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Red John Pumped Storage Hydro Scheme

Volume 5, Appendix 6.2: Bat Survey Report

ILI (Highlands PSH) Ltd.

November 2018

Quality Information

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Revision History

Revision	Revision Date	Details	Authorized	Name	Position
1	November 2018	Submission	CA	Catherine Anderson	Associate Director

Distribution List

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Appendix 6.2 Bat Survey Report

6.1 Introduction

Background

6.1.1 AECOM was appointed by Intelligent Land Investments (ILI) to carry out an Environmental Impact Assessment (EIA) for the proposed Red John Pumped Storage Hydro Scheme (hereafter also referred to simply as the 'Development').

6.1.2 The area encompassed by the red line boundary of the Development is hereafter also referred to as the 'Development Site'.

6.1.3 As part of the EIA process, the Red John Scoping Report (which can be found in Appendix 4.2: Scoping Report) identified the potential for a number of bat species to be present in the vicinity of the Development.

Purpose of this Report

6.1.4 This report has been written as an Appendix to Chapter 6: Terrestrial Ecology (Volume 2). It describes the methods used to survey for the presence of bat species and sets out and discusses the results obtained. Where appropriate, it provides recommendations for mitigation to minimise the ecological impacts of the Development and highlights opportunities for biodiversity enhancement.

Development and Site Description

6.1.5 A full description of the Development can be found in Chapter 2: Project and Site Description. The habitats within the area encompassed by the Development vary with altitude. On the lower slopes rising up from Loch Ness there is extensive ancient semi-natural broadleaved woodland whilst on the higher ground and around the Headpond the woodland becomes coniferous, predominantly comprising Scots pine *Pinus sylvestris*, which in places is considered to be ancient of plantation origin. Outside of the woodland habitats there are areas of semi-improved grassland, blanket bog and wet heath.

6.1.6 There are a number of waterbodies in the vicinity of the Development and associated Development Site boundary, including large oligotrophic lochs as well as smaller ponds.

Legislative and Policy Context

6.1.7 All species of bats found in Scotland are protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (more commonly known as the 'Habitats Regulations'). The Habitats Regulations make it an offence to deliberately or recklessly:

- Capture, injure or kill a wild bat;
- Harass a bat or group of bats;
- Disturb a bat in a roost;
- Disturb a wild bat while it is rearing or otherwise caring for its young;
- Obstruct access to a bat roost or to otherwise deny the animal use of the roost;
- Disturb a bat in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of that species; and

- Disturb a bat in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

6.1.8 It is also an offence to damage or destroy a breeding site or resting place of a bat and this does not need to be done deliberately or recklessly to constitute an offence.

6.1.9 A licence must be obtained from Scottish Natural Heritage (SNH) for any action that could otherwise constitute an offence under the Habitats Regulations. As European Protected Species (EPS), a licence can only be issued for a development subject to three strict qualifiers being met:

- It must be required for preserving public health or public safety or for some other imperative reasons of overriding public interest, including those a social or economic nature and beneficial consequences of primary importance the environment;
- There must be no satisfactory alternative; and
- The proposed action must not be detrimental to the maintenance of the species at favourable conservation status.

6.1.10 Local planning policies for the region are detailed in the Highland Council's Highland-wide Local Development Plan (HwLDP). Table 6.1 provides a summary of those policies which are of relevance to the conservation of bat species.

Table 6.1 Summary of Relevant Policies within the Highland-wide Local Development Plan

Planning Policy	Purpose
Policy 28 – Sustainable Development	The Council will support developments which promote and enhance the social, economic and environmental wellbeing of the people of Highland. Proposed developments will be assessed on the extent to which they impact on habitats and species.
Policy 57 – Natural, Built and Cultural Heritage	All development proposals will be assessed taking into account the level of importance and type of heritage features, the form and scale of the development and any impact on the feature and its setting.
Policy 58 – Protected Species	Surveys are required to confirm the presence of protected species on a site. A mitigation plan will be required, prior to determining the application, to avoid or minimise any impacts of protected species. Development that is likely to have an adverse effect on protected species will only be permitted where: there is no satisfactory alternative; the development is required for preserving public health or public safety and/or other imperative reasons of over-riding public interest; and/or, the development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in its natural range.
Policy 59 – Other Important Species	The Council will have regard to the presence of and any adverse effects of development proposals on other important species. These include species listed on Annexes II and V of the Habitats Directive, priority species listed in the UK and Local Biodiversity Action Plans (BAP) and species included on the Scottish Biodiversity List (SBL).
Policy 60 – Other Important Habitats	The Council will seek to safeguard the integrity of features of the landscape which are of major importance because of their linear and continuous structure or their importance as corridors for the movement of wild fauna and flora. The Council will have regard to the value of other important habitats, which include: habitats listed on Annex I of the Habitats Directive; habitats of priority and protected bird species; priority habitats listed in UK and Local BAPs; and, habitats included on the SBL.

Planning Policy	Purpose
Policy 67 – Renewable Energy Developments	The Council will support proposals for renewable energy development where it is satisfied that they will not have significant detrimental effects on natural heritage features, species and habitats.

6.1.11 Ten species of bat are found in Scotland, nine of these are identified as being of principal importance for biodiversity conservation through their inclusion on the Scottish Biodiversity List. The SBL is designed to highlight the species (and habitats) which are of highest priority for nature conservation to assist public bodies carrying out their biodiversity duty, as required by the Nature Conservation (Scotland) Act 2004.

6.1.12 Five bat species are also Priority Species of the Inverness and Nairn Local Biodiversity Action Plan (LBAP) which outlines various measures to protect and enhance the conservation status of species in the region. These are brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Daubenton's bat *Myotis daubentonii* and Natterer's bat *Myotis nattereri*. Additionally, selected habitats of importance to bat species are also identified as priorities for conservation and enhancement.

6.2 Methods

Desk Study

6.2.1 A desk study was carried out to identify nature conservation designations for which bat species are qualifying / notified features and to search for records of bat species in proximity to the Development.

6.2.2 A stratified approach was taken when defining the desk study area, based on the likely zone of influence of the Development on bats and an understanding of the maximum distances typically considered by statutory consultees. Accordingly, the desk study identified any international nature conservation designations within 10 km of the Development Site boundary and other national statutory and local non-statutory nature conservation designations within 2 km. A data search for records of bats within 2 km of the Development was also undertaken.

6.2.3 The desk study was carried out using the Scottish Natural Heritage SiteLink website (https://gateway.snh.gov.uk/sitelink/) to identify nature conservation designations within 2 km of the Development. A data request was submitted to the Highland Biological Recording Group (HBRG) on 04 August 2017 requesting all records of bat species within 2 km of the Development.

Field Survey

Ground-based Bat Roost Suitability Assessment

6.2.4 Following a review of aerial imagery and based on an understanding of the Site gained through completion of a Phase 1 habitat survey as part of the Preliminary Ecological Appraisal (PEA) for the Development (AECOM's PEA Report can be found as an appendix to the Scoping Report for the Development which itself is provided in Appendix 4.1), a walkover of suitable habitats was undertaken in order to assess the bat roost suitability of all trees and structures which may be impacted upon or lost to the Development.

6.2.5 The survey was conducted by experienced AECOM ecologists on 20 and 21 March 2018. Assessments followed the guidelines published by the Bat Conservation Trust (BCT) (Ref 1) and were carried out from the ground where access was safely possible, using binoculars and torches, as necessary. Potential roost features (PRF) searched for included suitable holes, cracks or splits in trees, and any possible ingress points in structures. Where such features existed, evidence searched for included droppings, staining, foraging remains, auditory evidence, and sightings of live or dead bats.

6.2.6 Any PRF which were identified were assigned a suitability category ('negligible', 'low', 'moderate', 'high' or 'confirmed' (if a bat was seen to be present)), as defined in the BCT guidelines (Ref 1), and the tree / structure was assigned a reference number.

Tree Climbing Inspection of PRFs

6.2.7 Trees identified by the bat roost suitability assessment described above as having moderate or high bat roost suitability were then subject to survey at height (where possible) using specialist equipment (ladder, rope and harness). Such surveys allow more detailed inspections of potential roost features than is possible from ground-based inspections. The more detailed information gained then allows for a more informed assessment of bat roost suitability and thus the requirement for further survey. Where considered safe, based on the structural stability of the tree and presence of any surrounding hazards, trees were climbed by appropriately qualified AECOM ecologists on 21 to 24 May 2018. One of the tree climbing team held a valid bat survey licence (number 120574), issued by SNH. All PRF were inspected using a variety of equipment as necessary, including torch and endoscope, to search for the presence of bats, or evidence of a feature having been used by bats. Evidence searched for included droppings, staining, foraging remains, auditory evidence and sightings of live or dead bats.

6.2.8 A description of all of the features on each tree which were potentially suitable for roosting bats was noted, regardless of whether bats were present. Features which from the ground looked like they may hold bat roost suitability but were found on closer inspection to be unsuitable were also described and recorded.

Further Bat Roost Suitability Survey

6.2.9 Due to evolution of the design of the Development, further bat roost suitability assessment was required to assess trees within previously un-surveyed habitat. This survey was conducted on 13 June by experienced AECOM ecologists. Assessment followed the guidelines as described in section above.

Bat Emergence / Re-entry Survey

6.2.10 Bat emergence and re-entry surveys were conducted on the trees identified on completion of ground-based assessments and tree climbing inspections of PRFs, described above, as having moderate or high bat roost suitability. The surveys followed the methodology described in the BCT Guidelines (Ref 1). During the emergence / re-entry surveys trees were watched carefully. If any bats emerged / entered a roost, the surveyors pinpointed the roost location, identified the species (using bat detection equipment, see below) and counted the number of bats emerging or re-entering (where light conditions allowed). General bat activity was also noted during the survey to provide further information on use of the Development Site by bats.

6.2.11 Dusk emergence surveys commenced 15 minutes prior to sunset and ended 1.5 – 2 hours after sunset. Dawn re-entry surveys commenced 1.5 hours prior to sunrise and ended 15 – 30 minutes after sunrise.

6.2.12 Detailed survey timings and weather conditions can be found in Table 6.2.

6.2.13 The surveyors used Elekon Batlogger M ('Batlogger') detectors to detect, identify and record bats and their calls. Batlogger detectors record continuously throughout the survey, in real-time (i.e. including calls and gaps, allowing distinctive 'rhythms' to be ascertained) and in full spectrum (i.e. all frequencies are recorded). This results in a complete sonogram and allows detailed analysis of the audio recording. Analysis of recorded bat calls was carried out using Kaleidoscope Pro and BatSound software to allow identification to species level (checked manually by an experienced AECOM ecologist).

Table 6.2 Bat Emergence / Re-entry Survey Details

Survey Date (2018)	Tree Reference(s)	Start Time	End Time	Temperature (°C)	Cloud / Sun	Precipitation	Wind
30 May	13	22:00	23:45	16	Cloudy	None	None
30 May	14	22:00	23:30	16	Cloudy	None	None
31 May	10	03:00	04:45	17	Cloudy	None	None
31 May	15	03:10	04:35	16	Cloudy	None	None
31 May	55, 58	21:30	23:30	16	Cloudy	None	None
31 May	54, 61	21:30	23:17	14	Cloudy	None	None
1 June	45	03:00	04:34	15	Cloudy	None	None
1 June	46	03:00	04:30	15	Cloudy	None	None
25 July	10	21:30	23:15	19	Partial cloud	None	None
25 July	15	21:34	11:15	19	Partial cloud	None	None
26 July	45, 46, 48	03:30	05:15	19	Partial cloud	None	None
26 July	106	03:30	05:15	13	Partial cloud	None	None
26 July	55, 58	21:45	22:30	18	Partial cloud	None	Light
26 July	54	21:40	23:15	19	Partial cloud	None	Light
27 July	13	03:30	05:15	16	Cloudy	None	Light
27 July	14	03:15	05:30	18	Partial cloud	None	None
06 August	103	21:07	22:52	13	Cloudy	None	Light
07 August	106	03:45	05:30	14	Cloudy	None	Light
07 August	53, 54 and 61	03:50	05:55	13	Cloudy	None	Light
07 August	48	03:55	05:40	13	Cloudy	Slight drizzle	Light
07 August	101	20:15	22:50	16	Cloudy	None	Light

Survey Date (2018)	Tree Reference(s)	Start Time	End Time	Temperature (°C)	Cloud / Sun	Precipitation	Wind
08 August	107	21:24	22:58	11	Partial cloud	None	None
09 August	48	04:00	05:45	9	Partial cloud	None	Light
09 August	103	04:05	05:45	12	Light cloud	None	None
09 August	101	04:00	05:45	10	Partial cloud	None	None
13 August	107	20:45	22:40	13	Light cloud	None	Light

Bat Activity (Transect) Survey

6.2.14 Three bat activity transect routes were designed to cover typical examples of all habitat considered suitable for bat foraging and commuting within the Development Site. In particular transects targeted habitat or linear features which may be both important to local bat populations and which may be potentially impacted upon by the Development.

6.2.15 Transect A covered the open moorland habitat around Loch na Curra and Lochan an Eoin Ruadha and was included in the bat activity survey because an early design of the Development involved the draining of these waterbodies to form the Headpond. Transect B covered the now proposed Headpond location and the surrounding conifer plantation of Dirr Wood. Transect C enabled survey of the ancient semi-natural broadleaved woodland on the slopes up from Loch Ness in addition to the grassland habitats around Balnafoich and the heath and juniper *Juniperus communis* scrub habitats near to Kindrummond. The transect routes are shown on Figure 6.2.1 (available at the end of this appendix).

5.1.1 Activity surveys followed the BCT guidelines (Ref 1) and comprised walking the three pre-determined transects once per month between April and September. Due to the Development programme, surveys were split over two years, with the September survey being carried out in 2017, and all others in 2018. Details of the transect surveys can be found in Table 6.3, below.

5.1.2 Transects were walked in differing configurations across the six visits to allow temporal variations in bat activity across the survey area to be recorded. The survey of Transect C on 24 April 2018 was carried out during the period prior to dawn, at which time bats may be actively foraging and / or returning to roosts.

5.1.3 The surveyors used Batlogger detectors to detect, identify and record bats and their calls. Analysis of recorded bat calls was carried out using Kaleidoscope Pro and BatSound software to enable identification species level.

Table 6.3 Bat Activity Survey Details

Survey Date	Transect	Start Time	End Time	Temp. (°C)	Cloud / Sun	Precipitation	Wind
11 September 2017	A	19:50	21:20	9.5	Cloudy	Showers	Moderate
12 September2017	C	19:45	21:50	11	Partial cloud	None	Light
13 September2017	B	19:48	21:30	11	Partial Cloud	None	Light
23 April 2017	B	20:48	22:28	9	Cloudy	Light drizzle	Moderate
24 April 2018	C	03:59	05:48	6	Cloudy	Light shower	Moderate
24 April 2018	A	21:00	22:33	6-7	Sunny	None	Light
23 May 2018	C	22:00	23:45	14	Cloudy	None	Light
29 May 2018	A	22:00	00:35	14	Partial cloud to full sun	None	Light
30 May 2018	B	00:40	02:00	12	Cloudy	None	None
11 June 2018	B	21:55	00:00	12	Cloudy	None	Light
11 June 2018	C	00:10	00:44	12	Cloudy	None	Light
12 June 2018	C	21:55	23:40	11	Cloudy	None	None
12 June 2018	A	23:55	01:55	11	Cloudy	None	None
12 July 2018	C	21:55	00:44	14	Partial cloud	None	Light
17 July 2018	B	21:59	23:51	14	Partial cloud	None	Very light
18 July 2018	A	21:52	23:45	14	Cloudy	None	Light
06 August 2018	B	21:14	23:10	14	Overcast	None	Light to moderate
08 August 2018	A	21:20	23:15	10	Partial cloud	None	Light to moderate
07 August 2018	C	21:18	23:42	12	Overcast	None	Light to moderate

Static Detector Survey

6.2.16 Wildlife Acoustic SM2+ static bat detectors were placed in three locations within the Site to record general bat activity over an extended period of time. The three static detector locations were chosen as being in representative habitat within the Development footprint which may be important to local bat populations. The static detector survey details are noted in Table 6.4 and the locations used shown on Figure 6.2.1. Detectors were deployed for a minimum of 14 continuous days for two separate periods between June and August 2018. Note that for unknown technical reasons incomplete data were collected for the first period at Location 2 (Headpond 1) and the second period at Location 1 (Loch Side).

Table 6.4 Static Detector Locations

Location	Grid Reference	Survey Period 1	Survey Period 2
1 – Loch side	NH 58877 33359	11 June – 27 June 2018	Failed
2 – Headpond 1	NH 60959 33040	11 June – 27 June 2018	26 July – 07 August 2018
3 – Headpond 2	NH 61583 33817	Failed	26 July – 10 August 2018

Limitations

6.2.17 Desk study information is dependent on records having been submitted for the area of interest. As such, a lack of records for particular species does not necessarily mean they are absent from the area of interest. Similarly, the presence of records for particular species does not automatically mean they still occur within the area of interest or are relevant.

All bat surveys described were undertaken within the optimal period described in best practice guidance. A lack of evidence of bat species identified by field survey does not preclude their future occurrence, and the likelihood of changes in the baseline described increases with elapsed time.

6.2.18 Due to evolution of the design of the Development, ten trees which were identified as having moderate and high bat roost potential were not subject to climbing or emergence / re-entry surveys. Based on the ground-based bat suitability assessment of the features, these trees are not considered likely to host a significant bat roost (i.e. features were not suitable for significant maternity or hibernation roosts) and therefore this is not anticipated to have a significant effect on the robustness of the impact assessment. Based on the current design, there is potential for three of these trees to be directly or indirectly affected by installation of a temporary access track and permanent spillway in the woodland adjacent to Loch Ness, with further potential for four more to be affected during secondary felling, the area of which is still indicative. Mitigation will be considered, primarily micro-siting of infrastructure to avoid disturbance to potential bat roosts. However, these trees should be subject to further pre-construction survey to confirm use by bats. Should any bat roosts be identified, this will become a licensing issue, which will be dealt with in liaison with the SNH Licensing Team.

6.2.19 Due to technical failure of the static bat detectors, for two static survey locations data were only collected for one period rather than two as intended. Given the species and frequency of bat activity recorded on the static detectors, it is considered that whilst recording for a shorter period than intended, the static detector data collected are representative of the bat activity on Site and the technological failures described does not affect the robustness of the data on which the impact assessment will be based.

6.3 Results

Desk Study

6.3.1 There are no designated sites for the protection of bats within the desk study area.

6.3.2 One record of a minor pipistrelle species roost was returned from 2009, however this is not within disturbance distance of the Development.

Field Survey

Bat Roost Suitability

6.3.3 All trees recorded as having suitability to support a bat roost are summarised in Table 6.5 below and their locations are illustrated on Figure 6.2.2. Note that the suitability of each tree illustrated on Figure 6.2.2 reflects the final classification following completion of both ground-based assessment and inspection of PRFs by tree climbing. Furthermore, trees which assessed as having negligible suitability for roosting bats are not shown on Figure 6.2.2.

6.3.4 The initial bat roost suitability assessment identified 44 trees with the potential to support roosting bats. No structures with suitability to be used by roosting bats were recorded. Of the total number of trees identified, 26 were considered to have either moderate or high bat roost suitability, with 17 assessed as having low suitability.

6.3.5 One tree (Tree 19) was confirmed as a bat roost during the ground-based bat roost suitability assessment, with one pipistrelle *Pipistrellus* sp. bat recorded in a rot feature low on the trunk. This tree in not within disturbance distance of the now-proposed layout of the Development and was therefore not subject to further survey.

6.3.6 A total of 11 of the trees which were identified as having moderate or high bat roost suitability and which were situated with the potential zone of disturbance from the Development (at that time) were climbed and their bat roost suitability assessment revised, as appropriate (as noted in Table 6.5 below). During the tree climbing survey an additional seven trees with moderate bat roost suitability (and ten trees with low bat roost suitability) were recorded in a small part of the survey area which was not surveyed during the original ground-based assessments.

6.3.7 No bat roosts or evidence of bat roosting were identified during the tree climbing survey.

6.3.8 A further four trees with moderate to high bat roost suitability (and two with low bat roost suitability) were recorded within an extension to the survey area required as a result of the evolution of the design of the Development.

6.3.9 A full description of the trees identified during the course of all ground-based and tree climbing survey as having bat roost suitability is provided in Table 6.5. The suitability of each tree following the initial ground-based assessment is provided, along with the final classification assigned to each tree following climbing inspection of PRFs, where these were carried out.

Table 6.5 Assessment of Bat Roost Suitability

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
1	NH 58732 32837	Birch *Betula* sp.	M	Birch with extensive epicormic growth. Significant rot hole on north-east side of main trunk.	Not possible to climb due to health and safety issues.	M	No	No
2	NH 58749 32888	Birch	M	Birch with rot in 'elbow' of branch extending approximately 10 cm.	Cavity narrows quickly.	L	No	No
3	NH 58749 32888	Birch	L	Birch with rot hole in south facing branch approximately 2 m up.	Low bat roost suitability – not climbed.	L	No	No
4	NH 58765 32997	Ash *Fraxinus excelsior*	M	Rot in branch collar on south aspect at approximately 7 m height.	Not possible to climb due to health and safety issues.	M	No	No
5	NH 58765 32997	Holly *Ilex aquifolium*	M	One dead stump approximately 10 m north-east of Tree 4 with multiple rot features, a few of which extend to enough depth for crevice-dwelling bats.	Not possible to climb due to health and safety issues.	M	No	No
6	NH 58767 33243	Alder *Alnus glutinosa*	M	Tree on loch shore with rot in branch collar on south aspect approximately 2.5 m high. Cannot confirm extent of void from ground.	2.5 m void 10 cm deep, wet with woodlice.	N	Yes	No
7	NH 58778 33260	Ash	L	Ash with hole in trunk approximately 2 m up, facing north.	Low bat roost suitability – not climbed.	L	Yes	No

[1] N – negligible, L – low, M – moderate, H – high and C – confirmed roost

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
8	NH 58785 33271	Ash	L	Hole in trunk facing west.	Low bat roost suitability – not climbed.	L	Yes	No
9	NH 58799 33304	Ash	M	Ash with hole approximately 3 m high facing north.	3 m hole closed.	N	Yes	No
10	NH 58810 33181	Ash	L/M	Larger mature tree with rot holes in branch collars – very small (2-3 cm diameter) but unclear depth. Also larger hole (5 cm diameter) on east of trunk.	2 large rot holes at 7 m both with a large cavity which extends up for 30 cm and is dry.	M	Yes	Yes, done.
11	NH 58825 33167	Ash	L	Rot / damage particularly on south-east facing bough. May be exposed / damp (appears open at top) but some small suitable cracks.	Low bat roost suitability – not climbed.	L	Yes	No
12	NH 58825 33361	Ash	L	Crack in east facing branch.	Low bat roost suitability – not climbed.	L	Yes	No
13	NH 58831 33004	Holly	M	Hole in off-shooting elbow of branch.	Endoscoped. Good cavity, no bats.	M	No – but was at time of roost surveys	No, but done.
14	NH 58845 33051	Birch	H	Main trunk sloping to west - large damage / void, unclear how far this extends back.	No large void, possibly big enough for few bats.	M	No – but was at time of roost surveys	No, but done.
15	NH 58848 33112	Holly	M	Many rot features / dead wood, some rot holes in branch collar.	Not possible to climb due to health and safety issues.	M	Yes	Yes, done.
16	NH 58866 33316	Ash	L	Void very low in trunk.	Low bat roost suitability – not climbed.	L	No	No

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
17	NH 58887 32681	Birch	M	Rot in low bough facing south-west and in higher bough facing east.	Not possible to climb due to health and safety issues.	M	No	No
18	NH 58896 33279	Ash	M	Damage / rot at base. Extends up into cavity.	Features open at top so rain can enter, provides limited shelter.	L	Yes	No
19	**NH 58904 32661**	**Birch**	**Confirmed**	**One bat (probably a pipistrelle) roosting in recently lopped branch collar. Feature on south / south-east aspect facing south. Surrounding habitat is open improved / wet woodland with clearing to south and improved grass to north.**	**Bat roost confirmed – no climbing required.**	**C**	**No**	**No**
20	NH 58910 33271	Ash	L	Almost dead, very large (15 cm x 20 cm) rot hole which extends to whole trunk but open at the top to the elements.	Low bat roost suitability – not climbed.	L	Yes	No
21	NH 58945 33306	Ash	M	Large rot feature 10 m high on south aspect of trunk.	Not possible to climb due to health and safety issues.	M	Yes - but was not at time of roost surveys	Yes, not done.
22	NH 58966 33250	Willow *Salix* sp.	L	Beside burn with rot hole low in trunk facing north.	Low bat roost suitability – not climbed.	L	Yes	No
23	NH 58966 33250	Ash	L	Damage and crack / rot hole 7 m high facing north.	Low bat roost suitability – not climbed.	L	Yes	No

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
24	NH 58974 33300	Ash	M/H	Large (15 x 20 cm) void / rot hole in east side of trunk approximately 10 m high.	Not possible to climb due to health and safety issues.	M/H	Yes – but was not at time of roost surveys	Yes, not done.
25	NH 58983 33276	Birch	L	Crack in bark, east facing, approximately 3 m high.	Low bat roost suitability – not climbed.	L	Yes	No
26	NH 58990 33306	Ash	M	Large ash with damaged north facing bough. Rot / boring in exposed wood. Appears to be open and extends downwards but cannot confirm from ground.	Not possible to climb due to health and safety issues.	M	Yes – but was not at time of roost surveys	Yes, not done.
27	NH 59025 32877	Alder	M	Extensive rot features (last tree in south-east corner of wood).	Endoscoped, no good spaces.	L	No	No
28	NH 59025 32877	Alder	M	Immature, adjacent to above with similar features.	Not possible to climb due to health and safety issues.	M	No	No
29	NH 59025 32877	Alder	M	Immature, adjacent to above with similar features.	Not possible to climb due to health and safety issues.	M	No	No
30	NH 59042 33175	Unknown	L	Tree beside burn with crack on east side and multiple small collar holes.	Low bat roost suitability – not climbed.	L	Yes	No
31	NH 59051 33007	Birch	L	Dead, approximately 5 m tall with damage on south aspect.	Low bat roost suitability – not climbed.	L	No	No
32	NH 59060 33234	Ash	M	Almost dead with cavity where branches have joined.	Not possible to climb due to health and safety issues.	M	Yes – but was not at time of roost surveys	Yes, not done.

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
33	NH 59112 33182	Ash	H	Ash with cavity approximately 2 m high in base and damage higher up. Holly growing on felled branch.	Not possible to climb due to health and safety issues.	H	Yes – but was not at time of roost surveys	Yes, not done.
34	NH 59119 33042	Birch	M	Hollow trunk with hole is 1.2 m high up trunk.	Rotten stem open to rain at top.	L	Yes	No
35	NH 59122 33222	Birch	M	Birch with damage / rot approximately 2 m up south sloping stem on south aspect of tree.	Not possible to climb due to health and safety issues.	M	Yes – but was not at time of roost surveys	Yes, not done.
36	NH 59145 33029	Birch	L	Birch	Low bat roost suitability – not climbed.	L	Yes	No
37	NH 59145 33029	Ash	L	Ash	Low bat roost suitability – not climbed.	L	Yes	No
38	NH 59145 33029	Ash	L	Ash	Low bat roost suitability – not climbed.	L	Yes	No
39	NH 59145 33029	Unknown	L	Dead stump with damage and rot features.	Low bat roost suitability – not climbed.	L	Yes	No
40	NH 59156 33167	Unknown	M	Large rot hole in fallen branch.	Not possible to climb due to health and safety issues.	M	Yes – but was not at time of roost surveys	Yes, not done.
41	NH 59160 33161	Unknown	L	Cavity on cracked branch.	Low bat roost suitability – not climbed.	L	Yes – but was not at time of roost surveys	Yes, not done.

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
42	NH 59168 33059	Alder	L/M	Large alder with rot in several branch collars on south aspect and damaged bough.	After climb several knotholes noted as closed, one unsuitable tear out, a branch with wound not suitable. Reassessed as low	L	Yes	No
43	NH 59174 33152	Ash	M	Old ash with damage / rot feature approximately 2 m high on south aspect	Rot 2 m high. Not very suitable.	L	Yes	No
44	NH 59190 33157	Ash	H	Ash with large hole on east / north-east aspect of trunk. Small entrance but considered likely to extend up / back / down.	Good features.	H	Yes – but was not at time of roost surveys	Yes, not done.
45	NH 59233 39233	Ash	Done with climbing survey.	-	Knot hole 5 m in height on west aspect.	L	Yes	No
46	NH 59228 33005	Unknown	Done with climbing survey.	-	Dead. Multiple cavities in trunks. Not possible to climb due to health and safety issues.	M	Yes	Yes, done.
47	NH 59225 33014	Ash	Done with climbing survey.	-	Several small knotholes and broken branch features which don't appear very suitable due to size.	L	Yes	No
48	NH 59216 33026	Ash	Done with climbing survey.	-	Fold / crack 6 m in height on west, good potential feature.	M	Yes	Yes, done.

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
49	NH 59203 33044	Ash	Done with climbing survey.	-	Dead. Lifted bark, large open tear out and tiny knothole. Suitable for small numbers (one or two) of bats.	L	Yes	No
50	NH 59203 33041	Alder	Done with climbing survey.	-	Tear out. Dry but space for only one bat potentially.	L	Yes	No
51	NH 59201 33049	Alder	Done with climbing survey.	-	Tear out on elbow 6 m. When climbed found to be limited to only 5 cm deep.	L	Yes	No
52	NH 59193 33061	Alder	Done with climbing survey.	-	Hollow trunk open in middle, when endoscoped found to be very open and too exposed for bats.	L	Yes	No
53	NH 59179 33078	Alder	Done with climbing survey.	-	Small knothole 2 m high with deep cavity facing north.	M	Yes	Yes, done.
54	NH 59185 33072	Alder	Done with climbing survey.	-	Large hollow cavity at base extends 1 m up on north-east side. Endoscoped, no bats found.	M	Yes	Yes, done.
55	NH 59210 33059	Ash	Done with climbing survey.	-	Unhealthy tree with several knot holes into potentially hollow branches plus large broken leader stem.	M	Yes	Yes, done.

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
56	NH 59222 33055	Alder	Done with climbing survey.	-	Dead. Lots of shallow cavities which when endoscoped were found to be unsuitable.	L	Yes	No
57	NH 59220 33042	Alder	Done with climbing survey.	-	Cracked branch 3 m high in west aspect of trunk. Other small features which were endoscoped and found to be very shallow.	L	Yes	No
58	NH 59221 33050	Alder	Done with climbing survey.	-	Cracked branch 5 m high in east leaning trunk. Not possible to climb due to health and safety issues.	M	Yes	Yes, done.
59	NH 59163 33132	Ash	Done with climbing survey.	-	Tearout / knothole 5-6 m high which extends to 20 cm, front half open but narrows to very small cavity.	L	Yes	No
60	NH 59226 33006	Ash	Done with climbing survey.	-	Cankers all over trunk which is hollow from the bottom for a significant way up trunk, endoscoped and found to be too open and exposed for bats.	L	Yes	No
61	NH 59189 33078	Unknown	Done with climbing survey.	-	Dead tree, only pole-like trunk remaining with various north facing rot holes.	M	Yes	Yes, done.

Tree Ref.	Grid Reference	Species	Initial Bat Roost Suitability[1]	Ground-based Bat Roost Suitability Assessment Description	Description Following Tree Climbing Inspection of PRFs	Final Bat Roost Suitability Assessment	Within 50 m of Development Footprint?	Emergence / Re-entry survey Required?
101	NH 60037 33330	Birch	M	Woodpecker hole on trunk, south-west facing.	Not climbed.	M	Yes	Yes, done.
102	NH 60005 33371	Birch	L	Cracked bough with small cavity which could house small number of bats.	Not climbed.	L	Yes	No
103	NH 60646 33520	Pine *Pinus* sp.	M	Dead tree with multiple woodpecker holes. In middle of dense pine plantation so habitat sub-optimal. Lower two holes currently occupied by birds (droppings / feathers noted).	Not climbed.	M	Yes	Yes, done.
104	NH 59159 33264	Ash	H	Hole from loss of bough 2 m high, east facing.	Not climbed.	H	Yes	Yes, not done.
105	NH 60829 33095	Pine	L	Dead tree with old woodpecker holes.	Not climbed.	L	Yes	No
106	NH 59345 32954	Unknown	M	Completely dead tree with holes, some containing bird droppings.	Not climbed.	M	Yes	Yes, done.
107	NH 60645 33535	Pine	M	Dead tree with multiple woodpecker holes. In middle of dense pine plantation so habitat sub-optimal.	Not climbed.	M	Yes	Yes, done.

Bat Emergence / Re-entry Survey

6.3.10 Following the suite of bat roost suitability surveys described above (including tree climbing inspections and further work required due to the evolution in the Development design) 15 trees were identified which had moderate or high bat roost potential (i.e. not low or confirmed), and were located within 50 m of the most up-to-date Development footprint (at the time of survey). These trees were subject to bat emergence and re-entry surveys. A summary of the results of these surveys can be found in Table 6.6. Due to regular changes to the Development footprint, ten trees which were identified as having moderate and high bat roost potential during the initial bat roost suitability assessment were not subject to further surveys, although the proposed layout of the Development indicates these trees may now be affected (see section regarding survey limitations). Similarly, two trees which were subject to full or partial roost surveys are now not relevant to the current design of the Development (i.e. they will not be affected).

6.3.11 A total of three trees were identified by the emergence / re-entry surveys as supporting roosting bats. One tree (Tree 45) was assessed as having low bat roost potential during the suitability surveys (and therefore was not included in the roost surveys schedule), however was immediately adjacent to a tree which was subject to survey (Tree 46). During the initial dawn re-entry survey on 01 June 2018, one soprano pipistrelle bat was recorded entering a very small, shallow rot feature on the east aspect of Tree 45 at around 3 m in height. As this observation was made incidentally and because the surveyor was not concentrating on this particular tree, further targeted emergence / re-entry survey was carried out at this location.

6.3.12 During the 26 July dusk emergence survey of Trees 55 and 58, a single soprano pipistrelle was observed entering Tree 56 under a small piece of lifted bark at around 4 m in height, and exiting four minutes later. Again this observation was incidental as Tree 56 had previously been identified as having low potential for supporting roosting bats, and so was not subject to dedicated emergence / re-entry survey. Given the very short period of time during which the bat resided in the tree and the use of a very minor feature (a bit of lifted bark) it is possible that this feature is not a roost but was utilised for other purpose, such as a singing post which is not a refuge and instead has a social function. However, with cognisance to the precautionary principal, for the purposes of this Report, and for the associated impact assessment, this tree is recorded as a roost.

6.3.13 The third roost was identified in a dead pine tree (Reference 107) where prior to both emergence surveys being conducted, one bat was observed roosting within a long, narrow woodpecker hole feature. During both emergence surveys the bat exited the roost feature (it was subsequently not observed within the feature when checked with a torch post survey), however the precise moment of exit was not recorded by the surveyor on either occasion. As a consequence, the species of bat was not ascertained at the time of survey. However, given the calls recorded on the Batlogger it is very likely to have been a soprano pipistrelle as only this species was recorded at the time of likely emergences.

6.3.14 The locations of all confirmed bat roosts (Trees 45, 56 and 107, described above, and Tree 19 recorded during the bat roost suitability assessment) are illustrated on Figure 6.2.3.

6.3.15 In general bat activity was low during the emergence / re-entry surveys, with a maximum of three bats seen at any one time. The majority of bats present were soprano pipistrelle with common pipistrelle recorded occasionally. These species were recorded during surveys of

all trees (although only on four occasions did they emerge / re-enter a tree – see above). Brown long-eared bat were recorded in several locations, as follows:

- On four surveys within the area of trees adjacent to Balnafoich;
- On two surveys at Tree 101 within broadleaved woodland near Park; and
- Once at Tree 103, within Dirr Wood plantation.

6.3.16 Daubenton's bat was recorded in similar locations to brown long-eared bats:

- On three surveys within the area of trees adjacent to Balnafoich;
- On one survey at Tree 101 within broadleaved woodland near Park; and
- Once at Tree 103, within Dirr Wood plantation.

6.3.17 At no time were brown long-eared or Daubenton's bats recorded emerging or re-entering tree roosts.

6.3.18 Bat behaviour recorded including foraging (with 'feeding buzzes' recorded) in clearings within woodland, along woodland edges, above tree canopies and over open habitat (such as improved fields). Bats were regularly observed commuting at height along woodland edge habitats. On one occasion in late-July, two bats were regularly seen displaying 'chasing behaviour' over an open, improved field.

Table 6.6 Bat Emergence / Re-entry Survey Results

Survey Visit Number	Survey Date (2018)	Tree Reference(s)	Roost?	Notes
1	30 May	13	No	Several very brief soprano pipistrelle passes between 22:13 and 22:39.
1	30 May	14	No	Seven soprano pipistrelle passes between 22:15 and 22:51. One possible non-pipistrelle species pass at 23:26.
1	31 May	10	No	Several pipistrelle bats heard not seen. One bat observed at 03:49 foraging in canopy of target tree then exited flying at height to the north-east.
1	31 May	15	No	Several soprano pipistrelle bats heard but not seen.
1	31 May	55, 58	No	First bat noted at 22:05, probably emerged from nearby but not from Tree 55 or 58. Pocket of soprano pipistrelle activity between 22:25 and 22:41, then common pipistrelle activity between 22:54 and 23:07. Activity recorded included foraging (feeding buzzes heard) and commuting, predominantly along / over the tree line but occasionally over the open improved field.
1	31 May	54, 61	No	Most bats heard but not seen but identified as passing pipistrelles and possible non-pipistrelle species. Several soprano pipistrelles seen flying overhead and low close to ground.
1	**01 June**	**45 (and 46)**	**Yes – Tree 45**	**High soprano pipistrelle activity throughout survey with occasional common pipistrelle and possible non-pipistrelle species. At 04:04 one soprano pipistrelle entered a very small hole on the north facing aspect of the eastern trunk of Tree 45.**

Survey Visit Number	Survey Date (2018)	Tree Reference(s)	Roost?	Notes
1	01 June	46	No	Low activity, predominantly common pipistrelle but also soprano pipistrelle. Bats foraging in canopy of trees, one bat paid particular attention to Tree 46 but did not enter. Activity dropped at 03:55, bats appeared to head north. One final soprano pipistrelle pass heading south at 04:04.
2	25 July	10	No	Possible bat chattering heard at 22:05 but no bats emerged. Soprano pipistrelles regularly recorded between 22:06 and 22:51, often heard but not seen. One bat seen flying high above tree canopy from east to west.
2	25 July	15	No	Activity from soprano pipistrelles, all heard but not seen. First bat recording was continuous quiet chatter from 22:03 – 22:05.
2	26 July	45, 46	No	Minimum of two soprano pipistrelles foraging / feeding along edge of trees / over improved field including focused foraging within close proximity to target trees. Commuting activity recorded at 04:22 with two bats flying high, due south. One bat seen hitting foliage. Last bat appeared to exit area at 04:37, no subsequent activity.
1	26 July	106 (x1)	No	Soprano pipistrelles mainly commuting down the treeline or feeding in the nearby garden. Final bat recorded at 04:38.
2	26 July	53, 54	No	Minimum of three bats (this number consistently seen together) foraging above the survey area and over the adjacent field. Two bats displayed 'chasing' behaviour on several occasions.
2	**26 July**	**56 (and 55 and 58)**	**Yes – Tree 56**	**Soprano pipistrelles throughout. First bat at 22:04 then mainly feeding in woodland or commuting east to west above trees. Bat entered Tree 56 at 22:12 and left at 22:16.**
2	27 July	13	No	First bat call at 04:40, not seen but probably along track to south. Intermittent low activity until 04:44 when activity stopped.
2	27 July	14	No	Very little activity. Some soprano pipistrelle foraging in surrounding trees. Final bat was at 04:48.
3	06 August	103	No	Bats seen along forest track from 21:30. Numerous brief passes heard but not seen from soprano pipistrelle (plus one common pipistrelle) between 21:45 and 22:33. One possible non-pipistrelle species recorded at 22:20.
3	07 August	106	No	Three bat passes between 03:55 and 04:18, heard but not seen.
3	07 August	53, 54 and 61	No	Mostly soprano pipistrelles, heard but not seen. Two soprano pipistrelles observed feeding around edge of wood / field.

Survey Visit Number	Survey Date (2018)	Tree Reference(s)	Roost?	Notes
3	07 August	48	No	Brief soprano pipistrelle passes between 04:26 and 04:45, did not emerge from tree. Two soprano pipistrelles seen flying around trees at 04:51.
3	07 August	48	No	Low activity, with only five soprano passes. Final bat at 05:00 flew from east.
3	07 August	101	No	Several single pipistrelle passes between 21:34 and 22:36.
3	**08 August**	**107**	**Yes**	**Bat seen in long, narrow woodpecker hole prior to survey, but not observed emerging. Several brief pipistrelle passes recorded, mostly heard but not seen.**
3	09 August	103	No	Brief pipistrelle passes recorded between 04:26 and 05:14, all heard but not seen.
3	09 August	101	No	Two bats seen but not heard at 04:14. Six passes throughout whole survey, all brief pipistrelles and not seen.
3	**13 August**	**107**	**Yes**	**Bat seen in long, narrow woodpecker hole prior to survey, but not observed emerging (for the second time, see survey on 08 August). Several brief pipistrelle passes recorded, mostly heard not seen.**

Bat Activity (Transect) Survey

6.3.19 Transect surveys recorded low levels of bat activity in general, particularly on Transects A and B which were located predominantly in open habitat at relatively high altitude. Soprano pipistrelles were the most commonly encountered species with common pipistrelle recorded occasionally throughout the transects (mirroring the results of the other bat surveys). Brown long-eared bats were recorded once in May on Transect C on the track east of Balnafoich. Daubenton's bat was recorded on five separate transect visits in three distinct locations:

- Within the broadleaved woodland adjacent to Loch Ness in June (Transect C);
- Also in June near the small waterbody Loch nan Geadas (which is forms a small extension of Loch Duntelchaig) (Transect A); and
- In August recordings of this species were captured on the west bank of Lochan an Eoin Ruadha (Transect A).

Static Detector Surveys

6.3.20 A summary of the number of recordings of each species at each static detector location is provided in Table 6.7. A value has been given which represents the number of instances of recordings of each species as a fraction of the total days the static detectors were deployed at each location. This provides a comparable value indicating the average activity of each species of bat at each recording location over the entire recording period. As per other bat surveys completed for the Development, soprano pipistrelle was the most commonly recorded species. This is followed by much lower numbers of common pipistrelle, and only occasional recordings of brown long-eared bat and Daubenton's bat.

6.3.21 On two occasions (at Loch side (Location 1) on 22 June and Headpond 2 (Location 3) on 06 August) bat calls were recorded which have been identified by the auto-analysis software Kaleidoscope as whiskered bat *Myotis mystacinus*. The known range of this species does not extend further north than central Scotland, and therefore both recordings were subject to further analysis by a highly experienced AECOM ecologist who works in Northern Ireland and regularly encounters this species. Given the degree in overlap in the range and shape of whiskered bat calls the calls of Daubenton's bat (which are close relatives), a definitive identification is not considered possible. However, on the basis of the known ranges of whiskered bat and Daubenton's bat in Scotland, these calls are considered more likely to be Daubenton's bat. As such, based on the data currently available, whiskered bat is considered likely to be absent from the Site for the purposes of this assessment and auto-identified whiskered bat recordings are included as Daubenton's bat in table 6.7. However, because certain parameters of the call strongly match those of whiskered bat, and because the ancient semi-natural habitat on Site is highly suitable for this species, it is recommended that the potential presence of this species is subject to further investigation. This would be best achieved through the implementation of advanced bat survey techniques (ABST) during the bat activity season to try and catch and identify bats in the hand.

6.3.22 Please note that the numbers shown in Table 6.7 are not of individual bats but of distinct recordings, which can include several calls made by the same bat repeatedly passing the detector. It is therefore the case that the total number of individuals actually present will be lower than the numbers presented in Table 6.7.

Table 6.7 Summary of Recordings Made by Static Bat Detectors

Detector Reference	Location	Survey Period 1			Survey Period 2			Total days deployed	Recordings of Each Species per Day[2]
		Number of Detections	Species	Days Deployed	Number of Detections	Species	Days Deployed		
1	Loch side	15	Common pipistrelle	12	Failed			12	**1.25**
		3	Daubenton's bat	12				12	**0.25**
		291	Soprano pipistrelle	12				12	**24.25**
2	Headpond 1	133	Common pipistrelle	16	52	Common pipistrelle	12	28	**6.61**
		1	Daubenton's bat	16	2	Daubenton's bat	12	28	**0.11**
		279	Soprano pipistrelle	16	345	Soprano pipistrelle	12	28	**22.29**
					12	Brown long-eared bat	12	12	**1.00**
3	Headpond 2	Failed			7	Brown long-eared bat	15	15	**0.47**
					129	Common pipistrelle	15	15	**8.60**
					5	Daubenton's bat	15	15	**0.33**
					449	Soprano pipistrelle	15	15	**29.93**

[2] In other words, instances of recordings of each species as a fraction of the total number of days the static detectors were deployed.

6.4 Discussion and Recommendations

6.4.1 The suite of bat surveys described illustrates a low level of bat activity across the Site. Soprano pipistrelle was the most commonly recorded species, followed by moderate numbers of common pipistrelle and occasional records of brown long-eared bat and Daubenton's bat.

6.4.2 Two recordings auto-identified by Kaleidoscope software as whiskered bats were made in two separate areas of the Site during static detector surveys. Given the known distribution of whiskered bat in Scotland, it is considered highly likely that these calls are from Daubenton's bats which have extremely similar call characteristics. However, because certain parameters of the call strongly matching those of whiskered bat, it is recommended that the potential presence of this species is subject to further investigation.

6.4.3 No significant roosts were identified, with only single soprano pipistrelle bats recorded roosting in four trees scattered across the Development area. The roost trees were present in areas of semi-natural broadleaved woodland, conifer plantation and scattered broadleaved trees.

6.4.4 None of the confirmed small roosts are anticipated to be directly affected by the Development, although two – Trees 56 and 107 – are potentially within disturbance distance (estimated to be 50 m, although this is highly precautionary given the predicted effects of the works).

6.4.5 Given the results of the bat roost suitability surveys, and the attributes of the confirmed roosts, potential bat roosting features within the Development footprint are limited to woodland habitat (broadleaved and to a limited extend conifer plantation) where features recorded have potential to support roosts of only small numbers of bats. Vegetation surveys have shown surrounding woodland to be similar in age and composition to that within the Development footprint (and bat survey area) and therefore this is considered likely to be typical of bat roosting opportunities in the wider area. Such limited roosting habitat reflects the low levels of bat activity recorded throughout the emergence / re-entry, activity transect and static detector surveys.

6.4.6 It can also be seen from the regularity of instances of bat recordings that the broadleaved woodland habitat in the south-west of the Development is of greater value to bats than the open heath / bog and plantation woodland habitats in the north-east of the Site.

6.4.7 Activity transect surveys did highlight the use of certain features within the large expanses of heath / bog habitat within the north-east area of the Development, but the data collected show a low number of bats with activity largely limited to habitat edges, for example along loch sides and plantation woodland rides / edges.

6.4.8 It is therefore considered that the majority of the habitat loss associated with the Development will have limited effect upon bats as it is largely represented by upland heath / bog habitat and plantation woodland associated with construction of the Headpond.

6.4.9 A significant area of semi-natural broadleaved woodland will require removal, and although this habitat represented the highest quality area for bats, there is evidence of only low numbers of bats and occasional small roosts.

6.4.10 If the final design of the Development impacts upon any bat roosts recorded, associated works must be carried out subject to strict mitigation, including obtaining the appropriate protected species licence (which is subject to strict qualifiers being met).

6.4.11 The installation of bat boxes of suitable specification within the woodland to be retained both within the Development area and within peripheral areas is likely to suitably mitigate for the loss of the woodland present which provides only a limited roost resource. Bat boxes should include typical summer roost models but also models designed for use by maternity colonies and as hibernacula. This may represent enhancement of the area as a whole for roosting bats.

6.4.12 Foraging and commuting habitats and features are considered likely to largely remain, or be created through felling of trees resulting in new edge habitat which is evidenced to be favoured by bats. The loch side habitats both at Loch Ness, Loch na Curra, Lochan an Eoin Ruadha and Loch nan Geadas will remain. In addition, the construction of the Headpond, although highly managed, is likely to result in creation of foraging habitat (particularly for species associated with still water bodies such as Daubenton's bat).

6.4.13 As noted previously, due to regular evolution of the Development design, not all trees with the potential to support roosting bats were subject to full survey. Further surveys to investigate the potential use of features present within the Development area by bats may be required prior to construction. It is not considered likely based on the survey results to date that the features present have the potential to support significant bat roosts and as such further surveys are not likely to provide results which will significantly alter the discussion provided above or the overall assessment of the effects of the proposed Development on bats.

6.5 References

Ref 1. Collins, J. (ed.) (2016). Bat Surveys: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London.

Figures

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY
- Development Site boundary
- Excluded from Development Site boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area
- Static bat detector location

Bat activity transect route
- A
- B
- C

TITLE
FIGURE 6.2.1
TRANSECT AND STATIC DETECTOR SURVEY LOCATIONS

REFERENCE
RJ_181031_EIA_A6.2.1_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

Scale @ A3 1:20,000

0 1 2 km

Project Management Initials: CA Designer: LC Checked: SY Approved: CS

Scale @ A3 1:7,000/:1,000

0 250 500 m

0 25 50 m

AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY
- Development Site boundary
- Excluded from Development Site boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area

Bat roost suitability
- Confirmed
- High
- Moderate
- Low

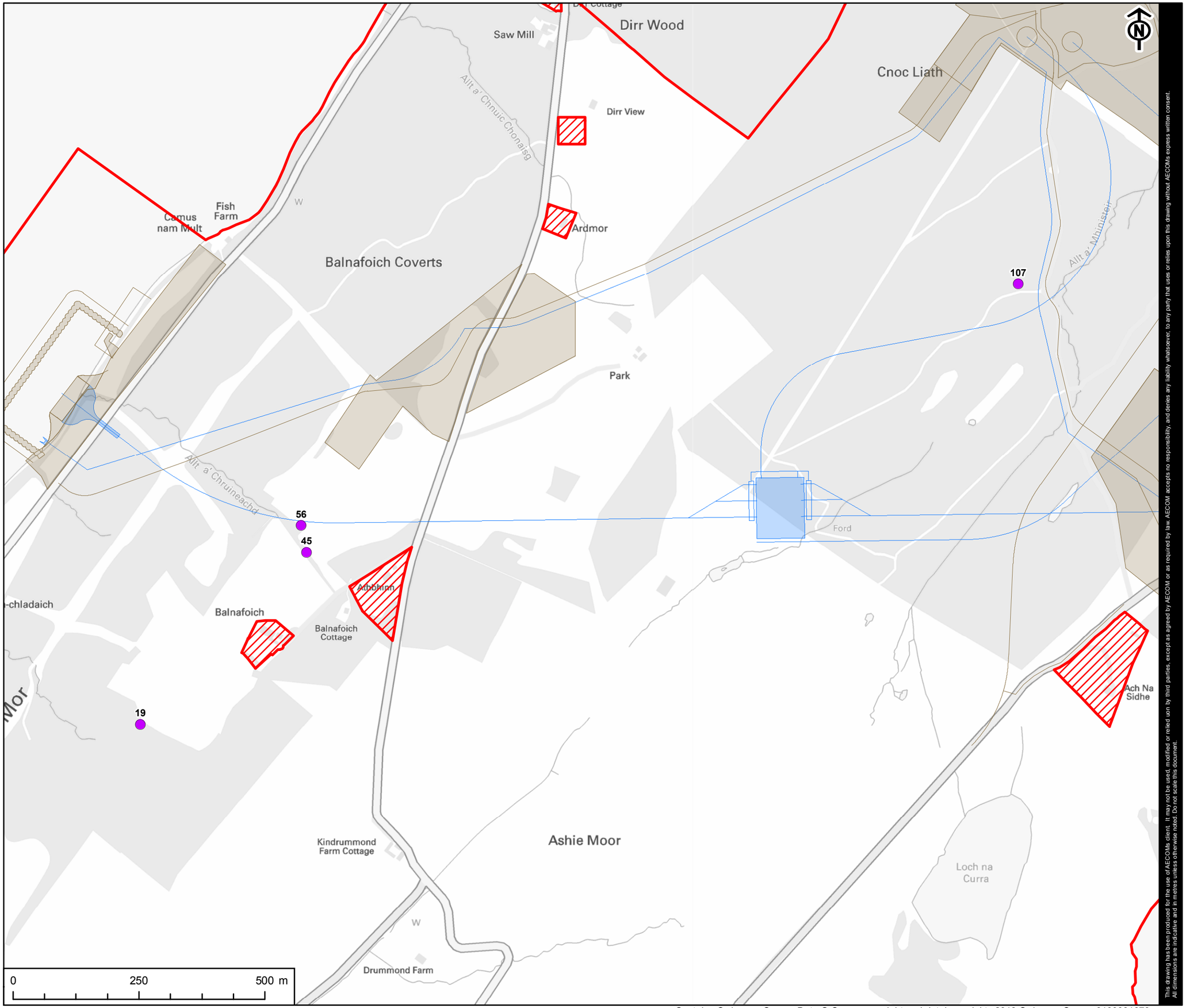
TITLE
FIGURE 6.2.2
BAT ROOST SUITABILITY SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.2.2_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

Project Management Initials: CA Designer: LC Checked: SY Approved: CS



Scale @ A3 1:7,000

AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY
- Development Site boundary
- Excluded from Development Site boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area
- Confirmed bat roost

TITLE
FIGURE 6.2.3
CONFIRMED BAT ROOSTS

REFERENCE
RJ_181031_EIA_A6.2.3_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

aecom.com