

Appendix A11.4

Protected Species

Transport Scotland

July 2016





Table of contents

Chapter	Pages
1. Introduction	1
2. Bats	1
2.2. Methodology	1
2.3. Results	4
2.4. Scope of Stage 3 Assessment	15
3. Great-Crested Newt	15
3.2. Methodology	15
3.3. Results	17
3.4. Scope of Stage 3 Assessment	21
4. Otter	21
4.2. Methodology	21
4.3. Results	22
4.4. Scope of Stage 3 Assessment	23
5. Pine Marten	23
5.2. Methodology	23
5.3. Results	24
5.4. Scope of Stage 3 Assessments	25
6. Red Squirrel	26
6.2. Methodology	26
6.3. Results	27
6.4. Scope of Stage 3 Assessment	28
7. Reptiles	29
7.2. Methodology	29
7.3. Scope of Stage 3 Assessment	31
8. Water Vole	32
8.2. Methodology	32
8.3. Results	32
8.4. Scope of Stage 3 Assessment	33
9. Scottish Wildcat	33
9.2. Methodology	33
9.3. Results	35
9.4. Scope of Stage 3 Assessment	37

Tables

Table 2.1: Assessment of Tree Suitability for Roosting Bats	2
Table 2.2: Assessment of Building Suitability for Roosting Bats	2
Table 2.3: Assessment of Bridge and Culvert Suitability for Roosting Bats	3
Table 2.4: Classification of Commuting and Foraging Habitats	4
Table 3.1: Great crested newt desk study results	17
Table 3.2: Great Crested Newt Survey Results	18
Table 4.1: Otter desk study results	22
Table 5.1: Pine marten desk study records	24
Table 6-1: Red squirrel desk study data provided in the Preliminary Ecological Appraisal (CH2M 2015)	27
Table 7.1: Reptile desk study results	30
Table 7.2: Important habitats recorded in the Reptile Study Area	30
Table 9.1: List of positive/negative indicators for suitability of habitat for wildcat	34



Table 9.2: Definition of high, moderate and low suitability of habitat for wildcat
Table 9.3: Wild cat desk study records

34
35

1. Introduction

- 1.1.1. This technical appendix details the findings of the protected species data collection, survey data and assessment of habitat suitability. This report contains information relating to bats, great crested newts, otter, pine marten, red squirrel, reptiles, water vole and wildcat. This report details desk study data collection, and the methods and results of this Stage 2 assessment and outlines the scope of surveys proposed for the DMRB Stage 3 Assessment.
- 1.1.2. A separate confidential appendix has been produced in relation to badger, see Appendix 11.4a. Aquatic species, including fresh water pearl mussel and fisheries are considered separately within Appendix 11.3. Notable species, including invertebrates and fungi are discussed within the main ecology chapter (Chapter 11). References are detailed in Section 10.

2. Bats

- 2.1.1. This section details the findings of a bat habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 survey scope.

2.2. Methodology

Desk study

- 2.2.1. The following organisations were contacted for bat records within 2km of the Proposed Scheme. Due to the presence of the existing A9, this was considered to be a suitable search area for records, as the existing road already severs commuting habitats for bats.
- Highland Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC);
 - Scottish Bat Conservation Trust; and
 - Scotland Transerv.

Field survey

- 2.2.2. A habitat suitability assessment has been undertaken to inform the DMRB Stage 2 Assessment. Suitable habitat has been identified within the Proposed Scheme Options, which encompasses all potential route options and their associated land-take, under consideration for DMRB Stage 2, along with a 50m buffer. This is termed the Bat Study Area and was agreed with SNH through the Environmental Stakeholders Forum and is as detailed in the A9 Dualling Outline Approach to Consistency in A9 Ecology Surveys Extents paper (technical memorandum, CFJV, JUK, AM, 2015ⁱ). The Bat Study Area is shown in Figure 11.6.
- 2.2.3. This habitat suitability assessment included a review of the Phase 1 habitat data gathered by CH2M (CH2M, 2015ⁱⁱ), aerial photography and a walk over survey. The aim of the assessment was to identify habitat features of value to bats for roosting, commuting and/or foraging.

2.2.4. Potential roosting sites for bats within trees were assessed to identify roosting features identification of droppings, feeding remains, gaps and potential access points, staining and bats. Trees were inspected externally, from the ground using torches to identify suitable features for use by bats (cracked/ missing limbs, raised bark, knot holes, wood pecker holes). Trees were assigned a category of confirmed roost, high, moderate, low or negligible potential (trees have been classified in accordance with Collins. J (ed) (2016)ⁱⁱⁱ, see Table 2.1 below). Where woodland blocks were present, the block as a whole was assessed for its suitability.

Table 2.1: Assessment of Tree Suitability for Roosting Bats

Category (potential to support roosting bats)	Description
Negligible	Tree contains limited features suitable for roosting bats. Usually young (sapling or semi-mature) trees with some ivy or some loose bark but no obvious cracks or fissures. No evidence of bats found (e.g. droppings / staining).
Low	A tree of sufficient size and age that it may contain suitable roosting features, but none seen from the ground, or features seen only have limited roosting potential.
Moderate	Tree contains one of more suitable roosting features that could be used by bats based on their size, shelter, protection, conditions and surrounding habitat but are unlikely to support a roost of high conservation status.
High	A tree with one or more suitable roosting features that are suitable for use by larger numbers of bats on a more regular basis and potentially longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Confirmed Roost	Bats discovered roosting within the tree (during climb and inspect survey), or recorded emerging / entering the tree at dusk / dawn. Tree found to contain conclusive evidence of occupation by bats, such as bat droppings. A confirmed record (as supplied by an established source such as the local bat group) would also apply to this category.

2.2.5. Structures, such as bridges, culverts and buildings within the Bat Study Area were assessed to identify suitable roosting features such as raised flashing, gaps underneath roof lining, gaps in beams and missing mortar. Structures and buildings were assigned a category of confirmed roost, high, moderate, low or negligible potential (these have been classified in accordance with Collins. J (ed) (2016)ⁱⁱⁱ, see Table 2.1). The categories were assigned following the descriptions in Table 2.2 and Table 2.3.

Table 2.2: Assessment of Building Suitability for Roosting Bats

Category (potential to support roosting bats)	Description
Negligible potential	Buildings with no features capable of supporting roosting bats. Often these buildings are of a 'sound' well-sealed nature, or have a single skin and no roof void. They tend to have high interior light-levels, and little or no insulation. Buildings without any roofs may also fall into this category.
Low potential	Buildings with limited features for roosting bats (e.g. shallow crevices where mortar is missing between building blocks/bricks). They may have open locations which may be subject to large temperature fluctuations and bat-access points may be constrained. No evidence of bats found (e.g.



Category (potential to support roosting bats)	Description
	droppings / staining). Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Moderate potential	Buildings with some features suitable for roosting bats. Buildings usually of brick or stone construction with a small number of features of potential value to roosting bats e.g. loose roof / ridge tiles, gaps in brickwork, gaps under fascia boards, and/or warm sealed roof-spaces with under-felt. These buildings may be used as occasional or transient roosts in the summer, but are unsuitable for large colonies. No evidence of bats found.
High potential	Buildings with a large number of features or extensive areas of obvious potential for roosting bats. Generally they have sheltered locations, with a stable temperature regime and suitable bat-access points. Could be suitable for a maternity roost. No evidence of bats found.
Confirmed roost	Bats discovered roosting within the building, or recorded emerging / entering the building at dusk / dawn. Building found to contain conclusive evidence of occupation by bats, such as bat droppings. A confirmed record (as supplied by an established source such as the local bat group) would also apply to this category.

Table 2.3: Assessment of Bridge and Culvert Suitability for Roosting Bats

Category (Potential to support roosting bats)	Description
Negligible potential	Bridge/structure with no features capable of supporting roosting bats. Often these are modern or well maintained and/or of a 'sound' well-sealed nature, or consist of a solid structure, prefabricated steel or sheet materials with no voids or cavities present and no cracks or crevices present.
Low potential	Bridge/structure with limited features for roosting bats (e.g. gaps between joints, shallow crevices where mortar is missing between building blocks/bricks). They may have open locations and/or bat-access points may be constrained. No evidence of bats found (e.g. droppings / staining). May be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Moderate potential	Bridge/structures with some features suitable for roosting bats. Usually of brick or stone construction with a small number of features of potential value to roosting bats e.g. gaps between brickwork (e.g. where mortar has fallen out, usually >100mm deep). These bridges/structures may be used as occasional or transient roosts in the summer, but are unsuitable for large colonies. No evidence of bats found.
High potential	Bridge/structure with a large number of features or extensive areas of obvious potential for roosting bats. Often poorly maintained and provide suitable sheltered access points for bats. Generally in areas of high quality bat foraging/commuting habitat or over watercourses. Could be suitable for a maternity roost. No evidence of bats found.
Confirmed roost	Bats discovered roosting within the bridge/structure, or recorded emerging/entering the structure at dusk/dawn. Found to contain conclusive evidence of occupation by bats, such as bat droppings. A confirmed record (as supplied by an established source such as the local bat group) would also apply to this category.

2.2.6. In addition to roosts, the survey also identified where suitable bat flight crossing points across the existing A9 corridor may be present, for example where suitable commuting corridors are present either side of the road. This survey considered the suitability of commuting and foraging habitats and classified these in accordance with Collins. J (ed) (2016)ⁱⁱⁱ as detailed in Table 2.4.

Table 2.4: Classification of Commuting and Foraging Habitats

Suitability	Habitats
Negligible	Negligible habitat features on site that could be used by commuting or foraging bats, site open and exposed.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated burn, which is not well connected to other habitat features. Suitable, but isolated habitat that could be used by small numbers of bats such as a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape, such as a line of trees or a hedgerow. Habitat which is connected to the wider landscape which could be used for foraging, such as trees, scrub, grassland or water. Habitat close to areas which may contain roosts.
High	Continuous high quality habitat that is well connected to the wider landscape which is likely to be used by commuting bats, such as watercourses, hedges, woodland edges and tree lines. High quality habitat that is well connected to the wider landscape that is likely to be used by foraging bats, such as broadleaved woodland and tree lined watercourses. Site close to and connected to known roosts.

2.2.7. Field surveys were undertaken in October 2015 and April 2016. The weather during the October 2015 surveys was largely dry and mild, with sporadic periods of heavy rain and cold temperatures during the mornings. In April 2016, the weather was dry and mild.

Limitations and deviations

2.2.8. Ecological surveys are limited by factors which affect the presence of bats such as the time of year, and behaviour. The absence of evidence of any bat should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

2.2.9. A number of private properties and other areas within the Study Area could not be surveyed fully due to access restrictions; these locations will be explored further at Stage 3. Features present on the rock faces were inspected using binoculars from the roadside and therefore features at height could not be fully viewed.

2.3. Results

Desk Study

2.3.1. The following records were received:

- A single record for pipistrelle bat species in 2008 from HBRG. Only a four figure grid reference was detailed, so an accurate location of this record is not known;
- Only historical records were received from NESBrec, dating between 1990 and 2003. Given the age of the records, these are not considered to provide any indication of the current bat population in the vicinity of the Proposed Scheme.

- 2.3.2. A review of the Phase 1 habitat survey results identified a number of structures and trees identified as offering bat roost potential and/or commuting and foraging opportunities for bats. Structures recorded included bridges, culverts and buildings. These locations were visited and assessed for their suitability during the 2015 and 2016 field surveys.

Field survey

- 2.3.3. The Study Area contains various habitats and features of potential value to bats. This includes areas of semi-mature to mature coniferous woodland offering potential roosting opportunities, largely found in the vicinity of Loch Alvie (Section 1 CH500 to 2100) and to the west of the existing A9 between Granish and Carrbridge (Sections 5 to 7, CH7900 to CH6800). However, a relatively large proportion of the woodland within the vicinity of the Proposed Scheme, including areas of immature plantation and semi-natural broad-leaved birch (*Betula* spp.) woodland, has negligible potential to support roosting bats.
- 2.3.4. Other potentially important features include a number of bridges and culverts located along the existing A9. Buildings, generally concentrated around the urban centre of Aviemore (east of Sections 3b and 4, CH5500 to CH7700), also offer suitability for roosting bats. The exposed rock / cliff faces in the vicinity of Craigellachie National Nature Reserve (NNR) (east of Sections 3a and 3b, CH3600 to CH6600) and Slochd Summit (Section 11, CH23500 to CH25500) also exhibit features which may support roosting bats.
- 2.3.5. Relatively large expanses of grassland and heathland are present within the Bat Study Area. These habitats, in addition to the woodland, running water, and standing water (such as Loch Vaa to the east of Section 6a (CH11200) and Loch Alvie to the east of Sections 3b and 4, CH500 to CH2100), are likely to be used by bats for foraging and commuting within the local landscape. Of particular note are the 18 watercourses which cross the Proposed Scheme (including examples such as the River Spey between Sections 1 and 5 and River Dulnain in Section 8, CH16600) that provide potentially important commuting routes for bats.
- 2.3.6. These habitats have been assessed to determine the DMRB Stage 3 Assessment survey requirements. Results of the assessments are found below and are illustrated on Figures 11.6a to 11.6c. Features detailed below with target notes are shown on these figures.

Woodland and Trees

- 2.3.7. The field survey identified a total of five trees with high potential, with two oak (*Quercus* spp.), two pine (*Pinus* spp.) and a silver birch (*Betula pendula*) recorded, details of these are provided in Table 2.5. A further 97 trees with moderate potential and 15 with low potential were noted (given the number of trees recorded, full details are not provided here, but locations are shown on Figure 11.6a).
- 2.3.8. The woodland block assessment located seven areas of woodland with high bat roost potential these are detailed in Table 2.6. A further 60 areas of woodland were recorded with low bat roost potential and 128 areas with negligible potential were recorded. The areas of negligible potential were largely immature plantation woodland.

Table 2.5 Details of Trees with High Bat Roost Potential

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature
Tr3	286513	810089	10	Section 1	Mature oak with numerous gaps, crevices and splits in limbs.
Tr8	286969	810147	15	Section 1	Mature oak with cavities at 2m and 3m.
Tr19	288704	810874	17	Section 3a	Mature pine with numerous callus rolls, flaky bark and broken limbs.
Tr95	291123	818782	0	Section 6b	Mature silver birch with a large trunk cavity extending upward. Additional features include northwest facing trunk cavities created by broken limbs at 8m high.
Tr114	289053	823318	0	Section 8	Dead pine with very flaky bark and many dead branches and a frost crack in limb.

Table 2.6: Assessment of Woodland Blocks - Locations with High Roost Potential

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature
W19	286882	810146	0	Section 1	Semi-natural broadleaved woodland, with mature oaks. Seven mature oaks. One dead standing tree present with multiple features including cavities in limbs and a knot hole.
W25	287156	810155	1	Section 1	Mixed plantation with Scots pine (<i>Pinus sylvestris</i>). Mature and immature trees present.
W28	287238	810202	0	Section 1	Semi-natural broadleaved woodland with dominant birch. Features noted in all trees, including knot holes, splits and broken branches. One dead standing tree is also present.
W33	287890	810439	0	Section 2	Broadleaved tree belt, with mature oaks present.
W63	289204	812129	23	Section 3a	Three mature trees with splits and crevices in the trunks and limbs.
W121	290406	816755	0	Section 5	Group of four mature wild cherry trees (<i>Prunus avium</i>). A number of mature silver birch also present.
W139	291094	818690	0	Section 6b	Semi-natural broadleaved woodland with oak and silver birch. Small patch of mature trees within younger areas of woodland. A couple of large trees with split limbs.
W194	284337	824396	29	Section 10	Broadleaved trees, including mature birch.

Housing

2.3.9. A total of 33 locations were recorded where properties, or groups of properties (e.g. farm complexes) were situated within the Study Area. Of these, 8 were assessed as having

high potential, six low potential, three as negligible and 16 locations could not be accessed at the time of survey and will be assessed in the DMRB Stage 3 Assessment. Details of the buildings with high potential are provided in Table 2.7 and are shown on Figure 11.6b.

Table 2.7 Assessment of Buildings - Locations with High Roost Potential

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature
S5	288983	811022	0	Section 3a	Two story stone house with pitched slate roof, three chimneys and a conservatory. Features include gaps below tiles, gaps between tiles and flashing, and possible gaps between stonework and at the head.
S9	289195	811641	3	Section 3a	Multi storey building with some pitched and some flat roof. Tiled and roofing felt. Wooden and pebble dashed. With wooden pannels Three garage structure located adjacent. Possible features, gaps under wooden sparking, where tiles meet flashing. Hanging tiles on south east face.
S10	289224	811734	26	Section 3a	Holiday Lodge constructed of brick with pebble dash and wood. Tiled pitched roof with gable ends and plastic soffit boxes. Well sealed and in good condition. Suitability under tiles and at soffit box.
S11	289224	811788	31	Section 3a	Roof is multi pitched with tiles with plastic rim - well sealed. Stone and brick structure with pebble dash. With gable ends and wooden soffit box. Features included gaps in soffit box, gaps under tiles.
S15	290361	816543	35	Section 5	Brick and pebble dashed structure with tiled pitched roof, gable ends and wooden soffit boxes. One chimney present and three skylights. Suitable features under tiles, lead flashing, soffit box.
S16	290371	816608	39	Section 5	Brick and pebble dashed structure with tiled pitched roof, gable ends and wooden soffit boxes. One chimney present. Suitable features under tiles, lead flashing, soffit box.
S17	290406	816652	36	Section 5	Group of out buildings located on a farming estate. Combination of structures including breeze block, stone, wood and metal. Metal pitched roofs and flat roof sections comprised of corrugated metal.
S18	290383	816725	0	Section 5	Two storey stone wall structure with a pitched roof, tiled. One skylight visible and two chimneys present. Residential property with additional one storey section flat roof with pebble dash, roofing felt and wooden soffit box. Gaps under tiles and ridge tiles provide suitable features.

Culverts and Bridges

2.3.10. Underpasses, culverts and bridges have also been assessed to determine the DMRB Stage 3 Assessment survey requirements. In summary, 26 culverts were assessed, the majority of which offer negligible suitability for roosting bats, being metal or concrete construction with no suitable features. Only one was found to have high bat roost potential and two could not be accessed for assessment and will be reviewed at Stage 3. Of the 26 bridges and underpasses assessed, five had high potential, four had low, 15 had negligible potential and two could not be accessed and will be assessed for the DMRB Stage 3 Assessment. The structure of the bridges and underpasses was variable across Proposed Scheme, but largely consisted of concrete or stone structures. Details of those features with high potential are provided in Table 2.8 and are shown on Figure 116b. Full details of these and the other structures will be provided at Stage 3.

Table 2.8: Details of Structures with High Bat Roost Potential

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature
C25	284057	824948	0	Section 11	Culvert with stone arch and barrel 3.5m by 2m. Watercourse through culvert. Features include missing mortar, gaps and crevices between rocks. Possible hibernation suitability, some wide gaps. Local habitat open and exposed; may reduce suitability for bats.
B6	290291	816331	34	Section 5	Small arched stone bridge over watercourse. Gaps between stones in the barrel
B7	290994	817588	55	Section 6a	Stone bridge structure carrying the railway line over an access track. Access point where wiring is feed along the bridge. Located on eastern side of the bridge only.
B12	289709	822507	0	Section 8	Concrete abutments and span with metal parapets. Carries the A9 over local road. Unable to see extent of gap in expansion joint. Bridge in good condition. Drainage pipes present on underside of bridge and on external side of abutments.
B14	289759	822582	51	Section 8	Stone abutments and span with some brickwork underneath. Carries the railway line over local road. Some missing mortar and bricks. Unlikely to extend deep enough but needs detailed inspection to fully assess.
B15	289132	823156	0	Section 8	Bridge going over the Allt nan Ceatharnach with concrete walls well sealed with no gaps. Small gap between top of bridge wall and road – south side has water running down walls and out of gap, while the north side is dry.

2.3.11. There are a number of exposed rock faces present along the existing A9 which have suitability for roosting bats. In total, 15 locations are present, two with high, six with

moderate and seven with low bat roost potential. These areas range in extent, the largest being 40m wide and 25m high. There are vertical cracks within the faces which may be used by bats for roosting. Details of the rock faces with high and moderate potential are provided in Table 2.9 and are shown on Figure 11.6b.

Table 2.9: Summary of Rock Faces with Bat Roost Potential

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Bat Roost Potential
R1	288610	810743	0	Section 3a	Rock face immediately adjacent to the road, reaching a maximum height of approx. 5 m. The rock face has a small number of cracks and crevices.	Moderate
R3	288588	810799	0	Section 3a	Large rock face with multiple cracks/crevices. Features could not be inspected from the ground.	Moderate
R4	288527	810824	4	Section 3a	Rock face with gaps/ crevices found. Features could not be inspected from the ground. 1.4m wide by 25m high. Surrounding habitat is high quality for foraging and commuting.	High
R5	288999	811089	0	Section 3a	Rock face with multiple gaps/crevices located throughout. Features could not be inspected from the ground. Fully illuminated at night as such assessed as having moderate suitability rather than high despite the presence of suitable features.	Moderate
R6	289004	811148	2	Section 3a	Large stone rock face (approximately 40m wide by 25m high) with several gaps /crevices located throughout. Many gaps and crevices in rock, the rock escarpment is also stepped at the north-east section. Surrounding habitat is high quality for both foraging and commuting bats.	High
R9	290609	817221	0	Section 6a	Exposed rock face with crevices that appear to extend in to the rock face. Unable to inspect closely due to height of features.	Moderate
R11	284061	825111	0	Section 11	Large rock face with cracks and crevices. Surveyed from the ground - features could not be inspected. Habitat surrounding the rock face is very open and exposed, with low suitability for bats.	Moderate
R12	283981	825225	0	Section 11	Rock face inspected using binoculars from the cycle path adjacent to the northbound carriageway. Suitable features noted in a small area of the rock face (approx. 5m by 7m). The rock face is located on a steep slope.	Moderate

2.3.12. In addition to suitability for roosting, a habitat assessment within the Bat Study Area has been undertaken to determine areas of suitability for bats to cross either over or under the existing A9. This assessment identified a total of 27 locations, including suitable underpasses and culverts beneath the A9, or locations where suitable vegetation corridors are present either side of the A9 carriageway encouraging bats to cross the road, 17 locations were assessed to have high suitability, six moderate and four low. Details of these locations are provided in Table 2.10 and are shown on Figure 11.6c.

Table 2.10: Assessment of Crossing Points – Commuting and Foraging

Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Suitability for Commuting
CP1	285687	809518	0	Section 1	Concrete box culvert.	Moderate suitability. Block of conifer plantation and young broadleaved woodland to the north-west. Allt Chriochaidh (2m wide) runs under the A9 towards Loch Alvie. Conifer and broadleaved woodland to southeast.
CP2	286857	810159	0	Section 1	Corrugated steel underpass with access track.	High suitability. Tree-lined access road to south provides good connectivity to Loch Alvie (150m south). Watercourse to north provides good connectivity between buildings of Ballinluig to A9 verges and crossing point.
CP25	286482	810004	0	Section 1	Underpass, corrugated with brick arch.	High suitability. South bound includes linear features (lines of trees and woodland edge) leading to Loch Alvie (located 130m south of the feature). Conifer plantation, open grassland and some mature trees surround the loch. North bound includes broadleaved trees and open grassland.
CP27	286671 (south) 286637 (north)	810064 810121	0	Section 1	Corrugated arch culvert with concrete headwall.	High suitability. North bound watercourse is tree-lined and provides flight line between buildings in the north (Ballinluig) and the culvert. South bound watercourse is tree-lined and provides connectivity to Loch Alvie.



Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Suitability for Commuting
CP3	287160	810208	0	Section 1	At grade access	High suitability. South side has tree-lined access road providing good connectivity to Loch Alvie (100m south). Watercourse to north provides good connectivity between buildings of Ballinluig to A9 verges and crossing point.
CP6	287629	810311	0	Section 2	Underpass, corrugated.	Moderate suitability. Linear trees along A9 verges linking Lynwilg Farm Cottages (270m east) to Loch Alvie in the south. No clear flight lines linking the underpass to foraging habitats in the wider landscape or other potential roosting features.
CP20	289690	822521	0	Section 8	Large three span bridge with two concrete piers, steel beams and concrete slab over the River Dulnain.	High suitability. River Dulnain likely to be a key commuting corridor. Woodland and housing present to the north-east. Arable fields with continuous hedgerows, woodland and buildings to the south-west.
CP14	290526	816964	0	Section 6a	A grade access	Moderate suitability. Tree-lined verges of A9 provide good connectivity between buildings on the east to coniferous woodland in the west. The A95 separates foraging habitats in the wider landscape and the crossing point. The fields on the east lack linear flight lines such as tree or hedge lines.
CP13	290115	815709	0	Section 5	Vehicular crossing / access road.	Moderate suitability. Coniferous plantation with forest rides on both sides of the A9. Good linear features connecting the crossing point to water bodies in the wider landscape. The railway is 660m east, which also offers a good commuting route for bats.



Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Suitability for Commuting
CP15	291076	818698	0	Section 6b	At grade access	High suitability. North bound is dominated by broadleaved woodland and coniferous woodland beyond with forest rides. South bound contains a band of birch woodland adjacent to A9 and railway line. Railway is tree-lined and connects to woodland edge habitats in the wider landscape.
CP16	291035	819541	0	Section 7	At grade access	High suitability. Young broadleaved woodland to south-west. Dense coniferous woodland to north-west. Eastern side includes young broadleaved woodland. Tree-lined railway line runs parallel to the A9, areas of open grassland with copses of trees.
CP17	290945	820096	0	Section 7	At grade access	High suitability. South bound includes railway line, building and band of mixed plantation woodland. North bound has large expanse of woodland with forest rides suitable for commuting and foraging.
CP18	290806	820610	0	Section 7	At grade access	High suitability. The tree-lined railway line to the east provides an excellent commuting route for bats. Forest rides along tracks also provide good sheltered commuting routes. The tree-lined verges of the A9 provide good flight lines, linking to pockets of open foraging areas.
CP19	289707	822492	0	Section 8	Concrete single span bridge carrying A9 over Station Road with bank side abutments.	Moderate suitability. Tree-lined road verges leading to woodland and housing on both sides.



Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Suitability for Commuting
CP4	288400	810558	0	Section 3a	Concrete box culvert carrying watercourse under the A9, which flows into River Spey.	High suitability. Good connectivity between the structure and to habitats to the west, comprising open grassland, pasture, tree-lined watercourse passing under A9, B9152 and train line. Mature oak tree line to the east along watercourse leading to River Spey.
CP7	289132	811997	0	Section 3a	Corrugated metal arched pedestrian underpass. Stone lined entrances.	High suitability. South bound has good connectivity from culvert to buildings (youth hostel and resort building) along pedestrian footway with lines of young silver birch. North bound offers good connectivity to Loch Puladdern (approximately 60 m to the north west) along pedestrian tree lined walkway.
CP8	289065	812356	0	Section 3	Small access tracks on either side of the road, tree lined.	High suitability. North bound includes area of open grassland and bracken and young birch woodland with good foraging habitat. Hotel complex present south bound.
CP10	289353	813846	0	Section 4	Corrugated steel arch culvert carrying watercourse under A9.	High suitability. The watercourse flows from hills in the north into Aviemore. Watercourse offers a good linear feature connecting housing on south to large area of broadleaved and coniferous plantation in the north. The watercourse is tree lined in the north.
CP9	289300	813680	0	Section 4	Corrugated steel arch pedestrian underpass with concrete floor.	High suitability. Good connectivity between wooded nature walk in the south with young broadleaved woodland and young broadleaved woodland and new build houses in the north.



Target Note	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	Feature	Suitability for Commuting
CP11	289345	813934	0	Section 4	Pedestrian underpass. Corrugated steel arch with lighting all along the length in the centre.	Moderate suitability. South bound has good connectivity to housing, vegetation, scrub and woodland. North bound has tree lined footpath and young birch woodland leading to good foraging and potential building roosts. Lighting may deter some species.
CP23	289693	814699	0	Section 5	Corrugated steel arch underpass with concrete base.	High suitability. South bound has small watercourse (1m wide) running adjacent to culvert. Densely wooded area with some mature trees. North bound has tree-lined watercourse running parallel to culvert with large areas of woodland present within close proximity.
CP21	289126	823144	0	Section 8	Large concrete bridge carrying A9 over watercourse (tributary of River Dulnain). Concrete wing walls.	High suitability. Tree lined watercourse leading to extensive woodland and railway to the east. Woodland and moorland to the west with buildings.
CP24	286862	810183	0	Section 1	Structure carrying small watercourse with natural banks under the A9. Structure is corrugated steel with concrete base and concrete wing walls.	High suitability. Unable to inspect inside the culvert due to access, likely to have high suitability due to its construction. Tree-lined access road to south provides good connectivity to Loch Alvie (150m south). Watercourse to north provides good connectivity between buildings of Ballinluig to A9 verges and crossing point.

2.4. Scope of Stage 3 Assessment

- 2.4.1. The presence of suitable habitat and numerous features suitable for roosting within the Bat Study Area require further survey at DMRB Stage 3 Assessment. Detailed bat surveys will be undertaken as part of the assessment.
- 2.4.2. Trees and rock faces will be subject to climb and inspect surveys to confirm if roosts are present where safe to do so.
- 2.4.3. Emergence and return surveys will be undertaken for areas of woodland, individual trees, housing, culverts and bridges identified with bat roost potential that are at risk of disturbance or will be directly affected as a result of the Proposed Scheme (for trees these emergence and return surveys will only be undertaken when climb and inspect surveys are inconclusive in the outcome or not practicable to be undertaken).
- 2.4.4. For rock face locations, where these are in close proximity to the existing A9, it may not be possible to undertake emergence and return surveys for health and safety reasons (e.g. working on the road verge at night). Where this is the case, other survey options will be explored, for example the use of static recorders.
- 2.4.5. The areas identified as suitable for bats to cross over the A9 will be subject to monthly or bi-monthly survey depending on the habitat suitability. Crossing surveys for the DMRB Stage 3 Assessment commenced in May 2016 and will run through to September 2016. Surveys were initially programmed for April 2016, but were not undertaken due to unseasonably low temperatures which were not considered suitable for bat surveys.
- 2.4.6. The surveys will follow standard bat survey guidance as detailed in Collins, J (ed) (2016)ⁱⁱⁱ.

3. Great-Crested Newt

- 3.1.1. This section details the findings of a great crested newt (*Triturus cristatus*) surveys undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

3.2. Methodology

Desk study

Biological records

- 3.2.1. The following organisations were contacted for great crested newt records within 1km of the existing A9:
 - Highland Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC).

Water bodies

- 3.2.2. Assessment of the effects of the Proposed Scheme on great crested newts has been undertaken in full accordance with standard methods (as detailed below) and concentrates on the investigation of breeding behaviour in water bodies that occur in proximity to the scheme.

- 3.2.3. Water bodies were searched for within 500m of the Proposed Scheme Options (see Figure 11.5). This is termed the Study Area.
- 3.2.4. The locations of water bodies were identified through review of Ordnance Survey (OS) maps and aerial photography. Additional water bodies discovered during site visits have also been taken into account, any water bodies found not to be present during surveys have also been removed.
- 3.2.5. Flowing water courses (including rivers, burns and drainage ditches with obvious water movement) are considered unsuitable sites for breeding great crested newts and were excluded from the list of possible breeding sites.

Field survey

Habitat suitability assessment

- 3.2.6. Each water body was visited by two experienced ecologists^{iv} to assess their suitability to support great crested newts. This assessment followed the Habitat Suitability Index (HSI) methodology produced by Oldham *et al.* (2000)^v as amended by subsequent guidance by Amphibian and Reptile Groups UK^{vi}. Each waterbody subject to HSI has been assigned a numerical score indicating the following suitability classes:
- Poor < 0.5
 - Below average 0.5 – 0.59
 - Average 0.6 – 0.69
 - Good 0.7 – 0.79
 - Excellent > 0.8

eDNA Sampling

- 3.2.7. All accessible ponds within 250m of the Proposed Scheme Options were subject to eDNA survey to determine the presence or absence of great crested newts. Studies^{vii} show that great crested newts are most likely to make use of habitat within 50m of the water bodies where newts are present. However, given the likely impact of the Proposed Scheme, it is considered appropriate to include all water bodies within 250m of the Proposed Scheme.
- 3.2.8. Environmental DNA sampling is a new survey technique that uses DNA analysis of water samples collected from a waterbody to determine whether great crested newts are present / absent within the sampled waterbody.
- 3.2.9. Water samples were taken from ponds where HSI field assessment had been undertaken and where access was possible. Water bodies found to be dry during the eDNA site visits were excluded from the eDNA sampling. eDNA sampling was undertaken by suitably trained and experienced ecologists¹. The eDNA sampling protocol used follows that in Biggs, *et al* (2014)^{viii}.

Limitations and deviations

Habitat suitability assessment

¹ Rebecca Hill and David Lovett (GCN licence 2015-11740-CLS-CLS) of Mouchel Consulting.

- 3.2.10. Of the 70 ponds identified within the Study Area, one pond (pond 40) was not subject to HSI due to access restrictions. This pond lies within a plot of land that is due to be developed; access was not granted by the developer on health and safety grounds.
- 3.2.11. The HSI, while a useful tool for indicating likely breeding suitability of a water body, is not completely reliable as great crested newts may breed in ponds that HSI scores suggest may be unsuitable. Assessments made using the HSI can vary for subjective reasons where, for example, the judgement of the surveyor is important in assigning value to one of its dependent factors. Nevertheless, the HSI surveys undertaken provide valuable information about the water bodies in order to inform further survey.

Environmental DNA (eDNA) sampling

- 3.2.12. Two ponds within 250m of the Proposed Scheme, ponds 28 and 29 were not subject to eDNA analysis due to access restrictions. Both water bodies were surrounded by tall deer fencing and could therefore not be accessed by surveyors to retrieve water samples. At the time of survey in April 2016 Pond 33, was outside of the 250m area. However, following updates to the design of the Proposed Scheme pond 33 now lies approximately 180m from the Proposed Scheme.
- 3.2.13. Ponds 28, 29 and 33 will not be directly affected by the Proposed Scheme and it is considered that sufficient data has been gathered to inform the selection of Scheme Options at DMRB Stage 2.
- 3.2.14. Natural variability in the timing of great crested newt breeding at individual ponds along with geographic variation in weather conditions could mean that the presence of eDNA within ponds will vary throughout the great crested newt breeding season. A negative result from eDNA testing is not necessarily confirmation that great crested newts do not breed in a given pond. For this reason, ponds directly affected by the Proposed Scheme may require further assessment.

3.3. Results

Desk Study

- 3.3.1. Three records of great crested newt dating from 2005 were provided by HBRG and NESBreC, details of which are provided in Table 3.1.

Table 3.1: Great crested newt desk study results

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Source	Details
291100	817700	In the near vicinity of Loch Vaa	03/05/2014	138	HBRG	Great crested newt egg record
291200	817800	In the near vicinity of Loch Vaa	08/05/2014	229	HBRG	Great crested newt egg record
291000	817000	Lochan by Loch Vaa	15/04/2007	568	NESBreC	1 Count Adult Female; 1 Count Juvenile Male; 2 Count Adult Male

3.3.2. 70 water bodies were identified for further survey within the Study Area; these are shown on Figure 11.5.

Field survey

Habitat Suitability Assessment

3.3.3. 70 water bodies were subject to HSI assessment. The surveys were undertaken during June 2015 and April 2016.

3.3.4. Six water bodies were found to be dry or to have running water. These six water bodies were not subject to an HSI and were excluded from further assessment in relation to great crested newts.

3.3.5. Pond 2, identified from OS mapping, was found to be an area of damp ground / wet heath, and was not suitable for HSI or eDNA. Some pooling was evident within this area, although the pools are small and are not considered suitable for supporting a breeding population of great crested newts.

3.3.6. Pond 40, was not accessible during the surveys (see Paragraph 3.2.10). The remaining 62 ponds were subject to HSI, the results of which are presented in Table 3.2 below.

eDNA sampling

3.3.7. Of the 62 ponds subject to HSI, 34 ponds are located within 250m of the Proposed Scheme and were subject to eDNA survey.

3.3.8. The findings of the HSI surveys and eDNA analysis are shown in Table 3.2. Ponds within 250m of the Proposed Scheme are highlighted in grey. Analysis of the samples collected has shown that three ponds are likely to support a breeding population of great crested newts: Ponds 15, 24, and 45 (highlighted in blue).

Table 3.2: Great Crested Newt Survey Results

Pond ID	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	HSI score	eDNA result
1	282378	826109	255	Section 11	0.38	N/A
2	283056	825837	130	Section 11	Not suitable for HSI or eDNA	N/A
3	284039	824197	390	Section 10	0.5	N/A
4	284141	824049	390	Section 10	0.41	N/A
5	284121	824071	402	Section 10	0.34	N/A
6	285481	823948	10	Section 10	Dry for HSI and eDNA	N/A
7	285731	824285	385	Section 10	0.44	N/A
8	286141	823803	20	Section 9	0.44	Negative
9	288081	824487	335	Section 9	0.47	N/A
10	288259	824424	410	Section 9	0.39	N/A



Pond ID	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	HSI score	eDNA result
11	289137	822383	415	Section 8	0.21	N/A
12	289920	823055	460	Section 8	0.44	N/A
13	291393	819345	308	Section 7	0.33	N/A
14	291161	819053	50	Section 6b	0.6	Negative
15	291097	819031	0	Section 6b	0.31	Positive
16	291191	818381	125	Section 6	0.58	Negative
17	291321	818387	255	Section 6	0.35	N/A
18	289928	815326	0	Section 5	0.39	Negative
19	290877	818046	40	Section 6/6a	0.53	Negative
20	290959	817730	0	Section 6a	0.21	Dry
21	291138	817774	100	Section 6a	0.36	Negative
22	290922	817505	0	Section 6a	0.45	Negative
23	290658	817098	0	Section 6a	0.45	Negative
24	290539	816612	142	Section 5	0.2	Positive
25	290453	816359	165	Section 5	0.51	Negative
26	290281	816345	20	Section 5	Running water habitat	
27	290183	816411	20	Section 5	Running water habitat	
28	290287	816153	50	Section 5	0.33	No access
29	290334	816021	135	Section 5	0.34	No access
30	290191	815537	77	Section 5	0.59	Negative
31	290934	818185	35	Section 6	0.5	Negative
32	290343	815120	180	Section 5	Dry for HSI and eDNA	
33	290348	815075	180	Section 5	0.48	No data
34	290228	815023	160	Section 5	0.44	Negative
35	290102	814901	240	Section 5	0.59	Negative
36	290172	815564	50	Section 5	0.58	Negative
37	289797	814874	0	Section 5	0.57	Negative
38	289305	814087	50	Section 4	Dry for HSI and eDNA	
39	289415	813311	200	Section 3b	0.21	Dry
40	289438	812831	300	Section 3b	No access	No access



Pond ID	X Ref.	Y Ref.	Distance from Proposed Scheme (m)	Section	HSI score	eDNA result
41	289577	812551	450	Section 3	Dry for HSI	N/A
42	288806	812391	220	Section 3	0.52	Negative
43	289076	812127	0	Section 3a	0.47	Negative
44	289181	812144	0	Section 3a	0.31	Negative
45	289199	812069	20	Section 3a	0.33	Positive
46	289705	811761	430	Section 3a	0.41	N/A
47	289563	811768	343	Section 3a	0.51	N/A
48	289600	811617	390	Section 3a	0.53	N/A
49	289593	811143	390	Section 3a	0.52	N/A
50	288571	810373	245	Section 3b	0.54	Negative
51	288538	810259	320	Section 2	0.39	N/A
52	288511	810195	330	Section 2	0.46	N/A
53	288497	810143	340	Section 2	0.36	N/A
54	287609	810190	0	Section 2	0.37	Negative
55	286843	810684	470	Section 1	0.41	N/A
56	286789	810655	420	Section 1	0.58	N/A
57	286208	810084	150	Section 1	0.52	Negative
58	286162	810086	180	Section 1	0.34	Dry
59	286138	810131	170	Section 1	0.5	Negative
60	286096	810074	180	Section 1	0.38	Negative
61	286075	810055	170	Section 1	0.46	Negative
62	285935	810051	200	Section 1	0.47	Negative
63	285932	810023	205	Section 1	0.49	Negative
64	285867	810024	242	Section 1	0.44	Negative
65	285935	809968	160	Section 1	0.4	Negative
66	285948	809922	115	Section 1	0.38	Negative
67	285986	809949	105	Section 1	0.34	Negative
68	285859	809894	105	Section 1	0.48	Negative
69	285847	809856	100	Section 1	0.41	Negative
70	285789	809730	20	Section 1	0.42	Dry

3.4. Scope of Stage 3 Assessment

- 3.4.1. The presence of great crested newts has been identified in three ponds within the Study Area, via eDNA data. This includes Pond 15, located near Kinveachy; Pond 24, located near to Loch Lochan, north of Aviemore; and Pond 45, in close proximity to Craigellachie National Nature Reserve.
- 3.4.2. Furthermore detailed surveys will be undertaken in 2017 to determine the size of the great crested newt populations within these three ponds. These surveys will comprise six survey visits to each water body between March and June, inclusive. Surveys will be undertaken in accordance with good practice guidance (English Nature, 2001^{ix}).
- 3.4.3. In addition, further eDNA surveys will be undertaken in 2017 on all ponds within 250m of the Proposed Scheme which were not subject to eDNA survey at Stage 2 (where access permits). Where the eDNA surveys indicate that great crested newts are present, further population surveys will be undertaken.

4. Otter

- 4.1.1. This section details the findings of the otter (*Lutra lutra*) habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

4.2. Methodology

Desk study

- 4.2.1. The following organisations were contacted for otter records within 1km of the existing A9:
- Highland Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC);
 - Scottish Wildlife Trust (SWT); and
 - Scotland Transerv.
- 4.2.2. In addition, the 2014 Phase 1 habitat survey (CH2M, June 2015^x) results were reviewed to identify aquatic habitats.

Field survey

- 4.2.3. No specific surveys were undertaken for otter at Stage 2. As part of a general walkover survey covering up to 100m from the Proposed Scheme Options, the habitat within this area was reviewed to assess its suitability to support otter. This survey was undertaken in May 2016.

Limitations

- 4.2.4. At Stage 2 a walkover survey to assess suitability of habitats was undertaken, covering the Proposed Scheme Options and 100m buffer. This did not cover all a full review of all watercourses within the Proposed Scheme, but was undertaken to give a broad overview of the habitat suitability for otter to supplement the information within the

existing Phase 1 habitat survey (CH2M, June 2015^{xi}). The survey did not include a detailed search for otter evidence and detailed surveys will be undertaken at Stage 3.

4.3. Results

Desk Study

- 4.3.1. Five records of otter were received from HBRG and NESBreC, details of which are provided in Table 4.1. One record of otter was also provided in the Preliminary Ecology Appraisal (CH2M, June 2015^{xii}).

Table 4.1: Otter desk study results

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Section	Source	Details
280500	827100	River Findhorn	25/10/2007	1855	N/A	HBRG	Road casualty.
289200	822200	Carrbridge	29/08/2006	375	N/A	HBRG	N/A
291550	819000	Lisi's Restaurant, Deshar	24/07/2005	454	N/A	NESBreC	Seen crossing the road.
291410	817390	Loch Vaa	12/03/2007	503	N/A	NESBreC	Seen from badger hide.
28866	824010	No details provided	09/11/2012	198	N/A	NESBreC	No details provided.
289630	822500	River Dulnain	2014 NH8963022500	0	8	CH2M, June 2015 ^{xiii}	Otter footprints seen in sandy substrate around base of bridge.

- 4.3.2. Otters are a qualifying feature of the River Spey SAC. At its closest, the River Spey is located approximately 170m south east from the Proposed Scheme. However, the River Dulnain, a tributary of the River Spey, and Allt na Criche both run under the existing A9 at Ellan and Lynwilg (Section 8, CH16600 and Section 3a, CH3500, respectively) and are included within the SAC designation.

Field survey

- 4.3.3. The Study Area contains a number of watercourses, small burns and drainage channels which are likely to be used by otter to forage, shelter, and commute within the local landscape. Eighteen watercourses cross the Proposed Scheme, some of which cross on multiple occasions. Twelve of these watercourses are likely to be of value to otter, given their large size and the high quality of the riparian habitats they support. This includes larger watercourses such as the River Dulnain (Section 8, CH16600), as well as the Bogbain Burn (Section 8, CH19200), Allt Ruighe Magaig, Section 8, CH7400), Allt Cnapach (Section 6b, CH12200), Milton Burn (Section 4, CH7100), Allt na Criche (north of Aviemore, Section 5, CH9200 and south of Aviemore, Section 3a, CH3500), Allt Chriochaidh (Section 1, CH500), Allt an Fhearna (Section 1, CH100), and four other unnamed tributaries. In addition to the running water habitats, large standing

waterbodies such as Loch Vaa at Kinveachy (east of Section 6a CH11200) and Loch Alvie at the southern end of the Proposed Scheme (Section 1, CH500 to CH2100) are also likely to provide foraging resources for otter. The smaller drainage channels and ditches within the Scheme are likely to provide connecting routes for otter, providing links to the high quality habitats for foraging and resting.

- 4.3.4. Terrestrial habitats, including the large expanses of woodland to the west and east of the A9 around Carrbridge and Kinveachy (Sections 4 to 8, CH6800 to 16400), are also likely to offer important sheltering and potentially breeding habitat for this species. The majority of the woodland habitats are well connected to the watercourses detailed above, and may therefore be used by otter.

4.4. Scope of Stage 3 Assessment

- 4.4.1. Otter are highly likely to be present within the Study Area, given the presence of suitable habitat and sites designated for otters. Detailed otter surveys will be undertaken as part of the DMRB Stage 3 Assessment. These surveys will follow good practice methodologies and will be based on guidance set out in DMRB^{xiv} and by SNH in Otters and Development^{xv}. The surveys will cover at least 250m up and down stream of the preferred scheme and will search for evidence of otter and record all signs and resting sites in order to inform the DMRB Stage 3 Assessment.

5. Pine Marten

- 5.1.1. This section details the findings of the pine marten (*Martes martes*) habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 survey scope.

5.2. Methodology

Desk study

- 5.2.1. The following organisations were contacted for biological records of pine marten within 1km of the existing A9:
- Highlands Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC);
 - Scottish Natural Heritage (SNH);
 - Scottish Wildlife Trust (SWT);
 - Forestry Commission Scotland;
 - National Trust for Scotland; and
 - Scotland Transerv.

Pine marten habitat

- 5.2.2. Pine marten require large home ranges with a variety of foraging habitats. In order to identify viable pine marten habitat the initial Study Area was extended to include suitable habitat extending up to 10km from the existing A9².
- 5.2.3. Consideration was given to the features listed below:
- Habitats comprising woodland, thicket-stage woodland, woodland edges or hedgerow habitats; and
 - Where these habitats form a component part of larger areas of connected habitats.
- 5.2.4. Once these viable areas were identified, those habitats which fell within 100m of the Proposed Scheme Options were selected for an ecological walkover survey, hereafter referred to as the Study Area.

Field survey

- 5.2.5. No specific surveys were undertaken for pine marten at DMRB Stage 2 Assessment. As part of a general walkover survey covering up to 100m from the Proposed Scheme Options, the habitat within this area was reviewed to assess its suitability to support pine marten. This survey was undertaken in May 2016.
- 5.2.6. The walkover survey also provided an opportunity to verify the desk study information, for example confirming areas of clear felled woodland, which is no longer considered suitable for pine marten.

Limitations

- 5.2.7. At Stage 2 a walkover survey to assess suitability of habitats was undertaken, this aimed to give a broad overview of the habitat suitability for pine marten to supplement the information within the existing Phase 1 habitat survey (CH2M, June 2015^{xvi}). This information is considered sufficient for the DMRB Stage 2 Assessment.

5.3. Results

Desk study

- 5.3.1. Two records of pine marten dating from 2005 were received from HBRG and one record was provided in the Preliminary Ecological Appraisal (CH2M, 2015^{xvii}) details of which are provided in Table 5.1.

Table 5.1: Pine marten desk study records

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Section	Source	Details
290000	821000	South of Lynphail Lodge	14/07/2008	590	N/A	HBRG	Pine marten prints.
285400	808200	Dalraddy	26/09/2006	856	N/A	HBRG	No details provided.

² Using Geographical Information System (GIS) data from the National Forest Inventory Great Britain, the Native Woodland Survey and aerial photography.

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Section	Source	Details
290930	820100	Near Docharn Wood	June to September 2014	0	7	CH2M, 2015 ^{xviii}	Carcass recorded on the A9.

- 5.3.2. A review of desk study data identified that the habitat to the west of the A9 is dominated by larger areas of continuous coniferous plantation woodland and semi-natural and broadleaved plantation woodland. To the east of the A9, the woodland is fragmented by the presence of lochs, arable land and towns/villages such as Aviemore and Carrbridge. The low-lying valley of the River Spey situated further to the east provides a natural break in the generally wooded landscape. Beyond this, the Spey Valley is shouldered by the Monadhliath Mountains to the west and the Cairngorm Mountains to the east, providing a natural corridor for wildlife movement.
- 5.3.3. Other habitats of note within the landscape include exposed rocky outcrops, and cliffs, heathland and upland bog which are likely to provide fringe foraging, breeding, and den opportunities for pine marten.

Field survey

- 5.3.4. The field survey verified the habitats identified during the desk study. Habitats adjacent to the A9 are dominated by large areas of coniferous plantation and semi-natural and broad-leaved plantation woodland. One particularly large, continuous area of plantation between Granish and Slochd (Sections 4 to 10, CH6800 to 22400), lies adjacent to the northbound carriageway and is of high suitability for pine marten.
- 5.3.5. Semi-natural, broad-leaved woodland is widespread between Aviemore (Sections 3a and 4, CH4900 to CH7700) and Kinveachy (Section 6a, CH11900). The habitat is typically dominated by birch over a ground layer of acid grassland or heath. This habitat provides cover and linkages to other larger areas of woodland offering connectivity to pine marten. Coniferous plantation woodland is also present in large, continuous blocks and comprises Scot's pine, with occasional stands of larch species (*Larix* sp.). Many of the stands are semi-mature and densely planted with a poor ground layer. Small pockets of possible stands of remnant Caledonian woodland, including wide-crowned pines, are present in the commercial forestry stands north of Carrbridge. These woodlands offer some suitability for pine marten to forage and for den sites as well as connectivity to wider landscapes.
- 5.3.6. The woodland habitats within the Study Area provides suitable habitat for pine marten to find shelter, to forage and for dispersal. Elevated den and resting opportunities are present, as is a diverse year-round food supply. Pine marten are considered likely to be present within the Study Area.

5.4. Scope of Stage 3 Assessments

- 5.4.1. Pine marten are likely to be present within the Study Area and have the potential to be affected by the Proposed Scheme. Further detailed surveys will be undertaken to inform the DMRB Stage 3 Assessment. The surveys will focus on suitable habitat for this species within 100m of the preferred scheme.
- 5.4.2. Transect surveys will be undertaken within suitable habitat between May and September 2017. Surveyors will walk transect lines along woodland rides, mammal tracks and

other linear features as described in Cresswell *et al.* (2012)^{xix}. Surveyors will search for evidence including scat, footprints, potential den sites and direct sightings of pine marten. All scats found will be collected and sent for DNA analysis to confirm the species. Any pine marten evidence recorded during the transect surveys, including likely den sites as described in Birks *et al.* (2005)^{xx}, or prints will be photographed and their GPS position recorded.

- 5.4.3. In addition, surveys to assess the quality of pine marten habitat affected by the Proposed Scheme will be undertaken. The survey method will be based on guidance provided in Cresswell *et al.* (2012)^{xix} and will focus on assessing the presence, quality, extent and abundance of four key habitat features of importance to pine marten: foraging resource, habitat extent and connectivity, den availability, and mortality risk.

6. Red Squirrel

- 6.1.1. This section details the findings of the red squirrel (*Sciurus vulgaris*) habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

6.2. Methodology

Desk study

- 6.2.1. The following organisations were contacted for biological records of red squirrel within 1km of the existing A9:
- Highlands Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC);
 - Scottish Natural Heritage (SNH);
 - Scottish Wildlife Trust (SWT);
 - Forestry Commission Scotland;
 - National Trust for Scotland; and
 - Scotland Transerv.
- 6.2.2. In addition the following data sets were reviewed to identify areas of potentially suitable habitat:
- 2014 Phase 1 habitat survey (CH2M, June 2015^{xxi})
 - GIS data from the National Forest Inventory Great Britain and the Native Woodland Survey; and
 - Aerial photography.

Field survey

- 6.2.3. No specific surveys were undertaken for red squirrel at Stage 2. As part of a general walkover survey covering up to 100m from the Proposed Scheme Options, the habitat within the was reviewed to assess its suitability to support red squirrel. This survey was undertaken in May 2016.

6.2.4. The walkover survey also provided an opportunity to ground-truth the desk study information, for example confirming areas of clear felled woodland which are no longer suitable for red squirrel.

Limitations

6.2.5. At Stage 2 a walkover survey to assess suitability of habitats was undertaken, this aimed to give a broad overview of the habitat suitability for red squirrel to supplement the information within the existing Phase 1 habitat survey (CH2M, June 2015^{xxii}). This information is considered sufficient for the DMRB Stage 2 Assessment.

6.3. Results

Desk Study

6.3.1. One hundred and sixty three records of red squirrel dating back to 2005 were received from the following sources:

- The Scottish Wildlife Trust (SWT) via the National Biodiversity Network (NBN) gateway - 94 records, for which specific details were not provided;
- NESBreC - 62 records of red squirrel sightings;
- HBRG – two records of red squirrel sightings, one record of road casualty and 10 records for which specific details were not provided;
- Jacobs UK Ltd - one record of road casualty and two records for which specific details were not provided;
- Scotland Transerv - one record of road casualty.

6.3.2. A further eight records of red squirrel were provided in the Preliminary Ecological Appraisal (CH2M 2015^{xxiii}), details of which are provided in Table 6.1 below.

Table 6.1: Red squirrel desk study data provided in the Preliminary Ecological Appraisal (CH2M 2015^{xxiv})

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Section	Details
290110	816180	Woodland near Avielochan	2014	60	5	Red squirrel seen in conifer plantation adjacent to the A9.
290490	817200	Woodland at Laggantygown	2014	0	6a	Two red squirrels seen.
290970	819390	Woodland at Kinveachy	2014	62	7	Red squirrel seen
289140	823240	Allt nan Ceatharnach	2014	34	8	Red squirrel seen crossing fallen water corridor over fallen tree.
289070	812110	Loch Pulladern	2014	46	3a	Incidental sighting at squirrel box.
290240	816650	Woodland near Avielochan	2014	47	5	Several squirrel dreys noted just below canopy layer.

X Ref.	Y Ref.	Location	Date	Distance from Proposed Scheme (m)	Section	Details
291040	818310	Properties at Kinveachy	2014	25	6	Anecdotal evidence of red squirrel activity provided by residents.
289820	822570	Properties at Carrbridge	2014	80	8	Residents report seeing red squirrel

- 6.3.3. The desk study records provide evidence that red squirrels are present within the Study Area and can be regularly seen crossing the A9.

Field survey

- 6.3.4. Habitats adjacent to the A9 predominantly comprise large areas of coniferous plantation and semi-natural and broad-leaved plantation woodland, both important habitats for red squirrel. Areas of parkland and gardens present within the Study Area are also important resources for foraging.
- 6.3.5. Semi-natural, broad-leaved woodland, plantation broad-leaved and coniferous woodland is widespread within the Study Area. The variety of woodland cover, connected by other habitats such as grassland and heathland, offer a wide range of foraging and shelter opportunities to red squirrel. During the walkover survey food availability and feeding signs were abundant.
- 6.3.6. The semi-natural, broad-leaved woodland is typically dominated by birch. It is unknown how valuable birch seeds are for red squirrels, but they have been known to drink birch sap and also forage for fungi, eat green shoots and fruits, flowers and berries of the ground flora present. It is, therefore, likely that this habitat is frequented seasonally when these alternative food sources become available.
- 6.3.7. The younger woodlands are unlikely to support resident squirrels due to the age structure of the trees and exposure. However the stands of more mature Scots pine plantation provide red squirrels with year-round supply of pine cones, and therefore support resident animals. Mature trees are also a highly valuable food source as they provide a higher crop yield for red squirrels.

6.4. Scope of Stage 3 Assessment

- 6.4.1. Red squirrels are known to occur within the Study Area and may be affected by the Proposed Scheme. Further surveys will be undertaken in 2017 in order to inform the DMRB Stage 3 Assessment. These surveys will determine the value of the habitat for these animals and the location of any potential active dreys within 50m of the Proposed Scheme.
- 6.4.2. Surveys will be undertaken within suitable habitat to assess squirrel activity and to identify active dreys. The survey methodology described by Gurnell *et al.* (2009)^{xxv} will be adapted for this study following the guidelines for Specific Survey Requirements set out by SNH. The surveys will entail walking areas of suitable woodland to using rides and tracks where practicable. Surveyors will visually searching the surrounding woodland for squirrels and squirrel evidence. The survey will be repeated at least four times over a period of two weeks (within suitable weather conditions; i.e. not strong winds, cold temperatures or heavy rain).

- 6.4.3. In addition, an assessment of the habitat suitable for red squirrels will be undertaken to evaluate the indicative carrying capacity of woodlands for red squirrel based on the dominant tree species present (Gurnell *et al.*, 2009^{xxv}).

7. Reptiles

- 7.1.1. This section details the findings of the reptile habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

7.2. Methodology

Desk Study

- 7.2.1. The following organisations were contacted for reptile records within 1km of the existing A9:
- Highland Biological Recording Group (HBRG);
 - North East Scotland Biological Records Centre (NESBreC); and
 - Scotland Transerv.
- 7.2.2. The presence and distribution of suitable reptile habitat within the Study Area was determined through a review of relevant guidance on suitable common reptile habitat, and existing Phase 1 habitat data (CH2M, 2015^{xxvi}) for the Proposed Scheme. The relevant guidance consulted included:
- Guidance on reptile survey contained within the DMRB^{xxvii} provides information on 'important habitat' and 'habitat of moderate importance' for reptiles and relates this to the JNCC Phase 1 habitat types.
 - SNH advice pertinent to reptiles in Scotland^{xxviii};
 - Froglife's Advice Sheet 10: Reptile Survey^{xxix}; and,
 - The Joint Nature Conservation Council's (JNCC) Herpetofauna Workers Manual^{xxx}.
- 7.2.3. The identification of suitable habitat for reptiles has been restricted to land within the boundary of the Proposed Scheme, the reptile Study Area, where direct effects such as habitat loss and harm on reptiles are most likely to occur.

Field survey

- 7.2.4. No specific surveys were undertaken for reptiles at Stage 2. As part of a general walkover survey covering up to 100m from the Proposed Scheme Options, the habitat within the was reviewed to assess its suitability to support reptiles. This survey was undertaken in May 2016.

Limitations

- 7.2.5. At Stage 2 a walkover survey to assess suitability of habitats was undertaken, this aimed to give a broad overview of the habitat suitability for reptiles to supplement the information within the existing Phase 1 habitat survey (CH2M, June 2015^{xxxi}). This information is considered sufficient for the DMRB Stage 2 Assessment.

Desk Study

- 7.2.6. Twelve records of reptiles dating from 2005 were received from the desk study, details of these records are provided in Table 7.1. Common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) were also recorded during the Preliminary Ecological Appraisal (CH2M, 2015^{xxxii}).

Table 7.1: Reptile desk study results

X Ref.	Y Ref.	Location	Date	Distance from Scheme (m)	Section	Source	Details
285800	809500	Allt Chriochaidh	16/06/2014	39	1	HBRG	Common lizard.
288800	812500	Craigellachie NNR	02/05/2012	255	N/A	HBRG	Common lizard.
289100	812000	Loch Puladdern	03/05/2014	16	3a	HBRG	Common lizard seen crossing B9153.
288100	810700	Lynwilg Quarry Dump	26/06/2009	212	N/A	NESBreC	Two adult slow worms.
291000	817000	Loch Vaa	17/04/2008	568	N/A	NESBreC	Slow worm.
289000	812000	Glenmore	2005	380	N/A	NESBreC	Adder (<i>Vipera berus</i>).
288200	824400	East Foregin	14/05/2010	435	N/A	NESBreC	Common lizard
289200	814700	West Miltonwood	20/07/2008	339	N/A	NESBreC	One adult slow worm.
288600	812800	Craigellachie Nature Reserve	29/03/2010	397	N/A	NESBreC	Common lizard.
288100	812400	Craigellachie NNR	02/05/2012	960	N/A	Scotland TranServ	Common lizard dead on road.
288200	824400	East Foregin	14/05/2010	365	N/A	Scotland TranServ	Common lizard dead on road.
288500	810700	Lynwilg	19/04/2014	13	3a	Scotland TranServ	Common lizard dead on road.

- 7.2.7. Table 7.2 presents a summary of the Phase 1 habitat types recorded within the Reptile Study Area and their 'importance' for reptiles in accordance with the methodology detailed above. The distribution of these habitats within the Reptile Study Area is presented on Figure 11.4a. Important habitat for reptiles is shown in dark grey, habitat of moderate importance for reptiles is shown in light grey. This ranking follows Guidance on reptile survey contained within the DMRB^{xxxiii}.

Table 7.2: Important habitats recorded in the Reptile Study Area

Phase 1 Habitat Type	Common lizard	Slow worm	Adder
A1.1 Broadleaved woodland			
A1.3 Mixed woodland			
A2 Scrub			
A3.1 Broadleaved parkland/scattered trees			
A4.2 Recently felled woodland			
B1 Acid grassland			

Phase 1 Habitat Type	Common lizard	Slow worm	Adder
B2 Neutral grassland			
B3 Calcareous grassland			
C3.1 Tall ruderal			
D2 Wet dwarf shrub heath			
D5 Dry heath/acid grassland mosaic			
D6 Wet heath/acid grassland mosaic			
E1 Bog			
A1.2 Coniferous woodland			
B5 Marshy grassland			
E2.1 Acid/neutral flush			
I Rock exposure and waste			
J1.2 Amenity grassland			
G1 Standing water			
G2 Running water			
J4 Bare ground			
Key			
'Important' habitat for reptiles			
Habitat of 'Moderate' importance for reptiles			

- 7.2.8. The common reptile species discussed above can be found in a broad range of habitats, including grassland, heathland, coppiced woodland, open woodland, immature forest plantations, and unintensively managed farmland^{xxxiv}. Unimproved or semi-natural grassland and heathland are of particular importance, as are mosaic habitats, such as heathland / grassland complexes or woodland / grassland edges.

7.3. Scope of Stage 3 Assessment

- 7.3.1. Desk study data has shown that three species of common reptile have been recorded in the Study Area: slow worm, adder, and common lizard. A relatively large proportion of the habitats within the Proposed Scheme are suitable for supporting reptiles, including grassland, heathland, and scrub. Areas of woodland (broad-leaved and coniferous) are generally of lower value for reptiles, although they do offer opportunity for shelter and hibernation over the winter months. The habitat edges between the wooded habitats and the more open areas of heath and grassland are likely to be particularly important for reptiles, as they offer opportunities for shelter, basking and foraging.
- 7.3.2. The need for further presence / absence survey for reptiles will be determined through consultation with SNH. Further survey may be required in areas where large areas of suitable reptile habitat will be directly affected by the Proposed Scheme and where there is no opportunity for impacts to be avoided through appropriate mitigation. Where considered appropriate, further survey will be undertaken in accordance with industry best practice guidance.

8. Water Vole

8.1.1. This section details the findings of the water vole (*Arvicola terrestris*) habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

8.2. Methodology

Desk study

8.2.1. The following organisations were contacted for water vole records within 1km of the existing A9:

- Highland Biological Recording Group (HBRC); and
- North East Scotland Biological Records Centre (NESBreC)

Field survey

8.2.2. No specific surveys were undertaken for water vole at Stage 2. As part of a general walkover survey covering up to 100m from the Proposed Scheme Options, the habitat within the was reviewed to assess its suitability to support otter. This survey was undertaken in May 2016.

Limitations

8.2.3. At Stage 2 a walkover survey to assess suitability of habitats was undertaken. This did not cover all a full review of all watercourses within the Proposed Scheme, but was undertaken to give a broad overview of the habitat suitability for water vole to supplement the information within the existing Phase 1 habitat survey (CH2M, June 2015^{xxxv}). The survey did not include a detailed search for water vole evidence and detailed surveys will be undertaken at DMRB Stage 3 Assessment.

8.3. Results

Desk Study

8.3.1. No water vole records were received from the record centres contacted.

Field survey

8.3.2. The Study Area contains a number of smaller burns, and drainage channels which may be used by water vole to forage and shelter within the local landscape. Open habitats supporting these smaller watercourses and drainage channels are likely to be the most suitable for this species, and include areas such as swamp, marshy grassland habitat, wet dwarf shrub heath, and acid grassland. Potentially suitable habitat for this species occurs south of Slochd Summit, within the vicinity of the River Dulnain (Sections 11 to 8), and within drainage channels and streams within the vicinity of Avie Lochan (Section 5) and Loch Alvie (Section 1).

8.3.3. A large proportion of the Study Area support relatively dense coniferous woodland, which is generally sub-optimal for this species.

8.4. Scope of Stage 3 Assessment

- 8.4.1. Water voles are likely to be present within the Study Area, given the presence of suitable habitat. Detailed water vole surveys will be undertaken as part of the DMRB Stage 3 Assessment. Surveys will follow best practice methodology as detailed in the *Water Vole Mitigation Handbook* (Dean, Strachan, Gow, Andrews 2016^{xxxvi}) and the *Water Vole Conservation Handbook*, 3rd Edition (Strachan 2011^{xxxvii}). The surveys will cover land 150m upstream and downstream of the Proposed Scheme and extending to 5m from the banks of the watercourses. All watercourses with identified suitability will be surveyed in September 2016 and May to June 2017.

9. Scottish Wildcat

- 9.1.1. This section details the findings of the Scottish wildcat (*Felis silvestris*) habitat suitability assessment, undertaken to inform the DMRB Stage 2 Assessment for the Proposed Scheme. It also outlines the DMRB Stage 3 Assessment survey scope.

9.2. Methodology

- 9.2.1. The A9 Dualling Environmental Steering Group (ESG), which includes Transport Scotland and the statutory authorities, has produced two technical papers relevant to wildcat: 'Outline approach to consistency in A9 ecology survey extents'^{xxxviii} and 'Wildcat crossings and surveys'^{xxxix}. The methodologies stated within these papers have been followed during the surveys for wildcat.

Desk study

- 9.2.2. The following organisations were contacted for wildcat records extending to a minimum of 5km from the existing A9:
- Highland Biological Recording Group (HBRC);
 - North East Scotland Biological Records Centre (NESBreC);
 - Scotland Transerv
 - SNH provided details of their Wildcat Habitat Suitability Model, which maps wildcat cover, movement and prey habitats; and
 - Cairngorms National Park Authority (CNPA) provided records of wildcat sightings from within the Cairngorms National Park.
- 9.2.3. The SNH paper on survey and scoping of wildcat priority areas^{xl} has been reviewed to identify if any priority areas located within the Study Area.
- 9.2.4. An evaluation of the suitability of habitats present within the Proposed Scheme was undertaken based on the existing Phase 1 habitat data (CH2M, 2015^{xli}).
- 9.2.5. In addition to the Proposed Scheme, a Study Area was defined which comprised the Proposed Scheme plus land up to 200m from its boundary. This area, recommended in SNH guidance^{xlii}, accounts for indirect effects, such as project related disturbance which may occur should any dens or resting sites be present in habitats close to the proposed works.

Habitat suitability assessment

- 9.2.6. In order to define ‘suitable wildcat habitat’, a literature review on the habitat preferences of wildcat was undertaken^{xliii}. Table 9.1 summarises the findings of this review and sets out positive and negative indicators for habitat suitability for wildcat.

Table 9.1: List of positive/negative indicators for suitability of habitat for wildcat

Positive Indicators
Heterogeneous, high diversity habitats
Margins of habitats, particularly moorland and woodland
Close to woodland, preferably mixed broad-leaved and small in size. Outer 50m zone of woodland is considered optimal
Close to grassland
Close to arable fields
Close to watercourses
Negative Indicators
Homogenous habitats e.g. large, dense conifer plantations, large expanses of extensive agriculture
Dwarf shrub
High mountain areas
Open/exposed habitats e.g. open rock face, sparsely vegetated areas
Proximity to man-made structures

- 9.2.7. The information presented in Table 9.1 has been used to develop the definitions of habitat suitability for wildcat set out in Table 9.2.

Table 9.2: Definition of high, moderate and low suitability of habitat for wildcat

Habitat Suitability	Definition
High	Heterogeneous habitats with opportunities for both shelter e.g. woodland and foraging e.g. grassland, moorland, riparian habitats. Good connectivity to other suitable habitats and suitability unlikely to be adversely affected by habitat fragmentation or proximity to man-made structures.
Moderate	Some suitable habitats present, but either lacking in opportunities for both shelter and foraging, or suitability reduced through habitat fragmentation or proximity to man-made structures.
Low	Open expanses of homogeneous habitat e.g. large dense conifer plantations, expanses of dwarf shrub, extensive agriculture, with little or very few opportunities for shelter and foraging. Habitats may be highly fragmented, in close proximity to man-made structures or in high mountain areas.

- 9.2.8. ‘Habitat units’ within the Study Area were identified using Phase 1 habitat survey (CH2M, 2015^{xliv}) along with aerial photography. Habitats were grouped into units based on their type and degree of connectivity. Each habitat unit was then considered in respect of the above definitions and assigned a suitability for wildcat of ‘high’, ‘medium’ or ‘low’.

Field survey

- 9.2.9. No specific field surveys for wildcat were undertaken during DMRB Stage 2 Assessment, however during other ecology surveys undertaken incidental sighting and field signs were recorded.

Limitations

- 9.2.10. Identification of habitat types present in the Study Area is dependent on the accuracy of Phase 1 habitat survey information and aerial photographs examined. However, the data is relatively recent and significant changes in landscape structure in the vicinity of the proposals are unlikely to have occurred in the interim period. This information is not considered to limit this study.

9.3. Results

Desk Study

- 9.3.1. Twenty seven records of wildcat were provided by NESBreC, HBRG and the Cairngorms National Park (CNP), dating between 1999 and 2011. Details of these records are provided in Table 9.3 and are shown on Figure 3a.

Table 9.3: Wild cat desk study records

X Ref.	Y Ref.	Date	Distance from Proposed Scheme (m)	Section	Source	Details
291000	821300	20/02/2002	401	N/A	NESBreC	Seen on the B9153.
284700	823700	19/06/2010	202	N/A	NESBreC	Adult wildcat in birch wood.
285000	808500	16/02/2009	572	N/A	NESBreC	Unsubstantiated probable wildcat moving across road in wooded landscape; stopped to look at observer; thick banded tail, very stocky, broad head and thick coat.
289300	810000	19/01/2011	694	N/A	NESBreC	Unsubstantiated probable wildcat running across road then jumping wall in woodland and grassland area. Same size as large domestic, with thick ringed tail. Observer has been trained in wildcat identification and was certain it was a wildcat.
289400	822900	2008 - 2011	92	8	NESBreC	Substantiated probable hybrid wildcat hunting and washing beside A9 in grass and scrub. Four broad lines running along nape of neck, unbroken stripes on flank, black, blunt thick end to tail, ringed at top, very robust looking body; thick dark markings.
289600	813800	06/03/2009	232	N/A	NESBreC	Unsubstantiated probable wildcat moving across urban road. Large tabby-marked (quite grey) cat with blunt, bushy banded tail; 5 second view in headlights from 15m.
289600	814500	13/07/2010	2	4	NESBreC	Unsubstantiated probable wildcat walking in woodland near house. Observer is an ecologist and is certain it was a wildcat.



X Ref.	Y Ref.	Date	Distance from Proposed Scheme (m)	Section	Source	Details
289600	822400	01/02/2009	92	8	NESBreC	Unsubstantiated possible wildcat walking across rockery in garden. Believed to have seriously injured observer's pet female cat; 3 feet long and 1 foot high with ringed tail.
290100	815100	09/05/2009	382	N/A	NESBreC	Unsubstantiated possible wildcat crossing road. Much bigger than a normal cat, bigger than a fox and much bulkier and furrer; tail was stubby rather than pointed.
290200	815200	01/07/2010	382	N/A	NESBreC	Unsubstantiated probable wildcat trotting across A95. Thick-set face, with stripy flanks, with a thick, ringed, blunt tail.
290900	822000	14/04/2010	428	N/A	NESBreC	Unsubstantiated possible wildcat sitting on grass verge of road. Very large and stocky compared to domestic. Typical striped markings; thick tail but no clear view of markings.
291000	817500	16/10/2009	568	N/A	NESBreC	Substantiated probable hybrid dead in woodland. Juvenile male. Analysis of skull suggests hybrid. No pelage analysis. Observer suggested it may have been one of the kittens from Kinveachy Gate Lodge.
291100	819800	14/04/2010	537	N/A	NESBreC	Unsubstantiated possible wildcat sitting on grass verge of road. Same black stripes/markings as a wildcat over the face and head.
291200	818800	11/07/2009	402	N/A	NESBreC	Substantiated probable hybrid. Female hunted voles and rabbits; kittens played on railway embankment and open woodland. Female had no white and no spottiness. Tail was thick, ringed, no dorsal stripe but tapered. Four kittens tabby marked.
290000	817000	11/08/1999	265	N/A	NESBreC & HBRG	Prints in mink raft.
280400	803400	18/01/2010	7513	N/A	CNPA	Image captured using camera trap in grassland and woodland habitat.
280500	803400	23/02/2010	7448	N/A	CNPA	Image captured using camera trap in grassland and woodland habitat.
289700	819700	08/02/2010	1202	N/A	CNPA	Image captured using camera trap.
289500	820600	29/08/2010	1195	N/A	CNPA	Image captured using camera trap.
289800	820700	17/04/2010	880	N/A	CNPA	Image captured using camera trap.
289800	820700	25/04/2010	880	N/A	CNPA	Image captured using camera trap.
289700	820800	06/12/2010	945	N/A	CNPA	Image captured using camera trap in conifer woodland habitat. Although it had broken stripes on torso, it matched the Project's definition of a wildcat (thick, ringed, blunt tail with no continuing dorsal stripe). Photographed on six dates at two stations, NH892219 and NH897208, from 6th December 2010 to 19th February 2011.

X Ref.	Y Ref.	Date	Distance from Proposed Scheme (m)	Section	Source	Details
289200	820900	06/04/2010	1362	N/A	CNPA	Image captured using camera trap.
289200	821900	13/12/2010	747	N/A	CNPA	Image captured using camera trap. Same cat as recorded on 06/04/10 in row above.
289100	822100	07/12/2009	657	N/A	CNPA	Image captured using camera trap.
289100	822100	19/03/2010	657	N/A	CNPA	Image captured using camera trap.
285700	824200	11/02/2010	317	N/A	CNPA	Image captured using camera trap.

Habitat suitability assessment

- 9.3.2. The existing Phase 1 habitat data and the SNH Wildcat Habitat Suitability model were reviewed to identify important habitat within the Study Area. The result below should be read in conjunction within the Phase 1 Habitat maps in Figure 11.4a.
- 9.3.3. High quality habitat for wildcat within the Study Area includes the relatively large expanses of plantation coniferous woodland and semi-natural broad-leaved woodland. The woodland areas provide optimal habitat for the shelter, movement, and foraging of wildcat. Particularly important areas include the expansive and continuous stands of woodland extending from Granish through to the River Dulnain, west of the A9 (Section 5 CH7900 to Section 8 CH16600). Other large continuous stands of woodland are found within the vicinity of Carrbridge and Kinveachy – these woodland are highly suitable for this species (Section 6a to 8 CH11900 to CH16300).
- 9.3.4. Grassland habitat within the Study Area is also relatively extensive, and generally well connected to areas which provide shelter, such as woodland or scrub. These areas of predominantly neutral and acid grassland, support prey species and are likely to provide foraging opportunities for wildcat, as does the large expanses of dry heath, often occurring in a mosaic with acid grassland.
- 9.3.5. Habitat within the Study Area which is likely to be of a lower suitability for wildcat includes areas of wet heath and bog, largely concentrated to the west of the A9 south of Slochd Summit (Section 9 CH19400 to CH20900). The urbanised areas within and immediately surrounding Aviemore (Sections 3a to 4) are also likely to be of a low suitability for this species.
- 9.3.6. The review of the SNH survey and scoping of wildcat priority areas^{xlv} identified that the area around Dulnain should be considered as a priority area. The paper makes recommendations for the locations of priority areas. The area identified around Dulnain follows the CNPA boundary to the west, the River Spey to the east, to the north, the boundary has been set at a 2km buffer onto hill ground from the woodland boundary but then excludes the town of Grantown-on-Spey. The boundary at the south excludes Aviemore running instead along the A9 to just south of Aviemore and then following a watershed up to the National Park boundary.

9.4. Scope of Stage 3 Assessment

- 9.4.1. In accordance with the A9 wildcat position paper, 'Wildcat Crossings and Surveys'^{xlvi} further survey at DMRB Stage 3 Assessment will likely be restricted to incidental observations of wildcat and their signs during other protected species surveys. For example, the pine marten and red squirrel surveys will cover woodlands within 100m of

the Stage 3 Preferred Route Option. However, targeted surveys for wildcat (for example using camera trapping) will be employed where deemed necessary, for example, if potential den sites are identified.

- ⁱ CFJV, JUK, AM (2015) Technical memorandum, Outline approach to consistency in A9 survey extents
- ⁱⁱ CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ⁱⁱⁱ Collins. J (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.
- ^{iv} Lucy Elliott (GCN licence 2015-7268-CLS-CLS), Rebecca Hill (GCN licence 2015-7704-CLS-CLS) of Mouchel Consulting
- ^v Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal*. 10:143-155.
- ^{vi} Amphibian and Reptile Groups of the UK (2010) Advice Note 5: Great Crested Newt Habitat Suitability Index
- ^{vii} Cresswell, W & Whitworth R (2004) An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus*. English Nature Research Reports No.576. English Nature, Peterborough.
- ^{viii} Biggs, J., Ewald, N., Valentini, A., Gaboriaud, C., Griffiths, R.A., Foster, J., Wilkinson, J., Arnett, A., Williams, P. and Dunn, F. (2014) Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.
- ^{ix} English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.
- ^x CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xi} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xiii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xiv} The Design Manual for Roads and Bridges (2001) Volume 10, Section 1 Part 9 HA 81/99: Nature Conservation Advice in Relation to Otters, Chapter 7.
- ^{xv} SNH (undated) <http://www.snh.org.uk/publications/on-line/wildlife/otters/effects.asp>
- ^{xvi} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xvii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xviii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xix} Cresswell, W.J., Birks, J., Dean, M., Pacheco, M., Trehwella, W.J., Wells, D. and Wray, S. (2012) UKBAP Mammals: Interim Guidelines for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.
- ^{xx} Birks, J.D.S., Messenger, J.E. and Halliwell, E.C. (2005) Diversity of den sites used by pine martens *Martes martes*: a response to the scarcity of arboreal cavities. *Mammal Review*, Vol. 35, Issue 3-4, pp 313-320, July 2005.
- ^{xxi} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxiii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxiv} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxv} Gurnell, J., Lurz, P. and Pepper, H. (2009) Forestry Commission Research Information Note 255: Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission, Surrey.
- ^{xxvi} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxvii} DMRB (2005) Volume 10, Section 4, Part 7, Nature Conservation advice in relation to reptiles and roads
- ^{xxviii} Scottish Natural Heritage (2015) Reptiles. Available at: <http://www.snh.gov.uk/about-scotlands-nature/species/amphibians-and-reptiles/reptiles/> (Accessed August 2014).
- ^{xxix} Froglife (1999) Advice Sheet 10: Reptile Survey. Froglife, Halesworth.
- ^{xxx} Gent, T. and Gibson, S. (2003) Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough
- ^{xxxi} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxxii} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxxiii} DMRB (2005) Volume 10, Section 4, Part 7, Nature Conservation advice in relation to reptiles and roads
- ^{xxxiv} Froglife (1999) Advice Sheet 10: Reptile Survey. Froglife, Halesworth.
- ^{xxxv} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xxxvi} Dean, Strachan, Gow, Andrews (2016) The water vole mitigation handbook (The Mammal Society Mitigation Guidance Series) Eds Matthews and Chanin. The Mammal Society
- ^{xxxvii} Strachan (2011) Water vole conservation handbook, 3rd Edition



- ^{xxxviii} CH2M Hill Fairhurst Joint Venture, Jacobs UK and AtkinsMouchel (2015) Outline approach to consistency in A9 ecology survey extents.
- ^{xxxix} CH2M Hill Fairhurst Joint Venture (2015) A9 Dualling Programme – Wildcat Crossings and Surveys.
- ^{xl} Littlewood, N.A., Campbell, R.D., Dinnie, L., Gilbert, L., Hooper, R., Iason, G., Irvine, J., Kilshaw, K., Kitchener, A., Lackova, P., Newey, S., Ogden, R. & Ross, A. (2014) Survey and scoping of wildcat priority areas. Scottish Natural Heritage Commissioned Report No. 768.
- ^{xli} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xlii} Scottish Natural Heritage (2015) Scottish Wildcats – Survey Requirements. Available at: <http://www.snh.gov.uk/about-scotlands-nature/wildlife-and-you/scottish-wildcats/survey-requirements/> (Accessed 14 October 2015)
- ^{xliii} Friembichler, S. and Slotta-Bachmayr, L. (2013) Potential habitats for the European Wildcat (*Felis sylvestris sylvestris*) in Austria – a basis for further steps in conservation. 5th Symposium for research into protected areas. Mittersill, 191-195.
- ^{xliv} CH2MHill (2015) Preliminary Ecological Appraisal. North Scheme – Dalraddy to Moy
- ^{xlv} Littlewood, N.A., Campbell, R.D., Dinnie, L., Gilbert, L., Hooper, R., Iason, G., Irvine, J., Kilshaw, K., Kitchener, A., Lackova, P., Newey, S., Ogden, R. & Ross, A. (2014) Survey and scoping of wildcat priority areas. Scottish Natural Heritage Commissioned Report No. 768.
- ^{xlvi} CH2M Hill Fairhurst Joint Venture (2015) A9 Dualling Programme – Wildcat Crossings and Surveys.

