Appendix 12.7

Protected Species Survey Part 2

ch2m FAIRHURST

Annex 3
Photographs

Otters

9_O1_16

9_O12_27

9_O12_28

9_O15_29

9_O18_26

9_HS1_93

9_HS2_94

Water Voles

9_WVH1_30

9_WVH2_38

Red Squirrels

9_RS2_33

9_RS3_36

9_RS7_44

9_RS9_45

9_RS11_48

9_RSH5_52

9_RSH9_76

Bats

9_BA1_20

9_BA9_22

9_BA13_25

9_BA14_28

9_BA14_29

9_BA14_32

9_BT8_1012

9_BT13_1021

9_BT17_1074

9_BT19_1024

9_BT22_1029

9_BT26_1026

9_BT29_1046

9_BT31_1048

9_BT32_1027

9_BT34_1051

9_BT38_1057

9_BT40_1066

9_BT45_1033

9_BT46_1060

Annex 4
Desk Study – Table and Figures

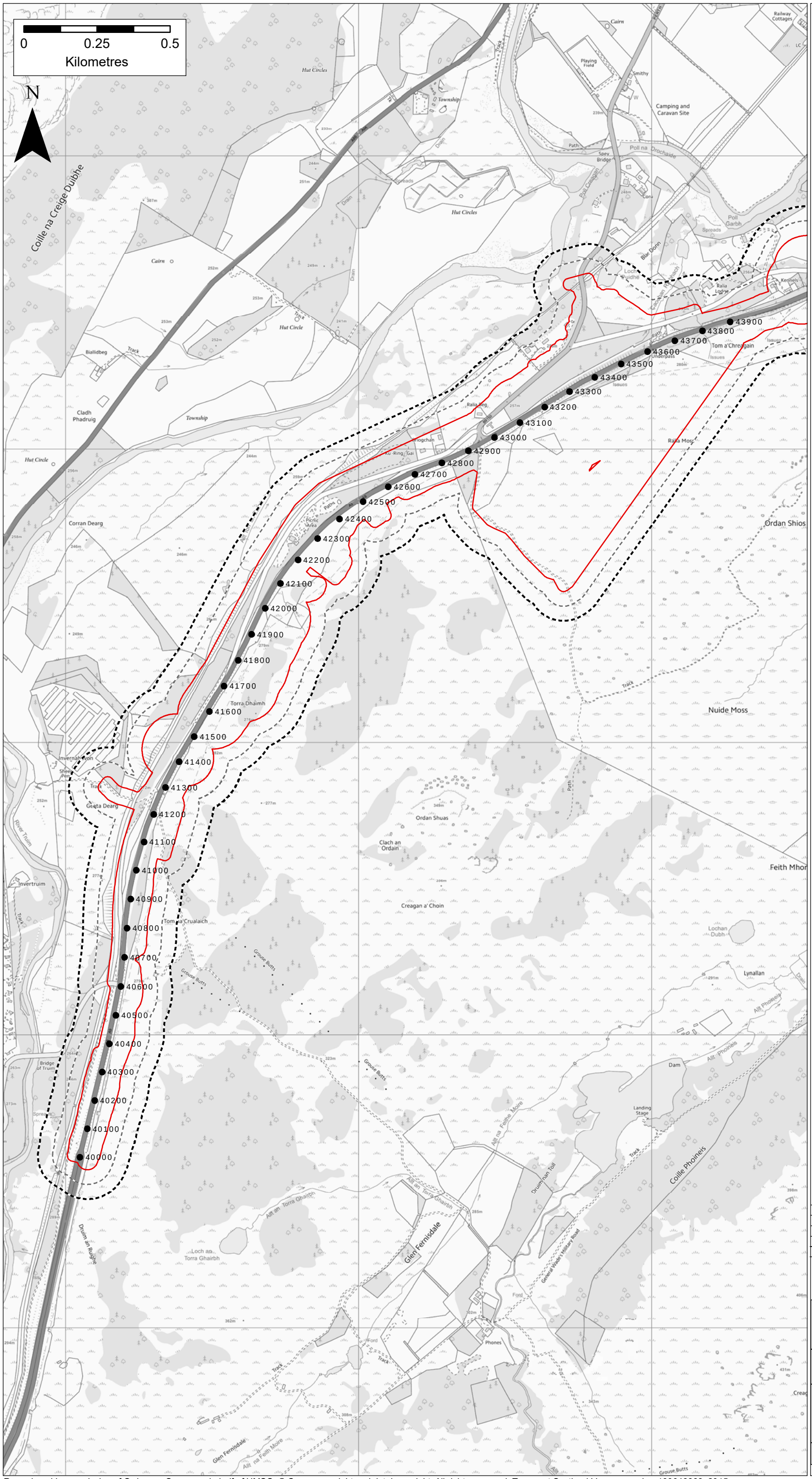
Project 9 Desk Study Table

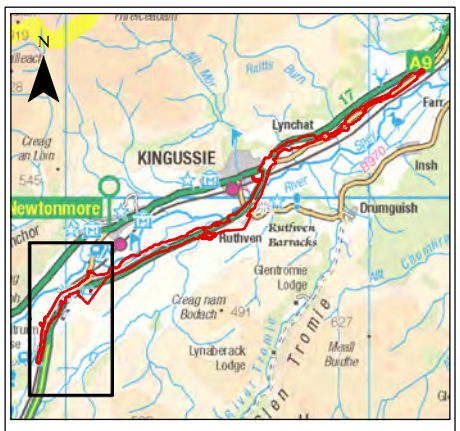
Map Code	Species	Comment	Section	Closest Chainage (Distance in m)	National Grid Reference	Date
BG2	Badger	A well-worn animal path near a cottage, which could possibly be a badger path	1	44050 (73)	271412 797550	
BG3	Badger	Road casualty	1	48200 (35)	275200 799100	2013
BG4	Badger	Possible badger snuffle holes and runs on the edge of a narrow band of mixed plantation woodland on a steep slope adjacent to the B970 road	2	49250 (22)	276056 799691	
BG5	Badger	Road casualty. Within 10 m of BG6.	3	56950 (300)	282000 804000	04/10/2009
BG6	Badger	Road casualty. Within 10 m of BG5.	3	56950 (300)	282000 804000	04/10/2009
BG7	Badger	2 dead badgers within 10m	3	56950 (305)	282000 804400	04/10/2009
BG8	Badger	2 dead badgers within 10m	3	56950 (305)	282000 804400	04/10/2009
BG9	Badger		3	56950 (305)	282000 804400	
BT4	Bat	Bat dropping	1	40750 (25)	269187 795333	2014
BT5	Bat	Building with bat roost potential	1	43000 (45)	270451 797083	
BT6	Bat	Building with bat roost potential	1	44050 (72)	271412 797550	
BT7	Bat	Tree with bat roost potential	1	44700 (73)	271917 797877	

Map Code	Species	Comment	Section	Closest Chainage (Distance in m)	National Grid Reference	Date
BT8	Bat	Tree with bat roost potential	2	49300 (58)	276028 799782	
BT9	Bat	Tree with bat roost potential	2	49450 (37)	276132 799885	
BT10	Bat	Bridge/ culvert with bat roost potential	2	50500 (3)	276566 800827	
BT11	Bat	Bridge/ culvert with bat roost potential	2	50750 (20)	276624 801052	
BT12	Bat	Tree with bat roost potential	3	53250 (40)	278746 802113	
BT13	Bat	Tree with bat roost potential	3	53600 (43)	279114 802240	
BT14	Bat	Tree with bat roost potential	3	54900 (35)	280074 803097	
BT15	Bat	Tree with bat roost potential	3	55300 (43)	280404 803245	
BT16	Bat	Tree with bat roost potential	3	55450 (25)	280550 803315	
BT17	Bat	Tree with bat roost potential	3	55350 (45)	280456 803349	
BT18	Bat	Tree with bat roost potential	3	55650 (31)	280748 803398	
BT19	Bat	Tree with bat roost potential	3	55650 (36)	280709 803453	
BT20	Bat	Tree with bat roost potential	3	55900 (23)	280931 803574	
BT21	Bat	Tree with bat roost potential	3	56200 (28)	281210 803724	
BT22	Bat	Tree with bat roost potential	3	56950 (70)	281842 804206	
BT23	Bat	Tree with bat roost potential	3	56950 (167)	281924 804268	
BT24	Bat	Tree with bat roost potential	3	56950 (88)	281793 804282	

Map Code	Species	Comment	Section	Closest Chainage (Distance in m)	National Grid Reference	Date
BT25	Bat	Tree with bat roost potential	3	56950 (388)	282014 804500	
O25	Otter	Dead otter	2	50150 (56)	276400 800500	15/03/2010
O26	Otter	Dead otter	2	50150 (56)	276400 800500	15/03/2010
O27	Otter	Road casualty	2	50150 (56)	276400 800500	15/03/2010
O28	Otter		2	50150 (56)	276400 800500	
O29	Otter	Road casualty	3	55100 (75)	280253 803143	30/8/2013
O30	Otter	Road casualty	3	55100 (75)	280253 803143	30/08/2013
O31	Otter	Sprainting evident upstream of culvert under the embankment of the A9	3	56200 (30)	281155 803743	01/06/2006
O32	Otter		3	56200 (30)	281155 803743	
O33	Otter	Footprints in soft sediments near shoreline of Loch Insh	3	56950 (342)	282112 804241	01/06/2006
O34	Otter		3	56950 (342)	282112 804241	
RS1	Red squirrel		3	53600 (42)	279114 802240	
RS2	Red squirrel	Red Squirrel RTA found on the B9152 near the Mains of Balavil steading	3	53600 (45)	279114 802240	
RS3	Red squirrel	Red Squirrel RTA on the B9152 road	3	54050 (21)	279396 802557	
RS4	Red squirrel		3	54050 (21)	279396 802557	

Map Code	Species	Comment	Section	Closest Chainage (Distance in m)	National Grid Reference	Date
RSA1	Red squirrel area	NBN record	A(a)	40000 (586)	268500 793500	31/10/2004
RSA2	Red squirrel area	NBN record	A(a)	41500 (0)	269500 796500	25/02/2011
RSA3	Red squirrel area	NBN record	A(a)	43800 (525)	270950 797950	07/03/2011
RSA4	Red squirrel area	NBN record	A(a)	43650 (0)	271500 797500	24/11/2007
RSA5	Red squirrel area	NBN record	A(a)	43750 (625)	270850	29/08/2009
RSA6	Red squirrel area	NBN record	B	50850 (137)	276850	20/04/2010
RSA7	Red squirrel area	NBN record	C	52500 (0)	278500	17/09/2007
RSA8	Red squirrel area	NBN record	C	54850 (0)	280500	17/09/2007
RSA9	Red squirrel area	NBN record	C	55500 (41)	280550	11/04/2008
RSA10	Red squirrel area	NBN record	C	55350 (204)	280350	03/01/2009
WC2	Wildcat	Camera trap in grassland/woodland	3	55350 (112)	280400	18/01/2010
WC3	Wildcat	Camera trap in grassland/woodland	3	55450 (78)	280500	23/02/2010





KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Reptile Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4
Rev: -

Drawing scale @ A3 = 1:12,500
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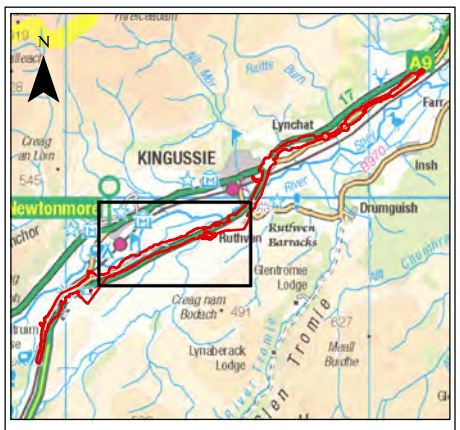

KEY

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- Section chainage

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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

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Reptile Records
Section A(b)

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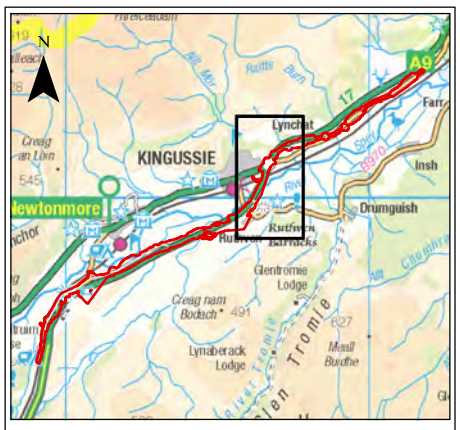

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- 50m from project footprint
- 100m from project footprint
- Section chainage

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Reptile Records
Section B

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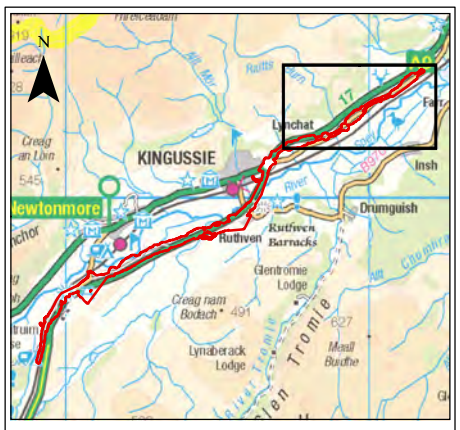

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Potential hibernacula habitat

- J2.5, Wall

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Reptile Records
Section C

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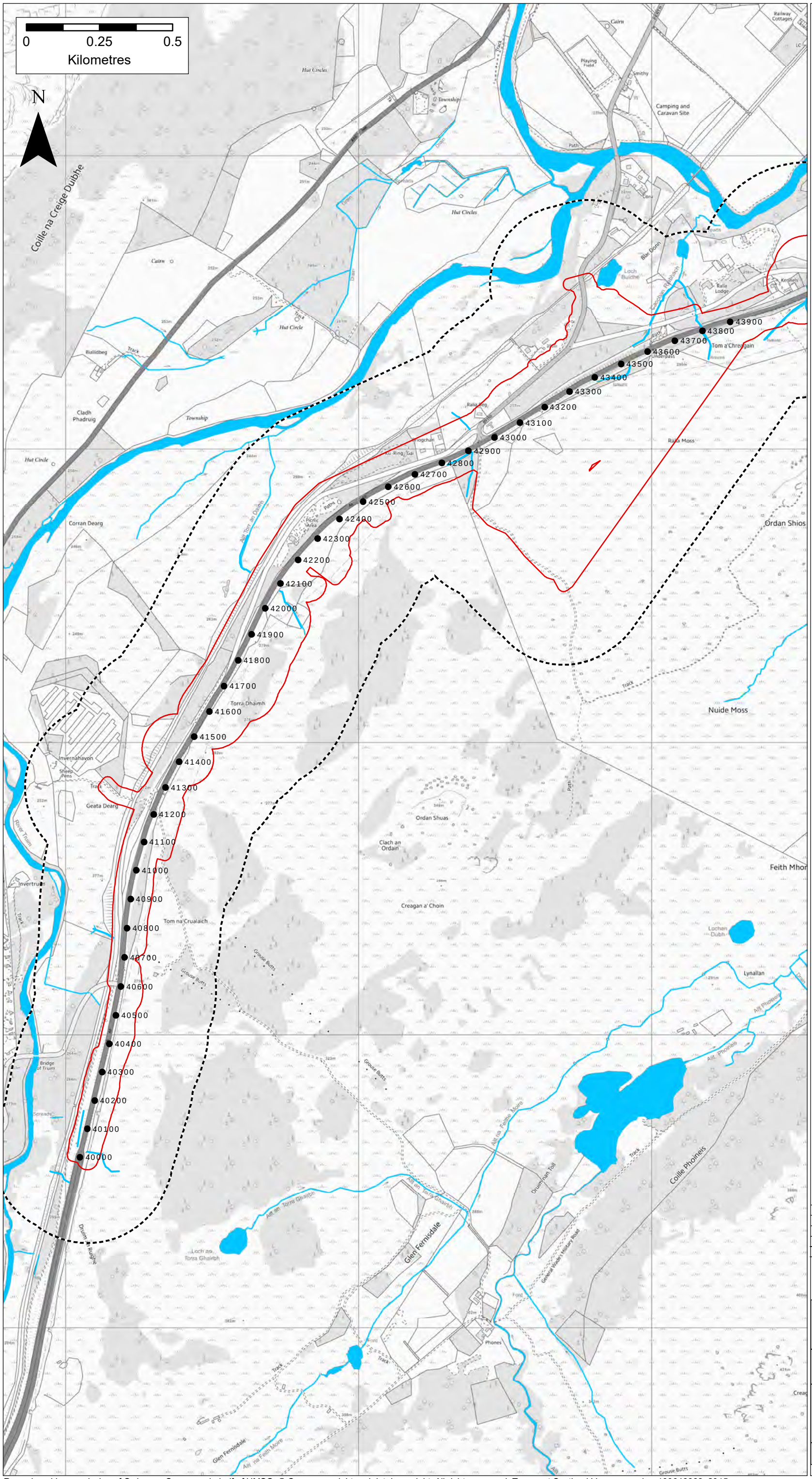

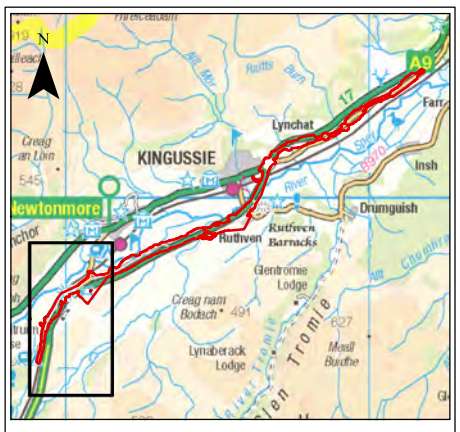

KEY

- Project 9 footprint
- 250m from project footprint
- Section chainage

Habitat potentially suitable for otter and water vole

- Watercourse

REV	SUIT	DATE	DESCRIPTION	BY	APP
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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

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A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:

Project 9 – Ecology Desk Study
Water Vole and Otter Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4

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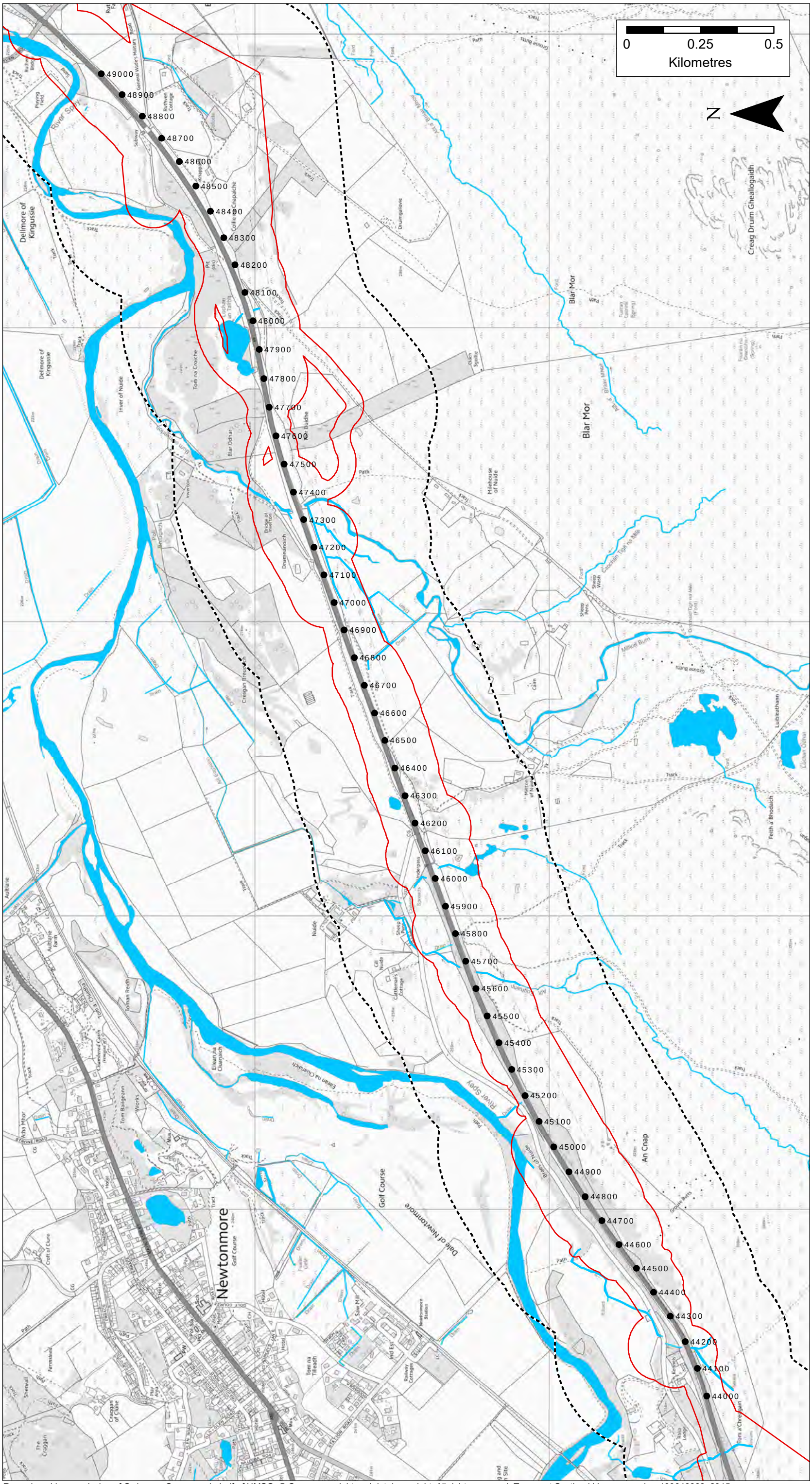
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Creag Druim Ghealllogaidh
Newtonmore
Golf Course
River Spey
Dale of Newtonmore
An Cnap
Millcot Burn
Drumnanoich
Creagan Breucain
Nuide
Malehouse of Nuide
Aultbeithe
Aultbeithe Farm
Tom Balgeann
Toman Reidh
Eilean na Cluanaich
Tom a'Chreagain
Craggan of Clune
Tomi na Tilleadh
Feith a' Bhodaich
Luibleathann
Tom na Croiche
Inver of Nuide
Blar Odhar
Allt Eilean Bhuidhe
Allt Mor
Allt Sgoilte
Allt a' Bhuilg
Allt Coire Sgoilte
Allt Coire Buidhe
Allt Coire Nuide
Allt Millcot
Allt Eilean na Cluanaich
Allt Coire a' Chaorainn
Allt Coire Ruadh
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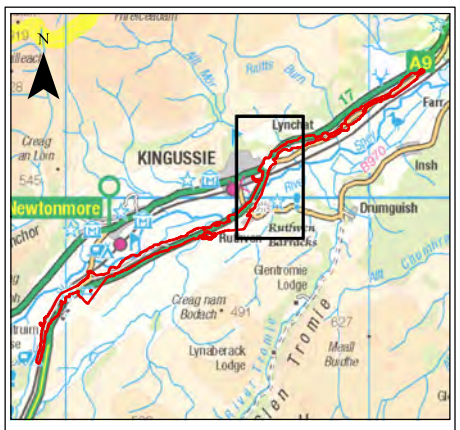

KEY

- Project 9 footprint
- 250m from project footprint
- Section chainage

Species record

- Otter

Habitat potentially suitable for otter and water vole

- Watercourse

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		10/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Water Vole and Otter Records
Section B

Drawing No: A9GGDALR - MAP 3 of 4
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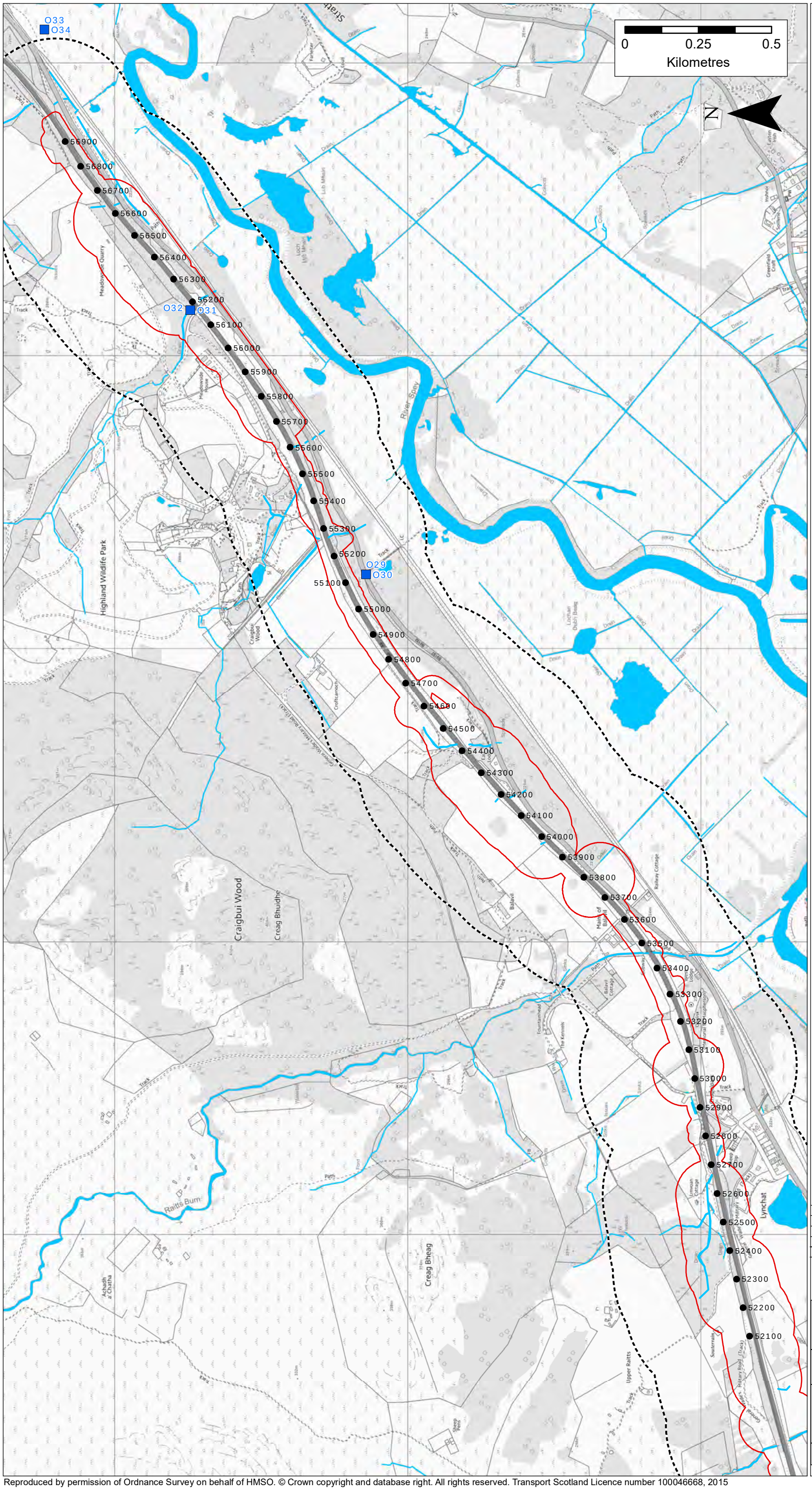

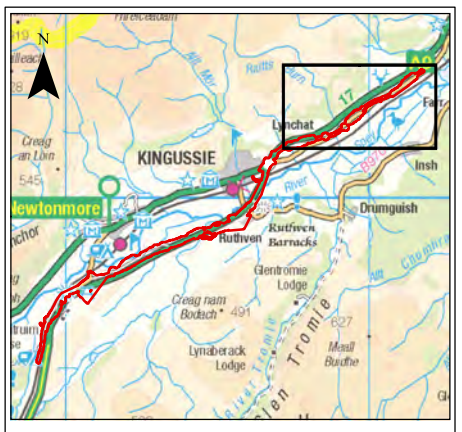

KEY

- Project 9 footprint
- 250m from project footprint
- Section chainage

Species record

- Otter

Habitat potentially suitable for otter and water vole

- Watercourse

REV	SUIT	DATE	DESCRIPTION	BY	APP
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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

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Drawing:
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Water Vole and Otter Records
Section C

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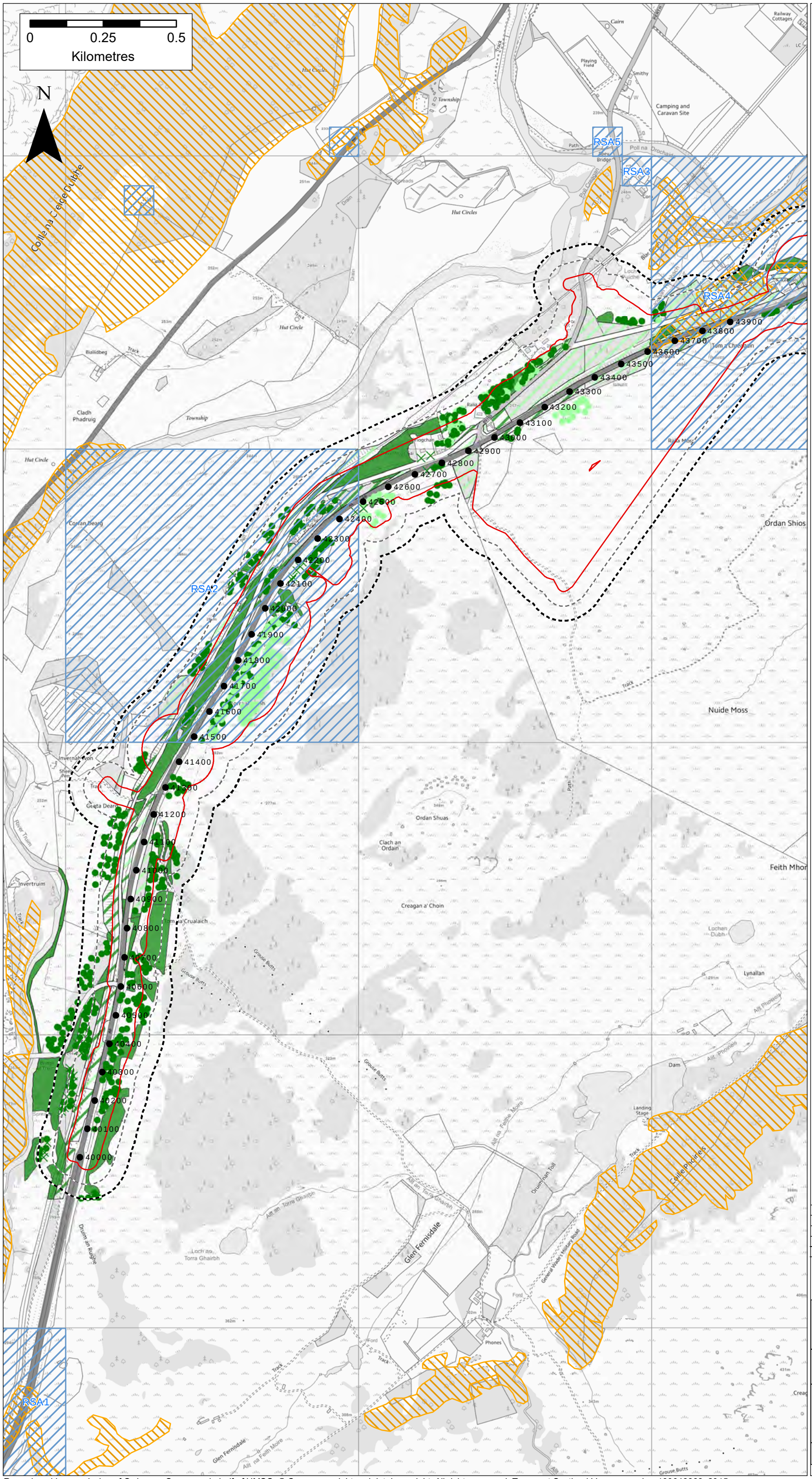

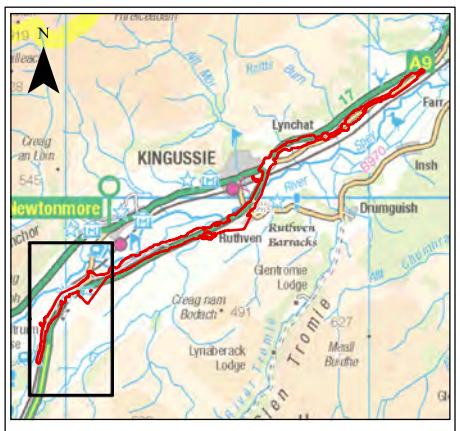

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage
- Red squirrel area
- Ancient woodland inventory

Habitat potentially suitable for squirrel dreys based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- A2.2, Scrub - scattered
- A3.1, Broadleaved Parkland/scattered trees
- A3.2, Coniferous Parkland/scattered trees

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Red Squirrel Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4
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Suitability:

Document Name: 6448_002_r2_RedSquirrel_A3P

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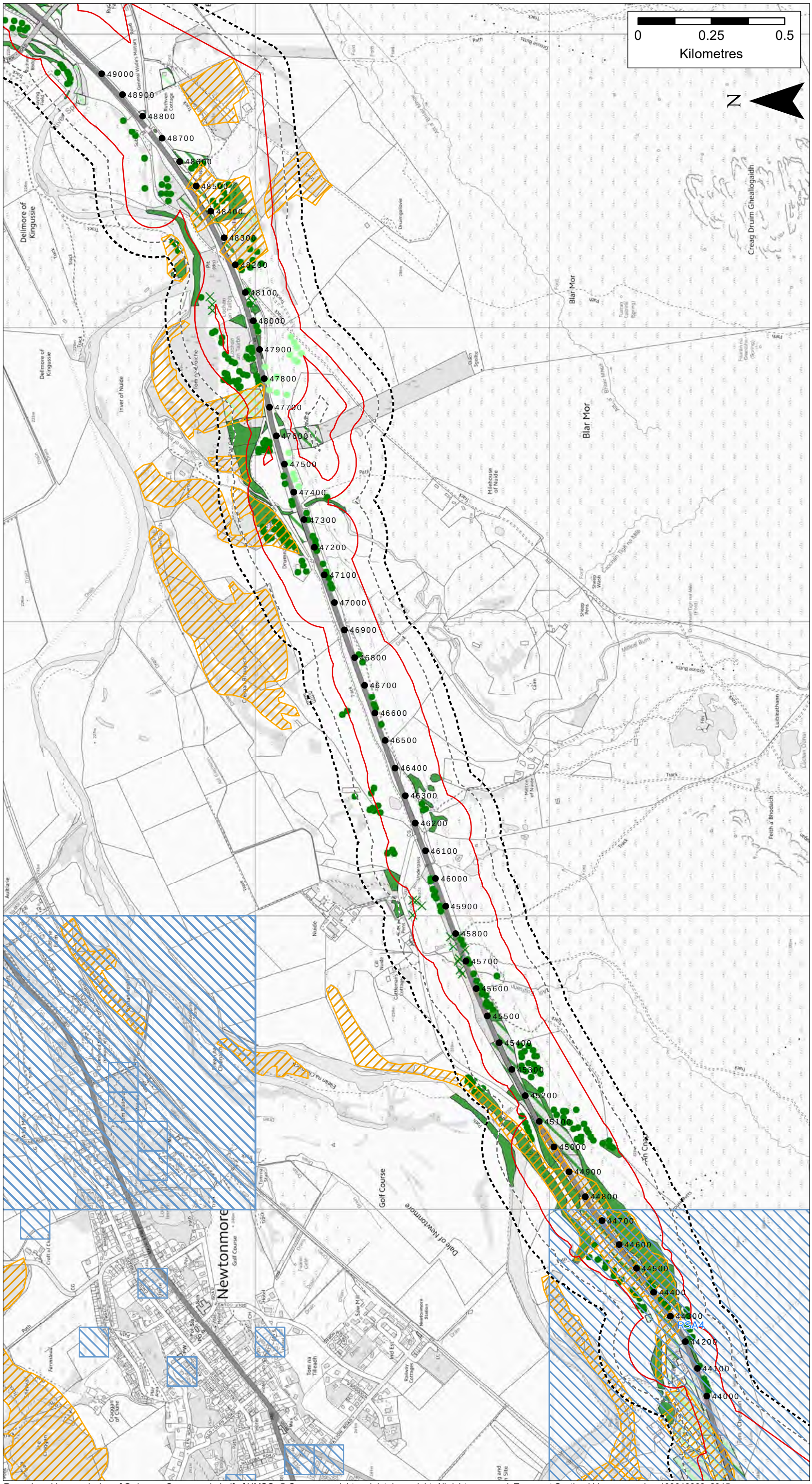

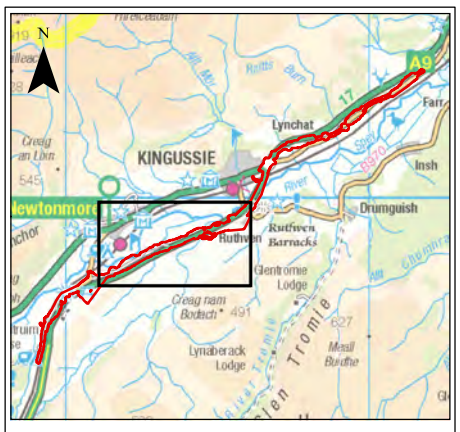

KEY

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- Section chainage
- Red squirrel area
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Habitat potentially suitable for squirrel dreys based on Phase 1 habitats

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- A1.2.2, Coniferous woodland - plantation
- A1.3.2, Mixed woodland - plantation
- A2.2, Scrub - scattered
- A3.1, Broadleaved Parkland/scattered trees
- A3.2, Coniferous Parkland/scattered trees

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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Red Squirrel Records
Section A(b)

Drawing No: A9GGDALR - MAP 2 of 4
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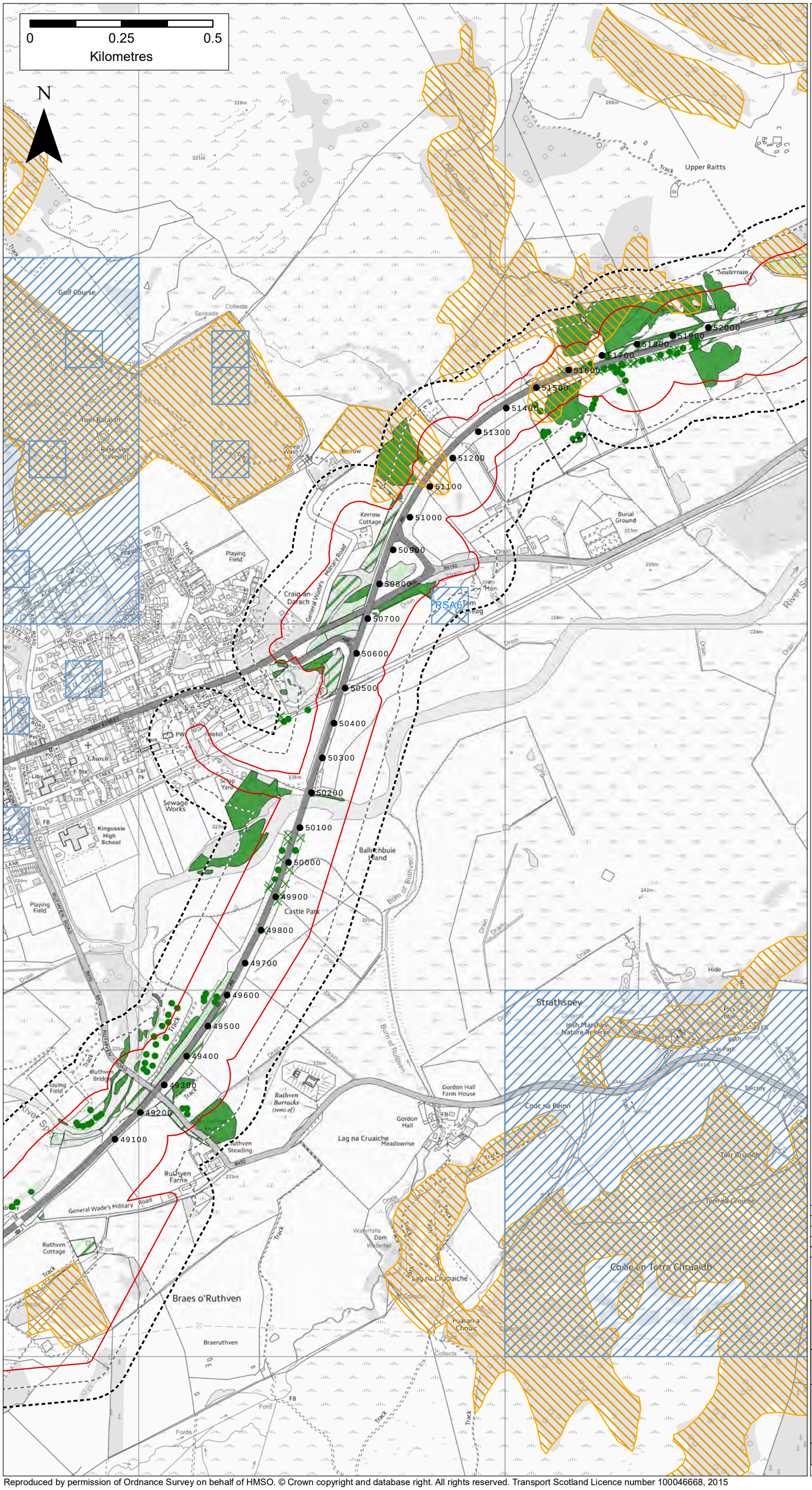
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Playing Field
Military Road
General Wade's Military Road
Craig an-Darach
RSA6
Sewage Works
Scrap Yard
Kingussie High School
Ballachbuie Wood
Castle Park
Burial Ground
Ruthven Bridge
Ruthven Barracks (rems of)
Ruthven Steading
Ruthven Farm
Ruthven Cottage
Gordon Hall Farm House
Gordon Hall
Lag na Cruaiche Meadowrise
Lag na Chapaiche
Braes o'Ruthven
Braeruthven
Burn of Ruthven
Waterfalls Dam
Strathspey
Insh Marshes Nature Reserve
Cnoc na Peiran
Coille an Torra Chruaidh
Tom Cruaidh
Torcroy
Hide
Path
Car Park
Sluice
Ford
Fords
Drain
Track
Ruthven Road
Bridge
Church
Hotel
Post Office
Liby
Car Pk
Sta
Pol Sta
Mon
Tumulus
Cairn
Quarry
Pond
Fm
FB
LC
PW
Golf Course
Rose Vale (covered)
Tom Beag
Tom Mor
Tom a'Chaig
Allt Coulbeg
Allt Ruthven
Burn of Ruthven
River Spey
Ruthven Road
Ruthven Steading
Ruthven Farm
Ruthven Cottage
Ruthven Barracks (rems of)
Ruthven Bridge
Braes o'Ruthven
Braeruthven
Lag na Cruaiche Meadowrise
Lag na Chapaiche
Gordon Hall
Gordon Hall Farm House
Cnoc na Peiran
Coille an Torra Chruaidh
Tom Cruaidh
Torcroy
Insh Marshes Nature Reserve
Strathspey
Kingussie High School
Sewage Works
Scrap Yard
Castle Park
Ballachbuie Wood
Burial Ground
Playing Field
Kerrow Cottage
Craig an-Darach
Military Road
General Wade's Military Road
RSA6
Souterrain
Golf Course
Collects
Spreads
Track
Drain
Ford
Fords
Hide
Path
Car Park
Sluice
Cairn
Quarry
Pond
Fm
FB
LC
PW
Mon
Tumulus
Church
Hotel
Post Office
Liby
Car Pk
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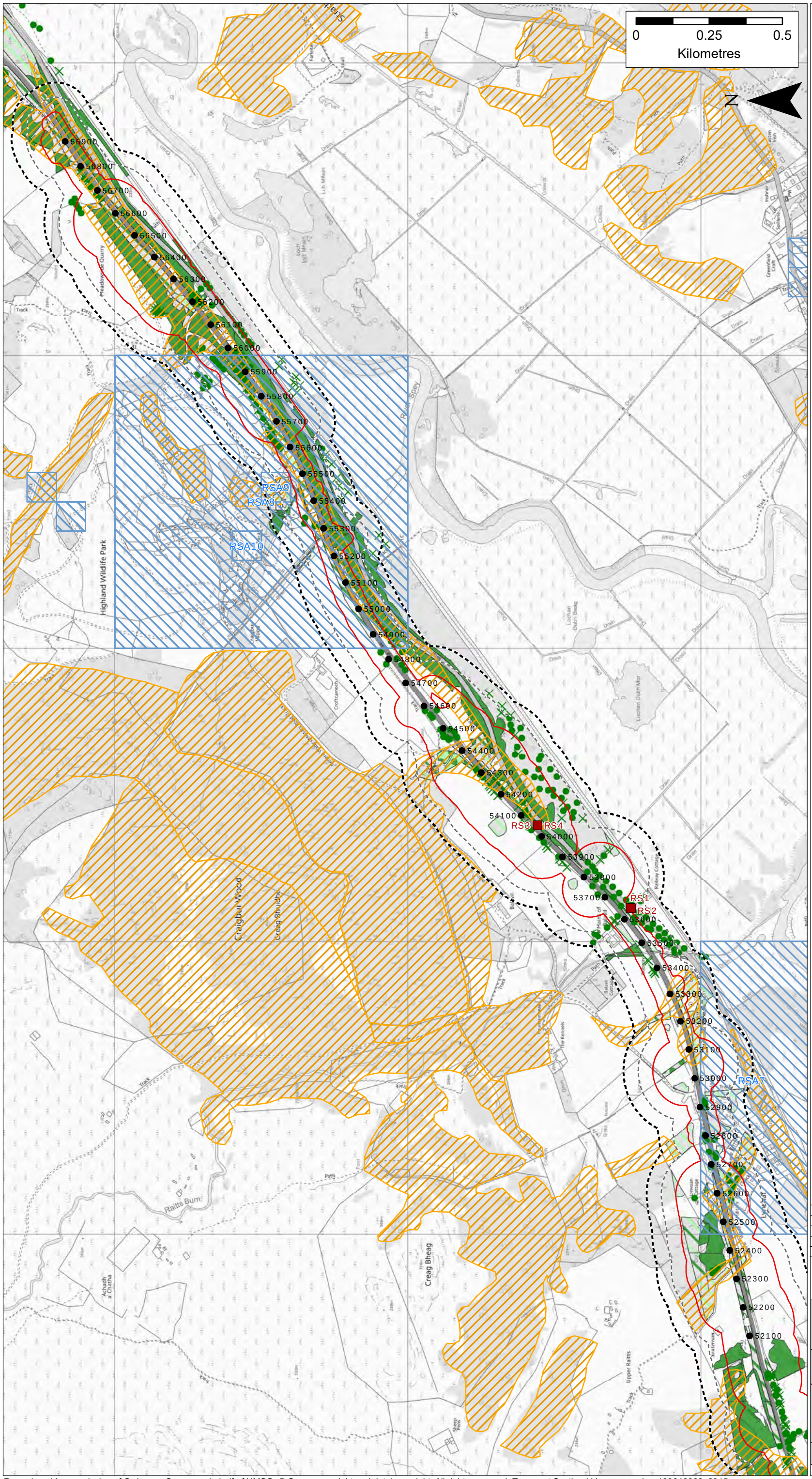
Pol Sta



REV	SUIT	DATE	DESCRIPTION	BY	APP
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1		15/06	Desktop study	EL	SB

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C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Red Squirrel Records
Section C

Drawing No: A9GGDALR - MAP 4 of 4
Rev: -
Drawing scale @ A3 = 1:12,500
Suitability:

Document Name: 6448_002_r2_RedSquirrel_A3P

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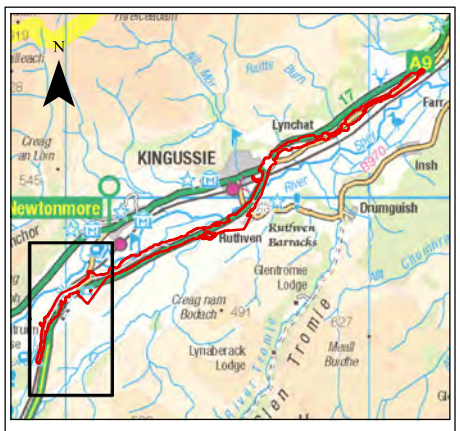

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Potentially suitable habitat for wildcat and pine marten den sites

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- A2.1, Scrub - dense/continuous
- C1.1, Bracken - continuous

REV	SUIT	DATE	DESCRIPTION	BY	APP
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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Wildcat and Pine Marten Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4
Rev: -

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Suitability:

Document Name: 6448_004_r2_WildcatPineMarten_A3P

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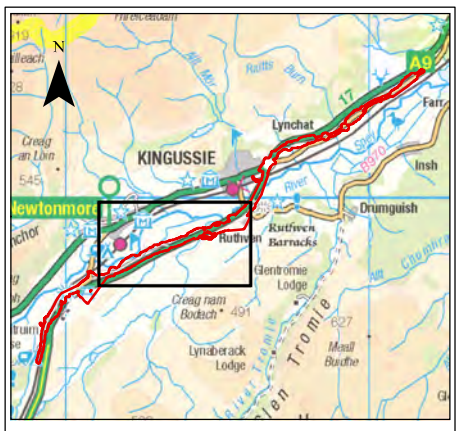

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Potentially suitable habitat for wildcat and pine marten den sites

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.2, Mixed woodland - plantation
- C1.1, Bracken - continuous
- I1.2.1, Scree - acid/neutral
- I2.2, Spoil

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Wildcat and Pine Marten Records
Section A(b)

Drawing No: A9GGDALR - MAP 2 of 4
Rev: -
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Suitability:

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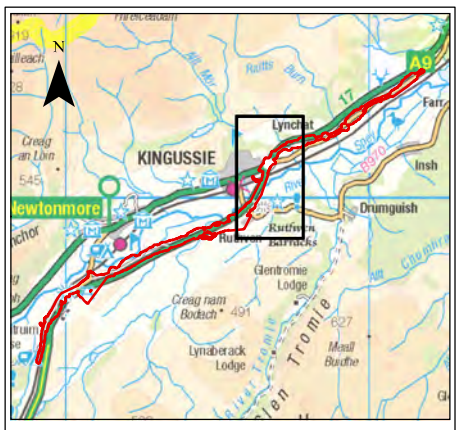

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Potentially suitable habitat for wildcat and pine marten den sites

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.2, Mixed woodland - plantation
- A2.1, Scrub - dense/continuous
- C1.1, Bracken - continuous
- I2.2, Spoil

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Wildcat and Pine Marten Records
Section B

Drawing No: A9GGDALR - MAP 3 of 4
Rev: -

Drawing scale @ A3 = 1:10,000
Suitability:

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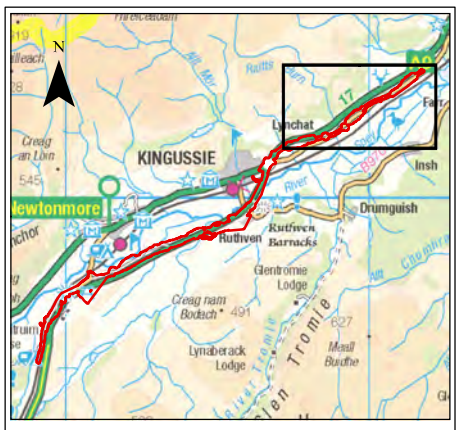

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Species record

- Wild cat
- Wild cat area

Potentially suitable habitat for wildcat and pine marten den sites

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- A2.1, Scrub - dense/continuous
- A2.2, Scrub - scattered
- C1.1, Bracken - continuous
- I2.2, Spoil

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Wildcat and Pine Marten Records
Section C

Drawing No: A9GGDALR - MAP 4 of 4
Rev: -

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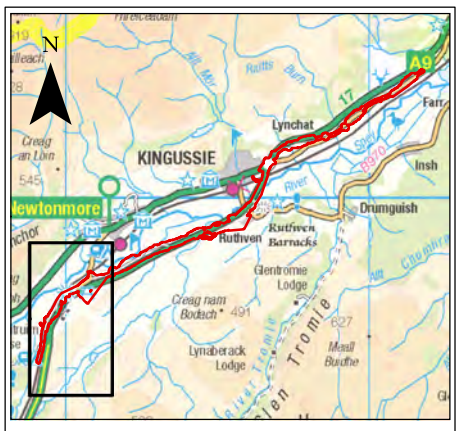

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Species

- Badger

Habitat potentially suitable for badger sett construction based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- A2.1, Scrub - dense/continuous
- B1.1, Acid grassland - unimproved
- B1.2, Acid grassland - semi-improved
- B2.2, Neutral grassland - semi-improved
- B6, Poor semi-improved grassland
- C1.1, Bracken - continuous
- C3.1, Other tall herb and fern - ruderal
- D1.1, Dry dwarf shrub heath - acid
- D5, Dry heath/acid grassland
- J1.2, Cultivated/disturbed land - amenity grassland

REV	SUIT	DATE	DESCRIPTION	BY	APP
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C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

TRANSPORT SCOTLAND
A9 DUALLING PERTH TO INVERNESS Glen Garry to Dalraddy

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Badger Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4
Rev: -

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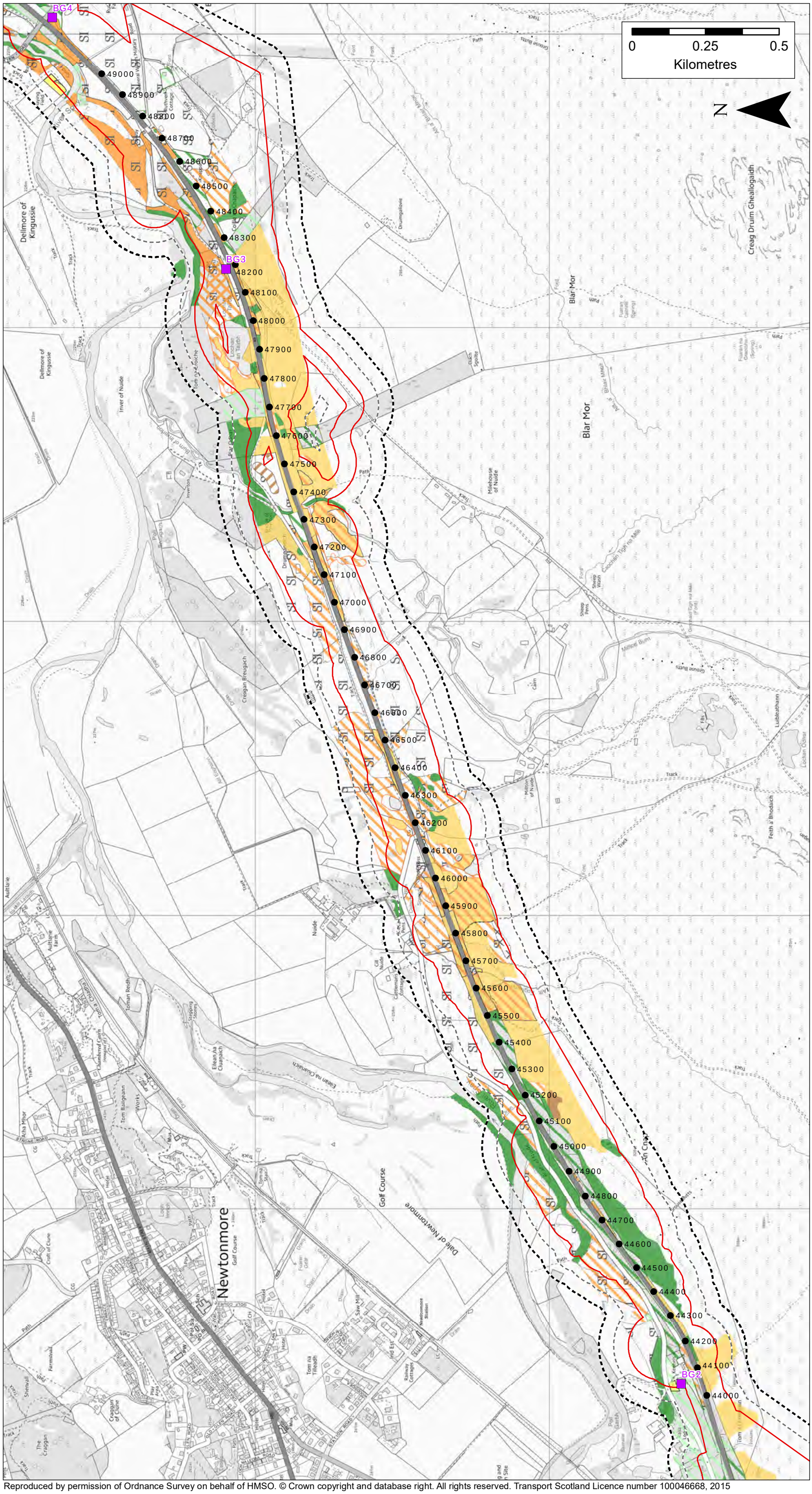
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BG3
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Kilometres
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Dellmore of Kingussie
Inver of Nuide
Blar Mor
Creag Druim Ghealllogaidh
Drumgallovie
Creagan Breugach
Milton of Nuide
Nuide
Golf Course
Newtonmore
Dalle of Newtonmore
Craggan of Clune
Aultbeithe Farm
Aultbeithe
Tom na Croiche
Tom Bailgeann
Tom na Tilleadh
Eilean na Cluanaich
Allt a' Bhlair Mhoir
Allt Mor
Milltat Burn
Luibleathann
Feith a' Bhedaich
Sheep Pens
Stepping Stones
Chambered Cairn
Railway Cottages
Saw Mill
Golf Course
Track
Path
Ford
Drain
Fence
Wall
Bridge
Hotel
Church
Post Office
Shop
Cairn
Works
Sch
Play Area
Newtonmore Station
Ind Est
Cattlemans Cottages
Ruthven Cottage
Ruthven Chapel
Ruthven Barracks
Glentromie Lodge
Lynaberack Lodge
Creag nam Bodach
Lynchat
KINGUSSIE
Newtonmore
Drumguish
Insh
Farr
A9
B9150
Tromie
Meall Buidhe
River Tromie
Allt Mor
Raitts Burn
Allt a' Bhlair Mhoir
Milltat Burn
Allt Cuil Chaorainn
Allt Coire Bhuirich
Allt Ruadh
Allt Ban
Allt Beag
Allt Creagan Breugach
Allt Dubh
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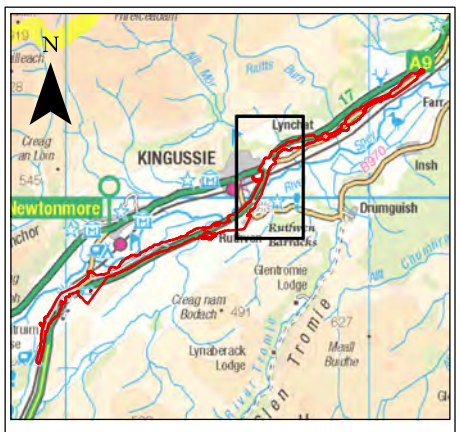

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Species

- Badger

Habitat potentially suitable for badger sett construction based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.2, Mixed woodland - plantation
- A2.1, Scrub - dense/continuous
- A3.1, Broadleaved Parkland/scattered trees
- B1.1, Acid grassland - unimproved
- B1.2, Acid grassland - semi-improved
- B2.2, Neutral grassland - semi-improved
- B4, Improved grassland
- B6, Poor semi-improved grassland
- C1.1, Bracken - continuous
- C3.1, Other tall herb and fern - ruderal
- D1.1, Dry dwarf shrub heath - acid
- J1.1, Cultivated/disturbed land - arable
- J1.2, Cultivated/disturbed land - amenity grassland

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C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Badger Records
Section B

Drawing No: A9GGDALR - MAP 3 of 4
Rev: -
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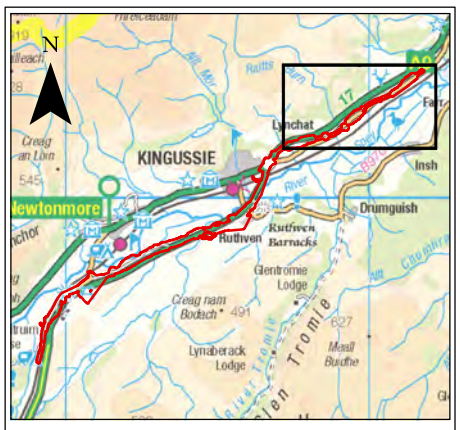

KEY

Project 9 footprint

50m from project footprint

100m from project footprint

Section chainage

Species

Badger

Habitat potentially suitable for badger sett construction based on Phase 1 habitats

A1.1.1, Broadleaved woodland - semi-natural

A1.1.2, Broadleaved woodland - plantation

A1.2.2, Coniferous woodland - plantation

A1.3.1, Mixed woodland - semi-natural

A1.3.2, Mixed woodland - plantation

A2.1, Scrub - dense/continuous

A2.2, Scrub - scattered

A3.1, Broadleaved Parkland/scattered trees

A3.2, Coniferous Parkland/scattered trees

A4.2, Coniferous woodland - recently felled

B1.1, Acid grassland - unimproved

B1.2, Acid grassland - semi-improved

B2.2, Neutral grassland - semi-improved

B3.2, Calcareous grassland - semi-improved

B4, Improved grassland

B6, Poor semi-improved grassland

C1.1, Bracken - continuous

C3.1, Other tall herb and fern - ruderal

D1.1, Dry dwarf shrub heath - acid

D5, Dry heath/acid grassland

J1.1, Cultivated/disturbed land - arable

J1.2, Cultivated/disturbed land - amenity grassland

REV	SUIT	DATE	DESCRIPTION	BY	APP
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1		15/06	Desktop study	EL	SB

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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Badger Records
Section C

Drawing No: A9GGDALR - MAP 4 of 4
Rev: -

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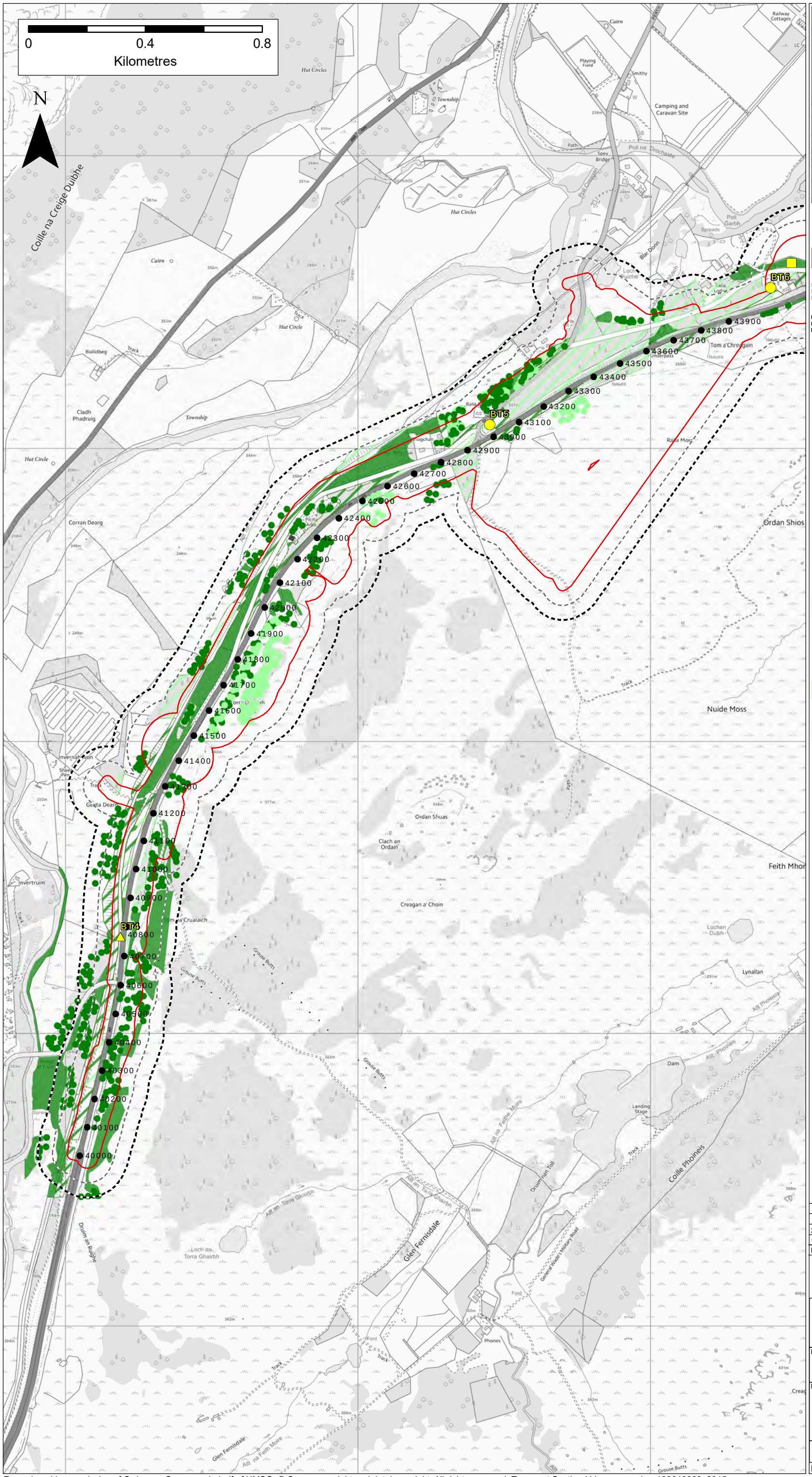

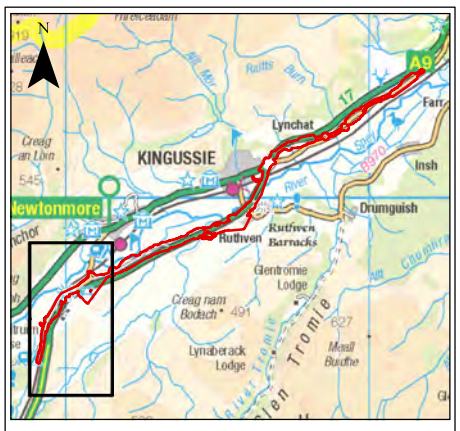

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Bat record

- Building with BRP
- Tree with BRP
- Bat dropping

Habitat potentially suitable for roosting bats based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- J3.6, Buildings
- A3.1, Broadleaved Parkland/scattered trees
- A3.2, Coniferous Parkland/scattered trees

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

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Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Bat Records
Section A(a)

Drawing No: A9GGDALR - MAP 1 of 4
Rev: -

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Suitability:

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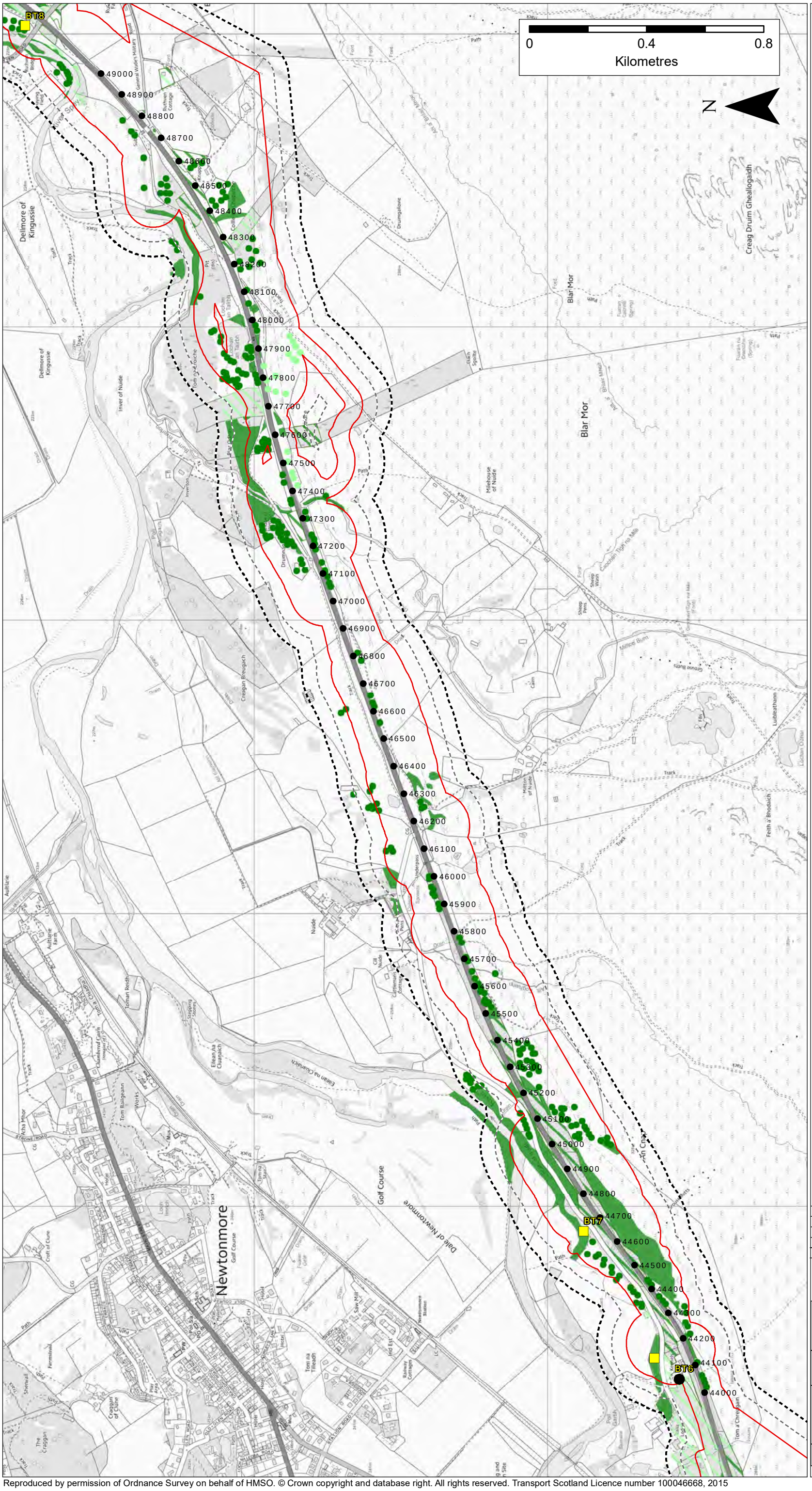

KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Bat record

- Building with BRP
- Tree with BRP

Habitat potentially suitable for roosting bats based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.2, Mixed woodland - plantation
- A3.1, Broadleaved Parkland/scattered trees
- A3.2, Coniferous Parkland/scattered trees

REV	SUIT	DATE	DESCRIPTION	BY	APP
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1		15/06	Desktop study	EL	SB

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Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Bat Records
Section A(b)

Drawing No: A9GGDALR - MAP 2 of 4
Rev: -
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Suitability:

Document Name: 6448_006_r2_Bats_A3P

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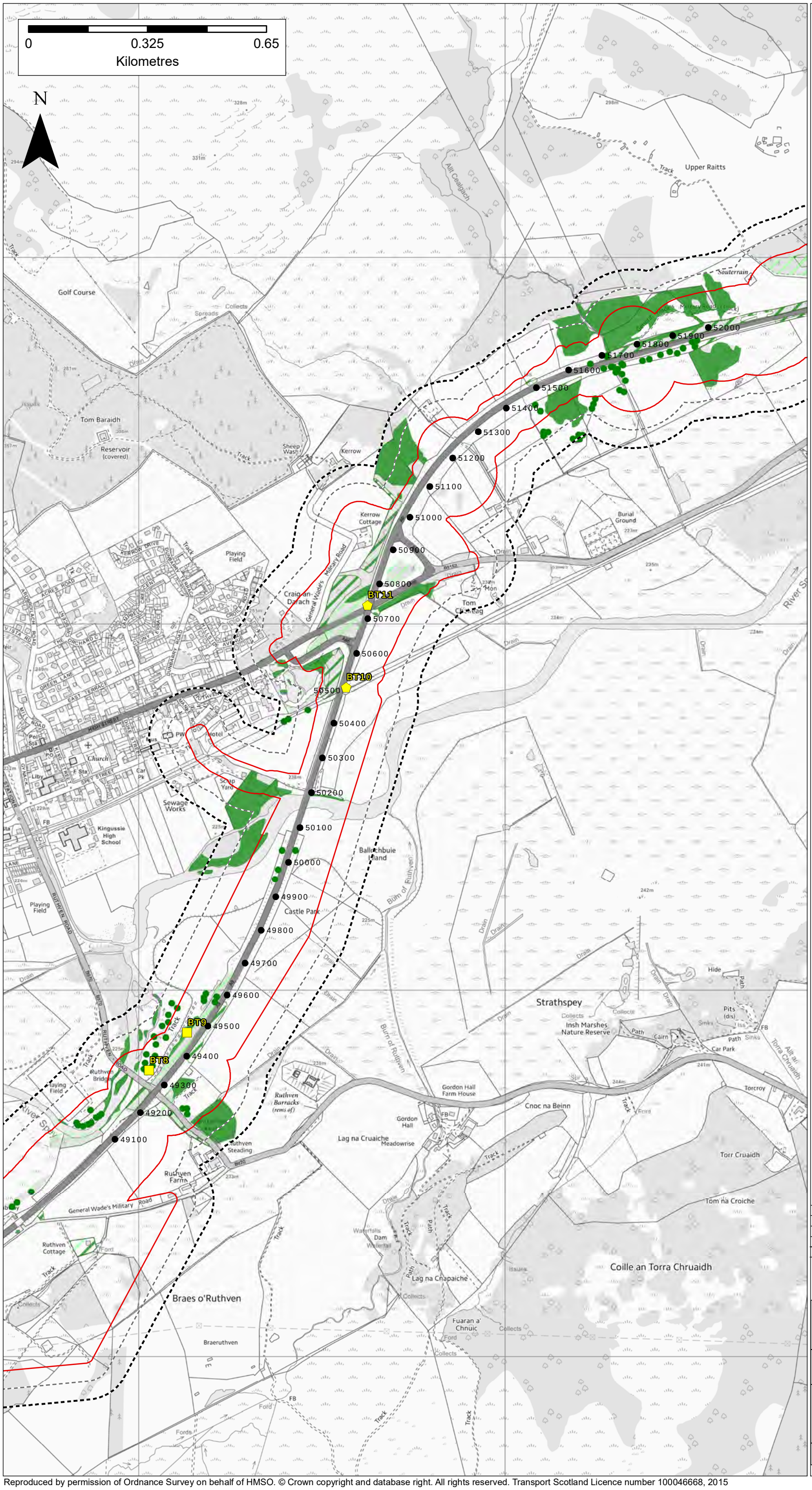
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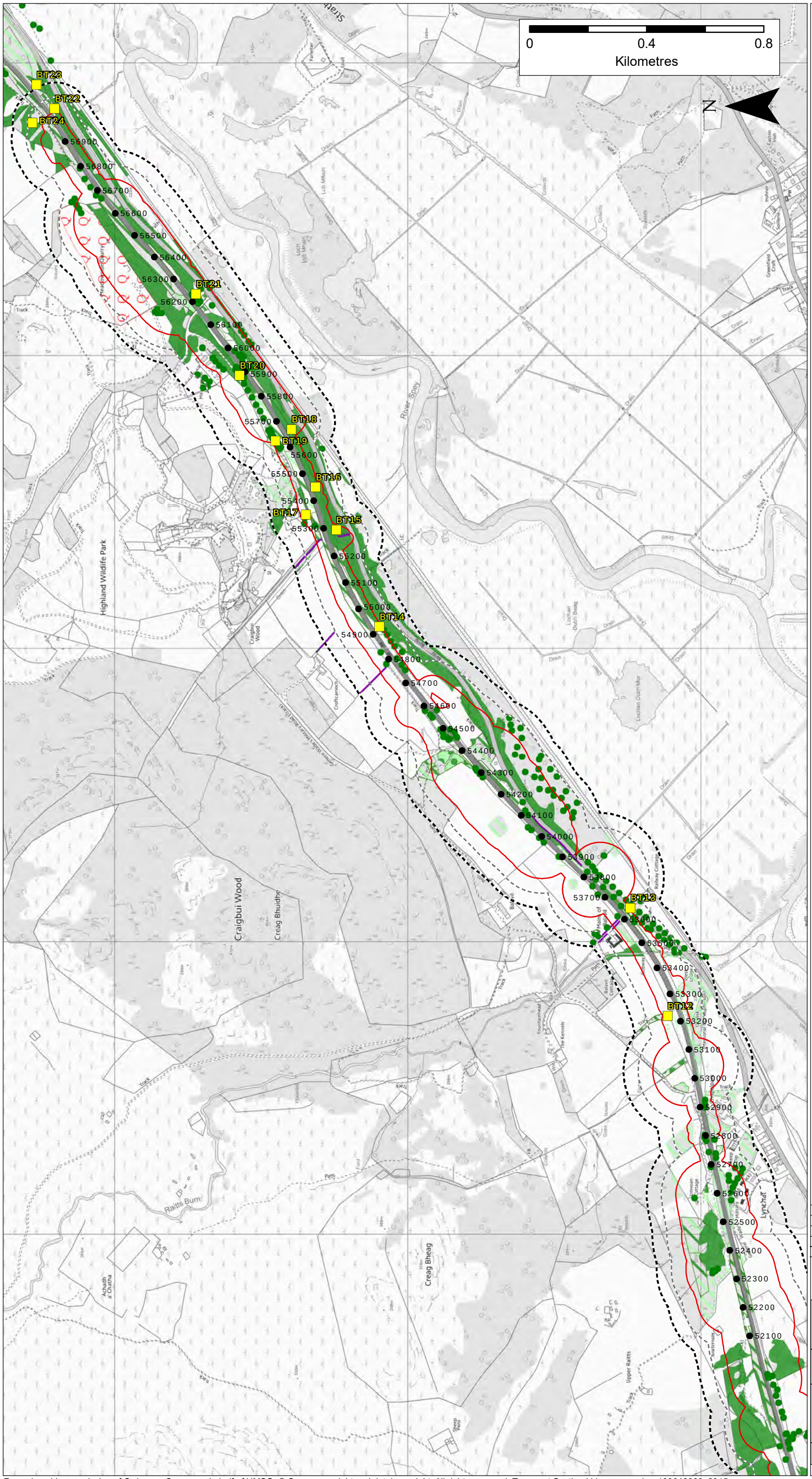
Golf Course
Tom Baraidh
Reservoir (covered)
Upper Raitts
Souterrain
Kerrow
Kerrow Cottage
Playing Field
Military Road
Craig an-Darach
Tom Chreitag
Burial Ground
Sewage Works
Kingussie High School
Ballachbuie Wood
Castle Park
Burn of Ruthven
Ruthven Barracks (rems of)
Ruthven Bridge
Ruthven Steading
Ruthven Farm
Ruthven Cottage
Gordon Hall Farm House
Gordon Hall
Lag na Cruaiche Meadowrise
Cnoc na Beinn
Torcroy
Torr Cruaidh
Tom na Croiche
Coille an Torra Chruaidh
Lag na Chapaiche
Fuaran a' Chnuic
Braes o'Ruthven
Braeruthven
Strathspey
Insh Marshes Nature Reserve
Hide
Pits (dis)
Car Park
Cairn
Waterfalls Dam
Waterfall
Scrap Yard
Church
Hotel
Police Sta
Liby
F Sta
Car Pk
PW
Bus
Track
Drain
Ford
Fords
Path
Collects
Sinks
Iss
Dfsm
FB
Lt
Mon
Cairn
Sand Pit
Sand & Gravel
Issues
Sheep Wash
Ruthven Road
General Wade's Military Road
River Spey
Allt Cealgaich
Allt an Torra Chruaidh
Burn of Ruthven
Tromie
Allt Mor
Raitts Burn
Allt Mhor
Allt Creagan Dhuin
Allt Ruadh
Allt Coire Chreagach
Allt Coire Mhic Nobuil
Allt Coire Ruadh
Allt Coire Chuilinn
Allt Coire Chuilinn
Allt Coire Chuilinn



KEY

- Project 9 footprint
- 50m from project footprint
- 100m from project footprint
- Section chainage

Bat record

- Tree with BRP

Habitat potentially suitable for roosting bats based on Phase 1 habitats

- A1.1.1, Broadleaved woodland - semi-natural
- A1.1.2, Broadleaved woodland - plantation
- A1.2.2, Coniferous woodland - plantation
- A1.3.1, Mixed woodland - semi-natural
- A1.3.2, Mixed woodland - plantation
- A3.1, Broadleaved Parkland/scattered trees
- A3.2, Coniferous Parkland/scattered trees
- I2.1, Quarry
- J3.6, Buildings
- J2.5, Wall
- A3.1, Broadleaved Parkland/scattered trees

REV	SUIT	DATE	DESCRIPTION	BY	APP
2		11/08	Desktop study	EL	SB
1		15/06	Desktop study	EL	SB

CH2MHILL Fairhurst JV
C/O: City Park 368 Alexandra Parade Glasgow G31 3AU
Tel + 44 (0) 141 552 2000 Fax +44 (0) 141 552 2525

Project:
A9 DUALLING - GLEN GARRY TO DALRADDY

Drawing:
Project 9 – Ecology Desk Study
Bat Records
Section C

Drawing No: A9GGDALR - MAP 4 of 4
Rev: -
Drawing scale @ A3 = 1:12,500
Suitability:

Document Name: 6448_006_r2_Bats_A3P

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Annex 5
Project 9 Bat Activity Survey Results

Introduction

1.1 A preliminary Bat Roost Potential (BRP) assessment was undertaken of trees and buildings within the Project 9 survey area during daylight hours in August 2015. The BRP survey was designed to identify and assess structures which could provide suitable roosting opportunities for bats and may therefore require targeted survey effort. Details of this survey can be found in the main body of the protected vertebrates baseline report (Section 4[9]). This annex provides the results of the activity surveys undertaken as a result of the BRP assessment.

Methods

2.1 Project 9 contained more diverse habitats and opportunities than the areas to the south of the survey area (i.e. Projects 7 and 8 survey areas of Glen Garry to Crubenmore). As such, approach to BRP classification required a more flexible and pragmatic approach than was applied in those areas to the south. Wherever possible, individual trees, structures and buildings were assessed for their bat roosting potential. Structures identified within the Project 9 area were classified for the level of potential they offered bats, using the guideline found in Table 3.1 of the main body of the baseline report[9]. The number of activity survey visits to each structure was determined by its individual BRP classification, to keep methods in line with best practice guidelines, updated in early 2016[10]. Table 2.1 outlines the approach taken to the activity survey effort within Project 9. This approach was determined by the CFJV, based on current best practice guidance. Not all structures, trees or areas identified in the BRP survey were followed up with activity surveys. The CFJV provided a list of survey targets based on their detailed information of design options and other aspects of the DMRB process.

Table 2.1 Survey effort for Project 9 BRP structures and trees

Roost Suitability	No. of Survey Visits	Detail
Structures		
High BRP 1	3	At least one dusk and one dawn survey (within the main active season for bats)
Moderate BRP 2	2	
Low BRP 3	1	One dusk or one dawn survey
Trees		
High BRP 1	3	At least one dusk and one dawn survey

[9] LUC. (October 2016) A9 Dualling – Project 9 Crubenmore to Kincraig: Protected Terrestrial Vertebrate Species Survey.
[10] Collins, J. (ed. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) The Bat Conservation Trust, London.

Roost Suitability	No. of Survey Visits	Detail
Moderate BRP 2	2	
Low BRP 3	0	None

2.2 However, where a larger area, i.e. woodland, tree belt, collection of buildings, was assessed as having bat roosting potential to such a level as to make classification of individual features impractical, the area was classified as a whole. For example, a mature broadleaved woodland containing a high proportion of trees with BRP features would be identified as a 'Bat Area' with appropriate BRP classification (e.g. BRP 1). The Bat Areas of BRP 1 or BRP 2 classification were subject to at least two transect-based or vantage point (VP) surveys, depending on ground conditions. This allowed surveyors to sample levels of bat activity, the species assemblage and, extent of usage of the supporting habitats; further details on the methods applied are found below.

2.3 In accordance with the current BCT guidance[10], survey visits (for either points or areas) were undertaken a minimum of two weeks apart to ensure robust data collection.

2.4 All inspections were undertaken by Juli Titherington (Comery) BA MSc MCIEEM AEECW, LUC Senior Ecologist, who also holds a personal bat roost licence from Scottish Natural Heritage (SNH) and has 10 years' experience in bat ecology. Juli was also the lead surveyor for all roost activity surveys undertaken; she was supported by Steve Jackson-Matthews CEnv MCIEEM MEECW, Sophie Punteney BSc (Hons) ACIEEM AEECW, Carolyn Drane BSc (Hons) MSc GradCIEEM AEECW, Katie Luxmoore BSc (Hons) MSc, Rory Glackin BSc, and Rosie MacLellan BA (Hons) MSc, all of whom have several years' experience undertaking bat surveys.

Roost Surveys

2.5 Following standard methods[10], dusk emergence and dawn re-entry surveys were undertaken in June, July and August 2016 (within the optimal survey season for bats) to determine the presence/probable absence of bat roosts. Surveys were conducted during suitable, mostly dry, mild weather conditions. Emergence surveys commenced at least 20 minutes prior to sunset and continued until at least 90 minutes after sunset. Re-entry surveys commenced 90 minutes before sunrise and continued until 15 minutes after sunrise.

2.6 Bat surveys rely on heterodyne detectors to allow surveyors to hear bat echolocation; the frequency and sound of the call is used to help determine the species of bat. While surveys depend on bat detector technology, site surveyors are sufficiently skilled and experienced to determine the species according to their flight patterns and emergence/re-entry behaviour in conjunction with the bat calls. An Anabat Express bat detector was also deployed during the surveys to record any calls for later analysis, using Analook sonogram analysis software. This approach increases the confidence of species identification and helps to ensure no passes were missed due to background noise (e.g. road traffic) or because they were too quiet (e.g. brown long-eared bats) to hear on a hand-held heterodyne detector.

2.7 In addition to roost activity surveys, several trees were located very close to a busy local road and activity surveys were expected to be challenging to undertake safely and robustly (safe survey positions were found to be sub-optimal for viewing all aspects of the tree). As the features on this group of trees were generally no higher than three metres, they were considered for inspection from a ladder. These six trees, located on the Balavil Estate, were inspected on a single day by SNH licensed bat workers Juli Titherington and Steve Jackson-Matthews. Each accessible feature was inspected using a torch and endoscope, if required. In addition to physical inspections, a single activity visit was undertaken (either dawn or dusk) on each tree to provide extra information on activity around the trees.

2.8 Table 2.2 outlines the survey dates and conditions for LUC's roost point surveys. Please read this table in conjunction with the Bat Records Figure in Annex 2 of the baseline report[9].

Table 2.2 LUC 2016 Roost Survey Metadata

Structure ID	Date & Sunrise/set Time	Start Time	Finish Time	Weather
BT 3	13 July 2016 s/s 22:02	21:30	23:32	Good visibility, 10-13° C, 88-100 % cloud cover, brief rain shower 23:00-23:15, no wind
	28 July 2016 s/r 05:08	03:38	05:23	Good visibility, 10° C, 100 % cloud cover, no rain, breezy at start of survey progressively calming down
BT 5	14 July 2016 s/r 04:43	03:10	04:58	Good visibility, 9-10° C, 100 % cloud cover, no rain, no wind
	28 July 2016 s/s 21:36	21:00	23:06	Good visibility, 9-15° C, 25-75 % cloud cover, no rain, no wind
BT 7	21 July 2016 s/r 04:53	03:23	05:08	Good visibility, 12° C, 38 % cloud cover, no rain, lightest breeze
	8 August 2016 s/s 21:12	20:55	22:42	Showers during the day with acceptable visibility, 10° C, 25-38 % cloud cover, no rain, lightest breeze gusting to moderate
BT 8	21 July 2016 s/s 21:49	21:30	23:19	Good visibility, 16° C, 50-100 % cloud cover, no rain, light breeze
	22 August 2016 s/r 05:59	04:30	06:15	Slight mist at start, 11-14° C, 100 % cloud cover, no rain, no wind leading to light breeze
BT 9	21 July 2016 s/r 04:53	03:23	05:08	Good visibility, 12° C, 38 % cloud cover, no rain, lightest breeze
	8 August 2016 s/s 21:12	20:55	22:42	Showers during the day with acceptable visibility, 10° C, 25-38 % cloud cover, no rain, lightest breeze gusting to moderate
BT 10	17 July 2016 s/s 21:53	21:23	23:23	Hot day with excellent visibility, 19° C, 25-50 % cloud cover, no rain, lightest breeze
	21 August 2016 s/r 05:59	04:30	06:15	Light mist at start, 11-14° C, 100 % cloud cover, no rain, no wind leading to light breeze

Structure ID	Date & Sunrise/set Time	Start Time	Finish Time	Weather
BT 17	14 July 2016 s/s 22:00	21:30	23:30	Acceptable visibility, 9-12° C, 100 % cloud cover, no rain, light breeze
	28 July 2016 s/r 05:08	03:38	05:23	Good visibility, 10° C, 100 % cloud cover, no rain, breezy at start of survey progressively calming down
BT 22	15 July 2016 s/r 04:43	03:13	05:58	Sufficient visibility but with unforecasted showers, 10-11° C, 100 % cloud cover, light drizzle showers intermittent, no wind
	28 July 2016 s/s 21:36	21:00	23:06	Good visibility, 9-15° C, 25-75 % cloud cover, no rain, no wind
BT 25	13 July 2016 s/r 04:40	03:10	04:45	Sufficient visibility, 6-7° C, 88 % cloud cover, light drizzle shower at 04:39, lightest breeze
	26 July 2016 s/s 21:40	21:08	23:10	Good visibility, 10-11° C, 100 % cloud cover, no rain, light breeze
BT 32	21 June 2016 s/s 22:16	21:55	23:36	Good visibility 13° C, 88 % cloud cover, no rain, breezy with moderate gusts
	19 July 2016 s/r 04:50	03:25	05:05	Good visibility, 13-15° C, 25-88 % cloud cover, no rain, lightest breeze
BT 35	12 July 2016 s/r 04:39	03:10	04:55	Good visibility, 10° C, 100 % cloud cover, no rain, lightest breeze
	26 July 2016 s/s 21:40	21:08	23:10	Good visibility, 10-11° C, 100 % cloud cover, no rain, light breeze
BT 36 (ladder inspection)	12 July 2016 s/r 04:39	03:10	04:55	Good visibility, 10° C, 100 % cloud cover, no rain, lightest breeze
BT 38 (ladder inspection)	17 July 2016 s/s 21:53	21:30	23:27	Good visibility, 15° C, 75 % cloud cover, no rain, light breeze
BT 39 (ladder inspection)	20 July 2016 s/s 21:51	21:25	23:21	Good visibility, 16° C, 75 % cloud cover, no rain, lightest breeze
BT 40 (ladder inspection)	20 July 2016 s/s 21:51	21:25	23:21	Good visibility, 16° C, 75 % cloud cover, no rain, lightest breeze

Structure ID	Date & Sunrise/set Time	Start Time	Finish Time	Weather
BT42	12 July 2016 s/s 22:03	21:45	23:33	Excellent visibility, 10-14° C, 100 % cloud cover, no rain, lightest breeze
	22 August 2016 s/r 06:01	04:30	06:16	Good visibility, 10-13° C, 100 % cloud cover, no rain, no wind
BT 43 (ladder inspection)	18 July 2017 s/s 21:53	21:30	23:27	Good visibility, 15° C, 75 % cloud cover, no rain, light breeze
BT 45 (ladder inspection)	18 July 2016 s/s 21:53	21:30	23:27	Good visibility, 15° C, 75 % cloud cover, no rain, light breeze
BT 46 (ladder inspection)	19 July 2017 s/s 21:53	21:23	23:23	Good visibility after hot day, 19° C, 25-50 % cloud cover, no rain, lightest breeze
BT 48	11 July 2016 s/s 22:04	21:40	23:35	Good visibility, 10-14° C, 100 % cloud cover, one light, brief shower at 23:25, lightest breeze
	26 July 2016 s/r 05:04	03:30	05:20	Good visibility, 10-12° C, 88 % cloud cover, no rain, breezy in exposed areas, but calmer within the woodland though picked up close to sunrise
	9 August 2016 s/r 05:32	04:00	05:45	Sufficient visibility, 9° C, 100 % cloud cover, very light mizzle on and off throughout survey, no wind
BT 49	11 July 2016 s/s 22:04	21:40	23:35	Good visibility, 10-14° C, 100 % cloud cover, one light, brief shower at 23:25, lightest breeze
	26 July 2016 s/r 05:04	03:30	05:20	Good visibility, 10-12° C, 88 % cloud cover, no rain, breezy in exposed areas, but calmer within the woodland though picked up close to sunrise
	9 August 2016 s/s 21:08	20:43	22:38	Good visibility, 5-9° C, 25-38 % cloud cover, no rain, no wind

2.9 All ladder inspections were undertaken on 10 August 2016, on mild (15° C), but overcast day. Showers began during the inspections, causing short delays throughout, but wind was no more than a light breeze.

2.10 Activity surveys were not undertaken on any dwellings or other buildings in 2016, at the request of the CFJV. Several trees, structures and areas were also scoped out due to design considerations. This report provides the results of those trees ad areas which were considered to require survey by the CFJV.

Bat Area Surveys

2.11 As indicated above, woodlands and collections of buildings were recorded as Bat Areas and surveyed as a whole. Wherever possible, two surveyors walked transect routes through the Bat Area to record the species composition and activity levels. Walked transects at dusk began 30 minutes prior to sunset and finished after at least 90 minutes after sunset. Walked transects at dawn commenced 90 minutes prior to sunrise and finished 15 minutes after sunrise. As transect lengths were not long, surveyors walked for the total length of their transect, then stopped for 15 minutes before walking back to the start, then repeating for the duration of the survey.

2.12 As ground conditions made some transects unsafe in the dark, they were surveyed by ecologists positioned at key locations while supported by Anabats deployed in the more difficult to access locations. The Anabats were deployed and collected during daylight hours before sunset and after sunrise. Where surveyor access in the dark was particularly dangerous, Anabats were deployed to be used in the given area with no surveyor back up; this occurred only once, within Bat Area 14.

2.13 During VP surveys, surveyors were in place at least 30 minutes prior to sunset for dusk visits and 90 minutes prior to sunrise during dawn visits. The dusk surveys lasted for a duration of at least two hours (minimum of 90 minutes after sunset) and dawn visits finished 15 minutes after sunrise.

2.14 Table 2.3 outlines the survey dates and conditions for the Bat Area surveys. Please note, as discussed above, not all areas were surveyed for bat activity. As such, though the target note numbering is sequential, there are gaps where some areas have been scoped out, leaving only seven areas to be surveyed at this time. Please refer to the Bat Records figure in Annex 2 of the baseline report for locations.

Table 2.3 LUC 2016 Bat Area Survey Metadata

Area ID	Date & Sunrise/set Time	Start Time	Finish Time	Weather
BA 2	17 June 2016 s/r 04:20	02:50	04:35	Good visibility, 8° C, 88 % cloud cover, no rain, light breeze
	21 July 2016 s/s 21:49	21:30	23:19	Good visibility, 16° C, 50 % cloud cover, no rain, light breeze
BA 9	16 June 2016 s/s 22:12	21:42	23:43	Sufficient visibility, 9° C, 100 % cloud cover, light drizzle at start which ended quickly, light breeze
	27 July 2016 s/r 05:06	03:25	05:21	Good visibility, 9-11° C, 100 % cloud cover, initial drizzle which stopped within 10 minutes, light breeze
BA 10	22 June 2016 s/s 22:16	21:47	23:45	Good visibility, 10-15° C, 88 % cloud cover, light rain at start then dry, lightest breeze
	27 July 2016 s/r 05:06	03:25	05:21	Good visibility, 9-11° C, 100 % cloud cover, initial drizzle which stopped within 10 minutes, light breeze

Area ID	Date & Sunrise/set Time	Start Time	Finish Time	Weather
BA 11	13 June 2016 s/s 22:10	21:40	23:50	Excellent visibility, 14° C, 88 % cloud cover, no rain, light breeze with gusts
	19 July 2016 s/r 04:50	03:25	05:05	Good visibility, 13-15° C, 25-88 % cloud cover, no rain, lightest breeze
BA 12	13 June 2016 s/s 22:10	21:40	23:50	Excellent visibility, 14° C, 88 % cloud cover, no rain, light breeze with gusts
	19 July 2016 s/r 04:50	03:25	05:05	Good visibility, 13-15° C, 25-88 % cloud cover, no rain, lightest breeze
BA 14 (remote survey, all night)	20-21 July 2016 s/s 21:51 s/r 04:53	21:21	05:08	Good conditions, 12-16° C, 75% cloud cover, no rain, lightest breeze
	8-9 August 2016 s/s 21:12 s/r 05:32	20:55	05:50	Good conditions, 9-10° C, 38 % cloud cover, light rain showers overnight (after midnight), mostly calm wind with moderate breezes through the night
BA 15	14 June 2016 s/s 22:12	22:00	23:42	Good visibility, 12° C, 100 % cloud cover, light rain showers though sheltered within woodland, light breeze
	22 July 2016 s/r 05:55	03:25	06:10	Good visibility, 16° C, 100 % cloud cover, no rain, no wind

Survey Constraints

2.15 Evidence of protected species is not always discovered during a survey. This does not mean that a species is not present; hence surveys also record and assess the ability of habitats to support protected species. The timeframe in which the survey is implemented provides a 'snapshot' of activity on the site and cannot necessarily detect all evidence of use by a species. Most bat species are transient and may use roosts for a short time only. It is therefore not possible to confirm that all roosts that may have existed at the site have been identified and described in this report. The surveys have, however, been undertaken in accordance with the most up to date guidance on bat surveys to ensure a high level of confidence in findings is held.

2.16 Weather in the highlands is also highly changeable and though every effort was made to undertake surveys in optimal conditions, it was not always possible. Most surveys were conducted above the preferred temperature of 10° C and where temperatures dipped below this (usually closer to midnight) the survey was undertaken above the threshold for flying insects (i.e. 6° C). In only one instance did the temperature fall to 5° C, but this was at the end of a dusk survey and flying insects were present throughout the survey. Indeed for all surveys the presence of prey insects was noted as being present and factored into the professional judgement made by the lead surveyor in any less than ideal conditions (e.g. light rain, moderate gusts). It is

considered that the conditions experienced during the survey period accurately reflect the cooler, more variable weather usually experienced in the central highlands.

2.17 Despite the use of hand-held bat detectors during surveys, some bat calls can be easily missed due to very quiet or lack of echolocation (e.g. brown long-eared bats), being drowned out by larger number of louder species (such as pipistrelles), and similarity of call patterns (e.g. *Myotis* species). This is why bat surveyors record their surveys using digital recording devices attached to bat detectors or all-in-one devices, such as Anabats. This allows analysis of bat calls by assessing sonograms based on the recordings. Despite applying extensive experience and skill in identifying bat species through observation of the call pattern and frequency during the survey, there is no guarantee that all species can be confirmed. The calls of those quiet species can be distorted by background noise. Additionally, the similarities between calls, for example between *Myotis* bats, are such that it still may not be possible to identify all species through sound analysis. No single technique is perfect and failsafe. However, professional judgement is applied and where there is any doubt as to species, this is indicated in the results by referring to genus or applying a qualifier.

Results

Roost Surveys

3.1 Only one bat roost was identified during all survey work. The roost, which is described further below, was located in BT48, which was located in one of the best quality habitats for bats, BA14.

3.2 The number of bat passes recorded across the site was variable and likely to be very dependent on factors such as exposure, quality and availability of foraging nearby, and weather. The number of passes recorded varied between numbers as low as one pass (possible brown-long eared) at BT46 up to 884 passes of common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelles *Pipistrellus pygmaeus*, Daubenton's *Myotis daubentonii*, and probable brown long-eared bats *Plecotus auritus* at BT25. The locations for all surveyed trees and areas can be found in Annex 2 of the baseline report.

Discovered roosts

3.3 Only one tree (BT48) was confirmed as a roost, thought to be used by soprano pipistrelles and possibly brown long-eared bats. This tree is located within the mature oak and birch broadleaved woodland along a steep slope separating the A9 from the B9152 road at the northern end of the project area. BT48 was originally classified as BRP 2, with a neighbouring tree (BT49) being classified as BRP 1.

3.4 During the first survey visit, three bats were observed leaving a small crevice under the edge of a branch on BT48, between eight and fourteen minutes after sunset (22:04) though they were not echolocating. At the time, it was assumed the bats were pipistrelles as these were the only species heard on the detectors during the survey, at both trees, and due to the early time of emergence. A single bat was seen circling the main trunk of the tree between 23:17 and 23:35, with light touches on the upper branches (possible gleaning), though no echolocation was picked up.

3.5 During the second visit, swarming behaviour was observed commencing at 04:07, almost an hour before sunrise. At this time, the species heard most frequently was soprano pipistrelle with very few passes by common pipistrelle. The pipistrelles started to disappear approximately half an hour before sunrise, with seven bats observed entering the roost by 18 minutes prior to sunrise. Most of these bats were not heard/recorded echolocating but they had the appearance of pipistrelles and the surveyor was confident they were not another species. There were 43 brown long-eared bat passes were recorded on the Anabat during the period of 60 to 30 minutes prior to sunrise. This number dropped to 13 during the next half hour with the last brown long-eared being recorded at 04:41, 23 minutes prior to sunrise. It is possible, though not confirmed, that brown long-eared bats could have entered the roost along with soprano pipistrelles.

3.6 By the third roost survey visit, bat activity around BT48 had dropped considerably. Only around six bats were recorded for the total survey, though there was a very light drizzle intermittent

through the survey period. Two brown long-eared bats were recorded in the period of 60 to 30 minutes prior to sunrise. Only four soprano pipistrelles were observed, with three being recorded in the last half hour before sunrise. No swarming behaviour was observed and no bats were seen entering the roost.

Other findings

3.7 Despite good BRP features, no bats were seen using the BRP 1 tree (BT49) adjacent to the roost tree, for shelter or demonstrating any swarming behaviour around this tree. Bat activity in this woodland (BA14) was recorded through the deployment of Anabats and the results of these observations are discussed in the Bat Areas section, below.

3.8 Detailed results for each roost survey visit can be found in the Annex of this report. No other roosts were confirmed through the survey. No bats were recorded either before sunset or after sunrise. Activity in the half hour immediately after sunset was only observed at six locations other than the two discussed above. Activity in the half hour immediately before sunrise was observed in just four other locations than the two trees discussed above.

3.9 Swarming behaviour was observed around BT22 though no bats were ever observed entering or exiting the feature on this tree. The bats observed swarming widely around this tree and its neighbours were eventually seen flying south, at exactly 20 minutes prior to sunrise, towards the large house and garage nearby, though it was too far away to observe whether they entered a roost there.

3.10 No bats were observed either exiting or entering a roost in these remaining trees. Additionally, excepting BT22, no incidental behaviour was observed which would lead any of the surveyors to conclude bats were roosting in other nearby features, which to date have not been subject to formal surveys.

3.11 More details on the survey results for each tree can be found in the Annex of this report.

Bat Area Surveys

3.12 The mature woodland (BA14), surrounding BT48 and BT49, was surveyed slightly differently from the other areas due to a change in classification once surveying began and an assessment of health and safety. Seven BRP trees, in addition to BTs 48 and 49, were originally recorded in this area. However, after re-examining the woodland in 2016, it was decided that more roosting potential could be found within the woodland due to winter storm damage. Additionally, it was established that the steep slope, and trees overhanging a historic borrow pit, made accessing the trees too dangerous in the dark. It became clear after the first survey that this woodland was the area with the most bat roosting potential for all of the Project 9 survey area. Anabats were deployed before dusk and collected after dawn, allowing data to be recorded through the night, but without any surveyor observations being made simultaneously. Therefore totals will include the inter-survey period (the period of time which would not have been observed with surveyors), as well as two full dusk and two full dawn survey periods.

3.13 The mature woodland of BA14 yielded the highest level of activity and the greatest diversity of species, with a total of 6,667 passes/calls and five different species confirmed. Even without the extra recordings during the inter-survey period and the incidental extra dawn/dusk survey data, this area would still yield the largest dataset by at least 300-800 more passes/calls. The species and numbers of bats recorded within woodland at BA14 can be found in Table 3.1.

Table 3.1 Species and Bat Counts for BA14

Species	First Survey Count (inter-survey period count)	Second Survey Count (inter-survey period count)	Total Count (inter-survey period count)
Soprano pipistrelle	706 (183)	3377 (895)	4083 (1078)

Species	First Survey Count (inter-survey period count)	Second Survey Count (inter-survey period count)	Total Count (inter-survey period count)
Common pipistrelle	35 (12)	789 (80)	824 (92)
Brown long-eared	5 (2)	11 (2)	16 (4)
Daubenton's	5 (1)	3 (0)	8 (1)
Natterer's	2 (1)	0	2 (1)

3.14 The rest of the observations are composed of unidentified *Myotis* species, probable but unconfirmed brown long-eared, and pipistrelle social calls; the latter of which totals 1697 (287 outwith inter-survey period).

3.15 All of the other bat areas were surveyed at only dusk or only dawn for each visit and included two surveyors to observe general bat behaviour. Of these areas, the area with the largest dataset was BA11, with 164 passes (2 social calls) and three species. The remaining areas surveyed recorded bat counts (over two visits) as listed below:

- BA2 – 56 passes
- BA9 – 101 passes
- BA10 – 149 passes
- BA12 – 92 passes, 5 social calls
- BA15 – 14 passes

3.16 More detailed results for each area are provided in the Annex of this report.

Discussion

4.1 While the data set is comprehensive, it is a challenge to assess bat activity levels and population numbers for central Highland as there is little historic data with which to compare. No cohesive bat survey effort has been made in this part of Scotland and what survey has been undertaken has been in small, targeted locations to inform individual developments. What data is available can be found on the National Biodiversity Network (NBN) Gateway, which was searched by Jacobs UK as part of a scheme-wide desk study (summary for Project 9 in Annex 4 to the baseline report[9]). As such, professional judgement based on experiences in other regions of Scotland, as well as the Highlands, will be integral to forming conclusions regarding bat populations within the study area.

4.2 The Project 9 survey area includes good quality bat roosting and foraging habitat, especially when compared to the areas surveyed for Projects 7 and 8, to the south. The larger areas of mature mixed and broadleaved woodland both close to the A9 and connected to it through tree lines, gardens and hedges, has unsurprisingly resulted in much higher levels of bat activity.

4.3 The increase of human habitation and agricultural buildings is likely to have offered a significant increase of bat roosting potential. This may account for the increased bat activity but the low

number of roosts found during surveying in 2016, as no houses or buildings were surveyed in 2016.

4.4 The broadleaved woodland of BA14 is the only area which has a confirmed bat roost (BT48); though, considering the large numbers and the times which bats were recorded, it is likely more roosts could be found in this area. Soprano pipistrelles were observed entering the roost during the second visit but it is possible that brown long-eared could also have entered without being picked up. During such swarming periods, pipistrelles can be very loud and very active around the roost which can make it possible to miss the very quiet bats, such as brown long-eared. Considering the late time at which brown long-eared bats were recorded, it is very likely that they are either using BT48 as a roost or another tree very close by. Care should be taken if any of these trees will be removed or otherwise directly affected by the road development. Updated surveys or tree inspections must be undertaken immediately prior to any direct works.

4.5 Where bat activity was recorded very close to emergence or re-entry times, it is assumed that roosts can be found very close by. For example, the surveyors of the dawn survey at BT22 observed considerable swarming behaviour around this tree but all bats suddenly flow south towards the line of large houses and garages nearby.

4.6 As with all highly mobile species, baseline conditions can change from month to month and year to year, so it is advisable that should any of these features be directly impacted, then pre-works checks must be made to ensure that bats have not moved into any of these features.

Annex 6

Bat Activity Survey Results Tables

Area	Survey Date	Species	Dusk Activity Levels					Dawn Activity Levels					Area Description	General observations
			Before sunset	Sunset to + 30 mins	Sunset +30 to +60 mins	Sunset +60 to +90 mins	Sunset +90 mins onwards	Before sunrise -90 mins onwards	Sunrise - 90 to -60 mins	Sunrise - 60 to -30 mins	Sunset -30 mins to sunrise	Sunrise onwards		
BA2	17/06/2016	Common pipistrelle							3	15	0	0	Small narrow strip of mixed age woodland comprised largely of birch trees. Bordered to west by marsh land and close to the River Spey.	Good levels of bat activity carrying on until close to sunrise, suggesting roost may be located nearby.
		Soprano pipistrelle							15	10	2	0		
		Common pipistrelle	0	0	2	4								
		Soprano pipistrelle	0	0	2	1								
		Daubenton's bat	0	0	0	2								
BA9	16/06/2016	Common pipistrelle	0	14	24	15							Small block of mixed age birch woodland, with wet ground underfoot. Surrounded by marshy fields to north and further areas of trees and dwellings to the south.	Near constant bat activity levels observed from sunset, suggesting bats roosting close by. Bats observed flying from trees to the south.
		Soprano pipistrelle	0	0	13	11								
		Daubenton's bat	0	0	0	1								
		Common pipistrelle							4	5	0	0		Very low levels of bat activity, especially compared to dusk survey
		Soprano pipistrelle							11	3	0	0		
BA10	21/06/2016	Pipistrelle Sp.	1	1	0	0							Block of mixed age birch woodland over steeply sloping ground with dense bracken understory. Marshy at western side.	High levels of pipistrelle activity, in the southeast corner, starting before sunset. Pipistrelle activity tailed off through the survey in the southwest corner. Moderate levels of Daubenton's close to sunset. *Myotis* sp. commuted through the area.
		Common pipistrelle	0	47	continuous foraging	continuous foraging								
		Soprano pipistrelle	0	18	16	6								
		Daubenton's bat	0	0	1	3								
		Myotis Sp.	0	0	0	3								
	27/07/2016	Soprano pipistrelle							1	3	0	0		Low levels of activity recorded, with minimal activity close to sunrise
		Common pipistrelle							37	12	0	0		
		Daubenton's bat							0	0	0	0		
BA11	13/06/2016	Common pipistrelle	0	1	48	101							Line of broadleaved trees (predominantly Lime and Sycamore) planted in 2 rough rows 100 m long.	Many bats observed foraging and commuting along tree line. Bats observed commuting to tree line from north along track and commuting away across the A9.
		Soprano pipistrelle	0	0	0	1								
		Pipistrelle social call	0	0	0	2								
		Daubenton's bat	0	0	0	1								
	19/07/2016	Common pipistrelle							7	0	0	0		Low numbers observed during dawn survey
		Soprano pipistrelle							5	0	0	0		
BA12	13/06/2016	Common pipistrelle	0	4	7	62							Line of 9 mature broadleaved trees from north end (outwith 50 m) then around 22 trees in 2 rough rows (mixed).	Bats were unseen mostly; perhaps flying low out of wind so couldn't see against dark vegetation. Bats observed on east side of tree line
		Soprano pipistrelle	0	1	3	12								
		Pipistrelle social call	0	0	0	5								
		Daubenton's bat	0	0	0	1								
	19/07/2016	Common pipistrelle							1	0	0	0		Low levels of bat activity
		Soprano pipistrelle							1	0	0	0		
BA14	20/07/2016	Common pipistrelle	0	0	0	1	23		10	0	1	0	Area of mature woodland between B9152 road and A9. Mixed age composition, dominated by birch and oak.	Soprano pipistrelle activity close to dusk and dawn. Otherwise bat activity appears to be commuting and foraging bats due to timings of bat passes.
		Soprano pipistrelle	0	18	48	4	523		66	34	13	0		
		Pipistrelle social call	0	1	1	0	79		9	3	0	0		
		Daubenton's bat	0	0	0	1	4		0	0	0	0		
		Myotis Sp.	0	0	0	0	1		0	0	0	0		
		Brown long-eared	0	0	0	0	3		1	1	0	0		
		Probable Brown long-eared	0	0	0	0	1		2	0	0	0		
		Natterer's	0	0	0	1	1		0	0	0	0		
	08/08/2016	Common pipistrelle	0	0	0	70	709		10	0	0	0		Soprano pipistrelle activity close to dusk and dawn. Many bats recorded, particularly during the inter-survey period. Bats at this time are likely to be foraging and commuting only.
		Soprano pipistrelle	0	32	307	262	2482		191	92	11	0		
		Pipistrelle social call	0	5	92	85	1331		76	15	0	0		
		Daubenton's bat	0	0	0	0	3		0	0	0	0		
		Brown long-eared	0	0	1	0	9		0	1	0	0		
		Probable brown long-eared	0	1	2	1	24		3	2	0	0		
BA15	14/06/2016	Common pipistrelle	0	0	0	3							Area of wet birch woodland adjacent to watercourse. Mixed age composition.	Very low activity levels, no bats heard close to sunset. Bat activity observed thought to be brief foraging passes made by bats commuting along the water course. Potential Daubenton's but not recorded due to detector fault so can't be confirmed.
		Soprano pipistrelle	0	0	3	0								
		Daubenton's bat	0	0	1	3								
	22/07/2016	Common pipistrelle							2	1	0	0		Very low levels of activity
		Brown long-eared							1	0	0	0		

Structure ID (Scheme wide)	Survey Date	Time Observed	Species from Sonogram **	Species from observation**	No. bats	Seen/not seen (S/NS)	Activity Type (E/R/C/F)	Comments	Species	Before sunset	Sunset to + 30 mins	Sunset +30 to +60 mins	Sunset +60 to +90 mins	Sunrise - 90 to -60 mins	Sunrise - 60 to -30 mins	Sunset - 30 mins to sunrise	Sunrise onwards
		Roosting behaviour log								Dusk Activity Levels				Dawn Activity Levels			
BT3	13/07/2016	No roosting behaviour observed during survey							Pipistrelle sp.	0	3	0	0				
	28/07/2016	No roosting behaviour observed during survey							No bats recorded	0							
BT5	14/7/2016	No roosting behaviour observed during survey							Common pipistrelle					9	15	3	0
									Soprano pipistrelle					0	2	1	0
	28/07/2016	No roosting behaviour observed during survey							Common pipistrelle	0	0	2	2				
									Soprano pipistrelle	0	0	0	0				
									Daubenton's bat	0	0	0	1				
									Probable Brown Long-eared	0	0	1	0				
BT7	21/07/2016	No roosting behaviour observed during survey							Soprano pipistrelle					49	0	0	0
	08/08/2016	No roosting behaviour observed during survey (Recording error during survey)							Pipistrelle sp.	0	0	1	0				
									Common pipistrelle	0	0	2	0				
									Soprano pipistrelle	0	0	1	0				
BT8	21/07/2016	No roosting behaviour observed during survey.							Soprano pipistrelle	0	0	1	1				
									Daubenton's bat	0	0	1	0				
	22/08/2016	No roosting behaviour observed during survey.							Common pipistrelle					7	25	0	0
									Soprano pipistrelle					4	2	0	0
BT9	21/07/2016	No roosting behaviour observed during survey							Soprano pipistrelle					55	0	0	0
	08/08/2016	No roosting behaviour observed during survey (Recording error during survey)							Pipistrelle sp.	0	0	1	0				
									Common pipistrelle	0	0	2	1				
									Soprano pipistrelle	0	0	1	1				
BT10	19/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	0	3				
									Soprano pipistrelle	0	0	1	3				
									Daubenton's bat	0	0	0	1				
	21/08/2016	No roosting behaviour observed during survey.							Common pipistrelle					1	0	0	0
									Soprano pipistrelle					1	12	0	0
BT17	14/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	6	7	4				
									Soprano pipistrelle	0	5	3	3				
									Pipistrelle social call	0	2	0	0				
	28/07/2016	No roosting behaviour observed during survey.							Common pipistrelle					1	11	0	0
									Soprano pipistrelle					16	9	0	0
									Pipistrelle social call					0	1	0	0
BT22	15/07/2016	No roosting behaviour observed at target tree, however swarming and late feeding was observed around this group of trees before all flying off towards the end house to the south at 04:38.							Common pipistrelle					6	34	85	0
									Soprano pipistrelle					0	1	2	0
	28/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	19	35	7				
									Soprano pipistrelle	0	3	4	3				
									Pipistrelle social call	0	0	1	0				
									Daubenton's bat	0	0	0	1				
									Probable Brown Long-eared	0	0	0	0				
BT25	13/07/2016	No roosting behaviour observed during survey.							Common Pipistrelle					115	90	31	0
									Soprano pipistrelle					111	49	0	0
									Pipistrelle social call					26	13	0	0
	26/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	69	208	96				
									Soprano pipistrelle	0	1	24	1				
									Pipistrelle social call	0	8	24	8				
									Daubenton's bat	0	0	5	3				
									Probable Brown Long-eared	0	0	1	1				
BT32	21/06/2016	No roosting behaviour observed during survey.							Pipistrelle sp.	0	0	1	1				
									Common pipistrelle	0	0	1	0				
									Soprano pipistrelle	0	0	2	1				
									Myotis Sp.	0	0	0	1				
	19/07/2016	No roosting behaviour observed during survey.							Pipistrelle sp.					1	0	0	0
									Common pipistrelle					1	0	0	0

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		Roosting behaviour log								Dusk Activity Levels				Dawn Activity Levels			
BT35	12/07/2016	No roosting behaviour observed during survey							Common pipistrelle					0	9	0	0
									Soprano pipistrelle					1	1	0	0
									Daubenton's bat					1	0	0	0
	26/07/2016	No roosting behaviour observed during survey							Common pipistrelle	0	0	2	5				
									Soprano pipistrelle	0	0	1	9				
									Pipistrelle social call	0	0	0	2				
									Daubenton's bat	0	0	0	3				
									Brown Long-eared	0	0	0	1				
BT36	12/07/2016	No roosting behaviour observed during survey							Common pipistrelle					4	0	0	0
									Soprano pipistrelle					0	1	0	0
	26/07/2016	No roosting behaviour observed during survey							Common pipistrelle	0	0	1	1				
									Soprano pipistrelle	0	0	0	5				
									Pipistrelle social call	0	0	0	1				
									Daubenton's bat	0	0	0	2				
BT38	17/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	1	2				
									Soprano pipistrelle	0	1	0	1				
	10/08/2016	LADDER INSPECTION - Open crevice inspected and found to be damp and filled with tree debris - BRP low and no evidence of roosting bats							No bats recorded	0							
BT39	20/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	3	0				
									Soprano pipistrelle	0	1	10	5				
	10/08/2016	LADDER INSPECTION - Tree sound and felt very hollow and weak. All crevices which could be checked were done so, but a few gaps could not be reached due to new growth around the edges and adjacent to tree.							No bats recorded	0							
BT40	20/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	2	1				
									Soprano pipistrelle	0	0	5	5				
									Pipistrelle social call	0	0	1	0				
	10/08/2016	LADDER INSPECTION - Small hole in far side is ideal for bats but no evidence of roosting was found.							No bats recorded	0							
BT42	12/07/2016	No roosting behaviour observed during survey							Common pipistrelle	0	0	2	5				
									Soprano pipistrelle	0	0	3	2				
	22/08/2016	No roosting behaviour observed during survey							Common pipistrelle					1	3	3	0
									Soprano pipistrelle					6	6	5	0
									Pipistrelle social call					5	3	1	0
BT43	18/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	1	1				
									Soprano pipistrelle	0	0	2	2				
	10/08/2016	LADDER INSPECTION - One owl pellet found within open hollow in centre of tree. No evidence of roosting bats.							No bats recorded	0							
BT45	18/07/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	1	2				
									Soprano pipistrelle	0	0	2	3				
	10/08/2016	LADDER INSPECTION - Knothole inspected and found to be shallow and damp and well occupied by slugs; no evidence of roosting bats.							No bats recorded	0							
BT46	19/07/2016	No roosting behaviour observed during survey.							Probable brown long-eared	0	0	0	1				
	10/08/2016	LADDER INSPECTION - SE facing crevice was shallow and clear; SW facing crevice was endoscoped and discovered to be wet and shallow - no evidence of roosting bats in either feature.							No bats recorded	0							
BT48	11/07/2016	22.12	Soprano pipistrelle only recorded at this time	not heard to echolocate	2	Seen	Emergent	Three bats appeared to emerge from tree at 22:12 and 22:18, although bats were not echolocating. Between 23:17, and 23:35 a bat circled around main trunk of tree, touching the branches, but not echolocating. Several pipistrelle passes recorded (commuting and foraging) during the survey.	Common pipistrelle	0	0	0	1				
									Soprano pipistrelle	0	10	14	3				
									Possible Daubenton's	0	0	0	0				
	26/07/2016	04:36 - 04:47	Brown long-eared bats only recorded at this time	Social calling only heard - was assumed to be pipistrelle social calling	7	Seen	Re-entry	Much swarming activity from around 04:07. Mostly soprano pipistrelle bats heard on heterodyne detectors	Common pipistrelle					6	0	0	0
									Soprano pipistrelle					14	13	0	0
									Pipistrelle social call					2	0	0	0
									Brown Long-eared					0	43	13	0
									Probable Brown Long-eared					1	0	0	0

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		Roosting behaviour log								Dusk Activity Levels				Dawn Activity Levels			
	09/08/2016	No roosting behaviour observed during survey, but swarming behaviour observed before bats flew away from view. (Recording error during survey)							Soprano pipistrelle					1	0	c. 3	0
									Brown Long-eared					0	2	0	0
BT49	11/07/2016	No roosting behaviour observed during survey.							Soprano pipistrelle	0	39	34	9				
									Pipistrelle social calls	0	1	0	0				
	26/07/2016	No roosting behaviour observed during survey.							Common pipistrelle					4	0	0	0
									Soprano pipistrelle					12	5	0	0
									Pipistrelle social call					1	0	0	0
									Brown Long-eared					0	14	8	0
									Probable Brown Long-eared					1	0	0	0
	09/08/2016	No roosting behaviour observed during survey.							Common pipistrelle	0	0	3	0				
									Soprano pipistrelle	0	7	95	116				
									Pipistrelle social calls	0	4	23	1				
									Probable brown long-eared	0	0	1	0				