and/or,
- Disturb a wildcat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly).

Wildcat is listed on the SBL, and consequently public bodies should have regard to wildcat when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.1.6. Red squirrel

Red squirrels are fully protected under Schedule 5 of the WCA. This makes it an offence to intentionally or recklessly:

- Kill, injure or take a red squirrel;
- Damage, destroy or obstruct access to a drey or any other structure or place which a red squirrel uses for shelter or protection; and/or
- Disturb a red squirrel when it is occupying a structure or place for shelter or protection.

Red squirrel is listed on the SBL, and consequently public bodies should have regard to red squirrel when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.1.7. Mountain hare

Mountain hare is now listed on Schedule 5 of the WCA. It was added primarily so that control of mountain hare can only take place under licence for a demonstrable reason, to conserve the species. Whilst it is thus an offence to intentionally or recklessly kill, injure or take a mountain hare, hares are highly mobile (including leverets, which are precocial) and together with standard measures to minimise risk of harm to mammals (such as providing means of escape from excavations) it is unlikely that construction activities would cause such offences.

Inclusion on Schedule 5 also affords protection to places of shelter similarly to other Schedule 5 species. However, refuges of mountain hares are most frequently depressions in dense vegetation ('forms'), which may not be easily detectable, and each hare would likely have many and not be dependent on any one. Mountain hares occasionally make use of holes, or burrows in peat (particularly leverets, but as noted above leverets are precocial and mobile) (Harris and Yalden, 2008), however NatureScot do not implement a means of licensing works that might affect such refuges (licensing for mountain hare is for regulating control activities).

Mountain hare is listed on the SBL, and consequently public bodies should have regard to mountain hare when implementing their biodiversity duty under the Nature Conservation (Scotland) Act 2004.

2.2. Relevant Planning Policy

Relevant national and local planning policy is discussed in *Chapter 6 Terrestrial Ecology* of the EIA *(Volume 2: Main Report)*.

2.2.1. Argyll and Bute Local Biodiversity Action Plan

The local biodiversity action plan for Argyll is the Argyll and Bute Local Biodiversity Action Plan (2010-2015) (https://www.argyll-bute.gov.uk/sites/default/files/migrated_files/Unknown/AandB%2520BAP%2520Draft.pdf), (herein referred to as the 'Local Biodiversity Action Plan (LBAP)'). Details of this plan relevant to the Development, and of the Biodiversity Technical Note for Planners and Developers (https://www.argyll-bute.gov.uk/sites/default/files/migrated_files/biodiversity_technical_note_feb_2017_4.pdf) produced by Argyll and Bute Council, are provided in Chapter 8 of the EIA.

Specifically relevant to this appendix, the 'Species Selected for Action' within the LBAP lists red squirrel, water vole, otter and wildcat.

3. Methods

For the purposes of this EIA, protected and notable mammal species are defined as:

- All mammals listed on Schedules 2 and 4 of the Habitats Regulations;
- All mammals listed on Schedule 5 of the WCA (as it applies in Scotland);
- All qualifying or notified species of Special Areas of Conservation (SAC) within 10 km of the Development Site or of Sites of Special Scientific Interest (SSSI) within 2 km of the Development Site; and,
- Species listed on the SBL or Argyll and Bute LBAP.

3.1. Desk Study

A desk study was carried out to identify:

- International nature conservation designations for which mammals are qualifying/notified species within 10 km of the Development Site;
- National statutory nature conservation designations for which mammals are qualifying/notified species within 2 km of the Development Site;
- Local non-statutory nature conservation designations within 1 km of the Development Site for which mammal species are an identified reason for designation or, where no designation information is available, for which mammals are likely to be part of the reason for site selection; and,
- Records of protected / notable species within 1 km of the Development Site.

The distances used in the desk study are hereafter referred to as the 'study area'. The desk study was carried out using the data sources detailed in *Table 1*.

Table 1. Desk Study Data Sources

Data Source	Date Accessed	Last Data Obtained
Argyll and Bute Council website (https://www.argyll-bute.gov.uk/)	30 October 2023	<ul style="list-style-type: none"> • Local Development Plan policies relevant to nature conservation. • Argyll and Bute LBAP information. • Relevant planning applications which could give rise to cumulative effects.
Argyll and Bute Council Open Data website (https://data-argyll-bute.opendata.arcgis.com/datasets/d05f7337b41e48b4af933404dc0592a2/explore)	06 July 2023	<ul style="list-style-type: none"> • Information on local non-statutory nature conservation designations.
Highland Biological Records Group (HBRG)	11 August 2023	<ul style="list-style-type: none"> • Records of important ecological species, obtained via the National Biodiversity Network (NBN) (see below – the Highland Biodiversity Recording Group (HBRG) advised

Data Source	Date Accessed	Last Data Obtained
		that records were uploaded to NBN and should be obtained from there).
NatureScot SiteLink and Open Data Hub (https://sitelink.nature.scot/home ; https://opendata.nature.scot/)	02 August 2023	<ul style="list-style-type: none"> Information on international and national statutory designations.
NBN Atlas Scotland (https://scotland.nbnatlas.org/)	11 August 2023	<ul style="list-style-type: none"> Commercially-available records of protected and notable mammals from the last twenty years (i.e. since 2003).
Ordnance Survey (OS) maps OS 1:50,000 maps and Bing aerial (https://www.bing.com/maps/)	1:25,000 31 October 2023	<ul style="list-style-type: none"> Habitats and connectivity relevant to interpretation of planning policy and potential presence of important features that could be used protected and notable mammals.

3.2. Field Survey

Field surveys for otter, water vole, badger, pine marten, and wildcat were conducted to search for evidence of these species within the Development Site and the wider surrounding area. A description of the field survey methods employed is provided below.

The surveys took place in several distinct areas which, together, make up the Development Site. These are:

- **Moorland Zone** – the extensive upland area within which the proposed Headpond and associated permanent infrastructure (including compounds and access tracks) and temporary infrastructure (construction compounds and access tracks) will be located. This area includes the higher parts of the Balliemeanoch Farm track, above the moorland edge (i.e. above the enclosed pastures);
- **Loch Awe** – the bank of Loch Awe, adjacent and nearby woodland, and open habitat (primarily pasture) in a lowland setting, within which lies the proposed Tailpond and associated permanent infrastructure, the western-most tunnel portal, temporary Construction Compounds and the Temporary B840 Realignment. It includes the lower part of the Balliemeanoch Farm track;
- **Inveraray** – includes Inveraray north-east, along an existing track running north and east of Inveraray, and Inveraray south-west, also primarily along an existing track running west and south of Inveraray and including the proposed jetty area;
- **Upper Sonachan** – an existing access track from the A819 in the north-east through commercial forestry.

Surveys were also carried out at Three Bridges and Blarghour, prior to confirmation that the Development would not carry out any works in this area, but would instead either use an existing access track in these areas if already constructed for Blarghour Wind Farm, or would not use this area for access. The Three Bridges area follows an existing track from the A819 running westwards mainly through broad-leaved woodland, young plantation and commercial forestry. Blarghour refers to the extensive open upland between the Three Bridges conifer plantation and the Moorland Zone.

Surveys were carried out within buffers around the above ground infrastructure of the Development Site in these areas as it stood at the time of survey. The survey buffers are referred to together as the 'survey area'. The survey area used in 2021 and 2023 is shown on *Figure 6.7 Mammal survey areas and camera trap locations (Volume 3: Figures)*. Note that since the surveys took place the Development footprint has evolved. However, the survey areas were planned to cover a larger than needed area to allow for movement of the Development, and as such this is only a limitation in localised areas. Notes on limitations to the surveys are provided below.

No specific survey was carried out for red squirrel. This is because a) the great majority of the Development Site is unsuitable for this species through lack of woodland, b) there will be very limited loss of existing woodland in comparison to the available resource, and c) likely presence of red squirrel in most woodland can be reliably assumed from the geographic location. However incidental observations of this species during the ecology surveys were noted.

No specific survey was carried out for mountain hare, however incidental observations during various ecological surveys were noted. Mountain hare, although a priority species in Scotland (and now subject to legal protection,

although offences are unlikely from construction activities), is widespread in suitable upland moorland, though NBN Atlas Scotland indicates that the species is absent from large parts of Argyll.

There was also no specific survey for hedgehog, which although also a priority species in Scotland has no legal protection. Hedgehog is highly likely to occur in the lower altitude parts of the Development Site including at Inveraray and Loch Awe. With the possible exception of unaffected narrow woodlands along lower-altitude watercourses, however, hedgehog can reliably be assumed absent from the Moorland Zone and associated higher altitude parts of the Site, where there is no suitable habitat.

Evidence of mammals was mapped and field notes recorded using ESRI FieldMaps or similar portable GIS software on GPS-enabled tablets using current aerial imagery, and occasionally with use of standalone GPS devices. Refinements were occasionally made (where GPS coordinates were clearly slightly inaccurate) using current aerial imagery in ESRI ArcGIS.

3.2.1. Otter and water vole survey

Otter and water vole surveys were carried out along suitable watercourses and waterbodies within 200 m of proposed above ground infrastructure, as far as access was feasible and safe. A few additional incidental records were made during other ecological surveys on intervening dates (April – September 2019, 2021 and 2023). The surveys followed guidance in published literature (Chanin, 2003; Liles, 2003; Strachan, 2007; Strachan *et al.*, 2011; Dean *et al.*, 2016). Evidence of otter searched for included refuges (holts and lay-ups – a holt is a well-enclosed otter refuge, such as a burrow, whilst a lay-up or couch is semi-enclosed and of lesser importance), spraints (faeces), footprints, trails and foraging signs. Where found, spraints were recorded as fresh, recent or old, according to their apparent age.

An attempt was also made to classify the holts as non-natal or as having the potential for natal use. Although there is limited available information on natal holts, they are typically difficult to find, since breeding female otters tend to be secretive and locate them in the most well-hidden and secure holts (or sometimes ‘nest’ in reedbeds) that minimise risk of disturbance and cub predation (see, for example, Liles (2003) and Harris and Yalden (2008)). Infanticide by unrelated adult male otters is known to occur (Kruuk, 2006), and since male and female otters share the same watercourses for foraging and commuting, this is likely a significant risk to breeding females, and probably part of the reason that natal holts are typically more secure. Whilst natal holts have been known up to 100 m from water, they have had direct covered habitat connectivity (such as continuous woodland) to water. Some natal holts have been found beside watercourses or lakes, but these (or the paths to them) were provided security by being situated amongst reedbed, in hollow trees, amongst or through dense scrub, or in terrain of difficult access (such as high up an inaccessible and undisturbed wooded slope). Thus typical and more obvious holts in riverbanks that are not particularly well-hidden and relatively accessible (and also if likely to frequently flood) are unlikely to be natal holts.

Evidence of water vole searched for included latrines, footprints, droppings, burrows, trails and foraging evidence. Surveyors walked in the channel of watercourses where possible and visually inspected all parts of the banks. Where dense vegetation prevented this, searches for field signs were made as far as access allowed.

Guidance in Dean *et al* (2016) advises two surveys for water voles, one in spring (mid-April to end of June) and another typically in early autumn (July to September) of the same year. This was not always possible for logistical reasons, and is discussed in the Limitations.

Surveys took place on the following dates:

- **Moorland Zone** - Initial survey took place in 2019 on the 09-10 April, 04, 11-13 June and 17-18 July. Surveys in 2019 did not cover the whole survey area within the Moorland Zone. These were repeated in 2021 on 27 April, 10-12 and 18-19 August and 30 September, and again in 2023 on 10-11 and 16-18 May;
- **Loch Awe** - Initial survey took place in 2021 on the 12 May 2021 August. Update surveys were carried out on 18 May 2023;
- **Inveraray** - Initial survey took place in 2021 on the 12, 14 and 28-30 April, and on the 09 and 13 of August. Update surveys were carried out on 09, 15 and 19 May 2023;
- **Upper Sonachan** - Initial survey took place in 2021 on 12 August and 28 and 30 September. Surveys in 2023 were limited to larger watercourses as smaller burns and ditches offered sub-optimal habitat for otter, and presented safety issues caused by accessing watercourses running through dense conifer plantation (see Limitations).

Additionally, although no longer relevant to the Development (since access tracks at these locations will not be constructed by the Development), surveys were carried out at Three Bridges (26 April, and 13,16 and 18 August 2021; and 19, 30 and 31 May 2023) and Blarghour (17 August 2021; and 17 May 2023).

3.2.2. Badger survey

Survey for badger was carried out in suitable habitat within a 100 m buffer of proposed above ground infrastructure, as far as access was feasible and safe. The survey followed guidance in published literature (Scottish Badgers, 2018; Harris *et al.*, 1989). Evidence searched for included setts, spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks and foraging activity. Badger evidence was mapped with the aid of aerial photography and GPS, with accompanying field notes. If present, setts were classed as main, annexe, subsidiary or outlier, where possible, and holes described as well-used, partially-used or disused. Where evidence of badger was encountered during the extensive coverage of the survey area for other surveys, this was also recorded.

The following details the dates of surveys:

- **Moorland Zone, Loch Awe, Upper Sonachan and Blarghour** - No specific badger survey of these areas was carried out. However, the habitat in these areas is largely unsuitable or, at best, suboptimal for the species, being of higher altitude and dominated by blanket bog, wet heath and, locally, Sitka spruce plantation. These areas were also covered extensively during other surveys (e.g. for otter) in 2019, 2021 and 2023 and, where encountered, any incidental badger evidence was recorded;
- **Inveraray** - The initial survey was carried out on 12-14 and 28-30 April, and 10 June 2021. Incidental evidence was recorded where it was observed during other surveys on subsequent dates throughout 2021. The survey was repeated on 09, 12 and 15 May 2023.

Additionally, prior to confirmation that no works would be carried out by the Development in this area, an initial badger survey was carried out at Three Bridges on 26 April 2021. Incidental evidence was also recorded where it was observed during other surveys on subsequent dates throughout 2021, and the area was resurveyed on 31 May 2023.

3.2.3. Pine marten and wildcat survey

Survey for pine marten and wildcat was carried out in suitable habitat within a 100 m buffer of proposed above ground infrastructure, as far as access was feasible and safe. The survey followed guidance in published literature (Cresswell *et al.*, 2012). Evidence searched for included dens, scats, footprints, foraging remains and trails.

Targeted pine marten and wildcat survey was carried out at the Moorland Zone on 03 and 04 June 2019, focussing on locations with potential for dens, such as slopes with rock outcrops and boulders.

Outside the Moorland Zone, evidence of pine marten and wildcat was also searched for concurrently with the extensive surveys for badger, otter and bat roost suitability in 2021 and 2023.

3.2.4. Camera trap survey

Five motion sensitive camera traps were positioned in a variety of habitats within the Development Site with potential suitability to support the target protected mammal species. Cameras were deployed for a maximum of 62 days between 05 June and 08 August 2019. Camera trap footage was recorded as motion capture images on SD cards, and subsequently analysed to determine the number of days on which different species had occurred and the total 'number of visits' (i.e. the number of discreet instances of a species at the camera). Where images were taken less than five minutes apart these were assumed to be the same individual and were recorded as one 'visit'. The locations of camera traps are noted below in *Table 2* and shown in *Figure 6.7 Mammal survey areas and camera trap locations (Volume 3: Figures)*.

Table 2. Location of camera traps

Camera Trap Reference	Location	Description	Recording Period (2019)	Number of Days Recording
CT1	NN 01194 16103	Located approximately 50 m east of the Balliemanoch Farm track on a defunct stone wall within semi-natural broad-leaved woodland along Allt a Chrosaid. Pine marten scat found nearby.	05 June – 06 August	62 days

Camera Trap Reference	Location	Description	Recording Period (2019)	Number of Days Recording
CT2	NN 04208 16203	Within the proposed Headpond on a defunct dry-stone wall in the Old Shielings.	05 June – 17 July	42 days
CT3	NN 05489 18103	Upper Sonachan. Located on the plantation edge looking out into a forest clearing. Distinct trail, most likely deer, leading into forest passing in front of camera.	13 June – 06 August	54 days
CT4	NN 04355 16432	Facing otter holt HP_OR06 on the edge of Lochan Airigh within the proposed Headpond. Numerous spraints and trails nearby.	18 July – 07 August 19 August – 30 September	20 days Unknown (<11 days)
CT5	NN 02944 08654	Adjacent to a proposed access route south of Inveraray that is now not considered as part of the design. Approximately 80 m north-east of Forestry and Land Scotland track, adjacent to a stream and facing old, overgrown forest track.	13 June – 06 August	54 days

3.2.5. Limitations

The aim of a desk study is to help characterise the baseline context of the Development and provide valuable background information that may not be captured by field survey alone. Information obtained during a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for particular species does not necessarily mean that they do not occur in the study area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the area of interest or are relevant to the Development.

The surveys were constrained in the Inveraray sections, particularly to the far north-east and far south-west, due to dense and impenetrable rhododendron *Rhododendron ponticum* and other scrub, which prevented access to some watercourses and into localised parts of the woodland.

Otter survey along the Allt Beochlich downstream of the survey buffer shown on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)* was only carried out in 2019. There was little evidence of otter found in 2019 along this lower section of the Allt Beochlich, which is steep, rocky and fast-flowing and thus not considered suitable for the raising of young cubs; this stream is also deeply incised and often further shielded by woodland, and therefore any holts along this section that may have become established since the survey would to a large degree be protected from disturbance. In addition, however, amendments to the design after all protected species surveys were completed included the bypass tracks/roads that tie in to the B840 near Loch Awe and the very downstream end of the Allt Beochlich. These tie-ins are beyond the otter survey extent along Loch Awe. Since the B840 is an existing well-used road, it is not likely that such tie-in works would cause significant disturbance of otter refuges (if any exist) near these tie-ins, and any such disturbance would not be significant compared to the large and prolonged degrees of disturbance of otter holts and lay-ups caused by the Headpond construction. However, this is a limitation and the proposed pre-construction surveys would need to include checks for otter refuges near these tie-ins.

Full otter and water vole survey could not be carried out around the entirety of the existing reservoir south-west of the proposed Headpond. This was because the peripheral substrate and vegetation, which is inundated frequently, is often treacherous and unsafe to walk on. However, given the regularly and severely fluctuating water level and lack of suitability of immediately adjacent habitat, it is unlikely that there would be otter refuges or water vole refuges immediately around the reservoir.

The limited extent of the bank of Loch Fyne within 100 m of the Development was not surveyed north-east of Inveraray for safety reasons associated with proximity to the A83 (a fast road with poor visibility in this area). However, any otter features that might be present (which could include otter holts, although there is limited potential owing to a high degree of exposure and limited habitat suitability) will already be subject to disturbance from the existing road, and the Development in this area comprises only the use of an existing track for access, situated beyond the road with intervening screening woodland. Therefore this is not a significant limitation to the assessment.

Guidance in Dean *et al* (2016) advises two surveys for water voles, one in spring (mid-April to end of June) and another typically in early autumn (July to September) of the same year. This was not logistically feasible given the

extremely large area covered by the Development Site which is within a remote location with many watercourses. Not all watercourses were surveyed in 2019 for this reason. However, each watercourse was surveyed at least once per year in 2021 and 2023, and the surveys that took place on each watercourse in these years (and in 2019) often fell at different, but suitable, times of year. All watercourses were surveyed in spring 2023, but no autumn surveys took place this year, and not all watercourses were subject to autumn survey in previous years. The number of surveys that took place allow the presence of water vole to be excluded from all areas except the Moorland Zone with considerable confidence. Although spring and autumn survey visits were not carried out in a single year, this is a minor limitation given that each watercourse received at least two surveys across 2019, 2021 and 2023, therefore sufficient data is considered to have been gathered to carry out a robust assessment. Dean (2016) also suggests that two water vole visits within one survey season may not be necessary, assuming the assessment of effects is made on a precautionary basis. It should also be noted that the locations of recorded evidence varied between years, and whilst all recorded locations are treated as water vole habitat, it is well-known that water voles may occupy locations in some years but not others, therefore their distribution at the time of construction may well be slightly different to the baseline provided here, highlighting the importance of pre-construction surveys.

Results from trail camera CT4 suggest that it was not fully effective at detecting all otter activity at holt HP_OR06. This is thought to be because this holt appeared to have a single entrance at the time of survey, but recordings showed the otter exiting the holt without entering and vice-versa. This will have caused a degree of underestimation of otter activity at this holt. In addition, a failure of the camera to record time data between 19 August and 30 September 2019 meant this data confirmed that the holt had been used in this period, and no information on the number of days / visits. However, these are considered minor limitations given the large number of recordings made and the frequent presence of spraints around the holt, the latter on its own confirming likely frequent use by otter.

High water levels and storm conditions on the River Aray and other watercourses within the Site in October 2023 may have destroyed some otter holts / lie-ups. The assessment has been undertaken according to the features present at the time of survey, however this highlights the importance of carrying out update and pre-commencement surveys within the timeframes specified by NatureScot.

4. Results

4.1. Nature conservation sites with mammal interests

There are no statutory or non-statutory nature conservation sites designated for mammal species within the desk study search distances.

4.2. Otter

The NBN Atlas held nine records of otter, all from the vicinity of Inveraray and provided by Argyll Biological Records Centre and Highland Biological Records Centre. One record was from 2014, from north-east of the study area, located within the 1 km grid square encompassing the east bank of Loch Shira. The remaining eight records were from 2010 and located within the 1 km grid square encompassing the bank of Loch Fyne and Inveraray Golf Course. The 2010 records were all of otter refuges, however no additional details of location were provided.

During the field surveys, a high quantity of otter field signs were found throughout the survey area. In total, 53 otter refuges (19 holts and 34 lay-ups) were identified within 200 m of the Development, and spraints were frequently found on the majority of watercourses. Details of otter refuges and other evidence are set out below.

In *Table 3 to Table 7*, below, unshaded (white) rows indicate that no impact on the feature is expected, light grey rows indicate some risk of disturbance, and dark grey rows indicate risk of the feature being lost. Note that the distance at which disturbance is likely is dependent on the nature of the refuge and relevant works. For these purposes, and in accordance with NatureScot advice (<https://www.nature.scot/doc/standing-advice-planning-consultations-otters>), disturbance of otter refuges is considered possible at up to 30 m from works (or further for severe works such as piling or blasting), and for natal holts potentially up to 200 m.

Holt HP_OR06 was subject to camera trap monitoring in 2019, the results of which are described in the Camera trap survey section below.

All otter evidence is presented on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)*, and photographs of refuges are provided in the Photograph Annex. Due to the footprint of the Development evolving throughout the survey period, some otter evidence that was identified during surveys and incidentally is now more than 200 m from the Development. Otter refuges beyond this distance are extremely unlikely to be impacted by the Development. These features are not detailed below, but are shown as faded symbols on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)* to provide context. Refuges which are more than 200 m from the Development are not labelled and have not been given reference numbers.

Moorland Zone

A total of 21 otter refuges – seven holts (one of which has the potential to be used as natal holts) and fourteen lay-ups – were identified within the Moorland Zone, mainly along Allt Beochlich and Buinne Dhubh and their tributaries, and on the associated lochans. Spraints were encountered on the majority of watercourses, with larger concentrations corresponding to the locations of refuges. Rarely there was evidence of otter foraging in the form of partially-eaten toads. Details of the otter refuges found are provided in *Table 3*, and all evidence is shown on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)*.

Table 3. Moorland Zone – Otter refuges identified during field surveys

Ref	Type	Potential to be used as natal holt	Date	Description	Distance from Development	OSGR
HP_OR01	Holt	None	18/05/2023	Within boulder pile. Extends back out of sight. Three recent spraints.	75 m from access track.	NN 02628 15133
HP_OR02	Lay-up	None	10/05/2023	Extends back 1 m. One fresh, one recent and one old spraint present.	51 m from below ground tunnel at permanent compound (PC19) (but tunnel is at 320 m depth),	NN 03134 16068

Ref	Type	Potential to be used as natal holt	Date	Description	Distance from Development	OSGR
					182 m from access track water crossing and 290 m from PC19.	
HP_OR03	Holt	None	11/08/2021	Dry crevice between boulders. Multiple entry points leading back into dry tunnel as far as could be seen. Three old spraints.	34 m from access track water crossing; 77 m from temporary compound (PC09).	NN 03688 15901
			10/05/2023	No access due to high water but feature still present and appeared suitable when viewed through binoculars.		
HP_OR04	Lay-up	None	10/05/2023	Sheltered area where bank has eroded. One old spraint on nearby boulder but none within.	Within temporary compound (PC09).	NN 03802 15864
HP_OR05	Holt	None	27/04/2021	Cavity behind overhanging bank covered in moss. Extends about 1 m parallel to river. One fresh spraint.	Within access track water crossing.	NN 04357 15167
			11/05/2023	As before with one possible spraint.		
HP_OR06	Holt	Potential	17/07/2019	Next to loch behind rushes. Round hole just above water level with slide/trail to water. Single entrance. Extends back at least 70cm. No spraints at holt entrance but many present around loch.	Within the proposed Headpond.	NN 04355 16435
			18/07/2019	As before. Trail camera set.		
			25/09/2019	A second entrance had been created which showed that the chamber was a short, 1.5 m long tunnel, which was now open at two ends (as a result of the second entrance). The feature was therefore less sheltered. Numerous fresh spraints were found around the original entrance. Trail camera collected. Camera trap recorded the otter using the holt on numerous occasions between 18/07/2019 and 07/08/2019.		
			11/08/2021	As before with possible bedding within entrance and 3 fresh, 2 recent and 5 old spraints. Soft moss marker placed.		
			19/08/2021	Tunnel clear and looks frequently used. Large pile of spraints of all ages, including fresh, at original entrance. Moss marker from last visit had moved. Trail camera set.		
			30/09/2021	Little evidence of recent use. Moss growth and cobwebs over entrances. No fresh spraints at entrances but 10 old spraints immediately outside holt, plus one with urine stain on top of bank. Trail camera collected. Camera trap recorded the otter using the holt once between 19/08/2019 and 30/09/2019.		
			10/05/2023	Possible bedding within original entrance. Many spraints on bank. 3 m away.		
			18/05/2023	Left entrance now blocked, original right entrance open. Possible rush bedding within. Trampled grass at entrance. No spraints /odour at entrance. Many spraints nearby.		
HP_OR07	Lay-up	None	18/05/2023	Cavity under mossy collapsed bank which is open at both ends. Back is visible. One fresh / recent spraint. Very similar to HP_OR08.	Within the proposed Headpond.	NN 04179 16653
HP_OR08	Lay-up	None	18/05/2023	Cavity under mossy collapsed bank which is open at both ends. Back is visible. One fresh / recent spraint. Very similar to HP_OR07.	Within the proposed Headpond.	NN 04138 16701

Ref	Type	Potential to be used as natal holt	Date	Description	Distance from Development	OSGR
HP_OR09	Lay-up	None	16/05/2023	Open cavity under overhanging bank with one recent spraint.	Within the proposed Headpond.	NN 04735 16978
HP_OR10	Holt	None	16/05/2023	Space behind overhanging bank. Two old spraints outside, one possible mouldy spraint inside. Extends back 1 m. Non-breeding.	Within the proposed Headpond.	NN 04524 16285
HP_OR11	Lay-up	None	16/05/2023	Overhanging bank with space extending back 30cm. Slide up to hole. No evidence.	Within the proposed Headpond.	NN 04566 16297
HP_OR12	Lay-up	None	16/05/2023	Overhang with rocky floor, open at both ends. Two old, mouldy spraints inside.	Within the proposed Headpond.	NN 04587 16310
HP_OR13	Holt	None	16/05/2023	Overhanging bank with space extending back 1 m. One old, mouldy spraint inside.	Within the proposed Headpond.	NN 04633 16283
HP_OR14	Lay-up	None	16/05/2023	Beneath large mossy rock. Doesn't extend back. Quite exposed with several old spraints and some urine discolouring. Three old spraints.	Within the proposed Headpond.	NN 04749 16183
HP_OR15	Holt	None	16/05/2023	Beneath mossy rock. Dry but with two entrances. Extends about 2 m. No evidence.	Within the proposed Headpond.	NN 04760 16193
HP_OR16	Lay-up	None	16/05/2023	Large rocks which provide some shelter but no evidence.	Within the proposed Headpond.	NN 04808 16225
HP_OR17	Lay-up	None	16/05/2023	Overhanging bank with rock in front. Open at both ends. Pile of old spraints within.	Within the proposed Headpond.	NN 04955 16428
HP_OR18	Lay-up	None	18/08/2021	Covered area under overhanging bank with urine staining. One old and one fresh spraint.	Within the proposed Headpond.	NN 05071 16148
HP_OR19	Lay-up	None	16/05/2023	Dry space under overhang. One mouldy spraint.	Within the proposed Headpond.	NN 05115 16294
HP_OR20	Lay-up	None	16/05/2023	Overhanging bank with mossy rock in front. Open at both ends. One old spraint.	Within the proposed Headpond.	NN 05228 16316
HP_OR21	Lay-up	None	18/08/2021	Covered area under overhanging bank. Two old spraints.	Within access track water crossing.	NN 05461 16353
			16/05/2023	As before, no spraints.		

White rows indicate otter refuges that will not be impacted by works. Dark grey rows indicate refuges that will be destroyed.

Holt HP_OR06 – located on Lochan Airigh within the proposed Headpond – has the potential to be used as a natal holt, though no evidence to confirm this was ever found. HP_OR06 was identified early in the survey programme and has been subject to ongoing checks since 2019. Holt HP_OR06 was subject to camera trap monitoring in 2019, the results of which are described in the Camera trap survey section, below. In summary, an adult otter was frequently seen resting within and carrying bedding into the holt. Initially, the large number of spraints and remote location of HP_OR06 suggested it could be used for breeding. However, the altered structure of the holt for part of the monitoring period (during which a second entrance was opened), made this less likely due to the more 'drafty' and less sheltered nature of the holt. The most recent survey indicates that the second entrance is now blocked again, and it is more likely the holt could be used for breeding, though this cannot be confirmed without further monitoring.

The additional holts are very unlikely to be used as natal holts due to their open and 'drafty' nature, or because they are enclosed but are very damp either due to proximity to watercourses, or from seepage from the earth (occasionally peat) ceiling of the feature. In addition, the features are on hillsides which are exposed to the elements, and to predators, due to the relative lack of vegetation cover in the Moorland Zone.

In summary, five holts, one of which has the potential to be used as a natal holt, and thirteen lay-ups would be lost as a result of the Development in the Moorland Zone. All holts that lost would first be subject to disturbance from the initial works. No additional refuges will be subject disturbance. Three other refuges are sufficiently distant that no disturbance is likely.

A mammal burrow was also identified in the Moorland Zone in 2019 (see Other notable species) appeared to be in use by fox *Vulpes vulpes* at the time of survey, and no evidence was present to attribute this feature to otter, however it is possible that otter (or badger) could use this burrow in future. It was not found after 2019 and has likely been covered with vegetation through disuse.

Loch Awe

A total of six otter refuges – one holt and five lay-ups – were identified at loch Awe along Allt a' Chrosaid and Allt a' Gheataidh. Spraints were encountered at the refuges and along the bank of Loch Awe, along with a single deposit of anal jelly. Details of the otter refuges found are provided below in *Table 4 Loch Awe – Otter refuges identified during field survey* and all evidence is shown on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)*.

Table 4. Loch Awe – Otter refuges identified during field survey.

Ref	Type	Potential to be used as natal holt	Date	Description	Distance from Development	OSGR
LA_OR01	Lay-up	None	18/05/2023	Cavity in bank behind roots. Two recent spraints.	15 m from temporary compound.	NN 01017 16347
LA_OR02	Lay-up	None	12/05/2021	Cavity under overhanging bank connected to tree roots. One fresh, one recent and one old spraint present.	23 m from temporary compound.	NN 00856 15989
LA_OR03	Lay-up	None	18/05/2023	Under tree roots. One very old spraint.	24 m from temporary compound.	NN 00960 16011
LA_OR04	Lay-up	None	18/05/2023	Under roots of fallen tree on bank. Two old spraints.	37 m from temporary compound.	NN 00989 16006
LA_OR05	Lay-up	None	18/05/2023	Undercut bank. One old spraint.	27 m from temporary compound.	NN 01011 16035
LA_OR06	Holt	None	18/05/2023	Under tree roots, with old slide to water. Back of feature is visible. Two entrances. One old spraint.	29 m from temporary compound.	NN 01013 16034

White rows indicate otter refuges that will not be impacted by works. Light grey rows indicate refuges that will may be disturbed by works.

The holt does not have the potential to be used as a natal holt due to its fairly open internal structure which could be viewed in full during surveys, and because of its proximity to a medium sized water course, which makes the holt vulnerable to flooding.

In summary, no known otter refuges along Loch Awe are at risk of being destroyed, however one non-natal holt and four lay-ups are at risk of being disturbed by the Development. One lay-up is sufficiently distant that no disturbance is likely. However, note the survey limitation in the Limitations section above, that the survey along Loch Awe did not extend to the vicinity of the track/road tie-ins to the B840, which were not known at the time of survey.

Inveraray

A total of eleven otter refuges – five holts (none of which are natal holts) and six lay-ups – were identified in Inveraray, mainly along the River Aray but also on smaller tributaries, and, in the far south, along a small burn that enters Loch Fyne. Spraints were encountered on the majority of water courses, with larger concentrations corresponding to the locations of refuges. Details of the otter refuges found are provided below in *Table 5*, and all evidence is shown on *Figure 6.8 Otter survey results and incidental records (Volume 3: Figures)*.

Table 5. Inveraray – Otter refuges identified during field survey

Ref	Type	Potential to be used as natalholt	Date	Description	Distance from Development	OSGR
Inv_OR01	Lay-up	None	09/08/2021	Covered but fairly open cavity in stone wall with one recent and one old spraint inside.	146 m from track.	NN 09625 09565
			19/05/2023	As before. Pile of old and recent spraints.		
Inv_OR02	Holt	None	15/05/2023	Crack in base of tree stump facing river. No otter evidence.	135 m from track.	NN 09309 09650
Inv_OR03	Holt	None	09/08/2021	Large cavity in roots of large cypress tree. Dry and sheltered cavity with easy access to river. No otter evidence.	156 m from track.	NN 09303 09718
			15/05/2023	As before. One recent spraint within.		
Inv_OR04	Lay-up	None	09/08/2021	Cavity beneath moss covered concrete slab. Open at other end. Dry with at least five old spraints inside.	190 m from track.	NN 09309 09650
			15/05/2023	As before. Fresh spraints within.		
Inv_OR05	Holt	None	29/04/2021	Hole in base of felled tree extending back 1 m. One old spraint within.	148 m from track.	NN 09303 09718
			09/08/2021	As before with three recent spraints in entrance.		
			15/05/2023	As before with fairly recent spraint.		
Inv_OR06	Holt	None	29/04/2021	Cavity within felled tree. Fairly enclosed towards the back. One fresh spraint within.	108 m from track.	NN 09301 09760
			15/05/2023	As before with no fresh or recent spraints.		
Inv_OR07	Lay-up	None	15/05/2023	Small cavity in rocky bank. Doesn't extend back. Slide down to water. Two recent spraints.	93 m from track.	NN 09246 09797
Inv_OR08	Holt	None	30/04/2021	Tunnel dug into bank extending back at least 1.5 m, possibly further. Five old spraints and one recent within.	35 m from track.	NN 09016 09739
			15/05/2023	Tunnel entrance still open and clear but partly collapsed. Doesn't appear recently used. One old spraint. Non-breeding.		
Inv_OR09	Lay-up	None	15/05/2023	Cavity beneath lone twisted stump. Pile of old spraints with one fresh.	162 m from track.	NN 08650 09631
Inv_OR10	Lay-up	None	28/04/2021	Cavity under overhanging bank. Covered from above but open. Four old spraints.	49 m from proposed track.	NN 08402 07472
			09/05/2023	Exact feature not re-found, but no otter evidence in the vicinity.		
Inv_OR11	Lay-up	None	12/04/2021	Cavity under upturned tree on stream edge. Three old spraints.	60 m from proposed track.	NN 08314 07397
			09/05/2023	Exact feature not re-found, but no otter evidence in the vicinity.		

White rows indicate otter refuges that will not be impacted by works.

These holts are considered extremely unlikely to be used for breeding due to the large size of the River Aray, and also because of a high degree of human disturbance in these area.

No otter refuges are at risk of destruction or disturbance from the Development at Inveraray, because none of these holts are suitable for natal use and all are therefore sufficiently distant to be unaffected.

Upper Sonachan

A single old spraint was identified on a minor watercourse at Upper Sonachan on 12 August 2021. No other evidence of otter was identified.

Three Bridges

A total of twelve otter refuges – six holts and six lay-ups – were identified at Three Bridges, mainly along the Erallich Water, Allt Criche and River Aray, and also on smaller tributaries of these. Spraints were encountered on the majority of water courses, with larger concentrations corresponding to the locations of refuges, and some on very small tributaries. Details of the otter refuges found are provided below in *Table 6*.

Table 6. Three Bridges – Otter refuges identified during field survey

Ref	Type	Potential to be used as natal holt	Date	Description	OSGR
TB_OR01	Holt	None	31/05/2023	Under tree roots. Dry cavity with room to shelter but doesn't extend back. Three recent and four old spraints on adjacent rocks and slide.	NN 08888 12591
TB_OR02	Holt	None	13/08/2021	Large, dry cavity in tree roots extending back with possible slide. Quite open. No evidence.	NN 08892 12365
			31/05/2023	Entrance slightly eroded. No evidence.	
TB_OR03	Lay-up	None	18/08/2021	Rocky and exposed cavity under beech and oak roots. Three old spraints.	NN 08801 12271
			31/05/2023	As before with three old spraints.	
TB_OR04	Lay-up	None	18/08/2021	In roots of beech and oak. Exposed cavity behind rock. Possible mink scat.	NN 08792 12264
			31/05/2023	As before with two recent and one old spraint.	
TB_OR05	Holt	None	31/05/2023	Cavity under tree roots / overhanging bank. Extends back 1.5 m. Fairly sheltered. Two old spraints. Non-breeding.	NN 08689 12420
TB_OR06	Lay-up	None	31/05/2023	Small cavity under large boulder. Exposed but room to shelter. Five old spraints.	NN 08261 12329
TB_OR07	Lay-up	None	31/05/2023	Open cavity behind tree roots / overhanging bank. One old spraint.	NN 08072 12387
TB_OR08	Lay-up	None	18/08/2021	In roots of cherry. Three old spraints.	NN 07834 11869
TB_OR09	Lay-up	None	18/08/2021	Large cavity/cave under oak. At water level, will frequently wash out. Two old spraints.	NN 07739 11847
TB_OR10	Holt	None	30/05/2023	Under overhanging bank. Sheltered but open at far end. Extends about 1 m. One old spraint.	NN 07693 11850
TB_OR11	Holt	Potential	18/08/2021	Large cavity under birch and rowan. One old spraint.	NN 07696 11830
TB_OR12	Holt	None	19/05/2023	Two potential holts under large boulders with dry cavities extending back about 1 m. No evidence.	NN 07067 12552

As noted above, the surveys included Three Bridges because they took place before it was confirmed that the Development would not carry out any works in this area. Therefore none of the otter refuges in this area would be impacted by the Development.

Blarghour

A total of three otter refuges – all lay-ups – were identified at Blarghour, all on small tributaries of the Allt Blarghour. Smaller tributaries of these. Spraints were also found on these and on small tributaries of the Erallich Water. Details of the otter refuges found are provided below in *Table 7*.

Table 7. Blarghour – Otter refuges identified during field survey

Ref	Type	Potential to be used as natal holt	Date	Description	OSGR
BG_OR01	Lay-up	None	17/05/2023	Rocks leaning against each other with cavity beneath. One recent spraint.	NN 04127 712968
BG_OR02	Lay-up	None	17/05/2023	Gap under mossy rock at edge of bank. Does not extend back. One recent and four old spraints. Also possible pine marten dropping on same rock as spraints.	NN 03604 713519

Ref	Type	Potential to be used as natal holt	Date	Description	OSGR
BG_OR03	Lay-up	None	17/08/2021	Cavity under overhanging bank. Two old spraints.	NN 03444 713723
			17/05/2023	As before with one old spraint.	

As noted above, the surveys in the Blarghour area are included because they took place before it was confirmed that the Development would not carry out any works in this area. Therefore none of the otter refuges in this area will be impacted by the Development.

4.3. Water vole

No recent desk study records of water vole were held by the NBN Atlas.

During the field surveys, all evidence of water vole was located within in the vicinity of the proposed Headpond, in the Moorland Zone. In this area, there are flatter or shallowly-sloping areas with suitable habitat including slow-flowing, deep streams and also wet flushes and damp areas with large swathes of soft rush. However, many of surveyed watercourses within the Moorland Zone are also unsuitable for water vole, including the lower reaches of Allt Beochlich and Buinne Dhubh, being too large, fast-flowing, steep and/or lacking suitable vegetation.

No evidence of water vole was found elsewhere. Within the Development Site (Loch Awe, Inveraray, Three Bridges, Upper Sonachan) the watercourses are also unsuitable or at best highly sub-optimal because they are either too large, too steep, too fast-flowing or heavily shaded by existing woodland or brash from commercial conifer plantations, and therefore do not support the lush vegetation required by water vole for foraging.

Evidence within the Moorland Zone tended to be found in clusters. The locations within which clusters of or sometimes individual evidence occurred have been numbered, and the evidence found at each numbered location is set out in Table 8, below. Figure 6.9 Water vole survey results and incidental records (Volume 3: Figures) shows the locations of recorded water vole evidence, and examples of evidence found are shown in the Photograph Annex at the end of the appendix.

Table 8. Summary of water vole survey results

Ref	Date	Description of area / evidence	Distance from Development	Central OSGR
WV01		<i>Marginal vegetation surrounding Lochan Romach and extending mostly along a highly suitable deep, long and slow flowing outflowing watercourse, with good deep banks for burrowing and plentiful rushy vegetation.</i>	Closest burrow to infrastructure is approximately 150 m from permanent compound PC19	NN 02625 15704 (Lochan Romach outfall)
	2019	Not surveyed.		
	27/04/2021	Three possible burrows, one of which was adjacent to possible footprints. Also three groups of droppings- two containing eight droppings and one containing five. All found along the ditch.		
	10/08/2021	Five latrines were found, each containing at least five droppings. These were both old and recent, and included recent 'stamped' droppings. Feeding remains and a single potential burrow were also identified. All found along the ditch.		
	10/05/2023	Several possible burrows with slides down to water. Also two small collections of droppings and a large amount of feeding remains. All found along the ditch.		
18/05/2023	Three potential burrows with feeding remains along the north edge of Lochan Romach. Also a single dropping adjacent to the ditch.			
WV02		<i>A generally flat area with large stands of soft rush and bare earth surrounding a narrow slow-flowing burn, approximately 40 m north-west of Lochan Airigh, adjacent to a tributary of Allt Beochlich.</i>	Within proposed headpond.	NN 04260 16563
	17/07/2019	Three latrines and one burrow were identified. The burrow in this area was recorded with a single water vole dropping within the entrance. Nibbled vegetation, cut at a 45-degree angle, was observed in the surrounding area. Three latrines were also recorded in the area, two of which contained approximately ten droppings each.		

Ref	Date	Description of area / evidence	Distance from Development	Central OSGR
	11/08/2021	A possible above ground nest, a ball of grass which was dry within, was identified to the south-east of WV02. Small groups of possible burrows were recorded in the south-east and north-west of WV02. Also in the south-west were four latrines, and two smaller collections of droppings with slides leading to the water.		
	18/05/2023	A single dropping was recorded on a flat muddy area next to the stream. No other evidence.		
WV03		<i>Rushy vegetation adjacent to the southern edge of Lochan Airigh, and extending along the stream down a steep slope to Buinne Dhubh</i>	Within proposed headpond.	NN 04321 16373
	17/07/2019	No evidence.		
	11/08/2021	No evidence.		
	10/05/2023	Six potential burrows – three along the bank of Lochan Airigh and three along the outfall stream. One of these along the stream was adjacent to feeding remains.		
WV04		<i>A tributary of Buinne Dhubh in an area dominated by soft rush.</i>	Within proposed headpond.	NN 04657 16431
	18/07/2019	A latrine containing approximately ten water vole droppings was recorded, along with vegetation cut at a 45-degree angle. A burrow was also recorded leading down to the water and nibbled vegetation and small mammal runs were observed throughout the surrounding rushes.		
	11/08/2021	No evidence.		
	16/05/2023	No evidence.		
WV05		<i>Extremely wet and rushy plateau on a minor tributary of Buinne Dhubh.</i>	Within proposed headpond.	NN 04726 15712
	2019	Not surveyed.		
	19/08/2021	A group of four burrows with eight associated latrines, and also a single old latrine. Several small groups of droppings.		
	11/05/2023	A single possible burrow. No other evidence.		
WV06		<i>Rushes along the headwaters of Allt Mor.</i>	Northern possible burrow 8 m from access track route.	NN 04676 15153
	2019	Not surveyed.		
	27/04/2021	A single possible burrow to the north of WV06. No other evidence.		
	11/05/2023	A single possible burrow to the south of WV06. No other evidence.		
WV07		<i>Extremely wet and rushy plateau between minor tributaries of Buinne Dhubh.</i>	Within proposed headpond.	NN 05371 16114
	2019	Not surveyed.		
	18/08/2021	Possible single dropping. No other evidence.		
	16/05/2023	No evidence.		
WV08		<i>Extremely rushy area along a minor tributary of Buinne Dhubh. Water is shallow.</i>	Within proposed headpond.	NN 05016 16498
	18/07/2019	No evidence.		
	18/08/2021	No evidence.		
	16/05/2023	Single possible burrow with feeding remains and trail to water. No other evidence.		
WV09		<i>Rushy area on tributary of Allt Mor.</i>	Immediately adjacent to southern embankment of the proposed Headpond.	NN 0372716 152
	17/07/2019	No evidence.		
	11/08/2021	No evidence.		
	10/05/2023	Single possible burrow. No other evidence.		

The largest amount of, and most constant, evidence was identified at WV01 (Lochan Romach) and WV02 (north of Lochan Airigh). The other areas tended to have only small amounts of sporadic evidence across 2019, 2021 and

2023. This, however, is consistent with the population structure of the species (SNH, 2005), whereby a metapopulation is maintained by dispersal between smaller populations. These smaller populations may be subject to local extinctions or colonisations from year to year.

4.4. Badger

No records of badger were held by the NBN Atlas Scotland within the desk study search distances.

During the field surveys, no evidence of badger was found anywhere on the Development Site except at Inveraray NE, and (although no longer relevant to the Development) at Three Bridges. No badger setts were found.

Evidence at Inveraray comprised:

- A latrine comprising two dung pits identified in 2021, located north of the Inveraray NE forest track;
- Latrines within Duchess Louise Wood. One was located in 2021 and contained fresh dung at this time. In 2023, there was no latrine at this location but another latrine was identified nearby, containing 1 dung pit with fresh dung;
- Snuffle holes in the vicinity of the latrines in Duchess Louise Wood identified in both 2021 and 2023;
- A single snuffle hole adjacent to a field drain south of the Inveraray NE forest track, identified in 2023.

Evidence at Three Bridges was limited to two freshly dug-out bumble-bee nests, both found in 2021, one of which was near a single fresh badger dropping.

All badger evidence is shown on *Figure 6.10 Pine marten, badger and red squirrel survey results and incidental records (Volume 3: Figures)*.

A mammal burrow was identified in the Moorland Zone in 2019 (see Other notable species). This feature appeared to be in use by fox at the time of survey, and no evidence was present to attribute this feature to badger, however it is possible that badger (or otter) could use this burrow in future.

No other evidence of badger was found during any ecological field survey conducted in 2019, 2021 or 2023. Given the extensive coverage of the survey area during other surveys, badger is considered absent from within at least 100 m of the Development, with the exception of Inveraray and (now not relevant) Three Bridges. At the latter two areas, there are however no known badger setts within 100 m of the Development.

4.5. Pine marten

All pine marten field evidence is shown on *Figure 6.10 Pine marten, badger and red squirrel survey results and incidental records (Volume 3: Figures)*.

The NBN Atlas Scotland held one record of pine marten from the vicinity of the Development Site, from the 1 km grid square south-west of the Development Site at Inveraray. This was from 2020 and was provided by the Mammal Society.

Localised parts of the Site, particularly where there is mature semi-natural woodland such as Loch Awe and Inveraray, provide good habitat for pine marten, including an abundance of mature trees with possibility of dens. Areas of mature conifer plantation, such as those at Inveraray, Upper Sonachan and (now irrelevant) Three Bridges are also suitable, though may provide fewer sheltering opportunities. The higher altitude open moorland, such as that within the Moorland Zone (and the now less relevant Blarghour section), is less favourable given the distance from woodland habitat and relative scarcity of potential sheltering opportunities. Pine marten could possibly shelter within occasional scree, rock aggregations or amongst riparian boulders in or near the Moorland Zone, although no dens were found in the Moorland Zone and evidence of pine marten presence was sparse in this area (see further below).

Three incidental sightings of individual live pine martens were made during the surveys by AECOM ecologists, confirming the presence of the species. One of these was from the access track at Three Bridges (now less relevant since the Development will not construct the access track here) on 19 May 2023. The other two observations were made off Site – one along the B840 between Balliemanoch Farm and Portsonachan on 03 July 2019, and one along the A819 close to the Upper Sonachan access route on 19 June 2019. Anecdotal evidence from communication with a local resident in 2019 also indicated that pine marten is regularly seen near the Tailpond area, adjacent to Loch Awe.

Two potential pine marten dens were identified:

- PM01 – a likely den within a mature oak which was identified during aerial surveys for bat roosts on 01 July 2021¹. This is adjacent to the garden where a local resident has observed pine marten. PM01 is approximately 24 m from the temporary construction compound adjacent to Loch Awe;
- PM02 – a potential den comprising a tunnel in tree roots with one very old scat. Open at both ends. Identified on 15 May 2021. PM02 is approximately 21 m from the Inveraray north-east access track.

Pine marten scats were most abundant along the tracks at Inveraray and in woodland adjacent to Loch Awe. A few were found along the tracks amongst conifer plantation at Upper Sonachan. Scats were rare in the Moorland Zone – one was found in the Headpond area, and three outside it including two at Lochan Romach where the known water vole presence could constitute a prey resource. A small number of scats were also found at Three Bridges and Blarghour (now less relevant since the Development will not construct an access track here).

Pine martens preferentially scat in prominent areas, such as on tracks, and scats are easier to find on tracks when compared with vegetation. It is possible that the presence of pine marten has been underestimated in areas without tracks. Pine marten scats also cannot be identified with absolute certainty without carrying out genetic analysis, which was not done. However, the recorded scats were typical of pine marten (dark, of the correct size/proportions, and twisted and/or looped), and the live sightings considerably increase the confidence with which scats can be attributed to pine marten.

4.6. Wildcat

The desk study indicated that the Development Site, and wider parts of Argyll, is within the range of wildcat based on information provided by the Mammal Society² and by NatureScot³, but is not within a wildcat priority area (Scottish Wildcat Action, 2014). Recent studies by NatureScot (Campbell, 2023) indicated that there was “scant evidence” of wildcat in Argyll and the Trossachs. However, the small amount of evidence that is present, based on public sightings submitted to iRecord between April 2015 and March 2020, does include a ‘plausible’ but unverified wildcat sighting immediately north of Loch Fyne, approximately 14 km south-west of the Development Site at closest. The nearest verified record of wildcat from this dataset is from Tayvallich, approximately 40 km south-west of the Development Site.

The NBN Atlas did not hold any recent records of wildcat within 1 km of the Development Site. The two most recent records (from Biological Records Centre) were from 1985 and of imprecise date between 1960 and 1994, both from the hectad containing the Development Site. No further information or more precise locations were provided.

No evidence of wildcat was found anywhere within the survey area during extensive surveys in 2019, 2021 and 2023, including on trail cameras. Similarly, surveys for the nearby Blarghour Wind Farm also did not find any evidence of wildcat, despite rare recording of pine marten which uses similar habitats (Ramboll/ESB/Coriolis Energy, 2018). However, suitable habitat for wildcat is present within the survey area, in particular near Loch Awe where there is a mosaic of moorland, rough grazing, pasture, scrub, broadleaved woodland and conifer plantation, and also in the wider landscape well beyond the Development footprint. Wildcats mostly use mosaics of habitat providing shelter and foraging. In Scotland, they tend to use woodland and riparian edges, young or old pine woodland, conifer plantations (including clear-fell), rough grassland and scrub; they do not favour open moorland (although have been known to use it in summer where near woodland and supporting rabbit prey and rocky areas suitable for dens) and also avoid long-lying and/or deep snow (Kilshaw *et al.*, 2023). Consequently, the extensive and very open upland moorland habitat constituting the majority of the Development Site (and all of the Headpond area) is unfavourable for wildcat (particularly given an apparent absence of rabbits/hares and no apparent denning potential at localised rocky slopes near the Headpond).

In view of the above, wildcat is considered likely absent from the Development Site.

4.7. Red squirrel

Recent records of red squirrel provided by the NBN Atlas (sources – the Mammal Society, Scottish Wildlife Trust, Argyll Biological Records Centre, Biological Records Centre, British Trust for Ornithology) are numerous and widespread within the study area. Records are particularly concentrated at Inveraray and Portsonachan, and this likely reflects the places that red squirrels are most likely to be observed by members of the public. These results

¹ In Appendix 6.5: Bats for this EIA this tree is referred to as “Awe20”.

² <https://www.mammal.org.uk/wp-content/uploads/2022/07/Wildcat-Fact-Sheet-v2.pdf>

³ <https://digital.nls.uk/pubs/e-monographs/2020/216528007.23.pdf>

are broadly reflected by the Saving Scotland's Red Squirrels website⁴. The desk study indicates that grey squirrels are absent from the study area.

Highly suitable mature, semi-natural woodland habitat for red squirrel is present along the banks of Loch Awe and around Inveraray. Though less suitable, the species likely also uses the blocks of mature commercial plantation near and within the Development Site. These commercial plantations are dominated by Sitka spruce *Picea sitchensis* which is well-known to be the least favourable type of woodland for red squirrel with typically low red squirrel densities. Harris & Yalden (2008), Bryce *et al.* (2005) and Lurz *et al.* (1995) all indicate that red squirrel density is lowest in Sitka spruce-dominated plantation, owing to factors such as small seed size (pine-dominated woodland is the most favourable). For these reasons, red squirrel density in conifer plantation within the survey area, which is dominated by Sitka spruce, can be expected to be low.

Several incidental observations of live red squirrels were made by AECOM ecologists. These include two in Inveraray (one in the north and one in the south) in 2023. The other observations were distant from the Development on a public road while driving to/from the Development Site. These sightings are shown on *Figure 6.10 Pine marten, badger and red squirrel survey results and incidental records (Volume 3: Figures)*.

As noted above, no dedicated red squirrel survey was carried out. However, no incidental observations of dreys were made whilst surveying for other protected mammals, including during thorough inspections of broadleaved trees for bat roost suitability. Nor was any footage of red squirrel recorded on the deployed motion sensitive trail cameras, three of which were located within suitable woodland habitat.

However, desk study data indicates that red squirrels are ubiquitous in woodland in the survey area, and their at least occasional presence in woodland within and adjacent to the Site can reliably be assumed.

4.8. Other notable mammal species

The NBN Atlas Scotland returned nine recent records of hedgehog, as provided by Argyll Biological Records Centre, The Conservation Volunteers, the Mammal Society and the Biological Records Centre. These were mainly from around Inveraray and the public road through Portsonachan. Several of these records were of hedgehogs killed by vehicles. No recent records of any other notable mammal species, including mountain hare, were identified by the desk study.

No sightings or evidence of other notable mammal species were recorded during the field surveys.

Older records held by the NBN Atlas Scotland indicate that mountain hare was historically present on or near the Development Site. Two records from 1959 and 1960 (both Biological Records Centre) show mountain hare as present within the hectad containing the Site (the centre of this hectad being at the proposed Headpond). Considering records out to approximately 20 km, recent records (since 2000) appear to be north/east of Loch Awe and between Lochgoilhead (in the south) and Dalmally (in the north), leaving the location of the Development Site (between Loch Awe and Loch Fyne) devoid of records. The nearest recent record is from 2006 (NatureScot), in the hectad north of that containing the Site, which likely places it north of Loch Awe and therefore not connected to the Site. The mammal survey technical report for the nearby Blarghour Wind F arm (Ramboll/ESB/Coriolis Energy, 2018) also did not find evidence of mountain hare except historically, and quotes anecdotal evidence of historic efforts to eliminate lagomorphs from the vicinity.

A mammal burrow was recorded in 2019 in the north-east of the Moorland Zone at OSGR NN 04913 17746, amongst heathland adjacent to an un-named tributary of Allt na Cuile Riabhaiche. When found this was only a short tunnel, approximately 1.5 m deep, with a fox footprint and likely fox guard hair on the small spoil heap at the entrance to the burrow, which is considered to have been a fox den. However, given close proximity to the watercourse, there is potential for future enlargement and use by other species including otter. This burrow could not be re-located on subsequent visits in 2021 and 2023, and it may have become overgrown with vegetation through disuse.

⁴ <https://scottishsquirrels.org.uk/squirrel-sightings/>

4.9. Camera trap survey

4.9.1. Camera trap monitoring of holt at Lochan Airigh

The only protected mammal species recorded by the motion sensitive trail cameras was otter using the holt HP_OR06 on the bank of Lochan Airigh in the proposed Headpond area, as recorded by camera CT4.

Video footage of an otter using HP_OR06 for resting was recorded on four days in July 2019, over a twenty-day monitoring period as described in *Table 2*. The video footage is described in *Table 9* and captured the otter apparently collecting soft rush *Juncus effusus* and mosses for bedding, and entering and exiting the holt multiple times.

Table 9. CT4 results from holt HP_OR06

Date (2019)	Otter visit number	Number of recordings during otter visit	Time of otter visit	Description of Activity
19 July	1	3	23:41 – 23:43	Otter enters holt three times, then settles within.
	2	1	00:50	Otter exits holt.
	3	9	19:00 – 19:11	Otter enters and exits holt numerous times with bedding. Recordings start with otter inside holt and finish with it leaving the holt.
20 July	4	1	20:42	Otter enters holt and disappears out of sight.
	5	1	21:41	Otter enters holt and settles within.
	6	1	01:11	Recording starts with otter at entrance to holt, as if having exited. It then leaves the area.
21 July	7	2	09:56 – 09:57	Recording starts with otter at the entrance to the holt, as if returning from the lochan. It then leaves the area.
	8	4	20:43 – 20:47	Otter enters the holt twice with bedding, once without, then leaves the area.
	9	1	23:42	Otter exits holt and leaves the area.
28 July	10	1	23:59	Otter enters holt and settles within.
	11	2	03:27 – 03:28	Otter enters holt and settles within.
	12	1	23:18	Otter enters holt and disappears out of sight.
One recording between 19 August and 30 September.				Otter recorded using the holt once in this date range. No further information available.

There are two instances where camera trap recordings indicate that the otter may have spent an extended period inside the holt: 1 hour and 7 minutes between otter visits 1 and 2, and 3 hours 30 minutes between otter visits 5 and 6. As described in the Limitations section, the camera trap was not fully effective in detecting and recording all otter activity, and it is therefore possible that the otter exited and re-entered the holt during these periods. It is also possible that the otter spent longer in the holt at other times, and the entry or exit was not recorded.

No other notable mammals were recorded on this trail camera.

4.9.2. Camera traps elsewhere

No protected or notable mammals were recorded on the other trail cameras.

However, deer were recorded, comprising red deer *Cervus elaphus*, roe deer *Capreolus capreolus* and possibly sika deer *Cervus nippon*:

- CT1 (Balliemeanoch) – recorded roe deer only;
- CT2 (at ruined shieling in Headpond area) – did not record any mammals of note;
- CT3 (Upper Sonachan plantation trail/clearing) – recorded roe deer, red deer and possibly (unconfirmed due to the poor quality of the image) sika deer;

- CT5 (Inveraray) – recorded frequent red deer.

Deer were also the most common mammals recorded on trail cameras deployed for the nearby Blarghour Wind Farm, where 24% of recording days/nights captured red deer, and red deer accounted for 66% of all recordings (Ramboll/ESB/Coriolis Energy, 2018).

5. Conclusion

The Development Site contains numerous water features suitable for and used by otter, including Lochan Airigh and associated watercourses. The following otter features are at risk due to disturbance or lost of habitat as a result of the Development:

- Five holts (one of which might be used for breeding purposes, although no evidence of this was found during the surveys) and thirteen lay-ups will be destroyed in the Moorland Zone, and most or all would be subject to construction disturbance before they are destroyed;
- One non-natal holt and four lay-ups may be disturbed at Loch Awe;
- No otter holts will be disturbed / destroyed at Inveraray.

No known holts or lay-ups will be impacted at Inveraray - where all identified refuges are sufficiently distant - or at Upper Sonachan, where no refuges were found.

There is localised suitable habitat for water vole in the Moorland Zone, where evidence was found locally. Outside the Moorland Zone, no water vole evidence was found and habitat is suboptimal at best, and water voles are assumed absent. Evidence in the Moorland Zone was most reliable (i.e. with latrines/droppings) at only two locations within the Headpond area, and one at Lochan Romach. The latter was most consistent over multiple survey years, but the others did not contain evidence in some survey years or the evidence was very little. Overall, assuming all possible burrows as well as confirmed burrows (with latrines/droppings) in all survey years are water vole burrows, there are approximately 24 recorded burrows in the Headpond area (including one at the very edge), and one possible nest, at seven broad locations spread widely apart. However, at each location only some of the burrows, and in some cases none, were present in different survey years, indicating movement of an apparently small metapopulation in the Headpond area between years. Given the number of burrows, the number of water voles within the Headpond area does not appear likely to much exceed 10-20, although it is possible that some burrows have not been detected. At Lochan Romach, a count of the burrows in the same way gives approximately ten burrows, and although again the burrows are liable to vary between years, there was frequent latrine and dropping evidence here, and it is significant that the habitat here is the best seen during the surveys for water vole (particularly the deep slow-flowing outflowing watercourse with deep diggable banks and rushy vegetation). The exact locations of water vole burrows would need to be determined nearer the time of construction given variability between years.

Suitable habitat for pine marten is frequent in the Development Site, although the main Moorland Zone is sub-optimal. Two known potential pine marten dens are located by Loch Awe and north of Inveraray.

Red squirrels are likely to occur in all woodland in the area (if in low density), and therefore dreys may be established within proposed tree-felling zones. This is only relevant to the very localised works affecting trees at Loch Awe, Upper Sonachan and Inveraray.

Limited potential habitat suitable for wildcat is present, mainly near Loch Awe. However desk study evidence and lack of field survey evidence (including on trail cameras), as similarly reported by surveys for Blarghour Wind Farm (Ramboll/ESB/Coriolis Energy, 2018), indicate that wildcat is likely absent from the Development vicinity.

Suitable badger habitat is present in the Site, mainly around Inveraray and beside Loch Awe, but badgers are likely absent from the Moorland Zone with no recorded evidence and sub-optimal habitat. The limited badger evidence found away from the Moorland Zone did not include any badger setts and was only near Inveraray.

There is no recent evidence of mountain hare, and hedgehog would be restricted to less-impacted lowland parts of the Development Site only.

Deer were frequently recorded on trail cameras, including both roe deer and red deer.

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7. Photograph Annex

Otter refuges found during surveys are shown below on *Table A-10*.

Table A-10. Photographs of otter refuges

Refuge location, reference, type and photograph

Moorland Zone

HP_OR01 (holt)



HP_OR02 (lay-up)



HP_OR03 (holt)



HP_OR04 (lay-up)



HP_OR05 (holt)



HP_OR06 (potential natal holt)



HP_OR07 (lay-up)



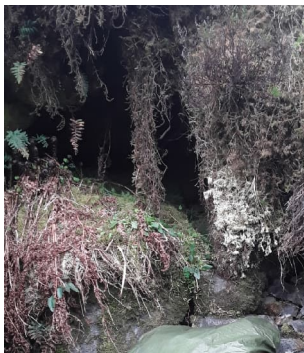
HP_OR08 (lay-up)



HP_OR09 (lay-up)



HP_OR10 (holt)



HP_OR11 (lay-up)



HP_OR12 (lay-up)



Refuge location, reference, type and photograph

HP_OR13 (holt)



HP_OR14 (lay-up)



HP_OR15 (holt)



HP_OR16 (lay-up)

N/A

HP_OR17 (lay-up)



HP_OR18 (lay-up)



HP_OR19 (lay-up)



HP_OR20 (lay-up)



HP_OR21 (lay-up)



Loch Awe

LA_OR01 (lay-up)



LA_OR02 (lay-up)



LA_OR03 (lay-up)



Refuge location, reference, type and photograph



LA_OR04 (lay-up)

LA_OR05 (lay-up)

LA_OR06 (holt)

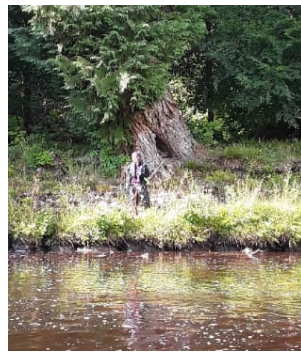


Inveraray

Inv_OR01 (lay-up)

Inv_OR02 (holt)

Inv_OR03 (holt)



Inv_OR04 (lay-up)

Inv_OR05 (holt)

Inv_OR06 (holt)



Refuge location, reference, type and photograph



Inv_OR07 (lay-up)



Inv_OR08 (holt)



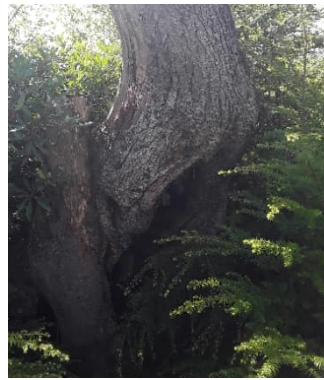
Inv_OR09 (lay-up)



Inv_OR10 (lay-up)



Inv_OR11 (lay-up)



Three Bridges

TB_OR01 (holt)



TB_OR02 (holt)



TB_OR03 (lay-up)



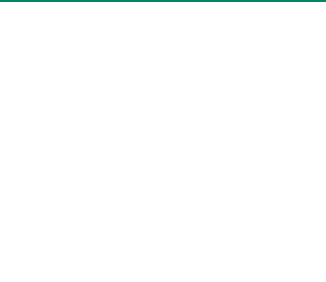
Refuge location, reference, type and photograph



TB_OR04 (lay-up)



TB_OR05 (holt)



TB_OR06 (lay-up)



TB_OR07 (lay-up)



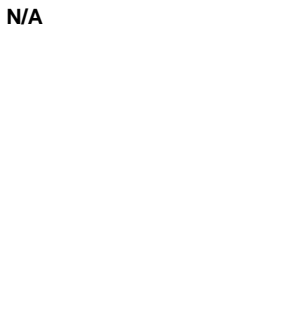
TB_OR08 (lay-up)



TB_OR09 (lay-up)



TB_OR10 (holt)



TB_OR08 (lay-up)
N/A



TB_OR09 (lay-up)
N/A



TB_OR10 (holt)



TB_OR11 (potential natal holt)
N/A



TB_OR12 (holt)

Blargour

BG_OR01 (lay-up)



BG_OR02 (lay-up)



BG_OR03 (lay-up)



Examples of water vole evidence and suitable habitat found within the Moorland Zone are shown below on *Table A-11*.

Table A-11. Photographs of water vole evidence and habitat

Area reference, year found and photograph

WV01		
2021	2021	2021
		
2023	2023	2023
		
WV02		
2021	2021	2021
		

Area reference, year found and photograph

WV03

2023



2023



2023



WV04 – N/A

WV05

2021



2021



2023



WV06

2021



2023



WV07

2021



Area reference, year found and photograph

WV08	WV09
2023	2023
	

The potential pine marten dens found during surveys are shown below on *Table A-12*.

Table A-12. Photographs of potential pine marten dens

Den reference, photograph and year taken

PM01 - 2021		   
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Den reference, photograph and year taken

PM02 - 2023



