



PROTECTED SPECIES SURVEY REPORT

Redmire Bridge, Tarsset, Northumberland

Northumberland County Council

October 2020

Quality Control

Report Status: FINAL

	Name	Signature	Date	Version
Prepared by	Daniel Gray		28/09/2020	1
Reviewed by	Ian Craft		28/09/2020	1
Issued by	Daniel Gray		01/10/2020	1

PROTECTED SPECIES SURVEY REPORT

Redmire Bridge, Tarsset, Northumberland

CONTENTS

	PAGE NO.
1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	3
2.1. Background	3
2.2. Site Description	3
2.3. Survey Objectives.....	3
2.4. Legislation	4
3.0 METHODOLOGY	10
3.1. Desk Based Study	10
3.2. Field Survey	10
4.0 SURVEY RESULTS	18
4.1. Desk Based Study	18
4.2. Consultation Data	18
4.3. Field Survey Results.....	19
5.0 CONCLUSION AND RECOMMENDATIONS	23
5.1. Conclusions	23
5.2. Recommendations.....	24
6.0 REFERENCES	28

APPENDICES

Appendix A	Figures
Appendix B	Survey Sheets
Appendix C	Site Photographs
Appendix D	Report Conditions

1.0 EXECUTIVE SUMMARY

Total Ecology was commissioned by Northumberland County Council in February 2020 to undertake surveys for protected species including bats, badger (*Meles meles*), red squirrel (*Sciurus vulgaris*), otter (*Lutra lutra*), water vole (*Arvicola amphibius*), and white-clawed crayfish (*Austropotamobius pallipes*) at Redmire Bridge, Tarsset, Northumberland following a Phase 1 survey in 2017 and an updated Phase 1 survey in January 2020. The approximate National Grid Reference for the centre of the site is **NY 78782 85884**. The survey is required prior to repair and maintenance works on the bridge.

The site consists of a three arch, ashlar built, arched bridge dating from the early 19th century and Grade II listed. It supports a single lane, unnamed road which connects Lanehead to the east and Falstone to the west. The bridge is located approximately 500m west of the small hamlet of Lanehead and 26km north west of Hexham, Northumberland. Below the bridge the Tarsset Burn flows roughly southwards where it joins the river North Tyne, approximately 700m to the south west. Overall, the surrounding landscape provides moderate foraging habitat whilst the Tarsset Burn provides a moderate-high quality commuting corridor to higher quality feeding habitat further afield.

The survey is required prior to repair works to the bridge. The Tarsset Burn, flowing beneath the bridge and the surrounding habitat was searched for signs of presence of bat, badger, red squirrel, otter, water vole and white-clawed crayfish, to assess potential impacts on these protected species.

Despite high levels of foraging activity around the bridge, no bats were observed to be utilising the bridge structure as a roosting space.

Evidence of badgers has been noted around the site on several separate occasions. Field signs have included both latrines and snuffle holes/signs of foraging and a partially active outlier sett was discovered just off the road approximately 60m north of the site. However upon later visits to the site this sett appears to have been completely overgrown by tall ruderal vegetation, suggesting it has not been active for some time.

No evidence or direct sightings of red squirrel were observed on site during the course of the survey.

Otter footprints and spraints were found beneath the bridge as well as upstream on rocks, however no holts, or other signs of Otter presence was observed. Burrows of the right size and shape were not found, nor were latrines or feeding remains which would suggest Water Vole presence. In regard to Otters, given their highly mobile nature, a precautionary approach to the works is recommended and vegetation immediately within the area of work should be checked and cleared before works commence.

No white-clawed crayfish have been identified within the survey area at this site during the surveys undertaken and therefore the proposed works will not impact on this species. However, the works do have the potential to impact on the ecology of the watercourse and therefore general recommendations for avoiding pollution impacts on the watercourse are given below.

Full recommendation details are provided in section 5.0.

2.0 INTRODUCTION

2.1. Background

Total Ecology was commissioned by Northumberland County Council in February 2020 to undertake surveys for protected species including bats, badger (*Meles meles*), red squirrel (*Sciurus vulgaris*), otter (*Lutra lutra*), water vole (*Arvicola amphibius*), and white-clawed crayfish (*Austropotamobius pallipes*) at Redmire Bridge, Tarsset, Northumberland following a Phase 1 survey in 2017 and an updated Phase 1 survey in January 2020. The approximate National Grid Reference for the centre of the site is **NY 78782 85884**. The survey is required prior to repair and maintenance works on the bridge.

2.2. Site Description

The site consists of a three arch, ashlar built, arched bridge dating from the early 19th century and Grade II listed. It supports a single lane, unnamed road which connects Lanehead to the east and Falstone to the west. The bridge is located approximately 500m west of the small hamlet of Lanehead and 26km north west of Hexham, Northumberland. Below the bridge the Tarsset Burn flows roughly southwards where it joins the river North Tyne, approximately 700m to the south west.

The surrounding landscape is dominated by arable land of grazing cattle and sheep with small pockets of broadleaf woodland (some of which is classified as Ancient and Semi-Natural) and hedgerows (though these appear to be sparse and poorly connected). Tarsset Burn itself is lined with broadleaf woodland both to the north and south for a considerable distance, though large sections of the river North Tyne are relatively bare. The wider landscape consists of areas of plantation woodland, upland heathland and grass moorland.

Overall the surrounding landscape provides moderate foraging habitat whilst the Tarsset Burn provides a moderate-high quality commuting corridor to higher quality feeding habitat further afield.

2.3. Survey Objectives

The principal objective of the ecological assessment was to identify whether there is any evidence of bats, badger, red squirrel, otter, water vole or white-clawed crayfish

present within the site and its immediate surroundings, and to characterise the habitat present on site in terms of its potential to provide suitable habitat for these species.

2.4. Legislation

2.4.1. Bats

All bat species and their roosts in Britain are protected under the Wildlife and Countryside Act 1981 (as amended) (WCA) through their inclusion on Schedule 5. The implementation of the Countryside and Rights of Way Act 2000 (CRoW 2000) has amended the WCA 1981 to include 'reckless' damage to, or destruction of a roost, and disturbance of bats whilst in a roost.

Bats are also included on Annex IV of Council Directive 92/43/EEC of 21st May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). As a result of the United Kingdom ratifying this directive, all British bats are protected under The Conservation of Habitats and Species Regulations 2017 (as amended). The Conservation of Habitats and Species Regulations (2017) provides safeguards for European Protected Sites and Species (as listed in the Habitats Directive) therefore combined, these make it an offence to kill, injure, capture or disturb bats or obstruct access to, damage or destroy roosts. This has recently been amended by the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations (2020) which continue the same provision for European Protected Species, licencing requirements and protected areas after 'Brexit'.

Paragraph 43 of the Regulations states: A person who deliberately disturbs wild animals of any such (European Protected) species, is guilty of an offence. For the purposes of this paragraph, the disturbance of animals includes in particular any disturbance which is likely: -

- a. to impair their ability-
 - i. To survive, to breed or reproduce, or to rear or nurture their young, or
 - ii. In the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- b. to affect significantly the local distribution or abundance of the species to which they belong.

Under the law, a bat roost is any structure or place used for shelter or protection e.g. a building, bridge or tree. Bats use many roost sites and feeding areas throughout the year and they tend to re-use the same roosts for generations.

Noctule, soprano pipistrelle and brown long-eared bats are listed as UK priority species (UKBAP, 2007). Several species of bat are listed as Species of Principal Importance under Section 41 of the NERC Act (2006). Northumberland has a generic local BAP that aims to cover all species of bats recorded within Northumberland as species of conservation concern (NBAP, 2014).

2.4.2. **Badger**

Badgers receive strict protection under the Protection of Badgers Act 1992, which makes it an offence to wilfully kill, injure or take a badger or interfere with a badger sett by damaging a sett or any part thereof. It is also an offence to wilfully destroy a sett, obstruct access to a sett or disturb a badger while occupying a sett. The 1992 Act defines a badger sett as 'any structure or place, which displays signs indicating current use by a badger'. Work that disturbs badgers whilst occupying a sett is illegal without a licence.

Badgers are largely nocturnal, omnivorous mammals and live predominately in social groups within setts. They are territorial, marking the borders of the territory with dung which is deposited in latrines or boundary dung pits. Territories occupied by a badger group or 'clan' can be between 14 and 300 ha in size dependant on the quality of the habitats present, with a cited average of 50 ha (Neale and Cheeseman, 1996). Badger territories will usually include a wide range of habitats and favour areas with a mosaic of habitats that include woodland, pasture and arable land and will locate their setts in a variety of habitats including woodland (deciduous, coniferous and mixed), scrub, hedgerows, orchards, quarries, sea cliffs, moorland, open fields and downland, although they show a marked preference for wooded areas. The site itself does provide suitable habitat for shelter (i.e. sett location) and foraging habitat for badger.

2.4.3. **Red Squirrel**

Red squirrels have been declining in Britain for many decades, largely as a consequence of the introduction of the grey squirrel *Sciurus carolinensis*. They currently receive full protection under the Wildlife & Countryside Act 1981 (as

amended). Red squirrels and their resting places are fully protected in Britain; it is an offence to deliberately capture, injure or kill a red squirrel, or to damage, destroy or obstruct their breeding or resting places. It is also an offence to disturb them whilst in their breeding or resting places.

2.4.4. **Otter**

The Otter is fully protected through its inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and in Schedule 2 of The Conservation of Habitats and Species Regulations 2017 as a European protected species. It is an offence under the Wildlife and Countryside Act 1981 (sections 9(1) and 9(4), Schedule 5) to intentionally kill, injure or take any wild animal included on Schedule 5. Under Section 9(4) it is an offence to damage or destroy or obstruct access to, any structure or place which any wild animal include in Schedule 5 uses for shelter or protection, or disturb any such animal while it is occupying a structure or place which it uses for that purpose. The term given to places of shelter or protection for Otters includes 'holt', 'couch' and 'den'. These terms all have slightly different origins and meaning, but all are related to places of shelter.

Otters are listed as priority species in the UK Biodiversity Action Plan (BAP) and also in the Northumberland BAP.

Otters have been recorded as exploiting virtually all types of waterway in the UK including fresh water and estuarine sites and ranging in size from ditches and ponds to rivers and reservoirs (English Nature, 2003). Riparian habitat for Otters however requires adequate food resources (e.g. fish, amphibians, crayfish) and suitable shelter (typically trees, shrubs along watercourses and potential den sites).

2.4.5. **Water Vole**

Following a severe national decline associated with habitat loss and predation by feral mink, Water Vole received habitat protection in 1998 through inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9(4) only. This protection has recently been extended (6th April 2008), so the Water Vole is now fully protected under Section 9.

Legal protection makes it an offence to:

- intentionally kill, injure or take (capture) a Water Vole;
- possess or control a live or dead Water Vole, or any part of a Water Vole;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place which Water Voles use for shelter or protection or disturb Water Voles while they are using such a place;
- sell, offer for sale or advertise for live or dead Water Voles.

Offences under Section 9 carry a maximum penalty of a fine not exceeding Level 5 on the standard scale (currently £5,000), imprisonment for up to six months, or both. In addition, the courts may order the forfeiture of any vehicle or other thing that was used to commit the offence.

Water Voles are listed as priority species in the UK Biodiversity Action Plan (BAP) and also in the Northumberland BAP (www.ukbap.org.uk).

Two national surveys carried out by the Vincent Wildlife Trust in 1989-90 and 1996-1998 have shown that the decline in Water Vole populations has now developed into a serious population 'crash' with a further loss of 67.5% of the occupied sites and 88% of the remaining population in only seven years.

Water Voles are typically associated with slow-flowing water ways and water bodies without extreme water level fluctuations. Water Voles prefer sites with a bank profile (soft soil to permit excavation) that shows a stepped or steep incline into which the vole can burrow and create nest chambers above the water table. The amount of bank side and emergent vegetation cover is very important, with the best sites offering a continuous swathe of tall and luxuriant riparian plants (waterside vegetation of grasses, sedges and rushes, rhizomes, bulbs and roots of herbaceous plants). Sites excessively shaded by shrubs or trees are less favourable (Strachan and Moorhouse, 2006).

2.4.4 **White Clawed Crayfish**

White clawed crayfish receive protection under a number of European and UK legal and policy documents including:

- Appendix III (Priority Species) of the Bern Convention
- Annex II and V of the EC Habitats Directive

- Schedule 5 of the Wildlife and Countryside Act 1981 as amended
- The Countryside and Rights of Way Act (2001)
- The Conservation (Natural Habitats &c) Regulations 1994 (as amended) The species is listed on the IUCN Red Data List for Endangered and Threatened Species as “Globally Endangered”.

Under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). It is an offence to:

- Intentionally take white-clawed crayfish from the wild;
- Sell, or attempt to sell, any part of a white-clawed crayfish, alive or dead, or advertise that one buys or sells, or intends to buy or sell any part of a white-clawed crayfish.

White-clawed crayfish in England are also listed under Section 41 of the Natural Environment and Rural Communities Act (2006) and as such is a priority species for conservation. Government policy dictates that local planning authorities consider such species when determining planning applications.

The International Union for the Conservation of Nature (IUCN) has identified that the most widespread threat to white-clawed crayfish is from invasive alien crayfish species such as Signal Crayfish (*Pacifastacus lenisculus*) and Red Swamp Crayfish (*Procambarus clarkii*) and from Crayfish Plague (*Aphanomyces astaci*). Invasive crayfish are aggressive competitors for food and habitat, and often prey upon the white-clawed Crayfish.

Pollution and sedimentation can have a severe impact on populations. Sedimentation can lead to the loss of in-stream refuges by filling the interstices between and beneath cobbles and rocks, and sedimentation resulting from run-off from fields, or bankside poaching by livestock, can have a significant impact.

Agricultural pollution by organic (e.g. run-off from slurry storage and manure heaps, surface run-off from fields immediately after muck-spreading, etc.) can impact on white-clawed crayfish by reducing the dissolved oxygen levels within the watercourse.

Populations may also be impacted by alteration to the hydrological regime of rivers (damming, water abstraction, and channelization), and by pollution including from arable and livestock farming.

This species is also threatened by Porcelain Disease (*Thelohania contejeani*). This disease may be present in up to 10% of a population without apparent harm to the population, though the presence of the disease may make individuals more susceptible to other environmental pressures.

The white-clawed crayfish occurs in areas with relatively hard, mineral-rich waters on calcareous and rapidly weathering rocks. They are found in a wide variety of environments, including canals, streams, rivers, lakes, reservoirs and water-filled quarries. The white-clawed crayfish is typically found in watercourses of 0.75m to 1.25m deep, but the species may occur in very shallow streams (about 5cm of water) and in deeper, slow-flowing rivers (2.5m). The white-clawed crayfish typically occupies cryptic habitats under rocks and submerged logs, among tree roots, algae and macrophytes, and holes in undercut banks. It emerges to forage for food, mainly at night. Juveniles in particular may also be found among cobbles and detritus such as leaf litter. Adults may burrow into suitable substrates, particularly in the winter months.

White Clawed Crayfish are listed as priority species in the UK Biodiversity Action Plan (BAP) and are also in the Northumberland BAP.

3.0 METHODOLOGY

3.1. Desk Based Study

A desk study was carried out as part of the original Preliminary Ecological Assessment (Total Ecology, 2017 and 2020). See the original reports for the specification of the desk search.

3.2. Field Survey

3.2.1 Bats

Risk Assessment

The bridge was visually assessed for potential access points and evidence of bat activity in January 2020. Features such as small gaps in stonework or dense vegetation, which have potential as access points were sought. Evidence that potential access points were actively used by bats, including staining within gaps and bat droppings or urine staining under gaps was recorded. Indicators that potential access points were likely to be inactive included the presence of cobwebs and general detritus within the access.

Nocturnal Surveys

All nocturnal surveys were conducted by surveyors equipped with BatBox Duet or Echo Meter Touch bat detectors, positioned to give a clear view of the walls being surveyed. Emergence surveys commenced 15 minutes before sunset and continue until all bats were considered to have emerged in accordance with the Bat Conservation Trust Guidelines (BCT, 2016). This is typically 1.5 – 2 hours after sunset. Dawn re-entry surveys started 90 minutes prior to sunrise and continued until 15 minutes after sunrise. Video cameras and infra-red lights were used during the second and third surveys to provide additional coverage.

Table 1 Survey dates and personnel

Date	Surveyor 1	Licence No.	Additional Surveyors
08/06/2020	Glen Brewis	NA	Fiona Muir Rachel Collier Julie Dyson
Sunset: 21:48 Start: 21:33			

End: 23:18			
Temp: S/ 12°C E/ 10°C			
Weather: No wind No rain			
17/07/2020	Daniel Gray	Accredited on Licence No. 2015- 15085-CLS-CLS	Jodi Bell (2020-45054-CLS- CLS) Rachel Galler Victoria Coulton
Sunrise: 04:53 Start: 03:23 End: 05:08			
Temp: S/ 14°C E/ 14°C			
Weather: Light breeze No rain			
15/09/2020		Accredited on Licence No. 2015- 15085-CLS-CLS	Jodi Bell (2020-45054-CLS- CLS) Rachel Galler Jenny Elliott
Start: 19:10 Sunset: 19:25 End: 20:55			
Temp: S/ 20°C E/ 17°C			
Weather: No wind No rain			

During surveys the main objective is to record any bats entering or leaving the surveyed bridges and supporting structures and the location of any entry/exit points. In addition, surveyors record any other bat activity detectable from their survey

position. Where possible the time of recording, species, number of bats, type of activity, and flight path of observed bats is recorded.

Surveyor Experience

Daniel Gray (Accredited agent Bat Licence No. 2015-15085-CLS-CLS)

Daniel has gained a range of experience working with bats over the past 3 seasons, in voluntary, subcontractor and full time positions – completing bat risk assessments on sites from schools and hostels to cathedrals and trees. He has also completed numerous dawn and dusk surveys using point and transect methods on projects including single buildings and sites with multiple buildings, bridges and castles.

Jodi Bell (Licence no. 2020-45054-CLS-CLS)

Jodi has a BSc in Environmental Science and MSc in Environmental Consultancy along with 10 years of bat surveying experience. Wide ranging and in-depth knowledge of bat behaviour and legislation and extensive practical experience in the use of various bat detectors, static detection equipment, infra-red camera surveillance/recording, radio tracking, harp trapping, handling and leading surveys with up to 20 surveyors of various abilities. She has experience of analysis and interpretation of data and searching for evidence of presence of bats within built structures and trees. She is a member of both Durham and Northumberland bat groups and is also a registered bat carer for both groups. She holds a Natural England level 2 bat licence (2020-45054-CLS-CLS).

Glen Brewis

Glen has been a seasonal surveyor since 2010 for various consultancies. Within bat ecology this has included static and transect surveys (both dawn and dusk) and assisting with bat risk assessments. This work has been at a variety of sites including schools, housing estates and rural developments. Outside of the working environment, Glen has undertaken training to help with rearing bats with Durham bat group in addition to assisting with the rearing of injured bats and on hibernation visits in adits as part of being a volunteer with the Northumberland bat group

Rachel Collier

Rachel is currently in her first season in Ecology. She has received in house training on bat species and calls

Julie Dyson

Julie has completed 11 seasons of bat surveying, vantage point monitoring both residential and commercial properties as well as transect surveys on arable land particularly in relation to wind farm energy developments. Julie has completed the Complete Bat Training course in 2019 and over the years has gained a wide range of experience in roost assessments including many hibernation and maternity roosts and bat handling. Julie has also assisted in numerous bat trapping activities, looking at swarming behaviour and The Nathusius Project.

Fiona Muir

Fiona has acquired two seasons of bat survey experience which includes vantage point surveys undertaken at both dusk and dawn. These nocturnal surveys have been conducted across a wide range of sites including housing, public buildings, university premises, farms and former industrial sites earmarked for redevelopment. A substantial proportion of Fiona's surveys this season are being undertaken on Ministry of Defence property.

Rachel Galler

Rachel received intensive in-house training both in 2018 and 2019. She has conducted nocturnal bat surveys across a number of different sites from houses to farm buildings and historic properties over the last three years.

Victoria Coulton

Victoria is in her first season of commercial bat surveys, having received in-house training on a number of dusk and dawn surveys both by vantage point and transect methods. She has completed nocturnal bat surveys on sites ranging from housing estates to historic built structures.

Jenny Elliott

Jenny has been a seasonal surveyor for the company for 3 years and has undergone training days using bat box duet detectors and Wildlife Acoustics Echo Meter Touch devices, as well as received training on bat identification techniques. She's completed nocturnal surveys on a variety of sites, including individual properties, schools, and heritage buildings.

3.2.2. Badger

Survey data was collected from a minimum of 100m from the site boundary, surrounding the proposed work area where possible. Within this, Visual Encounter Survey (VES) techniques were employed to search all fence lines, woodland and scrub habitats for evidence of badgers. Evidence of badgers include faeces – usually deposited in pits called latrines and found at home range boundaries, setts, runs between sets or to foraging areas, scratching posts, guard hairs, snuffle holes and footprints, following the methodology outlines in Harris et al (1989). Where setts were found, activity levels were recorded using the following criteria:

- Number of well-used holes (with one or more of the features: well worn entrance; freshly excavated soil; bedding material).
- Number of partially used holes (leaves or twigs in entrance and/or mosses and other plants growing in or around entrance).
- Number of disused holes (partially or completely blocked, with considerable amount of excavation required for reoccupation).

Setts were also classified using the conventions shown in Table 2.

Table 2 Sett definitions

Sett Type	Definition
Main	Several holes with large spoil heaps and obvious paths emanating from and between sett entrances.
Annex	Normally less than 150m from main sett, comprising several holes. May not be in use all the time, even if main sett is very active.
Subsidiary	Usually at least 50m from main sett with no obvious paths connecting to other setts. May only be used intermittently.
Outlier	Little spoil outside holes. No obvious paths connecting to other setts and only used sporadically. May be used by foxes and rabbits.

The survey was undertaken on 21st April 2020 by Victoria Telford and Sacha Elliott, both Senior Ecologists at Total Ecology.

Broad habitat data was recorded in the area surrounding the site while undertaking the badger survey to give an indication of habitat suitability and quality. Improved pasture, including amenity grassland; rough grassland; arable; scrub and broadleaved woodland, are the principle habitats used by badgers for foraging.

When available, badgers preferentially feed on earthworms *Lumbricus terrestris* and do so in short grazed or mown grassland, which frequently supports high densities of accessible worms and is of high importance in this respect.

3.2.3. Red Squirrel

Due to the relatively small size of the site and localised nature of the works, a full red squirrel survey consisting of a walked transect route was deemed unnecessary. Instead, trees were inspected from ground level for field signs of red squirrel including dreys, feeding signs and/or actual squirrel sightings. The survey took place on 21st April 2020 and was carried out by Victoria Telford and Sacha Elliott, both Senior Ecologists at Total Ecology.

3.2.4. Otter and Water Vole

The ecological assessment took place on the 14th July 2020 in accordance with the standard Water Vole survey guidelines (Strachan and Moorhouse, 2006) and guidelines outlined in 'Monitoring the otter *Lutra lutra*' (Chanin and Smith, 2003).

The survey was carried out by Kevin O'Hara (**CL11 2016-21845-CLS-CLS** and **CL23/0038**). Hydrological features, such as depth and flow rate and physical features such as width and bank profile were all noted and recorded on the survey form as background information. Information on the bank was recorded, i.e. whether it was earth, silt, canalised etc. as was the vegetation that was found along the water courses length.

The watercourse that runs under the bridge was surveyed for its ability to provide suitable habitat for Water Vole and Otter with a 100m buffer either side of the site bridge. Habitat 'suitability' was based on best practice guidance published by Strachan and Moorhouse (2006) and Chanin (2003) together with surveyor experience.

The surveyor aimed to determine the presence / likely absence of Water Voles and Otters on the watercourse. This was achieved by walking the length of the water course as specified above looking for signs of Water Vole and Otter occupation as per best practice guidance.

Due to the rarity and elusive nature of the targeted species an actual sighting would prove unlikely. Otter signs were looked for instead and these included droppings (either spraints or anal jelly), footprints / tracks, feeding remains and signs of habitation (e.g. holts). Evidence of Water Voles is listed below. Water Vole prints are hard to distinguish from rat prints and are therefore not a reliable field sign.

- Latrines – Latrines are established by Water Voles at the edges of their territories, where they enter and exit the water where their nests tend to be located or on physical structures such as bridge supports or rocks. Water Vole faeces are made of a few distinct cylindrical droppings 8-12mm long and 4-5mm wide with blunt rounded ends. They are brown or green in colour depending on the food recently eaten. They may also show signs of a green ring inside the dropping when broken in half. The latrine will contain old and new piles of faeces with some droppings being flattened by the Water Vole as it scent marks its territory using its large hind feet.
- Feeding station/remains – Water Voles often have favourite, or safe, feeding stations spread throughout their territories where they collect and store a neat pile of vegetation to be eaten at a later date. The vegetation is typically 10cm in length and has been chewed at one end to a near 45-degree angle. Upon close inspection it is possible to see the clear-cut marks of the Water Voles front teeth.
- Runs – A run occurs where a water vole has, over a period of time, consistently used the same path for moving around. The run is normally about 5-9cm wide and can be quite complex in nature with many branches or other runs coming from it.
- Burrows – Water Voles will dig into earth banks of river channels and excavate a network of tunnels to live in. These are called burrows. They can exist above or below the water line as well as two or three metres in land, appearing as a hole in the ground. The hole is normally wider than high with a diameter of 4-8cm.
- Cropped lawn – Lawns are areas of grass found around a burrow entrance that have been grazed down to a very short level by a Water Vole. They are generally created by the female when she is reluctant to leave the burrow and her young.

- Actual sighting – Some Water Voles do not seem to be affected by human activity so an actual sighting may take place. However, caution needs to be taken when identifying a Water Vole so not as to confuse it with a Brown Rat.

3.2.3 **White-Clawed Crayfish**

The survey was undertaken on the 14th July 2020 and at a time when water levels were low, and turbidity reduced. The survey was carried out by Kevin O'Hara (**CL11 2016-21845-CLS-CLS and CL23/0038**). Refuge sampling was carried out following the CSM Protocol (Bradley et al. 2015). Sampling was undertaken in a downstream to upstream direction and all equipment was disinfected before the commencement of the survey. 100m of stream (50m either side of the bridge) was searched and potential refugia were identified and then searched by hand, lifted vertically and sideways. Any crayfish noted within the watercourse were recorded.

4.0 SURVEY RESULTS

4.1. Desk Based Study

The results obtained from the MAGIC search revealed one Site of Special Scientific Interest (SSSI) within 2km of the site known as Greenhaugh Meadow located approximately 1.1km north east of the site. This area is also designated as North Pennine Dales Meadows (SAC).

The consultation with ERIC NE revealed three Northumberland Local Wildlife sites (NLWS) within 2km of the site. The Tarsset Burn is located upstream, approximately 1.1km north of the site. Chirdon Burn lies approximately 900m south of the site flowing into the River North Tyne from the south. Hesleyside Mill lies approximately 1.3km south of the site.

The full results of the Desk Study can be found in the initial Phase 1 report (Total Ecology, 2020).

4.2. Consultation Data

4.2.1. Bats

ERIC provided 171 records of bats within 2km of the site, up from 40 records in 2017. In total 29 records of bat roosts were returned from within 2km of the site. Species records include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, whiskered/Brandt's *Myotis mystacinus/brandtii* and noctule *Nyctalus noctule*. The nearest record of a confirmed bat roost is located in Greenhaugh, approximately 1.4km north east of the site dating from 2016. The roost consists of approximately 26 common pipistrelle, 20 soprano pipistrelle and eight brown long-eared bats.

4.2.2. Badger

The site offers potential suitable foraging habitat for badger mainly consisting of broad-leaf woodland. ERIC data revealed eight records of badger within 2km of the site between 1977 and 2018. The 2018 record is of a dead badger on the road at Lanehead, less than 500m from Redmire Bridge. A badger latrine and signs of foraging were discovered during the 2017 survey, with further signs of foraging as well as a potential sett being discovered in 2020.

4.2.3. **Red Squirrel**

A total of 47 records of red squirrel were returned from ERIC NE. The most recent record is associated with Lanehead recorded in 2014 approximately 300m from the bridge. Numerous records exist from Greenhaugh, approximately 1.5km north east of the bridge. Due to the proximity and the date of these records, it is likely that red squirrels frequent the wooded area as it may serve as a corridor to wider habitats to the north.

4.2.4. **Otter and Water Vole**

During the 2016 survey, signs of otter spraint were noted approximately 15m from the bridge. ERIC provided 26 records of otter from 1992 – 2016 within 2km of the site. The nearest record (excluding that which was provided by Total Ecology in 2016) is approximately 650m east of the site adjacent to a bridge by the banks of the River North Tyne. During the 2020 survey otter spraint was again noted on a rock on the northern riverbank approximately 20m east of the bridge, with another spraint noted on the bridge itself on the grass verge.

The site provides some suitable habitat for water voles with food sources and opportunities for burrow creation. No records of water voles were returned by ERIC, however.

4.2.5. **White Clawed Crayfish**

The Tarsset Burn consists of a relatively shallow watercourse with a mixed substrate and some areas of undercut bankside suitable for this species. No records of white-clawed crayfish were returned for within 2km of the site, however.

4.3. **Field Survey Results**

4.3.1. **Bats**

Bat Risk Assessment

The three-arch ashlar bridge was noted to have a number of small – medium size crevices within the brickwork, caused by failing/missing mortar. The mature trees adjacent to the bridge also have potential to support roosting bats. The woodland habitat adjacent the bridge provides high value foraging opportunities. Based on these features the bridge was assessed as having high bat roost potential (BRP).

Nocturnal Surveys

Surveyor details relating to the nocturnal survey undertaken is given in Table 1. The survey was undertaken during optimal weather conditions and at an appropriate time of year.

In summary bat activity across all three surveys was high with bats observed foraging above the adjacent woodland and beneath and between the arches of the bridge. Bats were also recorded commuting along the river in both directions. Four species were encountered during the surveys; these were common pipistrelle, soprano pipistrelle, Daubenton's and noctule. Unidentified *Myotis sp* were also encountered. **No bats were observed entering or emerging from the bridge structure.**

8th June 2020, Dusk Emergence Survey: Bat activity throughout the survey was high with bats observed foraging around the bridge and woodland as well as commuting along the river from the start of the survey throughout until 23:12 when the final bat was recorded. For species in total were observed during the survey, these were common pipistrelle, soprano pipistrelle, daubenton's *Myotis daubentonii* and noctule, in addition to several unidentified *Myotis spp.*

17th July 2020, Dawn Re-Entry Survey: Activity throughout this survey was once again high with constant foraging behaviour taking place around the bridge and beneath the arches. Soprano pipistrelle were the most frequently recorded species, followed by common pipistrelle and Daubenton's, with noctule recorded towards the end of the survey commuting high over the site. Overall activity had been reduced from 04:40 with the final bat, a soprano pipistrelle, being recorded flying upstream away from the bridge at 04:51.

15th September 2020, Dusk Emergence Survey: The third and final survey was noticeably quieter compared to the previous surveys, though activity was still consistent throughout. The first bat, a soprano pipistrelle, was recorded flying over the bridge from east to west at 19:35, 10 minutes after sunset. The majority of activity during this survey was attributed to bats commuting over the site, rather than foraging around it as was the case during the previous surveys. Species distribution was also more balanced with common and soprano pipistrelles being recorded equally. *Myotis sp* were also recorded.

4.3.2. Badger

Signs of badger were noted during the initial Phase 1 walkover in 2017 in the form of latrines on the bridge itself and snuffle holes within the woodland along the northern bank of the river to the west of the bridge. Similar signs were found during the January 2020 Phase 1 update with latrines and signs of foraging noted both on the bridge and in the grass verge off the road to the north of the bridge. A potential badger sett was also discovered in the woodland to the west of the bridge in January 2020, however it appeared disused and perhaps even recently inundated as the entrance was full of leaf litter and broken branches.

During the badger survey, which took place in April 2020, a partially active outlier sett was discovered approximately 60m north of the bridge on the western side of the road. The sett entrance faced south and showed signs of relatively recent activity as the entrance was clear of vegetation.

4.3.3. Red Squirrel

During the survey, neither grey nor red squirrel were encountered. Table 3 shows the full results of the survey.

Table 3 Red squirrel survey results summary.

Date	Weather Conditions	Grey Squirrel	Red Squirrel	Comments
21/04/2020	Sunny 30% Cloud Cover 13°C	0	0	N/A

4.3.4. Otter and Water Vole

Section results

The water course subject to this survey, is the Tarsset Burn, a tributary of the river North Tyne in Northumberland. The burn is lined by a narrow strip of woodland on both sides for the majority of its length, with a well vegetated understorey in the immediate vicinity of the bridge, beyond the wooded area the landscape is predominantly arable land used for sheep and cattle grazing. The vegetation on the riverbanks comprised of occasional herb species and abundant bankside trees. The river is 11 – 15m wide and

up to 1 metre deep with a mixed substrate. At the time of the survey the water flow was moderate.

100m either side of the river were searched. The results are summarised below.

Table 3 Water Vole Survey Results

Section No.	Distance (m)	Sightings	Latrines	Burrows	Feeding sites
1	100	0	0	0	0
2	100	0	0	0	0

Table 4 Otter survey results

Section No.	Distance (m)	Sightings	Spraint	Footprints	Feeding remains
1	100	0	3	1	0
2	100	0	1	0	0

4.3.2 White Clawed Crayfish

Following the CSM protocol an initial refugia search took place whereby stone turning and kick sampling methods were utilised. No crayfish were found during the survey and no evidence of their presence observed such as burrows or cast shells.

The water course subject to this survey, is the Tasset Burn, a tributary of the river North Tyne in Northumberland. The burn is lined by a narrow strip of woodland on both sides for the majority of its length, with a well vegetated understorey in the immediate vicinity of the bridge, beyond the wooded area the landscape is predominantly arable land used for sheep and cattle grazing. The vegetation on the riverbanks comprised of occasional herb species and abundant bankside trees. The river is 11 – 15m wide and up to 1 metre deep with a mixed substrate. The banks are relatively steep sloping on the eastern side of the river and the water was approximately 1m deep at the time of the survey.

Table 5: White Clawed Crayfish survey results

Section No.	Distance (m)	Sightings	Burrows	Cast shell	Remnants in scat
1	100	0	0	0	0
2	100	0	0	0	0

5.0 CONCLUSION AND RECOMMENDATIONS

5.1. Conclusions

The survey is required prior to repair works to the bridge. The Tasset Burn, flowing beneath the bridge and the surrounding habitat was searched for signs of presence of bat, badger, red squirrel, otter, water vole and white-clawed crayfish, to assess potential impacts on these protected species.

5.1.1. Bats

Despite high levels of foraging activity around the bridge, no bats were observed to be utilising the bridge structure as a roosting space.

Short and long-term impacts of roost disturbance, modification or loss.

As no roosting bats were found to be utilising the bridge on site, it is deemed that the proposed works to the bridge will not result in the disturbance, modification or loss of any bat roosts and therefore will not impact upon bat populations.

Long-term impacts: fragmentation and isolation.

There is excellent foraging habitat on site via the river and areas of woodland both up and downstream of the bridge. The woodland stretches along the watercourse providing excellent connectivity to the wider landscape and the high-quality foraging habitat within it. The proposed works are not expected to have any affect any of the habitats adjacent to the site, so the surrounding foraging areas and connectivity will remain intact. Therefore, there will be no impact from fragmentation and isolation.

5.1.2. Badger

Evidence of badgers has been noted around the site on several separate occasions. Field signs have included both latrines and snuffle holes/signs of foraging and a partially active outlier sett was discovered just off the road approximately 60m north of the site. However, upon later visits to the site this sett appears to have been completely overgrown by tall ruderal vegetation, suggesting it has not been active for some time.

5.1.3. Red Squirrel

No evidence or direct sightings of red squirrel were observed on site during the course of the survey.

5.1.4. **Otter and Water Vole**

Otter footprints and spraints were found beneath the bridge as well as upstream on rocks, however no holts, or other signs of Otter presence was observed. Burrows of the right size and shape were not found, nor were latrines or feeding remains which would suggest Water Vole presence. In regard to Otters, given their highly mobile nature, a precautionary approach to the works is recommended and vegetation immediately within the area of work should be checked and cleared before works commence.

5.1.5. **White Clawed Crayfish**

No white-clawed crayfish have been identified within the survey area at this site during the surveys undertaken and therefore the proposed works will not impact on this species. However, the works do have the potential to impact on the ecology of the watercourse and therefore general recommendations for avoiding pollution impacts on the watercourse are given below.

It is assumed:

- that the proposed works include repairs to the existing bridge structure including re-pointing and stone replacement
- that this may require the erection of scaffolding within the watercourse
- that those carrying out the works may need to enter the watercourse on foot, but most of the work will be carried out via a pontoon
- that power tools will be used and that these will be powered by diesel-powered portable generators or similar
- that there is potential for materials (stone debris, etc.) to be dropped into the watercourse
- that it will not be necessary to de-water any section of the watercourse

5.2 **Recommendations**

Given the highly mobile nature of otters, it is recommended that the vegetation around the immediate area of work be searched for any new signs or presence of otters and carefully cleared before commencement of the planned works.

Recommendations made within the Extended Phase 1 Habitat Survey Report (Total Ecology, 2017 and 2020) will be implemented. This refers to the risk to nesting birds, fish and general pollution prevention.

If in the unlikely event a protected species is encountered during the works, they will cease immediately, and an Ecologist contacted for advice.

To avoid or mitigate the potential negative impacts on watercourse biodiversity the following measures should be implemented:

- If possible, access for the work should be by use of a specialist articulated mobile elevated working platform (MEWP) positioned on the bridge deck.
- If scaffolding is required, this should span the river from bank to bank without any feet within the watercourse. If scaffolding is used, it should be fitted with kick boards and with debris netting, including below the scaffold, to prevent any debris falling into the watercourse.
- The following pollution control measures should be implemented:
 - To prevent siltation of the watercourse, minimise the amount of exposed ground on banks from which surface water drains (e.g. caused by trampling and vehicle movements) and the period of time the ground is exposed.
 - Install hay bales/sedimats downstream prior to the commencement of works to collect additional sediment and to control pollution from site operations.
 - Consider the use of geotextile silt fences at the toe of the slope where ground is exposed to reduce silt transport.
 - Ensure any plant and wheel washing is carried out in a designated area of hard standing at least 10 metres from the watercourse or any surface water

drain leading to it. Ensure that run-off is collected in a sump and settled solids are removed regularly.

- Any concrete and cement mixing and plant and tool washing areas should be sited a minimum of 10 metres from any watercourse or surface water drain and on an impermeable surface to minimise the risk of run off entering the watercourse (Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution). Collect wash waters and, where necessary, discharge to the foul sewer or contain for disposal off site. Wash waters from concrete and cement mixing, or plant or tool washing, should never be discharged into the water environment.
- Fuel, oil and chemical storage on site must be secure. It should be sited on an impervious base within a secondary containment system such as a bund, not within 10m of any watercourse, and above flood water level.
- Spill kits approved for the stored materials should be kept close to the fuel, oil and chemical storage area and contactors should be trained in their correct use. The risk of spilling fuel is at its greatest during refuelling of plant. To minimise the risk, mobile plant should be refuelled in a designated area more than 10m from any water course or surface drain. Drip trays should be placed under portable generators.
- Biodegradable hydraulic oil should be used in plant working in or near watercourses. Biodegradable chainsaw bar lubricant should be used in chainsaws used above or near watercourses.
- If cleaning of stonework is to be undertaken use physical cleaning instead of liquid chemicals such as caustic and acid solutions. Wherever possible contain wastewaters from surface washing and agree the disposal method with the Environment Agency as part of an environmental management plan.
- Use vacuum attachments on power tools wherever possible to reduce dust generation. If using high-pressure water or steam cleaners to clean stonework avoid using grit blasting with slag-derived grit as this can contain significant levels of heavy metals such as copper and can be toxic to the water

environment. The use of garnet, low silica abrasive or recycled glass media with vacuum attachments will reduce the potential for contamination.

- All contractors should be fully briefed on the pollution control measures to be adopted on site and the importance of not allowing waste materials or pollutants to enter the watercourse.
- Any pollution incidents such as fuel spillage, discharge of contaminated or silt-laden run-off to a watercourse, or disturbance to the riverbed should be immediately reported to the EA Incident Hotline on 0800 80 70 60.

6.0 REFERENCES

Bat Conservation Trust (2016) Bat Surveys Good Practice Guidelines.

Chanin, P. (2003) Ecology of the European Otter *Lutra lutra*. Conserving Natura 2000 Rivers Ecology Series No 10. Peterborough, English Nature.

Conservation of Habitats and Species Regulations (2017)
<http://jncc.defra.gov.uk/page-1379>

Davies C.E, et al (2004) Freshwater Fishes in Britain. The Species and their Distribution; Harley Books

Department for the Environment, Food and Rural Affairs (DEFRA) (2002) Working with the grain of nature. A biodiversity strategy for England. HMSO: London

HMSO. (1981) Wildlife and Countryside Act. www.hmso.gov.uk

HMSO. (2000) Countryside Rights of Way Act. www.hmso.gov.uk

Holdich D (2003); Ecology of the White-clawed Crayfish. Conserving Natura 2000 Rivers Ecology Series No 1. English Nature, Peterborough

Kemp E, Birkinshaw N, Peay S & Hiley PD (2003); Reintroducing the White-clawed Crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Conservation Series No 1. English Nature, Peterborough

Natural Environment and Rural Communities Act (2006) - Section 41 Species and Habitats.

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

Neal, E and Cheeseman, C (1996) Badgers, T & AD Poyser, London.

Peay S (2000) Guidance on Works Affecting White-Clawed Crayfish; English Nature/Environment Agency

Peay S. (2003) Monitoring the White-clawed crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Monitoring Series No. 1. English Nature, Peterborough.

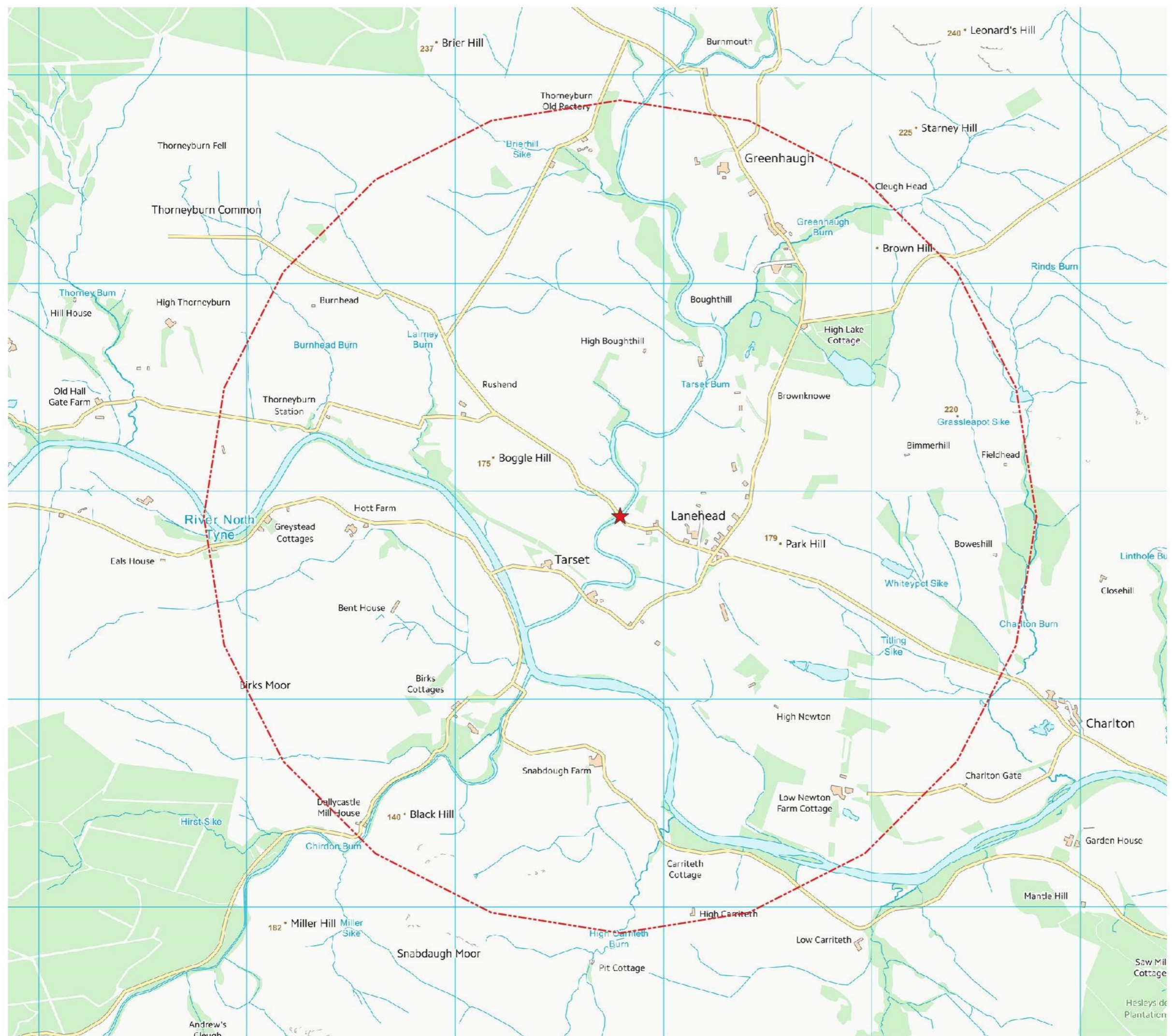
Strachan, R. & Moorhouse, T. (2006) *Water Vole Conservation Handbook- Second Edition*. Oxford: Wildlife Conservation Research Unit, Oxford.

Total Ecology Ltd. (2017, 2020) *Preliminary Ecological Appraisal: Redmire Bridge*

www.magic.gov.uk

APPENDIX A

Figures



Legend

- ★ Site Location
- ▭ 2km Buffer

Contains Ordnance Survey data © Crown copyright and database right 2019



Unit 1, Shawwell Business Centre
 Stagshaw Road
 Corbridge
 Northumberland
 NE45 5PE

info@totalecology.com
 www.totalecology.com

Project	Redmire Bridge, Northumberland
Title	Site Location
Client	Northumberland County Council
Date	22nd January 2020
Ref	Figure 1



Legend

★ Site Location

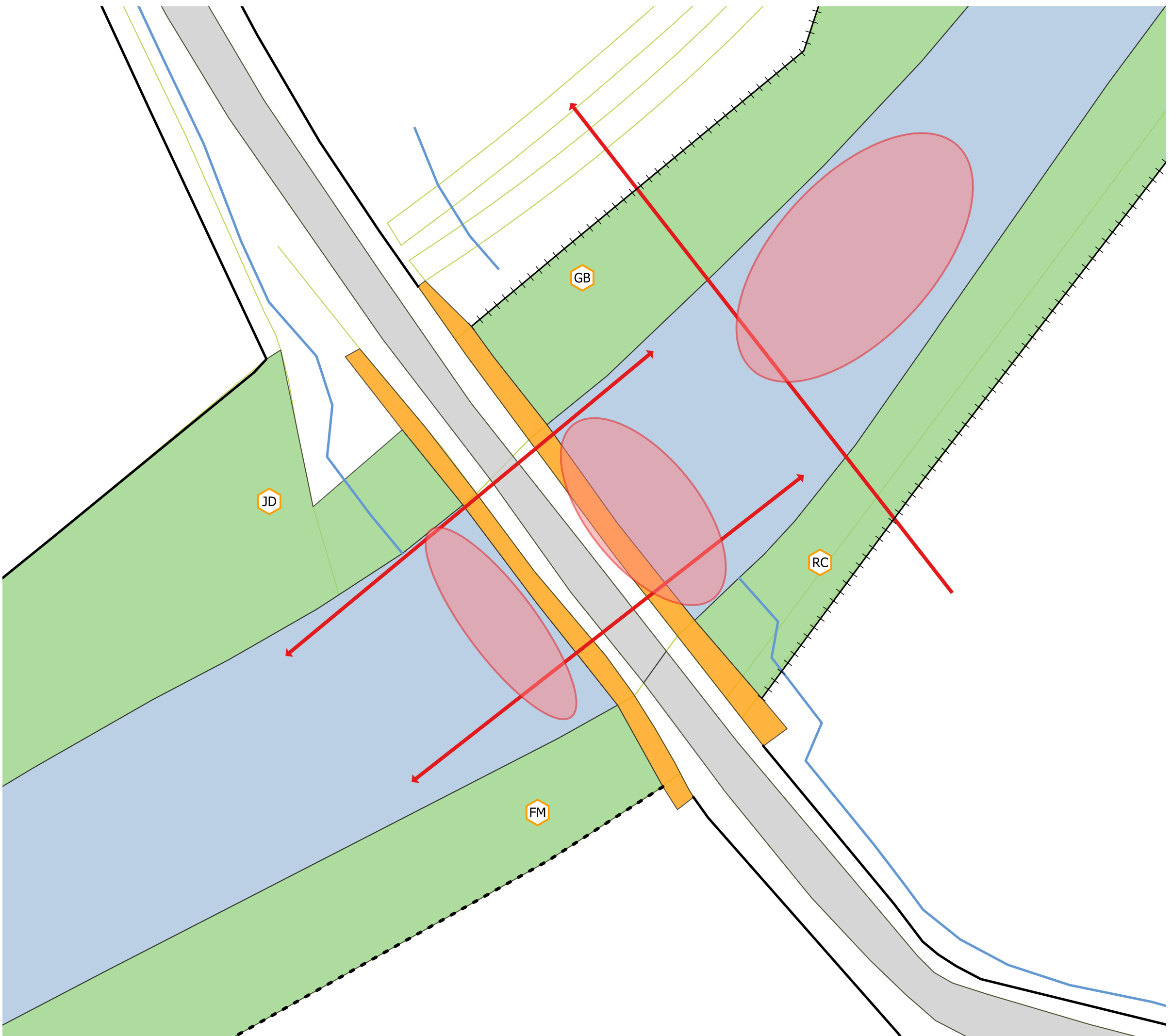
Contains Ordnance Survey data © Crown copyright and database right 2019







Unit 1, Shawwell Business Centre
Stagshaw Road
Corbridge
Northumberland
NE45 5PE

info@totalecology.com
www.totalecology.com

Project	Redmire Bridge, Northumberland
Title	Aerial Image Showing Surrounding Habitat
Client	Northumberland County Council
Date	22nd January 2020
Ref	Figure 2



Legend

-  Surveyed Structure
-  Surveyor Location
-  Commuting Routes
-  Main Foraging Areas

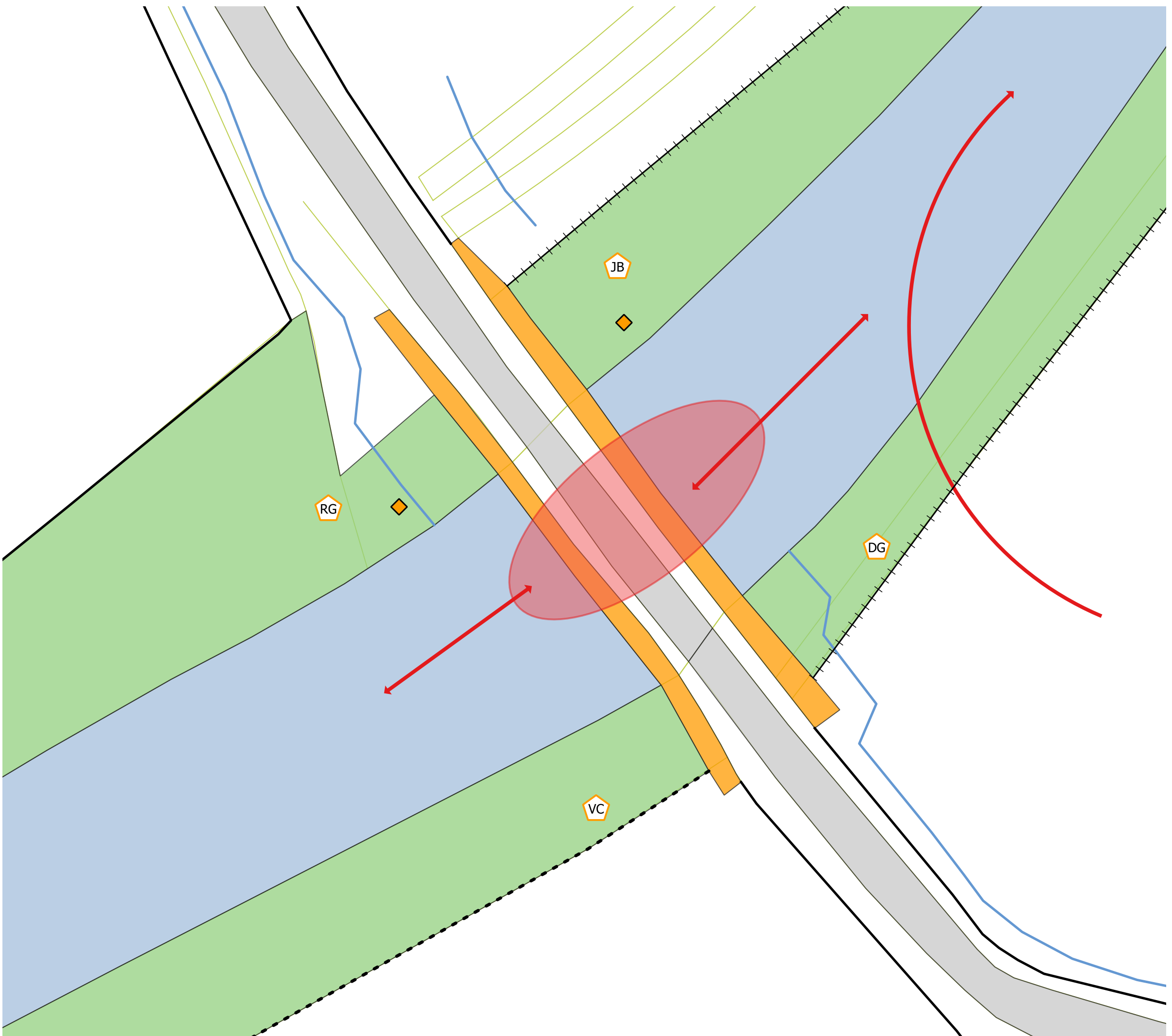
Contains Ordnance Survey data © Crown copyright and database right 2019








Unit 1, Shawwell Business Centre
 Stagshaw Road
 Corbridge
 Northumberland
 NE45 5PE

info@totalecology.com
 www.totalecology.com

Project	Redmire Bridge, Northumberland
Title	Nocturnal Survey Plan - 08/06/2020
Client	Northumberland County Council
Date	30th September 2020
Ref	Figure 3a



Legend

-  Surveyed Structure
-  Surveyor Locations
-  Camera Locations
-  Commuting Routes
-  Main Foraging Areas

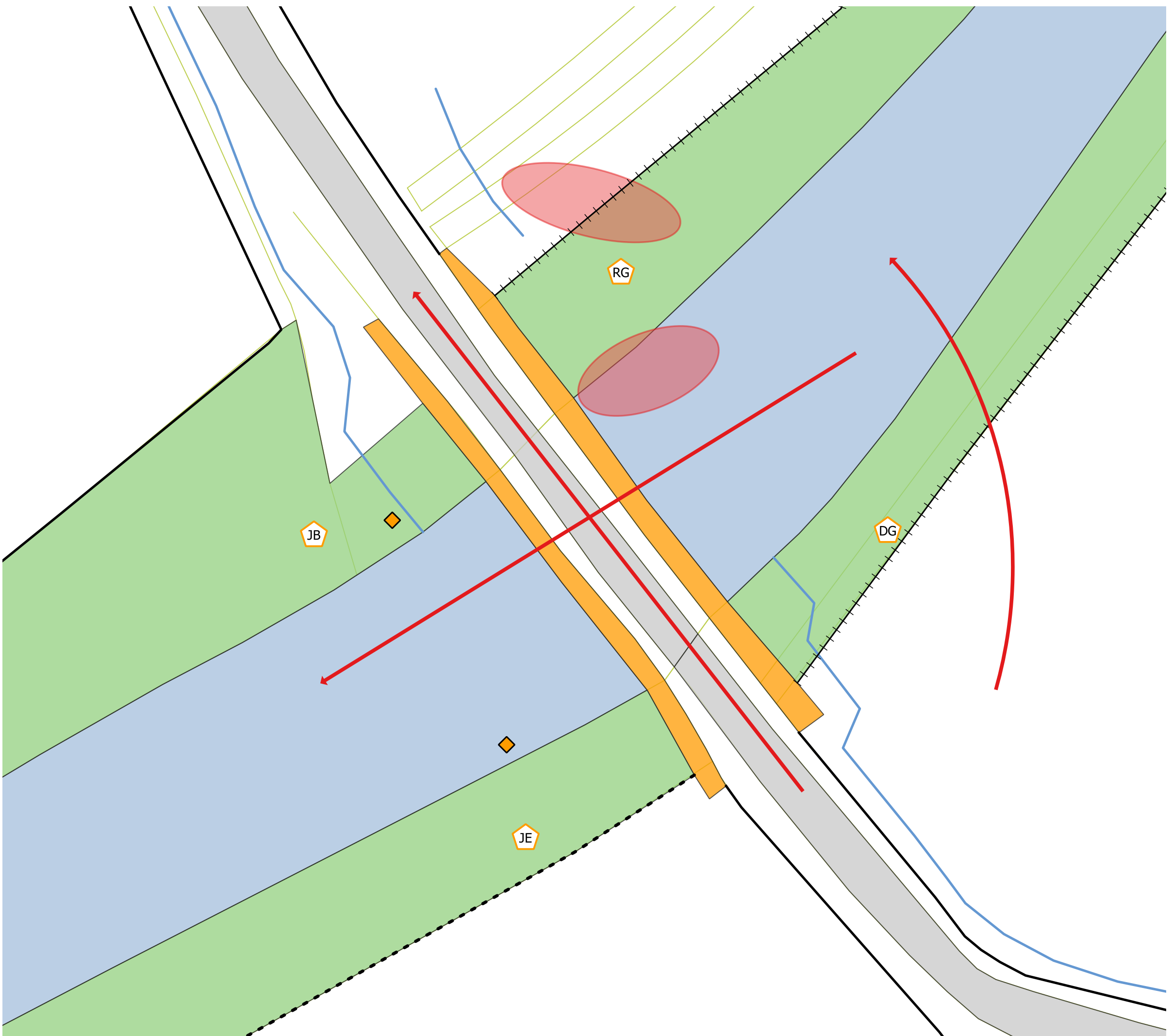
Contains Ordnance Survey data © Crown copyright and database right 2019



Unit 1, Shawwell Business Centre
Stagshaw Road
Corbridge
Northumberland
NE45 5PE

info@totalecology.com
www.totalecology.com

Project	Redmire Bridge, Northumberland
Title	Nocturnal Survey Plan - 17/07/2020
Client	Northumberland County Council
Date	1st October 2020
Ref	Figure 3b



Legend

- Surveyed Structure
- DG Surveyor Locations
- Camera Locations
- Commuting Routes
- Main Foraging Areas

Contains Ordnance Survey data © Crown copyright and database right 2019



Unit 1, Shawwell Business Centre
 Stagshaw Road
 Corbridge
 Northumberland
 NE45 5PE

info@totalecology.com
 www.totalecology.com

Project	Redmire Bridge, Northumberland
Title	Nocturnal Survey Plan - 15/09/2020
Client	Northumberland County Council
Date	1st October 2020
Ref	Figure 3c

APPENDIX B
Survey Sheets

Redmire

Badger Survey / Red squirrel

Rev1: 08/04/2020

Ref	Grid reference	Activity (Sett, latrine, foraging etc)	Sett type (M, A, S, O)	Usage (A, PA, D)	Orientation (of sett entrances only)	Notes
	55-167112 - 2 335168	Sett	O	PA	S	
	55-166519 - 2 335133	Other				
	Dipper box under bridge					
	55-166709 - 2 334154	Other				
	55-166757 - 2 334121	"				
	55-166158 - 2 335154	Temporary latrine				
	55-166908 - 2 334116	Other				

Sett type is Main (M), Annex (A), Subsidiary (S) and Outlier (O)
 Usage is Active (A), Partially Active (PA) and Disused (D)
 Orientation of sett entrances to be recorded (N, S, E, W etc)

[Handwritten scribbles]

Otter Survey Form

Site Details			Survey Details		
Code			Name		
Name	RODMIRE BR		Date	14/7/2020	
Catchment	TYNE - TARBET Burn		Weather	DRY	
Type	BRIDGE		Grid Ref	NY 78781 85873	
Watercourse Information					
Habitat		Shore/Bank		Vegetation	Width (m)
Running Water	<input checked="" type="checkbox"/>	Boulders/Stones/Gravel	<input checked="" type="checkbox"/>	Bankside Trees	<input checked="" type="checkbox"/> <1
Ditch		Sand	<input checked="" type="checkbox"/>	Bushes	<input checked="" type="checkbox"/> 1-2
Dyke		Silt		Herbs	<input checked="" type="checkbox"/> 2-5
Gravel Pit		Earth		Submerged Weed	5-10
Pond		Rock Cliffs	<input checked="" type="checkbox"/>	Reeds/Sedges	11-15 <input checked="" type="checkbox"/>
Lowland Lake		Earth Cliffs	<input checked="" type="checkbox"/>	Tall Grass	<input checked="" type="checkbox"/> 15-20
Reservoir		Reinforced (natural)		Short Grass	20-25
Channel Inflow		Reinforced (man-made)	<input checked="" type="checkbox"/>	Invasive Species	25-30
Channel Outflow		Poached		Bare/None	30-40
Otter Presence					
Otter Signs	Y	N	Other – please specify		
Spraint	<input checked="" type="checkbox"/>				
Collected?					
Footprints	<input checked="" type="checkbox"/>		Location (rock/man-made structure/log/etc.)		
Feeding Remains			BRIDGE FOOTING + several instream Boulders		
Other (ps)					
Comments/sketch:					

Water Vole Survey Form

BACKGROUND INFORMATION

Site	REDMIRE BR - TARSSET	Date	14/7/2020
Water body	TARSSET BUEN	Grid reference	N74878185873
Surveyor	KOH	Survey Length (m)	100m
Weather	DRY	Recent Weather	SHOWERS

HABITAT INFORMATION

<p>Habitat</p> <input type="checkbox"/> Ditch <input type="checkbox"/> Dyke <input type="checkbox"/> Gravel Pit <input type="checkbox"/> Pond <input type="checkbox"/> Lowland lake <input type="checkbox"/> Reservoir <input checked="" type="checkbox"/> Running water <input type="checkbox"/> Marsh/Bog <input type="checkbox"/> Channel Inflow <input type="checkbox"/> Channel Outflow	<p>Shore/Bank</p> <input checked="" type="checkbox"/> Boulders <input checked="" type="checkbox"/> Stones <input checked="" type="checkbox"/> Gravel <input checked="" type="checkbox"/> Sand <input type="checkbox"/> Silt <input type="checkbox"/> Earth <input checked="" type="checkbox"/> Rock Cliffs <input type="checkbox"/> Earth Cliffs <input type="checkbox"/> Poached <input checked="" type="checkbox"/> Reinforced (natural materials) <input checked="" type="checkbox"/> Reinforced (man-made)	<p>Bordering Land Use</p> <input checked="" type="checkbox"/> Upland Grass <input type="checkbox"/> Permanent/Temporary Grass <input checked="" type="checkbox"/> Mixed Broadleaf Woodland <input type="checkbox"/> Conifer Wood <input type="checkbox"/> Peat Bog <input type="checkbox"/> Arable Crop <input type="checkbox"/> Urban- Industrial /Housing <input type="checkbox"/> Park/ Garden <input type="checkbox"/> Heath <input type="checkbox"/> Fen <input type="checkbox"/> Livestock Grazing <input checked="" type="checkbox"/> Fenced	<p>Bank Profile</p> <input type="checkbox"/> Flat <10° <input type="checkbox"/> Shallow <45° <input checked="" type="checkbox"/> Steep >45° <input type="checkbox"/> Vertical <input type="checkbox"/> Undercut
<p>Bed Substrate</p> <input checked="" type="checkbox"/> Stones <input checked="" type="checkbox"/> Gravel <input type="checkbox"/> Sand/silt <input type="checkbox"/> Artificial	<p>Width (m) <input type="checkbox"/> 1-2 <input type="checkbox"/> 5-10 <input type="checkbox"/> 20-40 <input type="checkbox"/> <1 <input type="checkbox"/> 2-5 <input checked="" type="checkbox"/> 10-20 <input type="checkbox"/> >40</p>		
<p>Vegetation <u>D</u>ense/<u>A</u>bundant/<u>F</u>requent/<u>O</u>ccasional/<u>R</u>are/<u>N</u>one</p> <input checked="" type="checkbox"/> Bankside trees <input type="checkbox"/> Bushes <input type="checkbox"/> Herbs <input checked="" type="checkbox"/> Submerged weed <input checked="" type="checkbox"/> Reeds/Sedges <input type="checkbox"/> Tall Grass <input checked="" type="checkbox"/> Short Grass		<p>Depth (m) <input checked="" type="checkbox"/> 0.5-1 <input type="checkbox"/> >2 <input type="checkbox"/> <0.5 <input type="checkbox"/> 1-2</p>	
<p>Disturbance Level (1= Low - 5= High) <input type="checkbox"/> 1 Type of Impact: NONE</p>			

WILDLIFE INFORMATION

<p>Water Voles</p> <input type="checkbox"/> Sightings (count) <input type="checkbox"/> Latrines (count) <input type="checkbox"/> Burrows (count) <input type="checkbox"/> Footprints <input type="checkbox"/> Runs in vegetation <input type="checkbox"/> Feeding Remains <input type="checkbox"/> Grazed areas around burrow entrance	<p>Rat</p> <input type="checkbox"/> Sightings <input type="checkbox"/> Droppings <input type="checkbox"/> Tracks	<p>Mink</p> <input type="checkbox"/> Sightings <input type="checkbox"/> Scats <input type="checkbox"/> Tracks	<p>Otter</p> <input type="checkbox"/> Sightings <input checked="" type="checkbox"/> Spraints <input checked="" type="checkbox"/> Tracks
<p>Other Wildlife:</p>			

Identified Plant Remains from Water Vole Feeding Remains:

SKETCH OF SITE including Water Vole Activity (if any)

Key to Symbols (mark route and direction of survey)

Mature Trees		ADJACENT LAND-USE CODES
Overhanging Branches		Broadleaf Woodland BW
Fallen Tree		Conifer Woodland CW
Exposed Roots		Moorland/Heath MH
Pollarded Tree		Rough Pasture RP
Sapling		Wetland WL
Scrub		Improved Grass IG
Hedgerow		Tilled Land (crop) TL
Fence		Suburban/Urban Dev. (inc.gardens) URB
Reed/Sedge Bed		OTHER FEATURES
Flood Bank		Roadbridge
Artificial Bank		Footbridge
Earth Cliff		Weir
WATER VOLES: Sighting WVS Latrine WVD Burrow WVB Tracks WVT Feeding Signs WVFS		Culvert
RATS: Sighting RS Dropping RD Tracks RT		Ford
OTTER: Sighting OS Spraint OD Tracks OT		Outfall
MINK: Sighting MS Scat MD Tracks MT		Dredgings/Spoil
		Silt Bars
		Islands (mark position & size)

NOTES & COMMENTS

Habitat record card

Refuges tick all present ring main type(s) searched		Main substrate beneath		Refuges in bank	
cobble (6.5-15cm)	/	bedrock	/	none	
cobble (15-25.6cm)	0	cobble (6.5-15cm)	/	cobble/boulder	/
boulder (25.6-40cm)	0	pebble (<6.5cm)	/	tree roots, large	/
boulder (>40cm)	0	gravel (<1.6cm)	/	vertical or undercut bank	/
rubble (give size)	/	sand (<2mm)	/	dry stone wall	
woody debris	0	clay		other reinforced	/
other urban debris		silt		crayfish burrows	
tree roots, fine moss		Shading above (>30%)	750%	Evaluation crayfish habitat for whole site (0 none, 1 pres., 2 freq., 3 abund.)	
filamentous algae				in margins	2
other submerged veg.				in mid channel	2
emergent				in banks	2
Siltation		Description of the site and any additional comments including problems			
none					
low	/				
moderate					
high					
Problems: 1 - pollution 2 - erosion; E if >33% affected 3 - non-native crayfish					

APPENDIX C
Selected Photographs



Photograph 1 – Single track, unnamed road over Tarsset Burn.



Photograph 2 – Tarsset Burn looking upstream.



Photograph 3 – Tarsset Burn looking downstream.



Photograph 4 – Partially active outlier badger sett, approx 60m north of bridge (inactive during later visits).



Photograph 5 – Otter spraint on rock on western bank of Tasset Burn.

APPENDIX D
Report Conditions

Total Ecology Ltd.

REPORT CONDITIONS Redmire Bridge, Northumberland

This report is produced solely for the benefit of Northumberland County Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Total Ecology Ltd. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of Total Ecology Ltd. using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to Total Ecology Ltd. by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced

to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Total Ecology Ltd. accept no liability for issues with performance arising from such factors

February 2008