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Red John Pumped Storage Hydro Scheme

Volume 5, Appendix 6.3: Protected Mammal Surveys

ILI (Highlands PSH) Ltd.

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Quality Information

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Appendix 6.3 Protected Mammal Survey Report

6.1 Introduction

Background

6.1.1 AECOM was appointed by the Applicant 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 the following protected mammal species to be present in the vicinity of the Development:

- Badger *Meles meles*;
- Otter *Lutra lutra*;
- Pine marten *Martes martes*;
- Red squirrel *Sciurus vulgaris*;
- Water vole *Arvicola amphibious;* and
- Wildcat *Felix sylvestris*.

6.1.4 Bat species are the subject of a separate report, which can be found in Appendix 6.2: Bat Survey Report.

Purpose of this Report

6.1.5 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 protected mammal 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.

6.1.6 As a species which is sensitive to persecution, detailed information relating to the presence of badger has been omitted from this Report and is included in Confidential Appendix 6.1: Badger Sett Locations (Volume 6).

Development and Site Description

6.1.7 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 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 long-established of plantation origin. Outside of the woodland habitats there are areas of semi-improved grassland, blanket bog and wet heath.

6.1.8 There are a number of waterbodies in the vicinity of the Development, including large oligotrophic lochs as well as smaller ponds.

Species Ecologies

Badger

6.1.9 The badger is a large, heavy, low sett mustelid which favours woodland habitat but also uses improved grassland as well as arable and amenity land. Badgers live in social groups, on average of around six adults which inhabit a network of setts throughout their territory. Setts are dug in a variety of habitats including woodland, scrub, moorland and occasionally open habitat. An existing slope (including man-made embankments) will often be used. Badger feed mainly on earthworms foraged from improved grassland and will also eat plant roots, carrion, fruit and seeds. The species is now widespread in Britain following historical persecution, although this remains a threat in localised areas. The other primary threat to badger populations is deaths from road traffic collisions which is anticipated to increase as road traffic levels rise (Ref 7).

Otter

6.1.10 The otter is a large, carnivorous mustelid which is found throughout the UK in still and flowing freshwater habitats and along coasts. Otters inhabit below ground / enclosed shelters known as holts, and less enclosed shelters / more open refuges often known as lie-ups and / or couches. Otters have large, linear home ranges along watercourses of around 20 – 30 km (often less along coastline territories) and are mainly nocturnal. They feed on fish, crustaceans and amphibians and will opportunistically take other prey such as ducklings. Although widespread, otter populations are still recovering following historical persecution and continue to be threatened by road traffic collisions and environmental pollution (Ref 7).

Pine Marten

6.1.11 The pine marten is an arboreal mustelid which inhabits mature woodland. The species has a fragmented population in the UK following drastic declines in the 19th century. In Scotland they are present in low densities with a stronghold in the north of Scotland (Ref 7) and (including successfully re-introduced populations) in the Borders and Dumfries and Galloway. Pine martens rest in temporary shelters and these, along with breeding 'nests', are commonly known as dens. They are made in hollow trees, hollows between tree roots and in cavities in rock piles, with buildings also commonly used. Pine marten are opportunistic omnivores and will feed on a variety of seasonal food sources including small animals, carrion, eggs, insects, honey, fruit, nuts and fungi.

Red Squirrel

6.1.12 The red squirrel is a primarily arboreal rodent that inhabits broadleaved and coniferous woodlands. They are very scarce in the southern part of the UK but are locally frequent in the north of England and Scotland. In Scotland there are fragmented populations on either side of the central belt where they are displaced by the invasive non-native grey squirrel *Sciurus carolinesis*. Red squirrels construct refuges known as dreys out of twigs and other vegetation. Dreys are usually located high in trees near the trunk. Red squirrels feed predominantly on tree seeds and nuts but will also eat fruits, berries and fungi. They are mostly solitary animals and give birth to litters averaging three young, twice a year. As noted above, the main threat to red squirrels is the introduction of the grey squirrel which competes for food and carries squirrel pox, a virus which is deadly to red squirrels but to

which grey squirrels are immune. This threat is compounded by habitat loss and fragmentation (Ref 7).

Water Vole

6.1.13 Water voles are rat sized rodents. They have declined dramatically in the UK due to habitat loss and predation by the invasive non-native American mink *Neovison vison*, particularly in lowland areas (Ref 7). Water vole commonly inhabit burrows close to the edge of ditches, marshes, streams and slow flowing rivers where they feed mainly on grasses, rushes, and herbs. Upland populations can be found in very narrow burns and peat hags, preferentially in areas of thicker peat and lush vegetation. Localised dry grassland populations of water voles with no association to watercourses are also known in the central belt and islands of Scotland.

Wildcat

6.1.14 The wildcat is the only native cat species in the UK and its range is confined to the very north and west of Scotland. They are solitary outside the breeding season and hold large territories. They live in very low densities and require a mosaic of woodland edge and open heathland / rough grassland habitat. The wildcat is similar to a domestic 'tabby' cat in appearance but is larger and more robust with a bushier tail and longer legs. The primary threat to the remaining wildcat population is genetic extinction through hybridisation with domestic cats. Hybrids are known to be widespread and are difficult to distinguish from pure wildcats. The species is active throughout the day, particularly at dawn and dusk, and preys on small mammals such as rabbits *Oryctolagus cuninculus* and voles. They use refuges (known as dens) within cavities in trees, tree roots, rocky areas and the burrows of other mammals. Further threats to wildcat populations include habitat loss and persecution (Ref 7).

Legislative and Policy Context

6.1.15 Badgers are protected in the UK under The Protection of Badgers Act 1992 as amended by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2011. Badgers have dedicated legislation in the UK due to a long history of persecution and this prohibits offences not applicable to other protected species in the UK. Offences under the Protection of Badgers Act include:

- Wilfully taking, injuring or killing a badger;
- Cruelty to a badger;
- Sale, possession, marking or ringing of a badger; and
- Intentional or reckless interference with a badger sett.

6.1.16 Interfering with a badger sett includes damaging or destroying the sett or any part of it, obstruction of access, disturbing a badger while in its sett or causing / allowing a dog to enter a sett.

6.1.17 Otter, pine marten, red squirrel and wildcat are all listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the 'WCA') and Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (also referred to as the 'Habitats Regulations'). In addition, the protection afforded to these species under the WCA is enhanced by the Nature Conservation (Scotland) Act 2004, which introduced the term 'recklessly' in relation to the protection received. This legislation, when taken together, results in a level of protection that prohibits the intentional, deliberate or reckless:

- Killing, injuring, taking or disturbance of these species;
- Damaging, destroying or obstructing any place used by these species for the purposes of breeding, sheltering or protection; and
- Selling and/or advertising for sale any of these species, or any parts thereof.

6.1.18 Water voles receive protection in Scotland under Schedule 5 of the WCA, in respect of Section 9(4) only. In addition, this protection is enhanced by the Nature Conservation (Scotland) Act 2004, which includes 'reckless' acts as an offence. It is thus an offence to intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection, and to disturb water vole while they are using such a place.

6.1.19 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 protected mammal 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.
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.

6.1.20 With the exception of badger, all of the protected mammal species which were the target of dedicated survey at the Development Site are identified as being of principal importance for conservation through their presence on the Scottish Biodiversity List.

6.1.21 In addition, all of the protected mammal species considered are Priority Species of the Inverness and Nairn Local Biodiversity Action Plan.

6.2 Methods

Desk Study

6.2.1 A desk study was carried out to identify nature conservation designations for which protected mammals are qualifying or notified species and to search for records of protected mammals 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 protected mammals 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 boundary and other national statutory and local non-statutory nature conservation designations within 2 km. A data search for records of protected mammals within 2 km of the Development was also undertaken.

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

Field Survey

6.2.4 The following field survey areas were used to search for evidence of protected mammals:

- 100 m buffer – for badger and red squirrel; and
- 200 m buffer – for otter, pine marten, water vole and wildcat.

6.2.5 The buffer distances stated above are based around the footprint of the Development. The stretch of C1064 public road between its junction with the B862 and the point where it will be diverted through Dirr Wood was excluded from the survey area as works at this location will be limited to resurfacing only and are not expected to result in any impacts to ecological features. The survey areas are shown on Figure 6.3.1 (available at the end of this appendix).

Camera Trapping Survey

6.2.6 Six motion-sensitive camera traps were positioned in a variety of habitats with potential suitability to support the target protected mammal species, primarily semi-natural broadleaved woodland, conifer plantation and woodland edge habitat adjacent to bog / heath. Bait (e.g. dead rabbits) was placed in the area in front of the cameras which were deployed for 56 days between 27 April and 22 June 2018. Camera trap footage was recorded as motion capture images on to 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 6.2 and shown in Figure 6.3.2 (available at the end of this appendix).

Table 6.2 Locations of Camera Traps

Camera Trap Reference	Location	Description
1	NH 61853 33641	Located close to track within Scots pine plantation. Animal trail leading east – west through area. Camera located on tree facing bait on adjacent tree with trail running in between.
2	NH 61420 32741	Located approximately 10 m from stone dyke to south. Numerous deer trails leading through woods and through damaged section of stone dyke. Camera mounted on tree facing across main trail with bait located on adjacent tree. Location close enough to gain attention of animals passing along dyke.
3	NH 61022 33346	Located on small tree facing large Sitka spruce *Picea sitchensis* on edge of wet woodland area. Distinct trail, most likely deer, passing in front of camera. Smaller trail running from the south leading to trails and potential den site under tree roots.
4	NH 60225 33051	Located close to western edge of plantation along distinct deer trail with other smaller trails also present across wet grassland / burn area. Camera mounted on tree facing large Sitka spruce with bait attached.
5	NH 58881 33155	Located close to edge of broadleaved woodland ride near forest track. Evidence of badger extensive in area. Camera mounted on tree facing small multi-stemmed tree with bait attached.
6	NH 61015 34699	Located in small valley area with significant open areas, patchy bog and dense bracken *Pteridium aquilinum*. Camera mounted on tree in small area of coniferous woodland (avoiding growth of bracken). Bait attached to adjacent tree. Evidence of deer and other mammal trails in vicinity.

Badger Survey

6.2.7 Survey for badger was carried out on 06, 07, 13, 25 and 26 September 2017, by experienced AECOM ecologists. The survey followed guidance in published literature (Ref 6) and the survey areas encompassed all parts of the Development footprint considered to be suitable for supporting badger, plus a 100 m buffer. Evidence searched for included: setts, spoil heaps and bedding; guard hairs; latrines; footprints, trails and scratch marks; and foraging activity. Badger evidence was mapped with the aid of aerial photography and GPS, with accompanying field notes. Where possible, setts were classed as main, annexe, satellite or outlier, and holes described as well-used, partially-used or disused. Incidental evidence of badger activity found after the initial survey was also noted.

Otter and Water Vole Survey

6.2.8 Survey was carried out for otter and water vole on 15 May and 11 June 2018 by experienced AECOM ecologists. The survey followed guidance in published literature (Ref 2; Ref 8; Ref 9; Ref 10). Evidence searched for included, for otter: holts, laying-up areas, spraints, footprints, trails and foraging evidence; and for water vole: latrines, droppings, burrows, trails and foraging evidence. Evidence was mapped with the aid of aerial photography and GPS as necessary, with accompanying field notes.

6.2.9 All watercourses and the edges of all waterbodies within 200 m of the Development were surveyed for signs of otter and water vole.

Pine Marten Survey

6.2.10 Survey was carried out for pine marten on 19, 20 and 24 April 2018 by AECOM approved sub-consultants. The survey followed guidance in published literature (Birks *et al,* 2005), and the survey areas encompassed all parts of the Development footprint considered suitable to support pine marten, plus a 200 m buffer. Evidence searched for included: dens, scats, footprints and trails. Evidence was mapped with the aid of aerial photography and GPS as necessary, with accompanying field notes.

6.2.11 Following the initial camera trapping survey described above, a second period of camera trapping was carried out specifically to investigate pine marten activity. Six motion sensitive cameras were deployed for a period of 35 days (between 22 June and 27 July 2018) at six potential den sites identified by the pine marten field survey. The locations of these cameras and the features on which they were positioned are detailed in Table 6.3. The locations of the cameras are also shown on Figure 6.3.2.

Table 6.3 Locations of Camera Traps Monitoring Potential Pine Marten Dens

Camera Trap Reference	Location	Description
A	NH 58884 33144	Tree cavity – camera positioned on adjacent tree to focus on trunk of tree with cavity feature above broken limb, located above at approximately 8 m.
B	NH 58912 33177	Tree cavity – camera positioned on adjacent tree focussing on tree cavity within rot hole approximately 7 m above ground.
C	NH 59164 33052	Tree cavity – tree cavity at approximately 5 m within snapped off limb. Tree located in field corner. Camera positioned on fence post and installed upside down to enable bracket to point up at location. Camera was knocked out of position after a few hours by cattle although it remained pointing at the trunk, allowing capture of animals on lower section.
D	NH 58944 32934	Burrow – small burrow, too small for badger, possibly old rabbit warren. Camera located on post pointing at burrow.
E	NH 61392 32819	Burrow – camera located at burrow feature under large boulder which showed evidence of some use and animal trails in close proximity.
F	NH 61048 33340	Burrow – camera positioned at burrow feature under tree roots. Deer trails and areas of brash nearby. Camera located on adjacent tree on other side of trail.

Red Squirrel Survey

6.2.12 Sightings of two red squirrels which had been killed on the B852 road (which borders the Development to the north-west) were noted by AECOM ecologists during preliminary surveys. Given that red squirrel was therefore confirmed as present in the area, a full presence / absence survey was not considered necessary. Instead, drey count surveys were conducted in appropriate habitat (mature woodland) on 08 and 09 August 2018 and followed published guidance (Ref 5).

6.2.13 Any dreys or other signs of squirrel activity (e.g. sightings of live animals) identified during the survey were mapped with the aid of aerial photography and GPS as necessary, with accompanying field notes.

6.2.14 Survey for red squirrel dreys was carried out in all areas of suitable woodland habitat within the footprint of proposed infrastructure plus a buffer of 100 m.

Wildcat Survey

6.2.15 Survey was conducted for wildcat on 19, 20 and 24 April 2018 by approved AECOM sub-consultants. The survey followed guidance published in Cresswell *et al* (2012; Ref 4) and involved a walkover of suitable wildcat habitats searching for potential den sites and signs of wildcat presence including hair, scats, footprints and trails. Evidence was mapped with the aid of aerial photography and GPS as necessary, with accompanying field notes.

6.2.16 The survey area covered the proposed Development and a buffer of 200 m.

Limitations

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

6.2.18 Dense gorse *Ulex europaeus* at the location of Compound 3 presented a limitation to badger survey as it was not possible to access all parts of this area. However, the perimeter of this area was walked, including incursions into the footprint of the compound where possible, and no evidence of badgers was found. It is therefore considered unlikely that any setts are present in this area that were not identified by the field survey.

6.2.19 A lack of protected species evidence identified by field survey does not preclude their future occurrence, and the likelihood of changes in the baseline described increases with elapsed time.

6.3 Results

Desk Study

6.3.1 Records of badger, otter, pine marten and red squirrel were returned by the Highland Biological Recording Group. These included two records of otter evidence (spraints only), a single record of pine marten (dead on the road south of Dores), three records of badger (all dead on roads) and 13 records of red squirrel (both dead and live individuals). No records of water vole or wildcat were returned.

Field Survey

Camera Trapping Survey

6.3.2 The camera trapping survey recorded badger, pine marten and red squirrel activity. There were also recordings of deer species, fox *Vulpes vulpes* and birds. The species photographed at each location are summarised in Table 6.4, with detailed information provided under the relevant species sections below.

Table 6.4 Summary of Species Recorded at Camera Traps

Camera Trap Reference	Species Recorded
1	Red squirrel
2	Red squirrel, badger and pine marten
3	Red squirrel and pine marten
4	Red squirrel and badger
5	Red squirrel, badger and pine marten
6	Badger

Badger

6.3.3 Extensive badger activity was recorded within the survey area. Multiple active setts were identified including one main sett and one subsidiary sett. Seventeen outlier setts were also identified. Further detail on the locations of setts identified by the field survey is provided in Confidential Appendix 6.1. The location of badger evidence, excluding setts, is illustrated on Figure 6.3.3 (available at the end of this appendix).

6.3.4 Badgers were recorded during the camera trapping survey at four of the six camera deployment locations (as summarised in Table 6.5). However, instances of visits to cameras by badger were relatively low over the 56 day recording period, with the maximum activity recorded at Camera Trap Reference 4 (situated in the edge of conifer plantation adjacent to Ashie Moor) with visits on 11 days out of 56. Cameras re-positioned on potential pine marten dens also recorded three instances of badger at Camera Trap Reference D in woodland 450 m west of Kindrummond Farm (see Table 6.6).

Table 6.5 Summary of Badger Activity Recorded by Camera Trapping Survey

Camera Trap Reference	Number of Days on Which Badger was Recorded	Total Number of Badger Visits to Camera Trap Location
1	0	0
2	1	1
3	0	0
4	3	4
5	11	11
6	1	1

Table 6.6 Summary of Badger Activity Recorded by Camera Trapping at Potential Pine Marten Dens

Camera Trap Reference	Number of Days on Which Badger was Recorded	Total Number of Badger Visits to Camera Trap Location
A	0	0
B	0	0
C	0	0
D	3	3
E	0	0
F	0	0

6.3.5 Two incidental observations of single badgers were noted during bat surveys within the plantation to the north-west of the Site at approximately NH 62011 34766 and on the track down to Kindrummond Farm, at NH 59398 32989.

6.3.6 Fifteen badger latrines (often used to mark territorial boundaries) and single mounds of badger dung were recorded. These were primarily located along field boundaries to the south-east of Kindrummond Farm (in the centre of the Development area).

6.3.7 Other general badger evidence was recorded throughout the Development Site (although concentrated in the broadleaved woodland on the east bank of Loch Ness) and included footprints, trails, scratch marks, dug out bees nests and 'push-through' gaps beneath fences, as shown on Figure 6.3.3.

Otter

6.3.8 No otter holts or lie ups were found during the field survey and no otter activity was recorded during the camera trapping survey. However, otters were confirmed to be present in the survey area with spraints recorded on the south-west bank of Loch Ashie and on the Allt a' Mhinisteir burn within the Dirr Wood plantation (as shown on Figure 6.3.4 available at the end of this appendix).

6.3.9 An otter was also flushed from beside Lochan an Eoin Ruadha during a breeding diver survey on 30 May 2018.

Pine Marten

6.3.10 Field survey for pine marten recorded 21 sites which had suitability to be used as dens and 19 scats (droppings) which were considered likely to belong to pine marten. Scats were located within woodland areas throughout the Development Site but the features with suitability for use as dens were concentrated in the broadleaved woodland near Loch Ness (see Figure 6.3.5 available at the end of this appendix). During the camera trapping survey pine marten was recorded at three of the six camera positions (see Table 6.7). Pine marten activity was low with a maximum of four visits over the 56 day recording period.

Table 6.7 Summary of Pine Marten Activity Recorded by Camera Trapping Survey

Camera Trap Reference	Number of Days on Which Pine Marten was Recorded	Total Number of Pine Marten Visits to Camera Trap Location
1	0	0
2	3	3
3	2	2
4	0	0
5	4	4
6	0	0

6.3.11 During the dedicated camera trap monitoring of potential pine marten den sites, pine marten were recorded at three of the six potential den sites, at Camera Trap References C, D and E (see Table 6.8). Camera Trap Reference C, located on the boundary of semi-natural broadleaved woodland / improved grassland habitat within the Development footprint, recorded a pine marten ascending a tree with prey on 19 July 2018. This was the only confirmed instance of a pine marten entering any of the potential den sites. This feature is therefore a confirmed pine marten den but is apparently infrequently used, with pine marten recorded entering once in 35 days. Due to the low activity at this feature and the lack of recordings of young pine marten (the cameras were deployed during the period when pine marten kits would be active) it is considered that this feature is not used as a breeding den.

Table 6.8 Summary of Pine Marten Activity Recorded at Potential Den Sites

Camera Trap Reference	Number of Days on Which Pine Marten was Recorded	Total Number of Pine Marten Visits to Camera Trap Location
A	0	0
B	0	0
C	2	2
D	3	3
E	2	3
F	0	0

6.3.12 An incidental observation of a pine marten was also recorded by AECOM ecologists on 20 June 2018 at an approximate grid reference of NH 60111 34704, within felled conifer plantation near Dores.

Red Squirrel

6.3.13 During red squirrel field surveys, observations of live red squirrels were made within conifer plantation in the survey area (illustrated on Figure 6.3.6 available at the end of this appendix). One of these was within an area of proposed infrastructure in the centre of the Development footprint, 600 m north of Ach-Na-Sidhe B&B, with the second on the south-west bank of Loch Ashie. Eight potential dreys were identified within 100 m of the proposed Development and scattered feeding signs (chewed cones) were recorded as shown on

Figure 6.3.6. Three dreys are located within the footprint of the Development. In addition, three dead red squirrels were found on the B852 road near to Compound 2 on Loch Ness.

6.3.14 The camera trapping survey recorded red squirrel at five of the six original deployment locations. Activity was low with the maximum number of visits recorded over the 56 day monitoring period being four at Camera Trap Reference 5. Details of the red squirrel recordings made by the camera traps are provided in Table 6.9. In addition, red squirrel footage was also recorded by the camera traps during the dedicated pine marten den monitoring at locations C and E (see Table 6.10).

Table 6.9 Summary of Red Squirrel Activity Recorded by Camera Trapping Survey

Camera Trap Reference	Number of Days on Which Red Squirrel was Recorded	Total Number of Red Squirrel Visits to Camera Trap Location
1	2	3
2	1	1
3	3	3
4	1	1
5	4	4
6	0	0

Table 6.10 Summary of Red Squirrel Activity Recorded by Camera Trapping Potential Pine Marten Dens

Camera Trap Reference	Number of Days on Which Red Squirrel was Recorded	Total Number of Red Squirrel Visits to Camera Trap Location
A	0	0
B	0	0
C	4	4
D	0	0
E	3	3
F	0	0

Water vole

6.3.15 No evidence of water vole was found. The habitat within the survey area is considered to be sub-optimal for this species as the majority of watercourses are located within dense woodland. Some sections are within open bog / heath habitat, however such areas are fragmented by woodland blocks and the watercourse bank sides do not support the dense, lush vegetation preferred by water vole. Similarly the waterbodies present are sub-optimal for water vole due to their large size, sub-optimal areas of suitable marginal vegetation and lack of connectivity (due to the unsuitability of the adjoining watercourses).

Wildcat

5.1.1 No evidence of wildcat was found during field survey and no records were returned during the desk study. While this species is highly cryptic and therefore a lack of records / field

evidence cannot be relied upon to confirm absence, the Development is not located within a core wildcat area. Furthermore, although suitable habitat for wildcat exists, the proximity to human habitation (such as the village of Dores and other scattered residences / farms) and the high proportion of improved agricultural land reduces the likelihood of wildcat presence.

5.1.2 It is therefore concluded that wildcat is likely absent from the Development Site.

Other Mammal Species

6.3.16 Additional mammal species not afforded the levels of protection as those above were also recorded including roe deer *Capreolus capreolus*, sika deer *Cervus nippon* (which is a non-native species) and fox.

6.4 Discussion and Recommendations

Badger

6.4.1 A detailed discussion of the findings of the desk study and field survey for badger is provided in Confidential Appendix 6.1 (Volume 6).

Otter

6.4.2 Otters were confirmed to use the Development area, however no significant refuges were found to be present. Therefore otters are considered likely to be using the water features on-site only for commuting and / or as a seasonal foraging resource, including spawning amphibians. However, due to the high gradient, steep banks and the number of impassable barriers for migration throughout the catchment, migratory species including Atlantic salmon *Salmo salar* and sea trout *Salmo trutta* are considered unlikely to be present in any of the watercourses on-site (see Chapter 7: Aquatic Ecology, Volume 2 for more information).

6.4.3 Significant effects on potential otter foraging resources are not anticipated as no watercourses will be truncated / permanently lost. Other than standard mitigation to protect all mammal species (including common, non-notable species), no further mitigation for otter is considered necessary.

Pine marten

6.4.4 Pine marten were recorded within the Development area and one non-breeding refuge was identified. An area of semi-natural broadleaved and coniferous plantation woodland will be felled as part of the Development and this will result in the loss of pine marten foraging habitat. However, the confirmed non-breeding den located adjacent to Camera Trap C (see Figure 6.3.2) will be retained. A large area of semi-natural broadleaved and plantation woodland will remain in the wider area surrounding the Development and this, alongside the re-planted woodland delivered as part of the Forest Plan for the Development (see Chapter 12: Forestry, Volume 2 for more information), will provide a continued foraging resource for pine marten. However, as mature trees will be lost, which may also result in the loss of features which could be suitable for supporting pine marten refuges / dens, and as these are not replaceable in the short- to medium-term, alternative den sites should be provided. Such den sites can be provided using specially constructed den boxes which should be placed within nearby woodland which will not be disturbed by the Development (or any other known development / management activities).

Red squirrel

6.4.5 Red squirrel are present within the Development area, although are considered likely to be at low densities, and a small number of potential red squirrel dreys may be lost to the

Development. Appropriate mitigation will be required to permit works in the vicinity of confirmed dreys and this should be set out in a Species Protection Plan. A licence will also be required from SNH to allow the destruction or disturbance of the identified dreys. The loss of areas of mature broadleaved and coniferous woodland may impact upon red squirrel foraging resource, however extensive alternative habitat exists in proximity which is likely to be of sufficient area to support the small number of red squirrels which may be displaced. The loss of potential drey locations should be mitigated by the provision of red squirrel nest boxes placed in nearby woodland which will remain undisturbed by the Development (or any other known development / management activities). Such boxes can host features which reduce potential predation by, for example, pine marten.

6.4.6 As red squirrels which had been killed by traffic were seen on roads during field survey, and given that traffic is likely to increase during construction of the Development, it would be beneficial to erect rope bridges to allow red squirrels to cross safely. This would also promote red squirrel range expansion and give access to additional foraging areas. Rope bridges have been successfully used in Loch Lomond and the Trossachs and in Wester Ross, with evidence of their use provided by camera trap footage (Ref 11; Ref 1). Bridges are suspended from trees on either side of the road and vary in design complexity (Ref 3). It is recommended that squirrel feeders are installed at either end of the rope bridge to promote its use.

Wildcat

6.4.7 Wildcat are considered highly likely to be absent from the Development Site. Effects upon potential wildcat habitat are likely to be low as this species utilises a mosaic of habitats. For example, although mature woodland will be lost, wildcat tend to exploit woodland edge habitat which will remain. Wildcat can also utilise recently felled and regenerating woodland habitat as a foraging resource. This species, if present, is also likely to benefit from the provision of pine marten nest boxes which are recommended to be installed.

Water vole

6.4.8 Water voles are considered to be likely absent from the Development Site as no evidence of this species was recorded and the habitat present is sub-optimal. Therefore no effects upon water vole as a result of the Development are anticipated and no specific mitigation for this species is recommended.

6.5 References

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Ref 2. Chanin, P. (2003). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.

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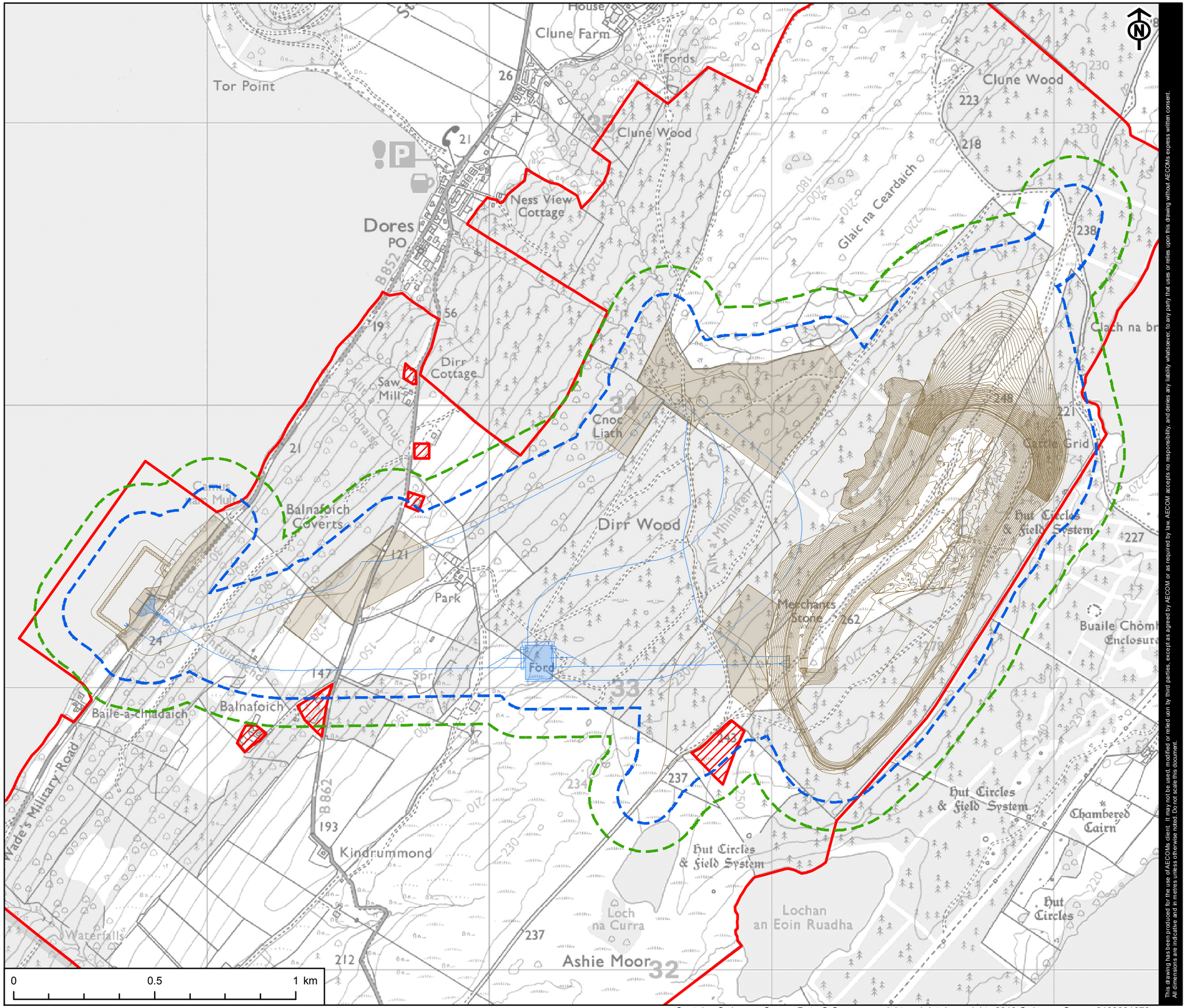
Figures

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
- 100 m survey boundary
  Badger and red squirrel
- 200 m survey boundary
  Otter, pine marten, water vole and wildcat
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area

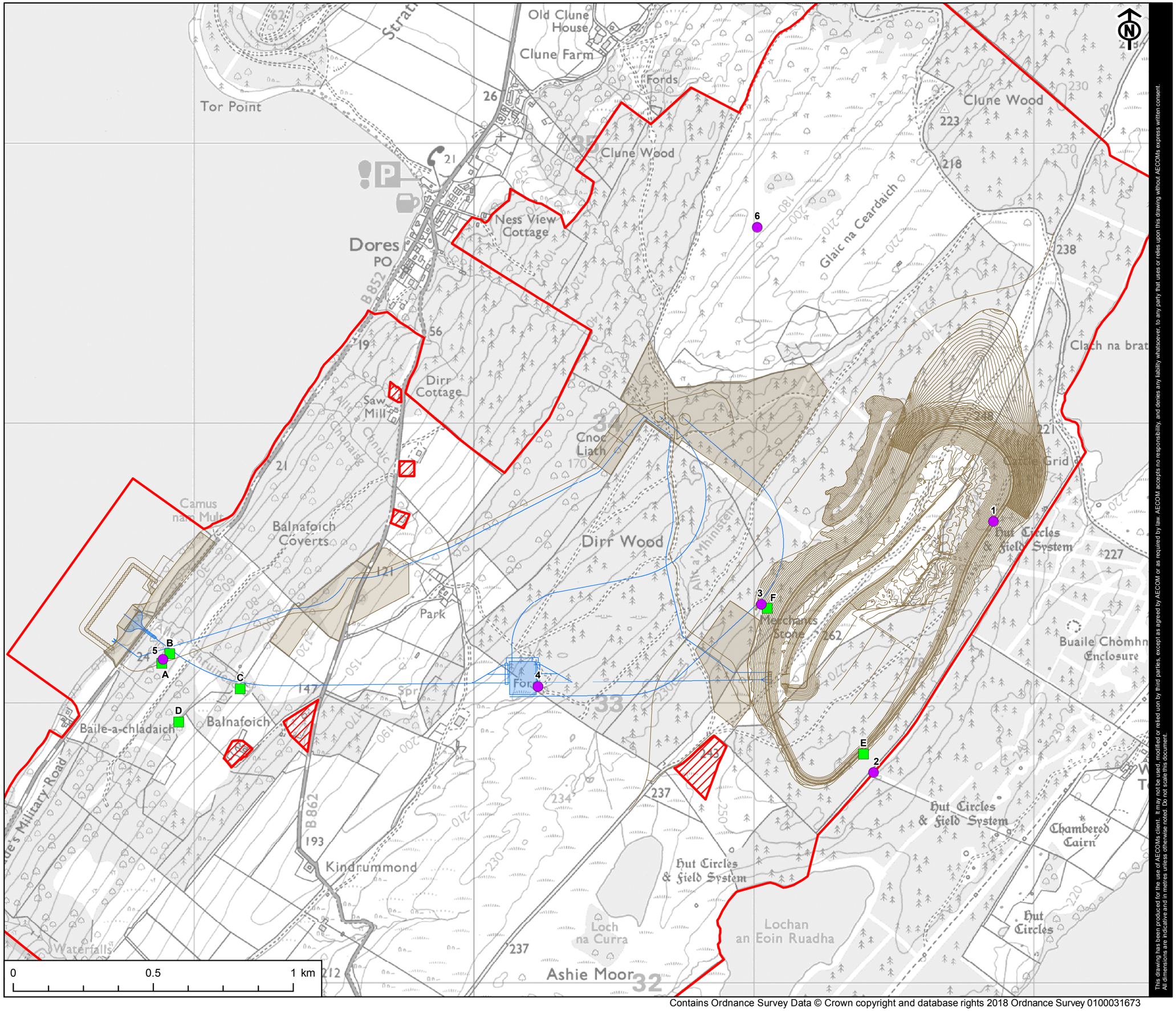
TITLE
FIGURE 6.3.1
PROTECTED MAMMAL SURVEY AREAS

REFERENCE
RJ_181031_EIA_A6.3.1_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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



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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
- Original monitoring location
- Potential pine marten den monitoring site

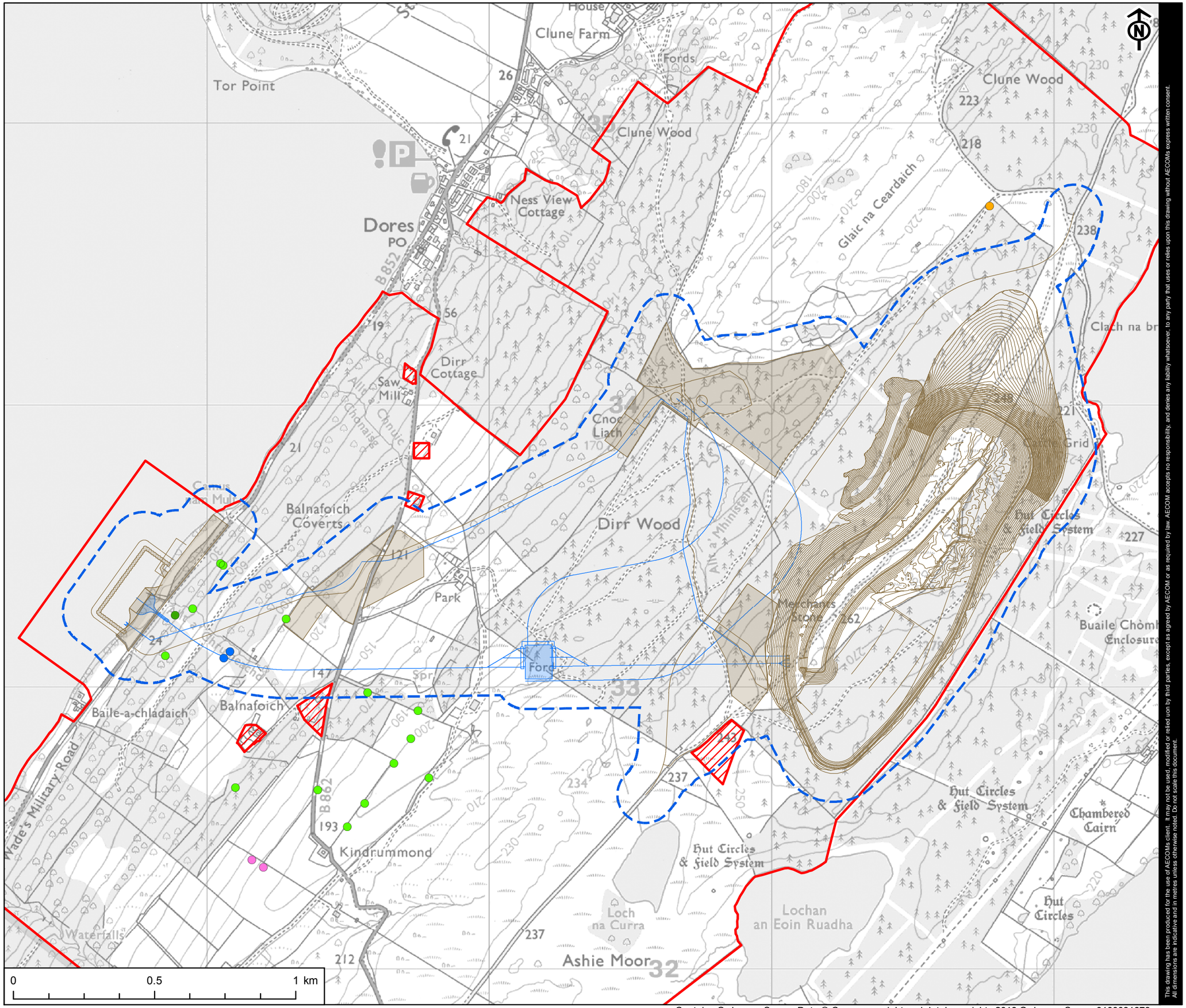
TITLE
FIGURE 6.3.2
MOTION SENSITIVE CAMERA TRAP LOCATIONS

REFERENCE
RJ_181031_EIA_A6.3.2_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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



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AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY

- Development Site boundary
- Excluded from Development Site boundary
- 100 m survey boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area

Badger field sign

- Footprint
- Foraging
- Latrine
- Mammal path
- Push-through

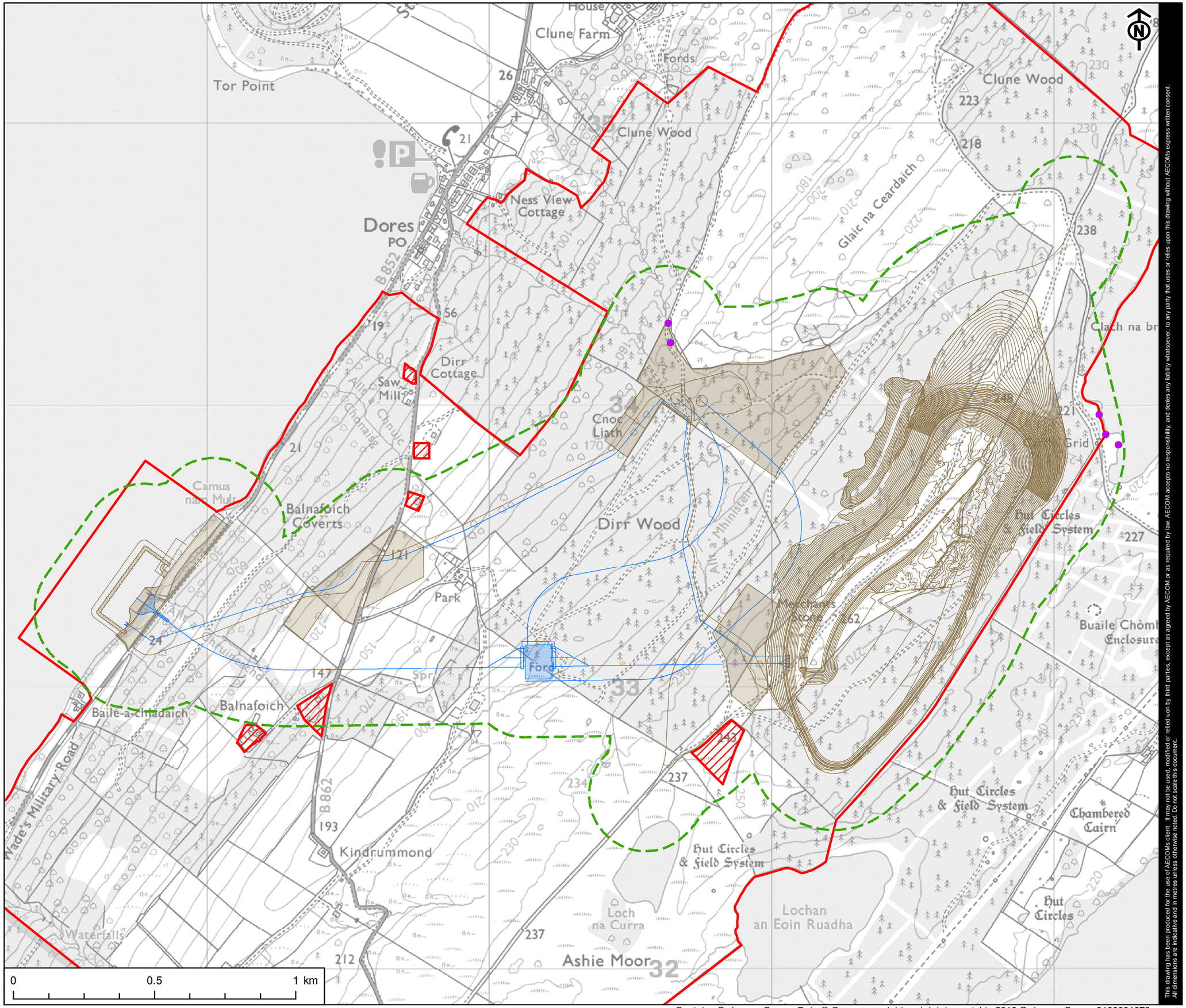
TITLE
FIGURE 6.3.3
BADGER SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.3.3_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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



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0 0.5 1 km

AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY
- Development Site boundary
- Excluded from Development Site boundary
- 200 m survey boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area
- Otter spraint

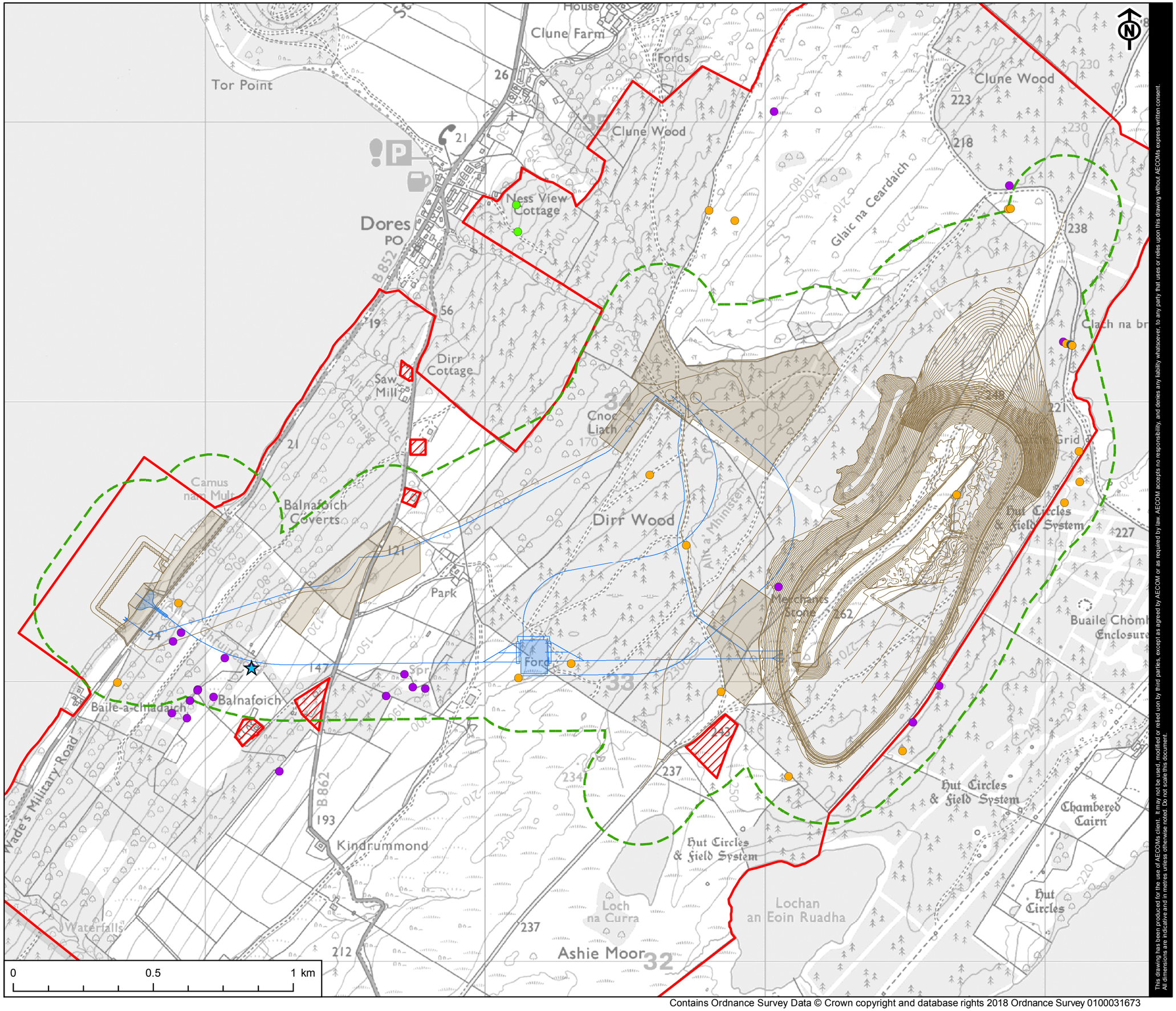
TITLE
FIGURE 6.3.4
OTTER SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.3.4_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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



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PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY

- Development Site boundary
- Excluded from Development Site boundary
- 200 m survey boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area

Pine Marten field sign

- Potential den
- Scat
- Trail
- Live sighting
- Confirmed den site

TITLE
FIGURE 6.3.5
PINE MARTEN SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.3.5_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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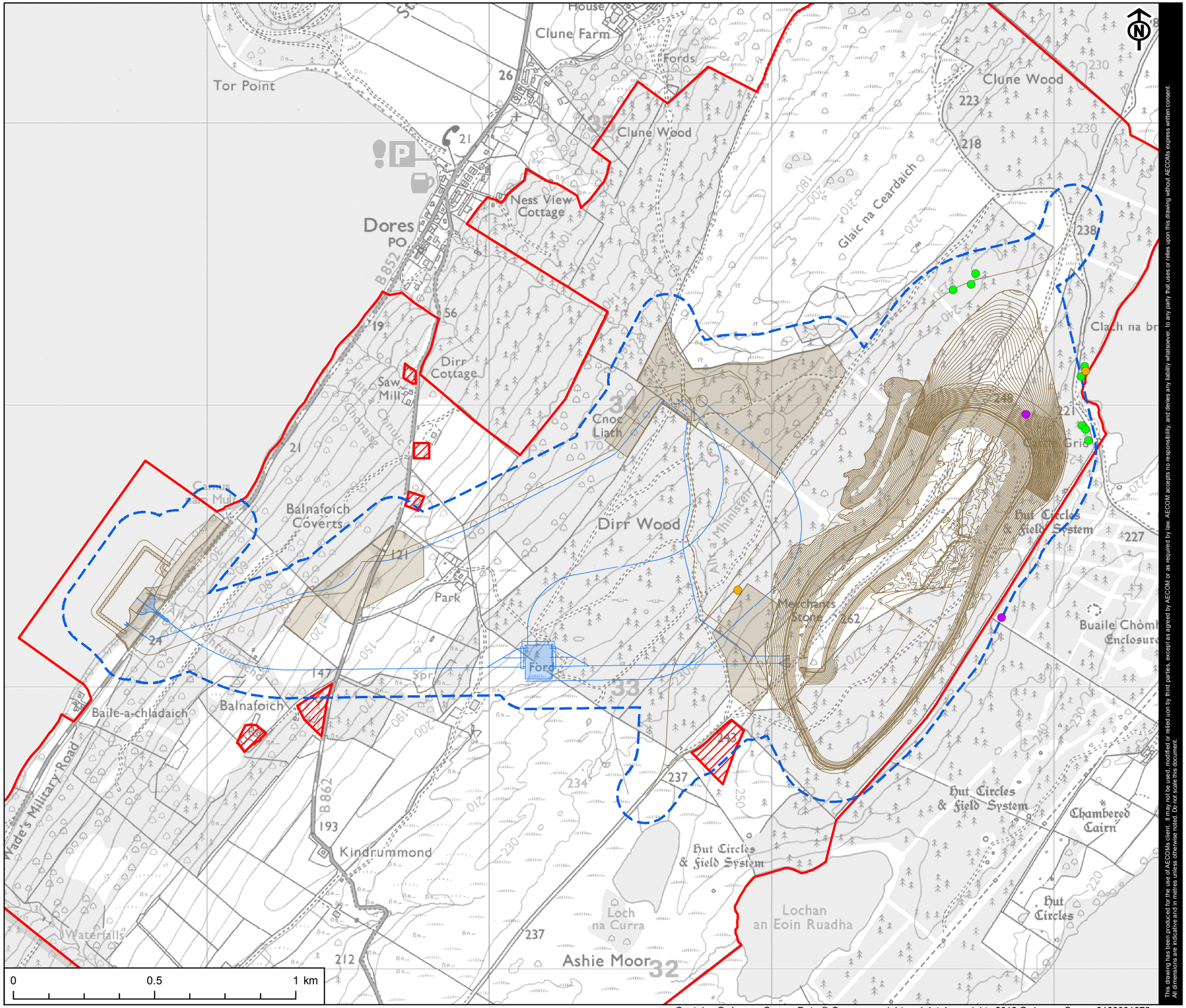

AECOM

PROJECT
RED JOHN PUMPED STORAGE HYDRO

CLIENT
ILI (Highlands PSH) Ltd.

KEY

- Development Site boundary
- Excluded from Development Site boundary
- 100 m survey boundary
- Above ground infrastructure - Line
- Above ground infrastructure - Area
- Below ground infrastructure - Line
- Below ground infrastructure - Area

Red Squirrel field sign

- Drey
- Feeding sign
- Live sighting

TITLE
FIGURE 6.3.6
RED SQUIRREL SURVEY RESULTS

REFERENCE
RJ_181031_EIA_A6.3.6_v1

SHEET NUMBER
1 of 1

DATE
31/10/18

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