moray offshore renewables ltd

Developing Wind Energy In The Outer Moray Firth

Environmental Statement

Modified Transmission Infrastructure for
Telford, Stevenson and MacColl Wind Farms

Technical Appendix 4.6 A

Terrestrial Ecology and Ornithology

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Table of Contents

1. Introduction

This Technical Appendix (TA) describes the terrestrial ecology and ornithology baseline conditions derived from desk studies and contemporary field surveys (2014) specifically associated with modified Onshore Transmission Infrastructure (OnTI) elements of the Telford, Stevenson and MacColl Offshore Wind Farms and Transmission Infrastructure Environmental Statement (ES). The following information is incorporated within this document:

- Baseline field survey methodology for winter walkover, breeding bird and coast line bird surveys;
- Baseline field survey methodology for Phase 1 Habitat, protected species, and bat roost and habitat suitability surveys,
- Baseline desk study results from Seabird 2000, British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS), the North East Scotland Biological Record Centre (NESBReC), the Northeast Local Biodiversity Action Plan (NE LBAP) and the National Biodiversity Network (NBN);
- Baseline field survey results from winter walk over, breeding bird and coast line surveys of the modified OnTI; and,
- Baseline field survey results from Phase 1 Habitat surveys, protected species surveys, and bat roost and habitat suitability surveys of the modified OnTI.

Survey results detailing badger (*Meles meles*) sett locations are included within a separate Confidential Annex to the ES. All surveys and consultations have been guided by recognised best practice and through consultation with Scottish Natural Heritage (SNH) to ensure a comprehensive baseline is collated. A summarised account of all information included within this TA is provided in Chapter 4.6 –Modified Transmission Infrastructure ES.

2. Background

The potential route options of the modified OnTI cable route corridor can be seen in Figure 4.6-1. Route Option 1a (received 14.04.14) is the option surveyed for the purposes of this submission and includes the landfall location at Boyndie Bay (Inverboyndie), (NGR NJ 668647) approximately 1 km to the west of Banff. Refined Route Option 1b shown (Figure 4.6-1), is the newly proposed route (as of 27.05.14). This route has not yet been fully surveyed for ecology or ornithology receptors, however overlap exists between the two proposed corridors and the much of the route has been surveyed. An update to the baseline interests will be undertaken through June and July 2014, however given the generic nature of the habitat throughout the wider area, assessments made using the data collected are deemed to be valid between Route Options 1a and 1b.

Figure 4.6-1 also shows a previous iteration of the cable route running to the north of Route Options 1a and 1b which was surveyed through the 2013/14 winter period for birds of conservation concern and for areas suitable for feeding and/or roosting. This data, although not now associated with the proposed route options, gives an additional sub-set of information to assist as an overview of the area for the potential impacts associated with the development.

The onshore export cable will run in an approximately south-easterly direction, to link with an as yet unconstructed substation near New Deer, which will connect into a second adjacent substation. Route Option 1a covered approximately 28 km, whilst Option 1b covers approximately 33 km.

Areas crossed by the proposed modified OnTI are typical of the wider landscape, with the majority of the route traversing open farmland including a mixture of arable and pastoral fields. Scattered pockets of broadleaved

and coniferous woodland are present along both route options, however, the proposed corridors have sought to minimise the impact to such habitats by deviating around these areas wherever practicable.

All the route options surveyed cross a number of watercourses, the majority of which are minor streams and tributaries draining the wider landscape. Only one major watercourse is required to be 'crossed' along the length of all route options; the River Deveron which, although is not designated within either EU or UK legislation, is known to contain populations of both salmon and sea-trout and is recognised as an important spawning ground for both species.

2.1 Conservation Designations

Eight conservation designations accompany species and habitat records throughout this report:

Habitats Directive

European Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') was adopted in 1992 in response to the Bern Convention. This Directive is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (together with the Conservation (Natural Habitats, &c.) Regulations 1994). The Directive requires Member States to maintain habitats listed on Annex I at a favourable conservation status through the creation of a network of Special Areas of Conservation (SACs).

Birds Directive

The European Union meets its obligations for birds through Directive 2009/147/EC (the 'Birds Directive') on the conservation of wild birds (codified version of the European Council Directive 79/409/EEC as amended). This legislation was adopted in 1979 in response to increasing concern about declines in Europe's wild birds. The Directive emphasises the protection of habitat for endangered and migratory birds listed on Annex I through the creation of a network of Special Protection Areas (SPAs).

Conservation of Habitats and Species Regulations 2010

In Scotland, the Conservation of Habitats and Species Regulations 2010 (together with the Conservation (Natural Habitats, &c.) Regulations 1994) transpose the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) into UK law. The Regulations protect European sites and European protected species (EPS). The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in rare and endangered animals listed on Schedule 2.

Wildlife and Countryside Act 1981

The Wildlife and Countryside Act 1981 consolidates existing national legislation to implement the Bern Convention and Birds Directive in the UK. The Act received royal assent in 1981. It protects native species, controls the release of non-native species, enhances the protection of Sites of Special Scientific Interest (SSSIs) and builds upon rights of way rules. Special penalties are available for offences related to rare and endangered birds, listed on Schedule 1, and animals, listed on Schedule 5.

Birds of Conservation Concern

The population status of UK birds is reviewed every five years to provide an up-to-date assessment of conservation priorities. The 2009 review of Birds of Conservation Concern (BoCCs) (Eaton et al., 2009) allocated 246 species onto red, amber or green lists. Seven quantitative criteria were used to assess population status: global conservation status, recent decline, historical decline, European conservation status, rare breeders, localised species and international importance.

Protection of Badgers Act 1992

Badgers are protected by the Protection of Badgers Act 1992, which consolidates previous legislation. Under the Act, it is an offence to kill, injure or take a badger; dig for a badger; cruelly ill-treat a badger; possess or control a dead or live badger; damage or destroy a badger sett (obstruct access, cause a dog to enter the sett, or disturb a badger while it is occupying the sett). Licenses to undertake some actions can be issued from SNH if justified.

Scottish Biodiversity List

The Scottish Biodiversity List (SBL), published in 2005, is a list of flora, fauna and habitats which Scottish Ministers consider to be important for Scottish biodiversity conservation. The list was developed by a partnership of organisations, specifically, the Scottish Biodiversity Forum as well as the Scottish public. The criteria required for inclusion on the SBL include scientific as well as a social criterion of culturally important species and habitats based on a survey of the Scottish public. The list now includes all species previously included within the UK Biodiversity Action Plan (UK BAP) for Scotland, which UK wide has been superseded by the UK Post-2010 Biodiversity Framework (2012). The SBL supports Scotland's Biodiversity Strategy in relation to the wider aims of the current UK framework.

Northeast Local Biodiversity Action Plan Priority Habitats and Species

The NE LBAP aims to protect and enhance local biodiversity across Aberdeen, Aberdeenshire and Moray. Formed in 1996, it is a partnership of statutory and voluntary agencies and individuals. The NE LBAP develops Local Action Plans which set out measures to conserve priority habitats and species. Once published, plans are implemented and periodically reviewed.

3. Baseline Survey Methodology

3.1 Baseline Field Survey Management

Baseline field surveys were carried out from November 2013 to March 2014 for wintering birds on an initial indicative route option to the north of Route Option 1a and 1b (Figure 4.6-1). Surveys for breeding birds are currently on-going along the refined Route Option 1b and at the coastal landfall location at Inverboyndie, increasing the baseline data for the OnTI. Surveys assessing the terrestrial ecology were undertaken throughout May 2014, quantifying the use of the area by protected mammals, mapping habitats and assessing their potential to support bats.

The 'ecology survey area' for all work completed was defined as a 550 m wide band including a construction corridor and suitable buffer surrounding this. The total area surveyed equated to 13.5 km^2 of a total available survey area of 18.3 km^2; restricted access by a number of landowners during the survey period limited the total area able to be assessed in the field. Updates to these restricted areas and the baseline survey information will be included within the report to be submitted in summer 2014.

All data collected throughout the course of the field surveys was entered into relevant databases, digitised using ArcGIS Geographical Information Systems (GIS) software, where applicable, and quality assured using RPS in house audit systems.

3.2 SNH Guidance on Determining an Ecological Baseline

Consultation with SNH was conducted via a Scoping Report issued in April 2014, and a meeting on 9 May 2014 to discuss survey and assessment methodology and timescales for both ecology and ornithology. Following this consultation process, SNH issued the following advice on 23 May 2014:

- Adequate detail of the cable laying technique(s) should be provided so that potential impacts to sensitive species and habitats during the construction phase can be assessed;
- The route is not expected to impinge on any designated ornithological sites;
- Omission of winter bird surveys is acceptable given that the timeline for construction specifies that the winter months will be avoided;
- Additional breeding bird surveys should be carried out immediately prior to construction to identify nesting attempts, particularly those of Schedule 1 species;
- SNH are content with the proposed list of protected species surveys outlined in section 5.2.6 of the scoping report;
- In addition to the scoping response received following submission of the scoping report, SNH confirmed at the meeting in May that great crested newt survey work was not required;
- Relevant District Salmon Fishery Boards should be consulted regarding potential impacts to salmonids and other fish species at river crossings;
- Surveys for freshwater pearl mussels are not required provided adequate sediment management and pollution prevention plans are in place;
- SNH support the proposal to undertake Phase 1 surveys along the cable corridor route and buffer with the understanding that follow up National Vegetation Classification (NVC) work for important areas may be required. As set out in the scoping report, they also advise that this is also used to identify where protected species survey work is appropriate; and,
- Protected species pre-construction survey work revisiting the project footprint should be undertaken to ascertain any changes in the degree of wildlife activity as this could have implications for the level of mitigation required.

During the course of the May 2014 meeting SNH were informed of the timelines for submission and it was outlined that all surveys would not be completed by these dates; this is particularly the case for breeding bird surveys along the modified OnTI including the landfall location. SNH accepted that a report submitted following the initial ES submission would be appropriate for further detail of the findings of these surveys.

3.3 Baseline Desk Studies

The following organisations and data sources were contacted for relevant historical and contemporary species and habitat records:

- Joint Nature Conservation Committee (JNCC).
- BTO;
- North East Scotland Raptor Study Group (NESRSG);
- Royal Society for the Protection of Birds (RSPB);
- Deveron, Bogie and Isla Rivers Charitable Trust;
- District Salmon Fisheries Boards;
- NESBReC;
- Scottish Wildlife Trust (SWT);
- North East Scotland Bat Group;
- Saving Scotland's Red Squirrels (SSRS); and
- Botanical Society of Britain and Ireland (BSBI).

3.4 Field Survey Methodology

Winter Bird Surveys:

A total of three winter walkover survey visits were undertaken of the proposed substation location and wider area in November 2013 and February and March 2014, coupled with a single walkover survey of the original indicative route option in March 2014. Surveys sought to identify species of conservation concern and habitat which might be utilised by such species for foraging and/or through the winter period. Although this information has now been deemed by SNH as not required, it still provides useful additional background regarding the use of the area by such species.

Breeding Bird Surveys

At the time of writing, a single breeding bird survey visit had been completed. Two further surveys will be carried out in June and July 2014, with the results of these surveys being included in the report to be submitted in Summer 2014. The surveys have been (and will be) undertaken according to the Common Bird Census (CBC) methodology (Gilbert *et al*., 1998; Marchant, 1983). Surveys are carried out during periods of good weather (i.e. good visibility, no persistent rain or fog, avoiding excessive heat or cold or wind speeds exceeding Beaufort Force 4) from one hour before dawn to six hours after dawn. The location and behaviour of all birds are recorded directly onto 1:10,000 scale Ordnance Survey (OS) maps using standard BTO notation.

All records of birds are digitised using ArcGIS software and territory analysis will be carried out on completion of all surveys. Birds are assumed to be holding territory if one or more of the following behaviours are observed:

- Displaying or singing;
- Presence of a nest, eggs or young (including newly-fledged birds);

- Agitated behaviour, specifically, alarm calls or distraction display; and/or
- A territorial dispute.

In the absence of any of these behaviours, a pair observed together in suitable habitat is also considered to be holding a territory. Other records are considered to be non-breeding birds.

Coastal Bird Surveys

Coastal bird surveys were undertaken at the two locations (Inverboyndie and Sandend) investigated as potential point of landfall for Offshore Transmission Infrastructure (OfTI(+)) cables originating from the three consented wind farms. A landfall location has now been selected at Inberboyndie but the results of both survey locations have been reported here for context. A total of three survey visits are proposed to each location between May and July 2014. To date only the May surveys have been completed.

The survey area at each location includes the working corridor of the proposed cable route plus an additional 1 km buffer stretching east and west along the coast lines. The coast lines were buffered to a distance of 500 m offshore to include birds on the water or in flight above the sea, visible from land. Surveyors walked the coast within the survey area from west to east, mapping all waterbird species (defined by the BTO as all divers, grebes, cormorants, herons, wildfowl, waders, gulls and terns) on a 1:5,000 scale OS map which had a north-south grid of 250 x 250 m cells placed across it to improve accuracy. Standard BTO codes were used in recording birds, with notes of behaviour also made (e.g. roosting, loafing, foraging etc.).

Surveys were undertaken simultaneously at both locations to reduce the impact of confounding factors (e.g. weather conditions and tidal state) causing any potential bias in results.

Surveys were timed to be carried out across the survey programme at different times of the tidal cycle to ensure that all species and activities were captured. Surveys were timed as such:

- One survey commencing two hours prior to high tide;
- One survey commencing two hours prior to slack tide; and,
- One survey commencing two hours prior to low tide.

Phase 1 Habitat Surveys

Surveys of the modified OnTI were carried out across May 2014 with the purpose of defining Phase 1 Habitat type and extent across the 18.4 km^2 of the available ecology survey area. Surveys followed the standard JNCC (2010) guidelines.

The Phase 1 Habitat classification and associated field survey technique provides a relatively rapid system of recording semi-natural vegetation and other wildlife habitats. Each habitat type is defined by way of a brief description and is allocated a specific name, alpha-numeric code and unique mapping colour. The system has been widely used and continues to act as the standard technique for habitat survey across the UK.

The ecology survey area was walked, habitats were inspected and delineated directly onto 1:10,000 Ordnance Survey maps using standard alpha-numeric notation. Target notes (TNs) were made to highlight features of interest or any aspect too small to be mapped; these were supported by photos and GPS (Global Positioning System) coordinates. Target notes are referred to throughout the text and in figures by a sequential number prefixed with TN, e.g. TN18. Where designated conservation sites, areas of high biodiversity or peat in the

superficial geology were encountered, these were mapped to National Vegetation Classification (NVC) level (Rodwell, 1991-2006; Rodwell, 2006)

Protected Species Surveys

Surveys were carried out across the OnTI throughout May 2014 in periods of suitable weather where heavy rainfall would not limit the quantity of field signs present across the survey area for each species.

Field evidence of the following protected species was searched for across the 18.4 km^2 of the accessible ecology survey area:

- Otter (*Lutra lutra*);
- Badger (*Meles meles*);
- Red squirrel (*Sciurus vulgaris*);
- Water vole (*Arvicola amphibious*);
- Pine marten (*Martes martes*); and
- Wild cat (Felis silvestris).

Otter

All safely accessible watercourses in the ecology survey area were searched for field evidence of otter. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support recordings made on maps. Otter field evidence recorded is as described by Bang and Dahlstrøm (2001) and SNH (2008):

- **Holts**: these are underground features where otters live. They can be tunnels within bank sides, underneath root plates or boulder piles, and even man-made structures such as disused drains. Holts are used by otters to rest during the day and are the usual site of natal or breeding sites. Otters may use holts permanently or temporarily;
- **Couches**: these are above-ground resting sites. They may be partly sheltered or fully exposed. Couches may be regularly used, especially in reedbeds and on in-stream islands. They have been known to be used as natal and breeding sites. Couches can be very difficult to identify, sometimes consisting of no more than an area of flattened grass or earth, and are best identified by the presence of other field evidence (e.g. spraints). Where rocks or rock armour are used as couches, these can be almost impossible to identify without observing the otter in-situ;
- **Feeding evidence**: the remains of prey items may be found at preferred feeding stations. Remains of fish, crabs or skinned amphibians can indicate the presence of otter;
- **Spraints**: otter faeces can be used to mark territories, often on in-stream boulders. They can be present within or outside the entrances of holts and couches. Spraints have a characteristic smell and often contain fish remains;
- **Prints**: otters have characteristic footprints that can be found in soft ground and muddy areas;
- **Paths**: these are terrestrial routes that otters take when moving between resting sites and watercourses, or at high flow conditions when they will travel along bank sides in preference to swimming; and
- **Slides and play areas**: slides are typically worn areas on steep slopes where otters slide on their bellies, often found between holts/couches and watercourses. Play areas are used by juvenile otters in play, and are often evident by trampled vegetation and the presence of slides. These are often positioned in sheltered areas adjacent to the natal holt.

Badger

All suitable habitat in the ecology survey area was searched for field evidence of badger. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support any recordings made. Badger field evidence recorded is as described by Neal and Cheeseman (1996), Bang and Dahlstrøm (2001) and SNH (2001):

- **Setts**: entrances are typically wider than they are tall with a flattened bottom. Widths vary dependent on use, however are on average approximate 30 cm. The number of entrances to a sett is dependent on the underground size amount of use a sett receives. Numbers of entrances can be used to classify the type of sett at a particular location;
- **Spoil heaps**: these are heaps of earth excavated by badgers. Material is often coarse due to badgers' large paws and claws, and heaps may contain scratched rocks, badger remains or hairs. Spoil heaps outside entrances of a well-established sett can be very large, and often have a well-defined furrow or groove from sett entrance to spoil heap;
- **Foraging signs**: badgers often dig 'snuffle holes' for worms or soil-dwelling grubs. These are typically conical in shape, 10-15 cm across, with material dug out on more than one side. Badgers also occasionally dig up wasps' and bees' nests in late summer;
- **Latrines**: these are small pits similar to snuffle holes which contain badger faeces. Faeces can be soft and muddy in appearance, or contain wing cases of insects, husks of grain or stones/pips of berries. Latrines are often, though not always, found close to setts and can comprise one to more than a dozen pits. Importantly, they are also used as territorial boundary markers;
- **Prints**: badger prints are very distinctive, with a broad, kidney-shaped pad and five toes lined up at the front. Fore prints (4.5-6.5 cm across) are larger than hind prints (4.0-5.0 cm across), and the imprints of claw ends are further away from the toes on fore prints as the claws are much longer;
- **Runs**: well-used badger runs are often very conspicuous. Runs typically link between sett entrances, or lead away from a sett towards foraging grounds or other setts. They can also be found well away from setts, often where badgers cross roads or go through gaps beneath fences;
- **Scratching posts**: setts often have one or more scratching posts nearby, the bark on the trees will be scored, shredded or completely removed up to a height of 1 m; and
- **Hair**: these are white or whitish with a black band towards the tip. They are 7-10 cm long, the black band is 1-2 cm and the white tip is about 1 cm, they are quite coarse and oval in cross-section. Hairs are often found stuck in brambles or barbed wire fences.

Red Squirrel

All suitable habitat in the ecology survey area was searched for field evidence of red squirrels. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support recordings made on maps. Red squirrel field signs are described in Gurnell *et al.* (2009) and evidence includes:

- **Feed signs** – Pine cones stripped of all seed leaving the remaining core;
- **Feeding stations** – Often stumps in forestry or open areas where a collection of stripped cones are present; and,
- **Dreys** – round ball / nest like structures, usually c.30 cm in diameter situated close to the stem / truck of a tree. Note, there is no discernable difference between red and grey squirrel dreys.

Sightings of individuals is the most reliable determinate of species presence.

Watervole

All suitable habitat in the ecology survey area was searched for field evidence of water vole. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support recordings made on maps. Water vole field evidence includes:

- **Burrows:** these are wider than they are tall, 4-8 cm across and usually surrounded by characteristic grazed 'lawns'. There may be droppings near burrow entrances, but no spoil heaps;
- **Feeding stations:** these are often located along runs or haul-out platforms at the water's edge. At the base of vegetation, they consist of neatly clipped stems of grass, sedge or rush up to 10cm long with grooved teeth marks at the cut ends;
- **Latrines:** these are typically found at prominent points along watercourses such as flat stones or bare earth. They contain lozenge-shaped droppings, approximately 8-12 mm long and 4-5 mm wide. Fresh droppings are greenish, changing to black when older;
- **Prints:** these are star-shaped, although hard to tell apart from prints of brown rat; and,
- **Runs:** these usually occur within 3 m of a watercourse. They are low tunnels pushed through vegetation, 5-9 cm across and branching, linking the watercourse with feeding areas and burrow entrances.

Pine Marten

All suitable habitat in the ecology survey area was searched for field evidence of pine marten. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support recordings made on maps. Pine marten field evidence includes:

- **Scats:** these vary greatly depending on diet but tend to be dark in colour with a coiled or twisted appearance. They are usually 4-12 cm long and 0.8-1.8 cm in diameter. Scats are reported to have a fruity smell often likened to parma violets. Pine marten use scats to mark territory and will often leave scats inside or close to dens;
- **Dens:** tend to be found in well wooded areas with lots of cover. Dens can be found in a variety of locations including elevated tree hollows, under fallen trees in the root ball and in rocky cairns; and,
- **Prints:** pine marten have 5 toes though often only 4 will show in the imprint. Paw imprints are between 40 and 65 mm in diameter.

Wildcat

All suitable habitat in the ecology survey area was searched for field evidence of wildcat. Evidence was recorded directly onto 1:10,000 Ordnance Survey maps. Photos and GPS coordinates were taken to support recordings made on maps. Wild cat field evidence includes:

- **Scats:** usually black or dark brownish-green when fresh, become a dry, light green-grey with age. Roughly cylindrical in shape, 15 mm diameter and 40-80 mm long, but may be formless depending on diet. Wildcat scats can be difficult to separate from those of domestic cats;
- **Claw marks:** left on trees to act as territory markers. Similar scratch marks are also left by badgers and domestic cats;
- **Paw prints:** again, similar to those of domestic cats. Footprint has 4 toes, a 3-lobed main pad and no claw marks as these will be retracted when walking; and
- **Dens:** wildcats den in a variety of locations including hollow trees, rock crevices, rabbit burrows, disused badger setts or fox earths.

Bat Roost and Habitat Suitability Survey

This survey was carried through May 2014 in conjunction with the Phase 1 Habitat survey covering the 18.4 km^2 of the ecology survey area. As surveyors walked the ecology survey area recording Phase 1 Habitats, habitats were also considered for their potential suitability to support roosting, foraging or commuting bats. Surveyors categorised habitats to be of high, medium or low suitability based on roosting, foraging or commuting suitability criteria (Table 1). Thus, potential bat roosts (buildings, bridges, mature trees), commuting routes (linear features such as hedgerows and lines of trees) and foraging habitat (water bodies, marshy grassland, cow fields) were classed to be of low, medium or high value. Photos, target notes and GPS coordinates were taken to support recordings made on maps.

Habitat suitability was digitised using ArcGIS software and overlain onto aerial imagery. Interpretation notes were made based on the target notes and habitat suitability. A future, targeted baseline field survey for bats was then recommended should these habitats be affected by the OnTI construction works.

Table 1. Bat habitat suitability criteria

Potential habitat suitability	Roosting habitat	Foraging habitat	Commuting habitat
High	Woodlands: any trees with roost potential – cracks, crevices and other gaps. Diverse choice of roosts. Caves, tunnels, mines and ice houses with humid atmospheres and sheltered, stable temperature conditions. Low disturbance.	High insect abundance. Native woodland, trees and hedgerows offering abundant shelter and diverse edge habitat. Slow flowing or still freshwater features with sheltered, vegetated edges. Low disturbance from lighting, pollutants and human activity. Pasture fields with cows.	Continuous, unbroken linear features (with little or no artificial lighting present) providing shelter and/or foraging opportunities and connectivity with other landscape features including roosting and foraging habitat. Includes treelines, woodland edge, hedgerows, waterways, walls, woodland tracks, road and drainage networks and buildings.
Medium	Roost sites and access points in cracks, crevices and gaps present, but not ideal due to size, disturbance, exposure.	Moderate insect abundance. Native woodland, trees and hedgerows offering some shelter and edge habitat. Fast flowing freshwater features offering some sheltered edges.	Partly discontinuous features offering some shelter and/or foraging opportunities. Continuous features with some form of artificial lighting.
Low	No suitable roost sites or access points visible. Less than one tree in 100 has roost potential due to age or species. High disturbance. Direct lighting on features.	Coniferous woodland, improved agriculture and built-up areas with low plant diversity and/or insect abundance. Lack of shelter, poorly connected to roost sites and commuting routes. High disturbance levels from lighting, pollutants and human activity.	Discontinuous features offering no shelter and/or isolated from potential roosting and/or foraging areas. Abundant artificial lighting.

Field Survey Limitations

The timing of submission of this document has not allowed for a full suite of surveys to be completed in relation to the ornithological interests of the modified OnTI. Similarly, access restrictions at the time of the surveys (April / May 2014) has meant that 6.1 km^2 of Route Option 1a was unable to be included within both ecology and ornithology surveys.

The data presented within this document has assessed proposed Route Options 1a. Refinement of the modified OnTI route to Route Option 1b occurred during the survey period, and consequently some sections of the finalised Route Option 1b have not been directly assessed in this report, However, for the purposes of this document and the assessments made within the ES Chapter, despite data for the modified OnTI being incomplete, given the largely homogenous nature of the majority of the landscape through which the assessed options pass, this is not deemed to affect the robustness of any assessment made. Habitats surveyed to date are typical of the wider landscape. This is of particular importance for the breeding bird surveys as, although data collected and presented for the first breeding bird survey visit (April / May 2014) might not assess the refined Route Option 1b it will provide an assessment of the species present in the area which may be affected by the development. Given that construction is not proposed to commence until 2016, and that SNH have requested that a full suite of surveys be conducted prior to construction commencing, all data collected in 2014, whether along the finalised route or in proximity to it, is suitable for assessing possible effects to all species of conservation concern throughout the area.

4. Baseline Survey Results

4.1 Desk Study Results

Coastal Birds Results

Seabird 2000

Seabird 2000 is a complete census of the entire breeding seabird population of Great Britain and Ireland. It was coordinated by the JNCC in partnership with other organisations such as SNH and RSPB. Beginning in 1998 and completed in 2002, Seabird 2000 counted over 8 million breeding seabirds at 3,300 coastal colonies, 900 inland colonies and 170 islands.

Relevant seabird breeding colony records within 3km of the two landfall points considered in the early stages of development prior to the final selection of Inverboyndie were sought from Seabird 2000. Records were received for colonies at five locations (Table 2).

Table 2. Seabird 2000 seabird breeding colony records

Location	Approximate Distance to Sandend Bay Landfall (km)	Approximate Distance to Inverboyndie Landfall (km)	Species	Number of occupied nests
Banff town	13	2	Herring gull	33
Macduff town	15	4	Herring gull	25
Findlater	2	13	Fulmar	123
			Great black-backed gull	2
			Herring gull	115
			Kittiwake	104
Garron Point	1	12	Fulmar	61
			Great black-backed gull	3
			Herring gull	720
			Kittiwake	211
			Shag	27
Redhythe Point	2	10	Fulmar	13
			Great black-backed gull	4
			Herring gull	137
			Kittiwake	198
			Shag	13

Wetland Bird Survey (WeBS)

WeBS is a joint scheme coordinated by the BTO, RSPB and JNCC in association with the Wildfowl and Wetlands Trust (WWT). The scheme monitors non-breeding waterbird populations across the UK to provide a scientific basis for their conservation. The records received from WeBS are 'core counts'. Core counts are coordinated for approximately 2,500 coastal and inland wetland sites throughout the UK. Counts are made monthly, for a range of species, throughout the year.

Relevant wetland bird count data were sought from the WeBS survey area in the Deveron Estuary (Table 3). The estuary at its closest point (southern end) is approximately 1.1 km from the modified OnTI.

Table 3. WeBS wetland bird count data for the Deveron Estuary count site, three year period from May 2007 to November 2010 (species for which mean peak monthly count across five years is <1 are not presented, 'unidentified gull' also not presented)

Bird species (alphabetical order)	Peak monthly count per year									Mean peak monthly count across 3 years
	May 2007-March 2008			January 2009-February 2009			October 2009-December 2010			
	Peak count	Month	Number of counts on which recorded (out of 9)	Peak count	Month	Number of counts on which recorded (out of 2)	Peak count	Month	Number of counts on which recorded (out of 10)	
Arctic tern	4	May	1	-	-	-	-	-	-	1.3
Bar-tailed godwit	-	-	-	-	-	-	3	Jan	2	1
Black-headed gull	18	Feb	5	-	-	-	54	Mar	8	24
Common gull	-	-	-	-	-	-	20	Oct (2009)	2	6.7
Cormorant	5	Aug	8	6	Jan	1	120	Nov (2009)	9	43.7
Curlew	1	Oct	1	3	Jan	1	16	Dec	9	6.7
Dunlin	1	Dec	1	-	-	-	-	-	-	0.3
Eider	13	Feb	4	2	Jan	2	23	Feb	9	12.7
Goldeneye	16	Nov	6	7	Feb	2	8	Apr	2	10.3
Goosander	5	Oct	6	1	Jan & Feb	2	-	-	-	2
Great black-backed gull	153	Oct	8	16	Jan	2	300	Jan	9	156.3
Great northern diver	-	-	-	-	-	-	2	Jun	2	0.7
Grey heron	10	Feb	8	1	Jan	1	5	Apr	4	5.3
Herring gull	1,000	Nov	9	300	Jan	2	1,351	Nov (2009)	9	883.7
Iceland gull	-	-	-	1	Feb	1	-	-	-	0.3
Lapwing	-	-	-	-	-	-	12	Mar	1	4
Long-tailed duck	-	-	-	3	Feb	1	1	Mar	1	1.3
Mallard	107	Nov	9	44	Jan	1	4	Apr	2	51.7
Mute swan	1	May, Sep, Nov & Jan	4	-	-	-	1	May	1	0.7
Oystercatcher	28	Feb	9	14	Jan	1	63	Jan	9	35
Pink-footed goose	-	-	-	-	-	-	3	May	1	1
Purple sandpiper	-	-	-	-	-	-	3	Nov (2009 & 2010) & Mar	3	1
Red-breasted merganser	2	Mar	1	-	-	-	4	Oct (2009), Jan, Feb & Jun	4	2
Redshank	108	Dec	7	30	Jan	1	63	Nov (2009)	10	67
Red-throated diver	-	-	-	-	-	-	1	Nov (2010)	1	0.3
Sanderling	-	-	-	-	-	-	2	May	1	0.3

Bird species (alphabetical order)	Peak monthly count per year									Mean peak monthly count across 3 years
	May 2007-March 2008			January 2009-February 2009			October 2009-December 2010			
	Peak count	Month	Number of counts on which recorded (out of 9)	Peak count	Month	Number of counts on which recorded (out of 2)	Peak count	Month	Number of counts on which recorded (out of 10)	
Shag	-	-	-	4	Jan	1	43	Nov (2009)	7	15.7
Turnstone	3	Dec	2	-	-	-	28	Nov (2009)	6	10.3
Velvet scoter	2	Mar	1	-	-	-	-	-	-	0.7

Corn Bunting Results

Corn bunting is a red-listed BoCC, listed on the SBL, and noted as a NE LBAP priority species. The species is a scarce resident breeder in north east Scotland where it is at the northern extremity of its breeding range. There are an estimated 550-600 corn bunting territories in Aberdeenshire and Moray. This number comprises 64% of the Scottish population and 6% of the UK population. The northeast Scotland population has declined significantly in the past two decades. Most birds occur in the Buchan plain of Aberdeenshire, now the Scottish stronghold for the species, in several hotspots between Rattray and Rosehearty. Here, densities can reach 21 males/km^2 and the hotspots are therefore among the most densely populated areas of corn bunting in the UK (Francis and Cook, 2011). Extensive conservation work is being undertaken across Aberdeenshire to benefit this declining species (www.rspb.org.uk/ourwork/projects).

Corn buntings occur in open, lowland arable and mixed farmland. Nests are built on the ground within crops or in dense, grassy vegetation. The following nesting habitats are favoured (Forrester et al., 2007):

- Cereals;
- Set-aside;
- Improved grassland (ungrazed);
- Unimproved grassland (ungrazed);
- Brassica crops;
- Pea crops;
- Bean crops;
- Linseed crops; and
- Bulbs.

The following winter feeding habitats are favoured (Forrester et al., 2007):

- Cereal stubbles;
- Oilseed rape stubbles;
- Livestock feed sites;
- Grain spills;
- Unharvested crops; and
- Newly sown spring cereals.

Corn buntings typically rear two broods per year, first clutches are laid from late-May and second clutches are laid as late as mid-August, thus chicks can still be in the nest well into September (Forrester et al., 2007). Early nests are usually built in autumn-sown cereals or grass managed for silage and later nests in spring-sown cereals. The chick diet is centred on insects (Francis and Cook, 2011).

Corn buntings are broadly sedentary and form flocks from late-October to early-May. In winter the flocks sometimes move locally when deep snow or ploughing of stubble reduces food supplies. The species has very similar breeding and winter distributions (Forrester et al., 2007).

RSPB were consulted (31.08.11) to provide any relevant information on corn bunting presence. No additional consultation was sought with the RSPB regarding the species (Table 4).

Table 4. RSPB corn bunting consultation

Organisation	Consultation response
Hywel Maggs, Conservation Officer for Northeast Scotland, and Kathleen Sinclair, Assistant Conservation Officer for Northeast Scotland, both RSPB	Hywel Maggs confirmed Aberdeenshire was remaining UK stronghold for the species. He agreed that potential construction impacts on the species would be low and of a temporary nature. It was verified that there is no ideal season for construction as corn bunting are present all year round (31 August 2011).

Raptors

At the time of submission of this Technical Appendix, no response had been returned from the NESRSG

Protected Habitats and Species

The following section details the records received from relevant recording bodies regarding protected species and habitat present within 2 km of the modified OnTI. A summary of these can be seen in Table 5 below within details of records received from NESBReC in tables 6 to 8 and the Botanical Society of Britain and Ireland (BSBI) in Table 9 below.

Table 5. Recording bodies consultation responses

Organisation	Consultation response
Deveron, Bogie and Isla Rivers Charitable Trust	Awaiting response at the time of writing.
District Salmon Fisheries Boards	Directed to the Deveron, Bogie and Isla Rivers Charitable Trust. Awaiting response at the time of writing.
NESBReC	Provided data on protected habitats and species within the data search area. Tables 6 to 8.
Saving Scotland's Red Squirrels (SSRS)	Advised that all their records are available on NBN Gateway.
SWT	Provided a shapefile containing all SWT reserves and protected species records from the data search area.
North East Scotland Bat Group	Advised that all their records are held by NESBReC.
Botanical Society of Britain and Ireland (BSBI)	Records of IUCN red listed species and those present on the SBL received for a 2km buffer surrounding route option 1. Table 9 below.

North East Scotland Biological Records Centre (NESBReC)

Relevant bird, plant, mammal and fish records within the modified OnTI were sought from the NEBReC. A total of 21 bird species were returned by NEBReC (excluding green-listed birds of conservation concern which do not have other conservation designations associated with them). These are presented showing their associated conservation designations (Table 6). Eight mammal species were found, these are also presented showing their associated conservation designations (Table 7). Fifty-one plant species of conservation concern were returned and these are similarly presented with their associated conservation designations (Table 8).

Table 6. Records of Protected Bird Species within 2 km of the modified OnTI

Species	Annex I of Birds Directive	Schedule 1 of Wildlife and Countryside Act
Barn owl		✓
Barnacle goose	✓	
Black-throated diver	✓	✓
Brambling		✓
Common tern	✓	

Species	Annex I of Birds Directive	Schedule 1 of Wildlife and Countryside Act
Goldeneye		✓✓(Part II only)
Golden plover	✓	
Hen harrier	✓	✓
Kingfisher	✓	✓
Merlin	✓	✓
Osprey	✓	✓
Peregrine falcon	✓	✓
Purple sandpiper		✓
Red-throated diver	✓	✓
Redwing		✓
Ruff	✓	✓
Sandwich tern	✓	
Short-eared owl	✓	
Snow bunting		✓
White-tailed eagle	✓	✓
Whooper swan	✓	✓

Table 7. Records of Protected Species (Excluding Birds) within 2 km of the modified OnTI

Mammal and fish species (alphabetical order)	Conservation designation					Grid square presence
	Schedule 2 of Conservation of Habitats and Species Regulations 2010 (European protected)	Schedule 5 of Wildlife and Countryside Act 1981 (UK-protected)	SBL	NE LBAP priority species	Protection of Badgers Act 1992	
Badger	-	-	✓	-	✓	NJ56, NJ66, NJ74, NJ 75,
Chiroptera	✓	-	-	-	-	NJ56, NJ66
Otter	✓	✓	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ56, NJ65, NJ66, NJ74, NJ75, NJ84
Pipistrellus	✓	-	-	-	-	NJ56, NJ65, NJ66, NJ85
Common pipistrelle	✓	-	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ75
Brown long-eared. *(Plecotus auritus)*	✓	-	✓	-	-	NJ85
Red squirrel	-	✓	✓	Dedicated Species Action Plan	-	NJ56, NJ66, NJ75, NJ76, NJ84, NJ85
Water vole	-	✓	✓	Dedicated Species Action Plan	-	NJ74, NJ84,

Table 8. Records of IUCN Red Listed and SBL listed species recorded by the NESBReC as present within 2 km of the modified OnTI

Taxa	IUCN Red Listed	SBL Listed
Alopecurus myosuroides		✓
Anagallis arvensis		✓
Arabis alpine		✓
Astragalus danicus	✓	✓
Brassica oleracea		✓

Taxa	IUCN Red Listed	SBL Listed
Campanula glomerata		✓
Carex maritime	✓	✓
Carum carvi	✓	✓
Centaurea cyanus		✓
Chelidonium majus	✓	✓
Chenopodium bonus-henricus	✓	✓
Cichorium intybus		✓
Coeloglossum viride	✓	
Coronopus squamatus		✓
Diphasiastrum complanatum		✓
Draba incana		✓
Euphorbia helioscopia		✓
Fallopia convolvulus		✓
Filago vulgaris		✓
Galeopsis speciosa	✓	✓
Gentianella campestris	✓	✓
Gnaphalium sylvaticum	✓	✓
Hyoscyamus niger	✓	✓
Iberis amara	✓	
Juniperus communis		✓
Juniperus communis subsp. communis		✓
Linnaea borealis		✓
Lithospermum officinale		✓
Lolium temulentum	✓	
Mentha arvensis		✓
Mertensia maritima	✓	
Papaver argemone	✓	✓
Plantago media		✓
Platanthera bifolia	✓	✓
Pyrola media	✓	✓
Ranunculus arvensis	✓	
Ranunculus sardous		✓
Rosa tomentosa		✓
Salsola kali subsp. kali	✓	✓
Saxifraga hypnoides	✓	✓
Scandix pecten-veneris	✓	
Scleranthus annuus	✓	✓
Sherardia arvensis		✓
Silene noctiflora	✓	✓
Sinapis alba		✓
Sinapis arvensis		✓
Stachys arvensis	✓	✓
Teesdalia nudicaulis	✓	✓

Taxa	IUCN Red Listed	SBL Listed
Torilis nodosa		✓
Trifolium micranthum		✓
Viola tricolour subsp. tricolor	✓	✓

Botanical Society of Britain and Ireland

Plant records within the modified OnTI were sought from the BSBI. A total of 41 species were returned from the BSBI. These are presented showing their associated conservation designations (Table 9).

Table 9. Records of IUCN Red Listed and SBL listed species recorded by the BSBI as present within 2 km of the modified OnTI

Taxa	IUCN Red Listed	SBL Listed
Anagallis arvensis		✓
Astragalus danicus	✓	✓
Centaurea cyanus		✓
Cichorium intybus		✓
Cochlearia officinalis subsp. scotica		✓
Euphorbia exigua	✓	
Euphorbia helioscopia		✓
Euphrasia arctica subsp. borealis	✓	
Euphrasia confuse	✓	
Euphrasia foulaensis	✓	
Euphrasia micrantha	✓	
Euphrasia tetraquetra	✓	
Fallopia convolvulus		✓
Fumaria capreolata		✓
Gentianella campestris	✓	✓
Glebionis segetum	✓	
Gnaphalium sylvaticum	✓	✓
Hyoscyamus niger	✓	✓
Juniperus communis		✓
Juniperus communis subsp. communis		✓
Linnaea borealis		✓
Lithospermum officinale		✓
Mentha arvensis		✓
Mertensia maritima	✓	
Papaver argemone	✓	✓
Platanthera bifolia	✓	✓
Poterium sanguisorba		✓
Pyrola media	✓	✓
Radiola linoides	✓	
Salsola kali subsp. kali	✓	✓
Scandix pecten-veneris	✓	
Scleranthus annuus	✓	✓
Sherardia arvensis		✓
Silene noctiflora	✓	✓
Sinapis alba		✓
Sinapis arvensis		✓
Spergula arvensis	✓	
Stachys arvensis	✓	✓
Trifolium micranthum		✓
Viola canina	✓	
Viola tricolor subsp. tricolor	✓	✓

Scottish Biodiversity List and North East Local Biodivesity Action Plan

Priority habitats, birds and mammals most likely to occur along the length of the modified OnTI and surrounding area were sought from the SBL and NE LBAP. Twenty-five priority habitats (Table 10) and 48 priority bird and mammal species (Table 11) were found.

Table 10. SBL and NE LBAP priority habitats

Habitat type	NE LBAP priority/SBL habitat	NE Habitat Action Plan
Coastal		
Coastal sand dunes	SBL /NE priority	Coastal sand dunes and shingle
Coastal vegetated shingle	SBL /NE priority	Coastal sand dunes and shingle
Maritime cliff and slope	SBL/NE priority	Maritime cliff and slope
Coastal heath and shrub	Locally important	Coastal heath and scrub
Farmland and grassland		
Cereal field margins	SBL/NE priority	Farmland/field margins and boundary habitats
Arable and cultivated land	Locally important	Farmland
Boundary and linear feature including hedgerows	SBL/NE priority	Field margins and boundary habitats
Lowland meadow (neutral grassland)	SBL/NE priority	Species-rich grassland
Improved grassland	Locally important	Species-rich grassland
Woodland		
Lowland wood pastures and parkland	SBL/NE priority	Wood pasture, parkland and boundary trees
Lowland Birch woodland	Locally important	Broadleaved woodland
Scrub	Locally important	Broadleaved woodland
Wet woodland	NE priority	Wet and riparian woodland
Riparian woodland	Locally important	Wet and riparian woodland
Planted coniferous woodland	Locally important	Planted coniferous woodland
Bog		
Lowland raised bog	NE priority	Lowland raised bog
Blanket bog	NE priority	Blanket bog
Wetland and Freshwater		
Reedbeds	NE priority	Wetland
Fens	NE priority	Wetland
Coastal and floodplain grazing marsh	NE priority	Wetland
Fen, carr, marsh, swamp and reedbed	Locally important	Wetland
Rivers and burns	Locally important	Rivers and burns
Standing open water	Locally important	Lochs and ponds
Ponds	Locally important	Lochs and ponds
Urban		
Urban	Locally important	Urban areas

Table 11. NE LBAP priority birds and mammals

Species (alphabetical order)	Habitat type	NE Species Action Plan	
		Species action addressed through relevant Habitat Action Plan	Species with dedicated North East Species Action Plan
SBL Species			
Black grouse	Montane, heath and bog	✓	
Brown hare	Farmland and grassland	✓	

Species (alphabetical order)	Habitat type	NE Species Action Plan	
		Species action addressed through relevant Habitat Action Plan	Species with dedicated North East Species Action Plan
SBL Species			
Bullfinch	Woodland	✓	
Capercaillie	Woodland	✓	
Common scoter	Coastal and marine	✓	
Corn bunting	Farmland and grassland	✓	
Grey partridge	Farmland and grassland	✓	
Linnet	Farmland and grassland	✓	
Otter	Wetland and freshwater	✓	
Pipistrelle bat	Woodland	✓	
Red squirrel	Woodland		✓
Reed bunting	Wetland and freshwater, mountain, heath and bog	✓	
Scottish crossbill	Woodland	✓	
Skylark	Farmland and grassland	✓	
Song thrush	Woodland	✓	
Spotted flycatcher	Woodland	✓	
Tree sparrow	Woodland	✓	
Water vole	Wetland and freshwater		✓
UK species of conservation concern			
Arctic tern	Coastal and marine	✓	
Barn owl	Farmland and grassland	✓	
Bearded tit	Freshwater and wetland	✓	
Common tern	Coastal and marine	✓	
Crested tit	Woodland	✓	
Curlew	Coastal and marine	✓	
Daubenton's bat	Woodland/freshwater/farming and grassland		✓
Dotterel	Montane, heath and bog	✓	
Eider	Coastal and marine	✓	
Golden eagle	Montane, heath and bog	✓	
Golden plover	Montane, heath and bog	✓	
Goldeneye	Freshwater and wetland	✓	
Grasshopper warbler	Farming and grassland	✓	
Hen harrier	Montane, heath and bog	✓	
Kestrel	Montane, heath and bog	✓	
Lapwing	Farmland and grassland	✓	
Lesser redpoll	Woodland	✓	
Little tern	Coastal and marine	✓	
Redshank	Coastal and marine	✓	
Sandwich tern	Coastal and marine	✓	
Slavonian grebe	Coastal and marine	✓	
Snipe	Freshwater and wetland	✓	
Snow bunting	Montane, heath and bog	✓	
Spotted crake	Freshwater and wetland	✓	
Tree pipit	Freshwater and wetland	✓	

Species (alphabetical order)	Habitat type	NE Species Action Plan	
		Species action addressed through relevant Habitat Action Plan	Species with dedicated North East Species Action Plan
SBL Species			
Twite	Farming and grassland	✓	
Water rail	Freshwater and wetland	✓	
Water shrew	Freshwater and wetland	✓	
Yellowhammer	Farming and grassland	✓	
Locally important species			
Ptarmigan	Montane, heath and bog	✓	

National Biodiversity Network (NBN)

The NBN was formed in 2000 and is a partnership of many UK conservation organisations. Previously, there was a vast amount of biodiversity data gathered over the years by various organisations and individuals, held in various formats. Now, the NBN acts as a 'data warehouse' for a broad range of this biodiversity information.

Relevant bird, mammal and fish records within the modified OnTI were sought from the NBN. A total of 79 bird species were returned from the data search of the NBN (excluding green-listed birds of conservation concern which do not have other conservation designations associated with them). These are presented showing their six associated conservation designations (Table 12). Ten mammal species and one fish species were found, these are similiarly presented with their five associated conservation designations (Table 13).

Table 12. NBN bird records (in BNG NJ56, NJ65, NJ66, NJ74, NJ75, NJ76, NJ84, NJ85, and NJ94 squares)

Bird species (alphabetical order)	Conservation designation					
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species
Barn owl		✓			✓	✓
Black guillemot				✓		
Black-headed gull					✓	
Brambling		✓			✓	
Bullfinch					✓	✓
Common crossbill		✓				
Common gull				✓		
Common sandpiper				✓		
Cuckoo			✓		✓	
Curlew				✓	✓	✓
Corn bunting			✓		✓	✓
Corncrake	✓	✓	✓			
Dunlin			✓		✓	
Dunnock				✓	✓	
Eider				✓		✓
Fieldfare		✓				
Fulmar				✓		
Gannet				✓		
Golden plover	✓			✓	✓	
Grasshopper warbler			✓		✓	✓

Bird species (alphabetical order)	Conservation designation					
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species
Great black-backed gull				✓		
Green woodpecker				✓		
Grey partridge			✓		✓	✓
Grey wagtail				✓		
Greylag goose				✓		
Guillemot				✓		
Herring gull			✓		✓	
House martin				✓		
House sparrow			✓		✓	
Kestrel				✓	✓	✓
Kingfisher	✓	✓		✓	✓	
Kittiwake				✓		
Lapwing			✓		✓	✓
Lesser black-backed gull				✓		
Lesser redpoll			✓		✓	✓
Linnet			✓		✓	✓
Little egret	✓			✓		
Little grebe				✓		
Mallard				✓		
Meadow pipit				✓		
Mistle thrush				✓		
Oystercatcher				✓		
Pink-footed goose				✓		
Puffin				✓		
Quail		✓		✓		
Razorbill				✓		
Red grouse				✓	✓	
Red-backed shrike	✓	✓	✓		✓	
Redshank				✓		✓
Redwing		✓	✓		✓	
Reed bunting				✓	✓	✓
Ring ouzel			✓		✓	
Ringed plover				✓		
Sand martin				✓		
Sandwich tern	✓			✓	✓	✓
Shag				✓		
Shelduck				✓		
Short-eared owl	✓			✓	✓	
Skylark			✓			✓
Snipe				✓		✓
Song thrush			✓		✓	✓
Spotted flycatcher			✓		✓	✓
Starling			✓		✓	

Bird species (alphabetical order)	Conservation designation					
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species
Stock dove				✓		
Swallow				✓		
Swift				✓		
Teal				✓		
Tree sparrow			✓		✓	✓
Tree pipit			✓		✓	✓
Tufted duck				✓		
Twite			✓		✓	✓
Wheatear				✓		
Whinchat				✓		
Whitethroat				✓		
Willow warbler				✓		
Woodcock				✓	✓	
Wood warbler			✓		✓	
Yellow wagtail			✓		✓	
Yellowhammer			✓		✓	✓

Table 13. NBN protected species records and the relevant BNG squares in which they have historically been recorded

Mammal species (alphabetical order)	Conservation designation					NBN grid square presence
	Schedule 2 of Conservation of Habitats and Species Regulations 2010 (European protected)	Schedule 5 of Wildlife and Countryside Act 1981 (UK-protected)	SBL	NE LBAP priority species	Protection of Badgers Act 1992	
Badger	-	-	✓	-	✓	NJ 94
Otter	✓	✓	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ56, NJ65, NJ66. NJ75, NJ84, NJ94
Red squirrel	-	✓	✓	Dedicated Species Action Plan	-	NJ56, NJ65, NJ66. NJ74, NJ75, NJ76, NJ84, NJ85, NJ94
Water vole	-	✓	✓	Dedicated Species Action Plan	-	NJ74, NJ84, NJ85, NJ94
Pine marten	-	✓	✓	-	-	NJ56, NJ66, NJ75
Atlantic Salmon *(Salmo salar)*	-	-	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ74, NJ85, NJ94
Common Pipistrelle *(Pipistrellus pipistrellus)*	✓	-	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ75
Daubenton's *(Myotis daubentonii)*	✓	-	✓	-	-	NJ94
Soprano Pipistrelle *(Pipistrellus pygmaeus)*	✓	-	✓	Species Action addressed through relevant Habitat Action Plan	-	NJ85
Chiroptera	✓	-	-	-	-	NJ56, NJ65, NJ75, NJ84
Wild cat	✓	✓	✓	-	-	NJ75

5. Field Survey Results

5.1 Ornithological Surveys

Winter Bird Surveys

A total of nineteen bird species were recorded during the course of the winter walkover surveys (Table 14). Of these, four (long-tailed duck, red-throated diver, redwing and whooper swan) are listed on Annex I of the Birds Directive and on Schedule 1 of the Wildlife and Countryside Act 1981. In addition, golden plover, which is also listed on Annex I of the Birds Directive, was also recorded in November 2013 only. The majority of the remaining species were recorded in low numbers and/or infrequently. However, herring gull, starling, tree sparrow and yellowhammer, which are all red-listed BoCC, were all recorded in relatively high numbers (peak counts of 400, 594, 144 and 164, respectively).

Table 14. Species recorded during winter walkover surveys, including peak counts for each

Bird species (alphabetical order)	Conservation designation							
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species	Peak count	Number of visits on which recorded
Corn bunting			✓		✓	✓	15 (Mar)	3
Dunnock				✓	✓		3 (Nov)	1
Golden plover	✓			✓	✓	✓	134 (Mar)	1
Greylag goose				✓			10 (Mar)	1
Herring gull			✓		✓		400 (Mar)	3
House sparrow			✓		✓		62 (Mar)	3
Lapwing			✓		✓	✓	20 (Feb)	2
Linnet			✓		✓	✓	53 (Apr)	3
Long-tailed duck		✓					2 (Mar)	1
Pink-footed goose		✓		✓			60 (Nov)	1
Red-throated diver	✓	✓		✓	✓			
Redwing		✓	✓		✓		1 (Apr)	1
Skylark			✓		✓	✓	96 (Mar)	3
Song thrush			✓		✓	✓	3 (Mar)	3
Starling			✓		✓	✓	594 (Nov)	3
Tree sparrow			✓		✓	✓	144 (Mar/Apr)	3
Twite			✓		✓	✓	11 (Nov)	1
Whooper swan	✓	✓		✓	✓	✓	1 (Mar)	1
Yellowhammer			✓		✓	✓	164 (Mar/Apr)	3

Breeding Bird Surveys

At the time of writing this Technical Appendix, breeding bird surveys are on-going, with a single visit currently completed along Route Options 1a. This survey included the route to the potential Sandend Bay landfall location which has since been scoped out. However, for the purposes of providing a breadth of data for the modified OnTI and the surrounding area, these results have been included within this report. Full results of the

breeding bird surveys, including the results of territory analysis, will be provided within a report to be provided in July following submission of this ES including all results for refined Route Option 1b.

In summary, however, a total of 57 species were recorded during the first of the 2014 breeding bird surveys (Table 15). A single osprey, which is listed on Annex I of the Birds Directive and on Schedule 1 of the Wildlife and Countryside Act 1981, was observed flying overhead during this survey. In addition, two flocks of golden plover (numbering 120 and 28 birds), which are listed on Annex I, were also recorded flying high overhead. Six golden plover were also recorded on the ground but were not observed to be displaying any evidence of breeding. A total of 18 singing corn buntings were encountered. The remaining species are, in general, common and widespread. Figure 4.6-3 shows a summary of the corn bunting records recorded along Route Option 1a to the proposed landfall at Inverboyndie.

Table 15. List of species recorded to date (single visit) during breeding bird survey programme

Bird species (alphabetical order)	Conservation designation					
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species
Blackbird						
Blackcap						
Blue tit						
Bullfinch					✓	✓
Buzzard						
Carrion crow						
Chiffchaff						
Chaffinch						
Coal tit						
Cormorant						
Curlew				✓	✓	✓
Corn bunting			✓		✓	✓
Dunnock				✓	✓	
Goldcrest						
Golden plover	✓			✓	✓	✓
Goldfinch						
Great spotted woodpecker						
Great tit						
Greenfinch						
Grey heron						
Greylag goose				✓		
Grey partridge			✓		✓	✓
Grey wagtail				✓		
Herring gull			✓		✓	
House sparrow			✓		✓	
Kestrel				✓	✓	✓
Lapwing			✓		✓	✓
Lesser redpoll			✓		✓	✓
Linnet			✓		✓	✓
Mallard				✓		
Magpie						
Meadow pipit				✓		
Osprey	✓	✓		✓	✓	
Oystercatcher				✓		

Bird species (alphabetical order)	Conservation designation					
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species
Pheasant						
Pied wagtail						
Red-legged partridge						
Reed bunting				✓	✓	✓
Robin						
Rook						
Sand martin				✓		
Sedge warbler						
Siskin						
Sparrowhawk						
Skylark			✓			✓
Snipe				✓		✓
Song thrush			✓		✓	✓
Starling			✓		✓	
Stock dove				✓		
Swallow				✓		
Tree sparrow			✓		✓	✓
Wheatear				✓		
Whitethroat				✓		
Willow warbler				✓		
Wood pigeon						
Wren						
Yellowhammer			✓		✓	✓

Coastal Bird Surveys

At the time of writing this Technical Appendix, coastal bird surveys are on-going, with a single visit currently completed. Full results of these surveys will be presented within a report to be provided in July following submission of this ES.

A total of twenty species were recorded at the proposed Inverboyndie landfall option. These are shown in Table 16. Four species (great northern diver, red-throated diver, sandwich tern and whimbrel) are listed on Annex I, while six (common scoter, great northern diver, long-tailed duck, red-throated diver, whimbrel and white-billed diver) are listed on Schedule 1 of the Wildlife and Countryside Act 1981. White-billed divers are uncommon in British waters, with the area around Banff thought to be an important wintering ground for the species (Baxter *et al*., 2013). The likely effects on this species are considered in the Environmental Statement.

Table 16. List of species recorded to date at Inverboyndie landfall point option, including numbers of each present

Bird species (alphabetical order)	Conservation designation						
	Annex I of Birds Directive (European protected)	Schedule 1 of Wildlife and Countryside Act 1981 (UK-protected)	Red-listed Bird of Conservation Concern (BoCC)	Amber-listed Bird of Conservation Concern (BoCC)	SBL Listed Species	NE LBAP priority species	Number recorded
Common gull				✓			6
Common scoter		✓	✓		✓	✓	2
Eider				✓		✓	8
Gannet				✓			1
Great black-				✓			2

backed gull							
Great northern diver	✓	✓		✓	✓		1
Grey heron							1
Guillemot				✓			7
Herring gull			✓		✓		292
Kittiwake				✓			1
Long-tailed duck		✓					9
Oystercatcher				✓			14
Razorbill				✓			4
Red-throated diver	✓	✓		✓	✓		14
Ringed plover				✓			2
Sandwich tern	✓			✓	✓	✓	65
Shag				✓			7
Shelduck				✓			1
Whimbrel	✓	✓		✓			9
White-billed diver		✓					1

5.2 Phase 1 Habitat Surveys

Baseline field survey results show that the habitat within the modified OnTI comprises an intensively managed, open landscape of predominantly arable land and improved grassland, with a small number of built up areas present, particularly surrounding the landfall studied in the north. Pockets of both plantation and semi-nature woodland are present scattered along the length of the modified OnTI. A total of 23 Phase 1 Habitat types were recorded within the c.13.4 km^2 of the cable route corridor surveyed. Due to access restrictions at the time of the survey, a further c5 km^2 within the survey area was unable to be accessed. However, as previously mentioned within the limitation section, this is not thought to detract from the robustness of the survey given the largely homogenous nature of the habitats found, and the requirement for additional surveys to be completed prior to construction commencing in 2016.

Phase 1 Habitat results are presented below (Table 17) with three associated conservation designations considered to give the findings of the survey perspective in relation to the likely effects associated with the modified OnTI. Target notes recorded during the course of the survey highlighting areas of particular interest or importance are presented in Table 19.

Table 17. Phase 1 Habitats recorded within the Ecology Survey Area, their quantity and relevant conservation designation.

Phase 1 habitat	Potentially overlaps with Annex I of Habitats Directive (European protected)	Potentially overlaps with SBL habitat	Potentially overlaps with NE LBAP priority habitat	Total area surveyed within cable route corridor (ha)	Total % of cable route corridor surveyed (descending order)
Arable land	-	Arable field margins	Farmland Field margins and boundary habitats	943.93	51. 2
Improved grassland	-	Coastal and floodplain grazing marsh	Farmland Field margins and boundary habitats	122.50	6.7

Phase 1 habitat	Potentially overlaps with Annex I of Habitats Directive (European protected)	Potentially overlaps with SBL habitat	Potentially overlaps with NE LBAP priority habitat	Total area surveyed within cable route corridor (ha)	Total % of cable route corridor surveyed (descending order)
Semi-natural broadleaved woodland	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland Upland birchwoods Upland mixed ashwoods Upland oakwood Wet woodland	Wet and riparian woodland Wood pasture, parkland and wayside trees	67.40	3.7
Plantation coniferous woodland	-	-	-	47.26	2.6
Road	-	-	-	38.41	2.1
Marshy grassland	-	Lowland meadows Purple moor grass and rush pastures	-	32.91	1.8
Semi-improved neutral grassland	-	Lowland meadows	Farmland Field margins and boundary habitats	32.48	1.8
Bare ground	-	-	-	12.71	0.7
Amenity grassland	-	-	Urban areas	10.15	0.6
Buildings	-	-	Urban areas	6.70	0.4
Semi-improved acid grassland	-	Lowland dry acid grassland	Lowland dry acid grassland	5.57	0.3
Plantation broadleaved woodland	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland Upland mixed ashwoods Upland oakwood Wet woodland	Wood pasture, parkland and wayside trees	5.38	0.3
Dense/continuous scrub	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland	-	4.34	0.2

Phase 1 habitat	Potentially overlaps with Annex I of Habitats Directive (European protected)	Potentially overlaps with SBL habitat	Potentially overlaps with NE LBAP priority habitat	Total area surveyed within cable route corridor (ha)	Total % of cable route corridor surveyed (descending order)
		Upland birchwoods Upland mixed ashwoods Upland oakwood Wet woodland			
Tall ruderal herb and fern	-	-	Field margins and boundary habitats	2.70	0.1
Running water	-	Rivers	Rivers and burns	2.58	0.1
Wet modified bog	Degraded raised bogs still capable of natural regeneration	Blanket bog Lowland raised bog	Lowland raised bog	1.85	0.1
Quarry	-	-	-	1.56	0.1
Plantation mixed woodland	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland Upland birchwoods Upland mixed ashwoods Upland oakwood Wet woodland	Wood pasture, parkland and wayside trees	1.06	0.1
Standing water	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.	Ponds Reedbeds Lakes	Wetland	0.92	0.1
Parkland – mixed trees	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland	Wood pasture, parkland and wayside trees	0.29	<0.1

Phase 1 habitat	Potentially overlaps with Annex I of Habitats Directive (European protected)	Potentially overlaps with SBL habitat	Potentially overlaps with NE LBAP priority habitat	Total area surveyed within cable route corridor (ha)	Total % of cable route corridor surveyed (descending order)
		Upland birchwoods Upland mixed ashwoods Upland oakwood Wet woodland			
Inland Cliff	-	Inland rock outcrop and scree habitat	-	0.18	<0.1
Semi-natural mixed woodland	-	Lowland mixed deciduous woodland Lowland wood-pastures and parkland Upland birchwoods Upland mixed ashwoods Upland oakwood Wet woodland	Wood pasture, parkland and wayside trees	0.04	<0.1
Scattered scrub	-	-	-	0.02	<0.1
Note: 1. No access was available to c.489 ha (26.7%)of the proposed route at the time of survey. 2. Other habitats not classified within the Phase 1 Habitat nomenclature occupied c.6.03 ha (0.3%)of the survey area. All such habitats were target noted recording the use of the area.					

Field boundaries and woodland edges form important linear features in otherwise open, homogonous landscapes such as the arable land and improved grassland within the modified OnTI. Native, species-rich hedgerows were widespread, comprising rowan (*Sorbus aucuparia*), silver birch (*Betula pendula*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*) and elder (*Sambucus nigra*). Fences, with or without hedgerows, were common, and small number of dry stone walls existed.

Phase 1 Habitats within the modified OnTI were summarised into the following habitat categories:

- Arable land and grassland, 61.8 %;
- Woodland, 6.7 %;
- Built-up areas, 4.1 %
- Scrub, tall herb and fern, 0.4 %
- Water and wetland features, 0.2 %;
- Mire, 0.1 %; and,
- Rock and quarry, 0.1%.

Key Phase 1 Habitats within these categories are summarised below along with additional target notes corresponding to features of interest/importance in Table 19. A visual representation of the mosaics of habitats present along the modified OnTI can be seen in Figure 4.6-5.

Arable Land and Grassland

The prevalence of this habitat category (61.8%) underscores the predominance of agriculture within the landscape of the modified OnTI. Arable land (51.2%) was the most widespread Phase 1 Habitat, comprising mostly barley, wheat, oilseed rape, oats, silage, potatoes and short-term grazing. Improved grassland (6.7%) was the second most widespread habitat. Marshy grassland (1.8%), semi-improved neutral grassland (1.8%) and semi-improved acid grassland (0.3%) comprised the remaining Phase 1 Habitats within this category.

Arable land and grassland within the modified OnTI potentially overlaps with six SBL habitats (arable field margins; coastal and floodplain grazing marsh; lowland meadows; lowland dry acid grassland; maritime cliff and slopes; and purple moor grass and rush pastures) and three NE LBAP priority habitats (farmland; and field margins and boundary habitats).

Woodland

The limited abundance of this habitat category (6.7%) reflects the openness of the landscape within the modified OnTI. Plantation woodland (3.0%) and semi-natural woodland (3.7%) are equally represented across the area. Plantation coniferous (2.6%), broadleaved (0.3%) and mixed (0.1%) woodland mainly occurred as commercial forestry blocks or shelter belts, or along roadsides and around farm buildings. Semi-natural broadleaved (3.7%) and semi-natural mixed (<0.1%) woodland mostly occurred as small, disconnected linear features. Woodlands were usually mature and comprised the following species: Sitka spruce (*Picea sitchensis*), lodgepole pine (*Pinus contorta*), Scots pine (*Pinus sylvestris*), silver birch, sycamore (*Acer pseudoplatanus*), pedunculate oak (*Quercus robur*), rowan, goat willow (*Salix caprea*) and wych elm (*Ulmus glabra*).

Woodland within the modified OnTI potentially overlaps with seven SBL habitats (lowland mixed deciduous woodland; wood-pastures and parkland; birchwoods; upland mixed ashwoods; upland oakwood; wet woodland; and native pinewoods) and two NE LBAP priority habitats (wood pasture, parkland and wayside trees; and wet and riparian woodland).

Built-up Areas

The low occurrence of this habitat category (4.1%) highlights the largely rural nature of the landscape within the modified OnTI. Roads were the most abundant feature in the category (2.1%), with buildings (0.4%), bare ground (0.7%), amenity grassland (0.6%) and 'other' areas(including parkland – mixed trees) (0.3%) contributing to the overall total land use for this category.

Built-up areas within the modified OnTI potentially overlap with one NE LBAP priority habitat; urban areas.

Scrub, Tall Herb and Fern

This category occupies approximately 0.4% of the total area surveyed. Tall ruderal herb and fern (0.1%) was found bordering linear features such as field boundaries and watercourses. Rosebay willow-herb (*Epilobium angustifolium*) was the most widespread species, alongside common nettle (*Urtica dioica*) and broadleaved dock (*Rumex obtusifolius*). Scattered (<0.1%) and dense/continuous (0.2%) scrub occurred on many field verges, along drainage ditches and among grazed fields. Common gorse (*Ulex europaeus*) was the most frequent species, with occasional rowan, goat willow and silver birch seedlings interspersed.

Scrub, tall herb and fern within the modified OnTI potentially overlaps with seven SBL habitats (lowland mixed deciduous woodland; lowland wood-pastures and parkland; native pinewoods; upland birchwoods; upland mixed ashwoods; upland oakwood; and wet woodland) and one NE LBAP priority habitat (field margins and boundary habitats).

Mire

Mire habitats accounted for only 0.1% of Phase 1 Habitats found within the modified OnTI, with only wet-modified bog habitat recorded and most closely matches the M15 *Trichophorum germanicum – Erica tetralix* wet heath commmunty.

This habitat potentially overlaps with three Annex I habitats (degraded raised bogs still capable of natural regeneration; blanket bog; and depressions on peat substrates of the Rhynchosporion), two SBL habitats (blanket bog and lowland raised bog) and two NE LBAP priority habitats (lowland raised bog; and wetland).

Water and Wetland Features

Due to issues surrounding lone working near water and also unstable, soft ground, surveys of water and wetland features were restricted to areas considered safe for lone access. Running water (0.1%) was common within the modified OnTI, however much of this was associated with small burns and tributaries draining the farmland to larger watercourses outwith the survey area. One main watercourse is present along the modified OnTI; the River Deveron which flows south to north to discharge into the Moray Firth at Banff.

Standing water (0.1%) occurred as ponds; species associated within these small waterbodies included common clubrush (*Scirpus lacustris*), pondweed (*Potamogeton spp*.), duckweed (*Lemna minor*), branched bur-reed (*Sparganium erectum*) and bulrush (*Typha latifolia*).

Water and wetland features within the modified OnTI potentially overlap with three Annex I habitats (hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*.; water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; and oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*), four SBL habitats (ponds; reedbeds; rivers; and purple moor grass and rush pastures) and three NE LBAP priority habitats (rivers and burns; wetland; and field margins and boundary habitats).

Rock and Quarry

Two areas of limited quarry habitat (0.1%) occurred within the modified OnTI, while inland cliff makes up <0.1% of the mapped habitats.

5.3 Protected Species Surveys

Table 18 below outlined the findings of the protected species surveys conducted along the length of the modified OnTI. As with the Phase 1 Habitat survey, not all areas of the corridor were able to be assessed due to access restrictions during the survey period. In summary, the following signs of protected mammals were recorded: 161 counts of badger presence; seven locations containing indicative sign of otter; two locations with signs indicative of red squirrel; and 37 counts of signs of water vole. Records of protected species presence are visually represented in Figure 4.6-6 showing the utilisation of the corridor by these species. Badger sett locations, due to their potentially sensitive nature, can be seen in the Confidential Annex to this document and the associated Figure 4.6-7.

Table 18. Protected species survey results: field evidence records (for badger sett records refer to Confidential Annex 4.6B of this ES)

Species	Easting	Northing	Field evidence	Sign Count	Details
Badger	382460	844249	latrine	2	Path and latrines. Recent
Badger	382773	845238	latrine	4	Recent
Badger	384060	845338	latrine	2	Recent
Badger	383112	845364	latrine	7	Some recent
Badger	383995	845653	latrine	2	Recent
Badger	380409	847761	latrine	5	Recent
Badger	379079	849612	latrine	8	Some recent
Badger	379335	849619	latrine	5	-
Badger	378799	850380	latrine	2	Recent latrines / path (multiple)
Badger	377365	852908	latrine	5	Recent
Badger	377125	853394	latrine	1	Recent
Badger	371111	859885	latrine	19	Very large latrine area
Badger	370911	860374	latrine	1	Recent
Badger	369799	861683	latrine	1	Recent
Badger	366676	861896	latrine	1	Recent
Badger	366650	861981	latrine	10	2 recent latrines
Badger	365737	862390	latrine	1	Recent
Badger	360739	863936	latrine	1	Old
Badger	366752	864243	latrine	1	Dung in latrine recent
Badger	359825	864296	latrine	1	Droppings in latrine recent
Badger	359250	864493	latrine	5	2 old, 3 recent
Badger	358635	864668	latrine	3	1 recent
Badger	356451	865060	latrine	4	Recent
Badger	356269	865067	latrine	12	Several recent
Badger	381975	843967	run	1	-
Badger	383200	844031	run	1	-
Badger	383159	844078	run	1	-
Badger	382657	844114	run	1	-
Badger	381917	844160	run	1	-
Badger	382508	844277	run	1	-
Badger	382902	844296	run	1	-
Badger	382855	844334	run	1	-
Badger	382104	844373	run	1	-
Badger	382536	844667	run	1	-
Badger	382907	844730	run	1	-
Badger	382585	844773	run	1	-
Badger	382921	844995	run	1	-
Badger	382777	845235	run	1	-
Badger	383158	845310	run	1	-
Badger	381964	845667	run	1	-
Badger	383716	845683	run	1	-
Badger	382077	845689	run	1	-
Badger	383749	845749	run	1	-
Badger	382005	845775	run	1	-
Badger	381853	845831	run	1	-
Badger	381607	845957	run	1	-
Badger	381665	846063	run	1	-
Badger	381844	846144	run	1	-
Badger	381686	846492	run	1	-
Badger	380591	847229	run	1	-
Badger	380467	847456	run	1	-
Badger	380281	847560	run	1	-
Badger	380200	847729	run	1	-

Species	Easting	Northing	Field evidence	Sign Count	Details
Badger	380369	847742	run	1	-
Badger	380290	847789	run	1	-
Badger	380481	847810	run	1	-
Badger	380693	847850	run	1	-
Badger	380272	847936	run	1	-
Badger	380599	847988	run	1	-
Badger	380322	848068	run	1	-
Badger	380506	848070	run	1	-
Badger	380345	848372	run	1	-
Badger	379948	848632	run	1	-
Badger	379811	848721	run	1	-
Badger	379961	848769	run	1	-
Badger	379423	849474	run	1	-
Badger	378971	849535	run	1	-
Badger	379259	849715	run	1	-
Badger	378900	850390	run	1	-
Badger	378041	851172	run	1	Path snuffle marks
Badger	377773	851715	run	1	-
Badger	377825	851822	run	1	-
Badger	377662	852171	run	1	-
Badger	377172	852287	run	1	-
Badger	377298	852731	run	1	-
Badger	377329	852908	run	1	-
Badger	377289	853021	run	1	-
Badger	377066	853389	run	1	-
Badger	375752	855000	run	1	-
Badger	372001	859019	run	1	-
Badger	369741	861491	run	1	-
Badger	369905	861569	run	1	-
Badger	368329	861577	run	1	-
Badger	368828	861774	run	1	-
Badger	369901	861779	run	1	-
Badger	367789	861860	run	1	-
Badger	367318	861868	run	1	-
Badger	367826	861981	run	1	-
Badger	369720	862007	run	1	-
Badger	366717	862058	run	1	-
Badger	366065	862486	run	1	Hair on barbed wire
Badger	366206	862583	run	1	Guard hair on barbed wire
Badger	366390	862735	run	1	Guard hair on barbed wire
Badger	366539	862861	run	1	-
Badger	366616	862914	run	1	-
Badger	366824	863090	run	1	-
Badger	360443	863800	run	1	-
Badger	361273	864007	run	1	-
Badger	359324	864359	run	1	-
Badger	358257	864566	run	1	-
Badger	358238	864623	run	1	-
Badger	358123	864924	run	1	Guard hair on fence
Badger	356398	865044	run	1	Guard hair on fence
Badger	357330	865051	run	1	Guard hair on fence
Badger	356936	865196	run	1	Guard hair snout marks
Badger	357189	865306	run	1	Crossing A98
Badger	357033	865330	run	1	Crossing A98
Badger	356139	865392	run	1	Guard hair on fence
Badger	382773	843999	snuffle hole	1	Recent

Species	Easting	Northing	Field evidence	Sign Count	Details
Badger	382633	844139	snuffle hole	1	Recent
Badger	382433	844708	snuffle hole	1	Recent
Badger	383886	845254	snuffle hole	1	Recent
Badger	383615	845676	snuffle hole	1	Recent
Badger	381663	846288	snuffle hole	1	Path and snuffle marks. Recent
Badger	381228	847093	snuffle hole	1	Path and snuffle marks. Recent
Badger	380484	847428	snuffle hole	1	Path and snuffle marks. Recent
Badger	380249	847727	snuffle hole	1	Path and snuffle marks. Recent
Badger	380232	847937	snuffle hole	1	Recent
Badger	380562	848096	snuffle hole	1	Path and snuffle marks. Recent
Badger	380234	848403	snuffle hole	1	Recent
Badger	380300	848638	snuffle hole	1	Path and snuffle marks. Recent
Badger	378074	851193	snuffle hole	1	Snuffle marks - recent
Badger	372048	859032	snuffle hole	1	Snuffle marks - recent
Badger	365912	862405	snuffle hole	1	Recent snuffle marks
Badger	358240	864673	snuffle hole	1	Recent
Otter	378657	850209	couch	1	Recent spraint - fish remains - resting up place
Otter	378747	850327	couch	1	Recent spraint - resting up place
Otter	360792	864128	couch	1	Hole in river bank, probably used as a resting up place. No signs of recent use, grass growing up in entrance
Otter	382968	844278	spraint	1	Under road bridge. Recent
Otter	378587	850135	spraint	1	Recent fish remains
Otter	357809	864965	spraint	3	2 old, 1 recent
Otter	356213	865509	spraint	5	3 old, 2 recent fish remains
Red Squirrel	378875	849447	feeding signs	1	Scots pine cone chewed by red squirrel
Red Squirrel	370989	860382	sighting	2	Seen on feeder at Coll Mhor cottage. Residents said they appeared about a year ago after woodland was clear felled in the area.
Watervole	382422	844714	burrow	2	-
Watervole	382416	844721	burrow	4	-
Watervole	382397	844734	burrow	1	-
Watervole	382389	844740	burrow	3	-
Watervole	382382	844742	burrow	2	Burrows and latrine. Recent
Watervole	382368	844756	burrow	3	-
Watervole	382347	844772	burrow	1	-
Watervole	381821	845836	burrow	1	-
Watervole	381764	845846	burrow	4	-
Watervole	381722	845864	burrow	3	-
Watervole	381659	845874	burrow	2	-
Watervole	381686	845882	burrow	5	-
Watervole	381593	845958	burrow	3	-
Watervole	381528	846016	burrow	1	-
Watervole	381489	846061	burrow	3	-
Watervole	379926	848491	burrow	2	-
Watervole	379927	848492	burrow	2	-
Watervole	379928	848504	burrow	2	-
Watervole	379931	848528	burrow	2	-
Watervole	379934	848536	burrow	2	-
Watervole	379933	848545	burrow	2	-
Watervole	379932	848567	burrow	2	-
Watervole	379931	848599	burrow	1	Burrows and run. Recent
Watervole	379942	848725	burrow	2	-
Watervole	379943	848775	burrow	3	-
Watervole	379973	848853	burrow	2	-
Watervole	379970	848855	burrow	2	-

Species	Easting	Northing	Field evidence	Sign Count	Details
Watervole	379988	848890	burrow	2	-
Watervole	380003	848926	burrow	7	-
Watervole	380005	848934	burrow	2	-
Watervole	380021	848976	burrow	2	-
Watervole	380023	848988	burrow	2	-
Watervole	381561	845996	latrine	1	Burrow, latrine. Recent
Watervole	381724	846240	latrine	1	Recent
Watervole	379940	848760	latrine	1	Recent
Watervole	379983	848878	latrine	1	Recent
Watervole	380016	848965	latrine	1	Recent

Protected species evidence collected along the length of the modified OnTI shows the area is highly utilised by badgers. Thirty-six individual setts were recorded along the length of the corridor (these results can be seen in the Confidential Annex and the associated figure). Thirty of these setts were defined as main setts, with at least eleven of these exhibiting signs of current use. Well used runs, recently visited latrines, and snuffle holes and marks found along the corridor route similarly corroborate the high utilisation of the area by the species.

Use of watercourses by otters for foraging appears widespread with numerous couches and spraint locations discovered during the course of the surveys. Much of the indicative evidence shows recent use of the area, and it is likely the species uses watercourses within the corridor as part of a number of wider territories.

Feeding signs of red squirrel were noted at a single location; however a sighting of an individual was recorded within the ecology survey area. Due to this confirmation of species presence, precautions should be taken if areas of suitable habitat fall within the construction footprint.

Water vole sign was found throughout the survey area in habitats dominated by marshy grassland. Thirty-two burrow and five latrines were found across the ecology survey area.

No evidence of pine marten presence was recorded during the protected mammal surveys. Habitat suitable for pine marten was limited due to the low density of suitable woodland habitats along the cable route.

No evidence of wildcat was recorded during the protected mammal surveys and the habitat was considered to have low potential to support this species.

Bat Roost and Habitat Suitability Survey

Studies of bat habitat preferences show most species favour deciduous/mixed woodland and water for foraging. Bats favour landscapes with well-connected networks of different foraging habitats with abundant mature trees and buildings for roosting. They require a varied supply of insect prey throughout the year, thus intensive agricultural landscapes tend to be of low habitat suitability. Local climate is also important, with higher winds and lower night temperatures reducing bat activity. Consequently, the modified OnTI's northerly latitude and managed, open landscape of predominantly arable land and improved grassland, lacking well-connected networks of different foraging habitats, suggests low numbers and diversity of bats.

Grampian (north east Scotland) supports at least five resident bat species (Haddow and Herman, 2000):

- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Common pipistrelle (Pipistrellus pipistrellus);
- Brown long-eared bat (*Plecotus auritus*);
- Daubenton's bat (*Myotis daubentonii*); and
- Natterer's bat (*Myotis nattereri*).

Soprano pipistrelles use a wide range of habitats and roost in various buildings and trees, however they strongly favour foraging over habitats associated with water, especially rivers and lochs with marginal woodlands, yet few such waterbodies exist within the modified OnTI. However common pipistrelles are better adapted to agricultural landscapes with limited woodland and water, such as that within the modified OnTI. Daubenton's bat is a specialist of sheltered, calm water with a healthy chironomid midge population, whilst Brown long-eared and Natterer's bats favour foraging habitat of mixed landscapes with mature woodland, and roosting habitat in old, large buildings; few such habitats for any of these species exist within the modified OnTI. As such, common pipistrelle is likely to be best adapted to the habitat found along the cable route.

Assessments conducted of habitat suitability along the modifed OnTI in conjunction with the Phase 1 Habitat surveys categorised habitats throughout the route as either high, medium, or low according to their ability to provide bat species with roosting, foraging or commuting habitats. Table 19 details the target notes collated for Phase 1 and Bat Habitat Suitability surveys. Locations of these notes and the corresponding habitats they relate to can be seen in Figure 4.6-5.

Table 19, Bat Roost and Habitat Suitability survey results

Target Note Number	Easting	Northing	High suitability for bat species	Target Note Comment
1	366534	864009	✓	Property has medium to high roost potential with the surrounding habitat offering good opportunities for commuting and foraging bats.
2	366699	863241	✓	Semi-natural broadleaved woodland. Is present at this location dominated by mature beech. Cracks and fissures present throughout the area which are suitable for roosting bats.
3	365941	862432	✓	Semi-mature deciduous woodland. Mostly beech, birch and sycamore. Many trees with holes/fissures suitable for bats. Valuable within the context of the area and intrinsically.
4	367900	862092	✓	Species rich deciduous semi-natural woodland including sycamore, beech, elm. Many roosting opportunities for bats within the mature canopy.
5	367760	861695		Inaccessible cliffs.
6	368367	861826	✓	Open birch woodland - semi - mature - mature. Diverse understory in places. Grazed by cattle. Good foraging potential for bats. Some trees had a roosting potential within cracks and fissures.
7	368412	862027	✓	Semi-mature/mature semi-natural woodland containing a diverse understory in places. Valuable within context of survey area for bat species. Some trees with high bat roost potential as cracks and fissures present. Birch is the dominant species.
8	373381	857342	✓	Old farm buildings and farmhouse offering high potential for roosting bats.
9	374148	856606	✓	Highly suitable habitat containing the potential for bat roosts in the deciduous trees and some of the farm buildings. Good network of ditches and watercourses, coupled with a pond creates highly suitable foraging and commuting habitat within the area for the species.
10	374690	856433	-	Herb rich habitat dominated by reed canary grass, however the area is not classified as swamp as the water table well below the surface. Other species included lesser celandine and wood anemone.
11	374972	855758	-	Standing water is present at this location, however pollutants were noted and no invertebrates were recorded. As a result these ponds have little value for foraging bats.

Target Note Number	Easting	Northing	High suitability for bat species	Target Note Comment
12	379148	850209	✓	Highly suitable bat habitat recorded at this location. A pond, coupled with a sheltered valley containing marshy grassland species, young broadleaved trees in tubes and scattered scrub would provide high quality foraging and commuting habitat for bat species. Plant diversity throughout the area is moderately high.
13	379214	849885	-	Probable arable field however the land currently appears 'set-aside' with a range of species (moderately diverse) present.
14	379945	848670	✓	All running water recorded in this location contains high commuting and high foraging potential for bat species.
15	379946	848321	-	Wet heath / wet modified bog habitat present at this location. Natural regeneration of Scots pine is occurring across the habitat.
16	380108	848203	-	A patch of wet modified bog is present at this location. Sphagnum abundance and diversity appears poor across this habitat with abundant hare's tail cotton-grass and ling heather present.
17	380224	848217	-	Species rich marshy grassland is present at this location. Soft rush and sharp-flowered rush dominate the vegetation interspersed with a diverse herbal ground flora including marsh violet and stitchwort.
18	380213	848247	-	A recently dug man-made pond containing no vegetation on the surrounding banks.
19	381594	846588	✓	High bat roost potential within the semi-mature/mature beech trees present in this area. Trees contain abundant pockets and fissures for single roosting individuals.
20	381321	846193		A watercourse is present at this location, fenced on either side and with planted young deciduous (broadleaved) trees along the banks.
21	382360	845464	✓	Burn of Asleid contains high bat foraging and commuting potential, with abundant mature deciduous trees present along its banks.
22	382553	843632	✓	High foraging potential present at this location as fields contain cows increasing the invertebrate potential of the area.
23	382185	844226	-	A riding arena partially overgrown with grasses is present at this location. This is not deemed to be valuable ecologically.
24	381903	844225	✓	Two large mature broadleaved trees are present in proximity to the mapped house. The area would provide medium roosting, high foraging, and medium commuting potential for bat species.
25	382261	844325	✓	These improved grassland fields are grazed by horses which will provide a high invertebrate diversity, and therefore contain high bat foraging potential.

6. References

Bang, P. and Dahlstrøm, P. (2001). Animal Tracks and Signs. Oxford University Press, Oxford.

Baxter, P.A.A, Gibbins, G. and Maggs, H. (2013) The White-billed Divers off North-east Scotland – discovering a new birding spectacle, Scottish Birds, Volume 33(3)

Birds Directive, http://jncc.defra.gov.uk/page-1373

Conservation of Habitats and Species Regulations, http://jncc.defra.gov.uk/page-1379

Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. and Gregory, R.D. (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man, British Birds 102, pp 296 - 341

Forrester, R.W., Andrews, I.J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. and Grundy, D.S. (eds). (2007). The Birds of Scotland. The Scottish Ornithologists' Club, Aberlady.

Francis, I. and Cook, M. (2011) (eds). North-east Scotland Breeding Bird Atlas 2002-2006. The Scottish Ornithologists' Club, Aberlady.

Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Sandy.

Gurnell J, Lurz P and Pepper H (2009), Practical Techniques for Surveying and Monitoring Squirrels, Forestry Commission, Surrey.

Habitats Directive, http://jncc.defra.gov.uk/page-1374

Haddow, J.F. and Herman, J.S. (2000). Recorded distribution of Bats in Scotland. Scottish Bats. 5: 35-47.

JNCC (2010). Handbook for Phase 1 Habitat Survey, A Technique for Environmental Audit. JNCC, Peterborough.

Marchant, J.H. (1983). BTO Common Birds Census Instructions. BTO, Tring.

NBN, http://www.nbn.org.uk/

NE LBAP, http://www.nesbiodiversity.org.uk/

Neal, E. and Cheeseman, C. (1996). Badgers. Poyser Natural History, London.

Protection of Badgers Act 1992, http://www.legislation.gov.uk/ukpga/1992/51/contents

RSPB (2013), http://www.rspb.org.uk/ourwork/projects/details/200086-can-agrienvironment-schemes-halt-and-reverse-corn-bunting-declines-in-eastern-scotland

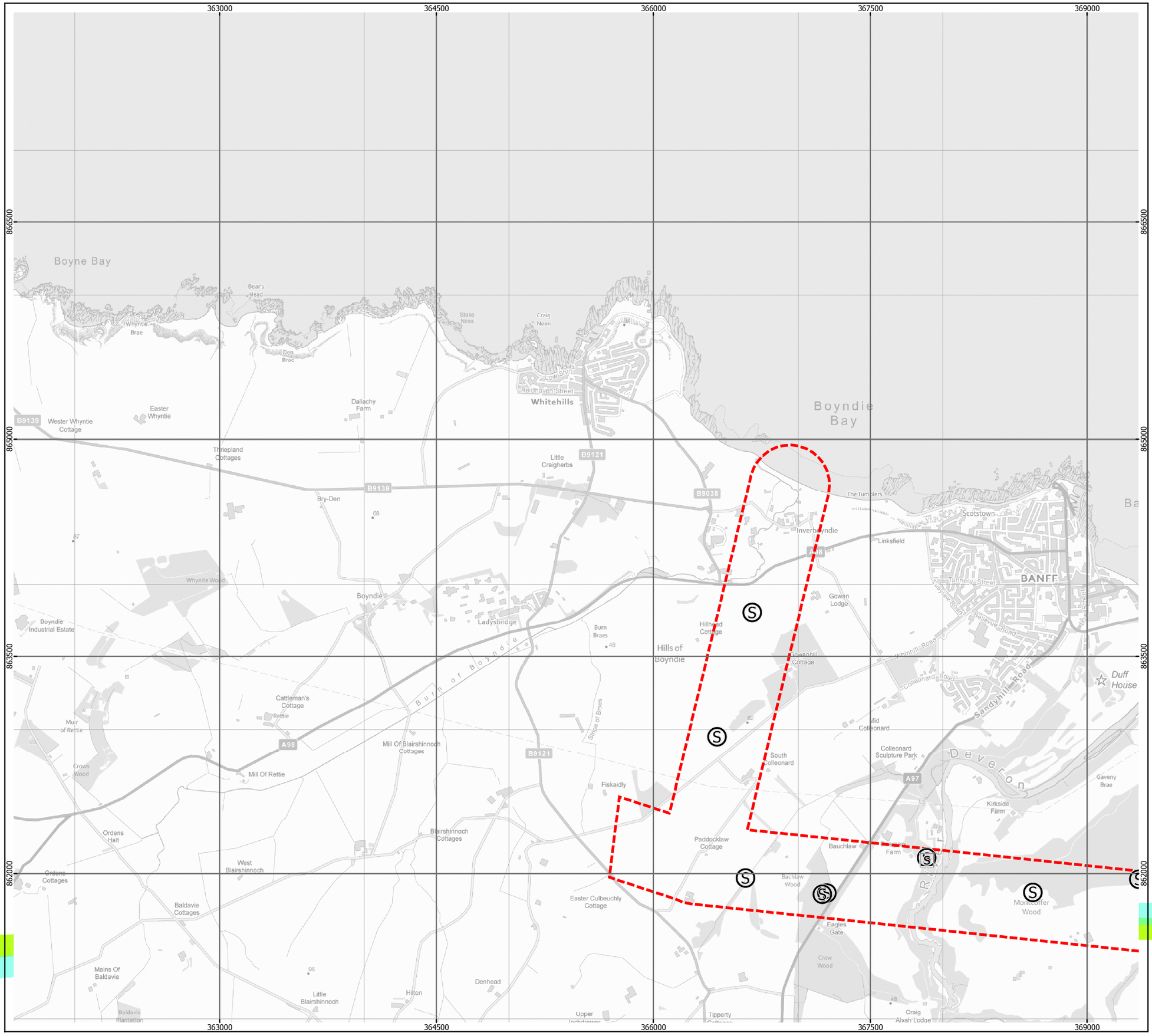
Scottish Biodiversity List, http://www.biodiversityscotland.gov.uk/advice-and-resources/scottish-biodiversity-list/

SNH (2001). Scotland's Wildlife: Badgers and Development, http://www.snh.org.uk/publications/on-line/wildlife/badgersanddevelopment/default.asp

SNH (2008). Otters and Development. Scottish Wildlife Series.

Seabird 2000, http://jncc.defra.gov.uk/page-1548#partners

Wildlife and Countryside Act 1981, http://jncc.defra.gov.uk/page-1377



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KEY

Option 1a - Ecological Survey Area (550m)

Badger Sett locations

Ⓢ Main sett

Ⓢ Annex sett

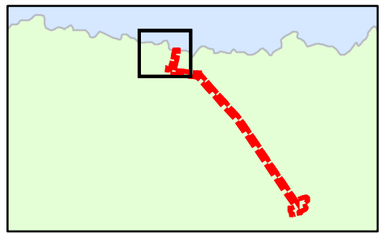

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Figure 4.6-7
Badger Sett Locations
(1 of 5)

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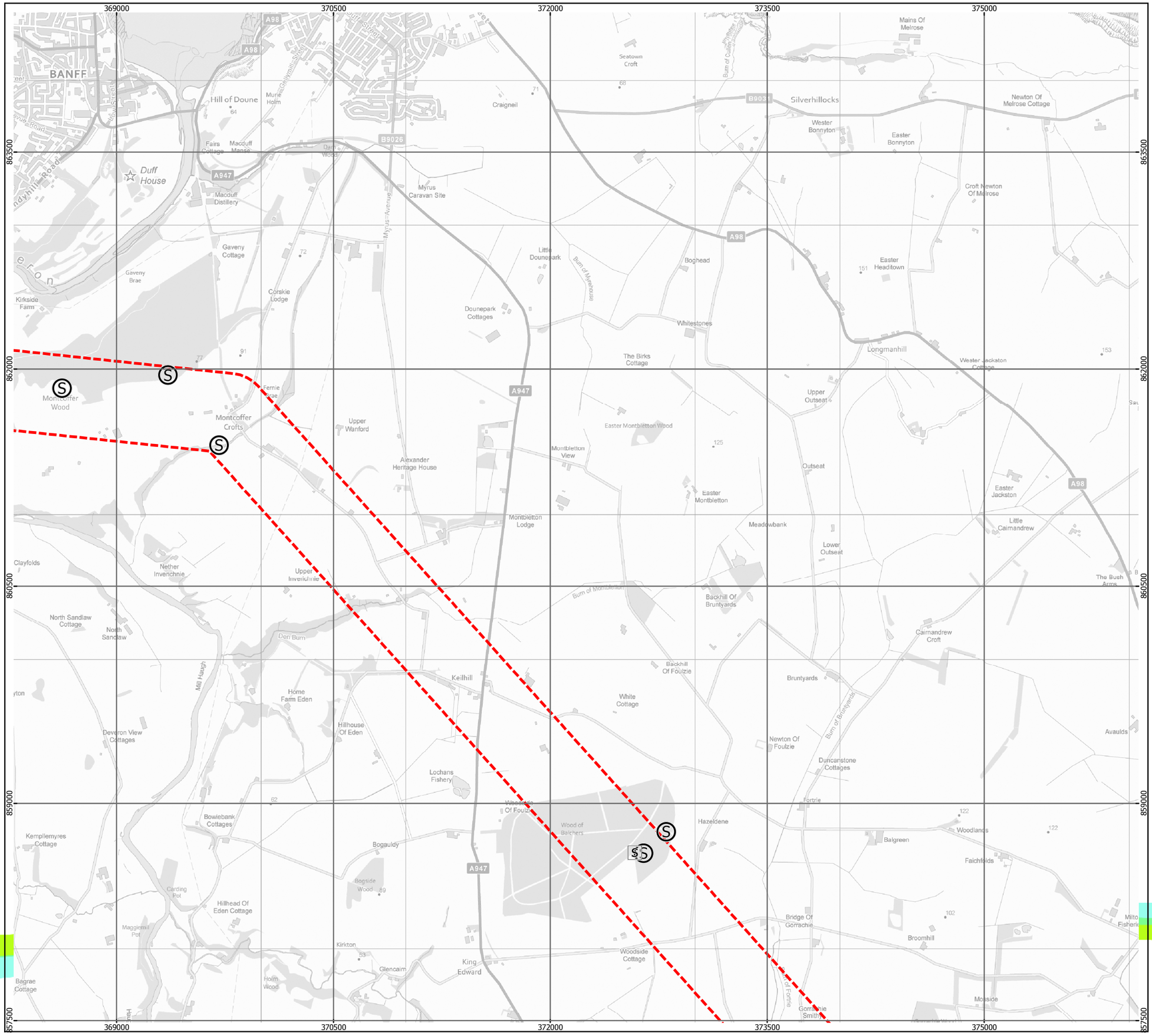

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Option 1a - Ecological Survey Area (550m)

Badger Sett locations

Ⓢ Main sett

Ⓢ Annex sett

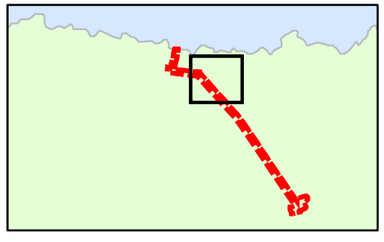

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Figure 4.6-7
Badger Sett Locations
(2 of 5)

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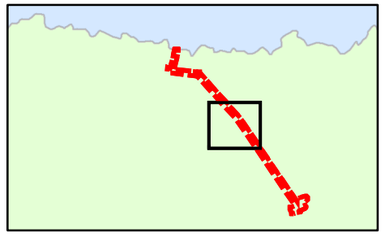

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KEY

Option 1a - Ecological Survey Area (550m)

Badger Sett locations

Ⓢ Main sett

[S] Annex sett

Figure 4.6-7
Badger Sett Locations
(3 of 5)

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KEY

Option 1a - Ecological Survey Area (550m)

Badger Sett locations

Main sett

Annex sett

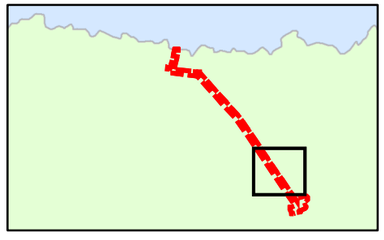

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Figure 4.6-7
Badger Sett Locations
(4 of 5)

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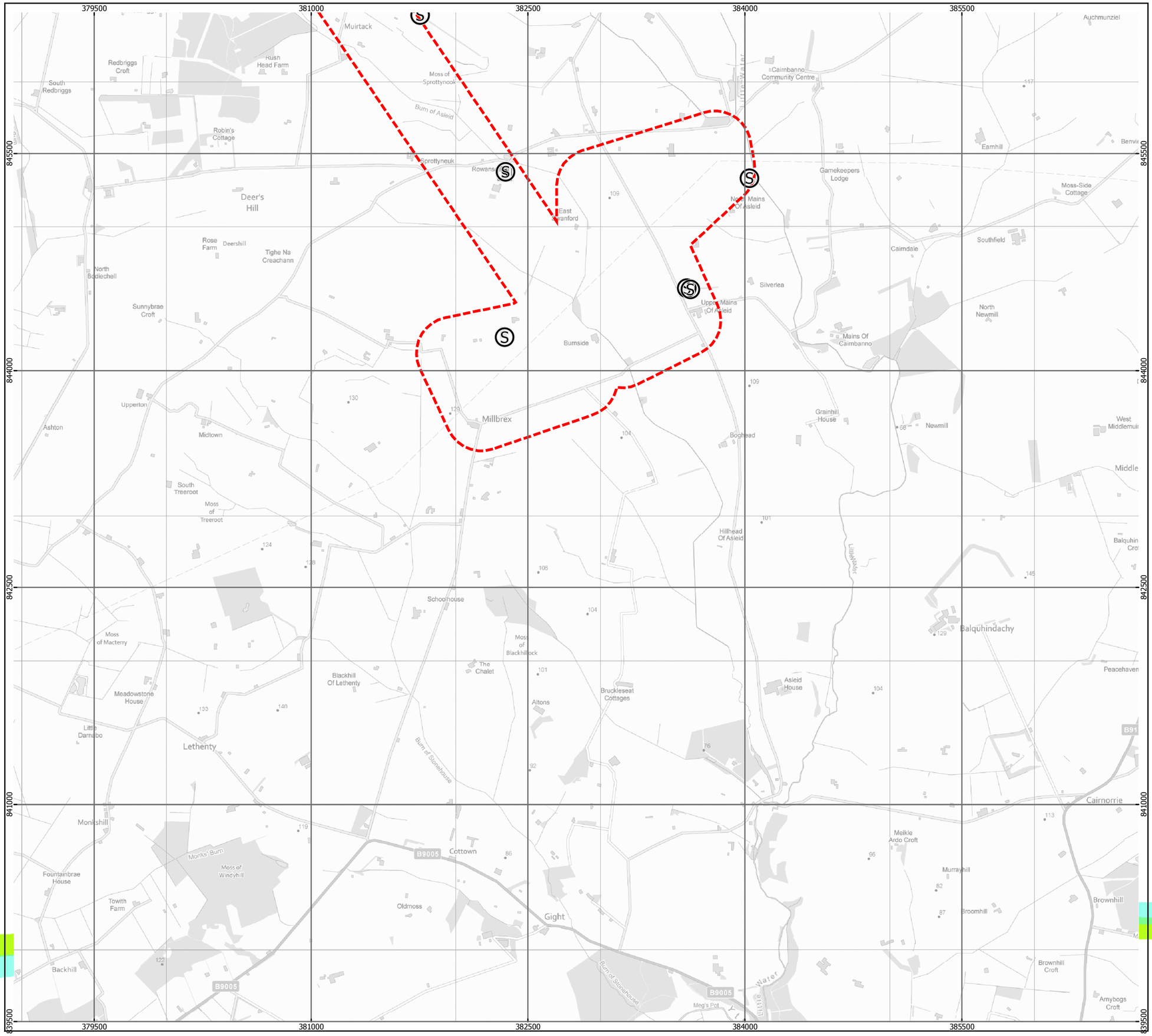

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Option 1a - Ecological Survey Area (550m)

Badger Sett locations

Main sett

Annex sett

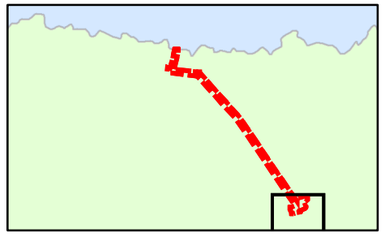

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Figure 4.6-7
Badger Sett Locations
(5 of 5)

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