

A47 North Tuddenham to Easton Dualling

Scheme Number: TR010038

Volume 6

6.3 Environmental Statement Appendices **Appendix 8.14 - Otter and Water Vole Survey** **Report**

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Planning Act 2008

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**The Infrastructure Planning
(Applications: Prescribed Forms and
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The A47 North Tuddenham to Easton
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ENVIRONMENTAL STATEMENT APPENDICES
Appendix 8.14 - Otter and Water Vole Survey Report

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1. Scheme introduction

1.1. Background

1.1.1. In January 2019, Sweco UK was commissioned to complete otter *Lutra lutra* and water vole *Arvicola amphibius* surveys for the A47 North Tuddenham to Easton Dualling Scheme. The survey is required to inform the Environmental Statement (ES) Biodiversity Chapter at PCF Stage 3 for the A47 North Tuddenham to Easton Dualling Scheme.

1.2. Scheme description and location

1.2.1. The A47 from North Tuddenham to Easton, comprising a single carriageway, is located approximately 10km to the west of Norwich and forms part of the main arterial highway route connecting Norwich and King's Lynn. The route currently experiences delays and high levels of congestion during peak hours. The situation is predicted to become worse with proposed growth in residential development.

1.2.2. It is proposed to upgrade the existing section of single carriageway between North Tuddenham and Easton to dual carriageway. The new section of dual carriageway, with junction improvements, is proposed to be constructed to the north and south of the existing carriageway. This scheme will be referred to as the 'Proposed Scheme'.

1.2.3. The Proposed Scheme is considered to be a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 and therefore requires a Development Consent Order (DCO), issued by the Secretary of State, before construction and operation can commence.

1.2.4. The Proposed Scheme improvements will:

- improve accessibility to and around the region, reducing congestion and delays to enable more reliable journey times
- improve safety performance for all road users, contributing to a 40% reduction target in accidents across Highways England's roads over the implemented schemes' first five years in operation
- provide alternative access to local roads
- improve the environmental impacts of traffic along the A47 route, particularly for the communities of the six scheme areas
- support economic growth in the Peterborough, Norwich and Great Yarmouth areas by improving overall road capacity

1.3. Aim and objectives

1.3.1. The purpose of the otter and water vole surveys is to support the DCO application by informing the assessment of impacts to ecological receptors. The aims and objectives of the survey is as follows:

- to determine the presence or likely absence of otters and water voles on site
- to provide preliminary advice on mitigation strategies against any adverse effects on the local otter and water vole population which may arise as a result of the Proposed Scheme
- to inform any Natural England mitigation licences that may be required

1.3.2. This baseline report details the results of the otter and water vole surveys undertaken at the Proposed Scheme site in September and October 2019 and June 2020. It discusses the implications for the Proposed Scheme and provides further instructions for mitigation and/or further ecological work where necessary.

2. Ecological background

2.1. Previous studies

Extended Phase 1 habitat survey

- 2.1.1. To inform the Proposed Scheme at PCF Stage 1, an Extended Phase 1 Habitat Survey was undertaken by Amey in 2016, which identified the River Tud and its tributaries as having areas of suitable habitat for water vole. Therefore, otter and water vole surveys were undertaken during PCF Stage 2.
- 2.1.2. The Extended Phase 1 Habitat Survey, and the subsequent otter and water vole survey detailed below, undertaken by Amey in PCF Stage 2 were to inform the options stage assessment when Highways England were examining four potential route options for the Proposed Scheme. As such, the 'survey area' surveyed by Amey included all suitable habitat within 250m of all four route options. This information has been obtained from the interim Environmental Assessment Report ((EAR) Amey, 2017).

Otter and water vole survey

- 2.1.3. During PCF Stage 2, otter and water vole surveys were undertaken in April 2017.
- 2.1.4. Several otter tracks and signs and potential holts were identified within 250m of the route options, some of which were located in close proximity to potential watercourse crossing points.
- 2.1.5. Water vole signs were identified along the River Tud including latrines, pathways, feeding remains and burrows.

2.2. Legislation

Otters

- 2.2.1. Otters are fully protected as a European protected species (EPS) under the Conservation of Habitats and Species Regulations 2017 (as amended) and are also protected under Sections 9 and 11 of the Wildlife and Countryside Act 1981 (as amended). This protection makes it illegal for any person to:
- Capture, kill, disturb or injure otters
 - Destroy or damage a breeding or resting place
 - Obstruct access to their resting or sheltering places
 - Possess, sell, control or transport live or dead otters, or parts of otters

- 2.2.2. In addition, otters are listed as a Species of Principle Importance (SPI) under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006. Subsequently, otters are listed as a UK Priority Species on the UK Biodiversity Action Plan (BAP).
- 2.2.3. Natural England is responsible for issuing licences where it is necessary to interfere with an otter breeding or resting place in the course of development, which can include demolition, building, construction, mining and engineering operations and material changes of use. Licences can be issued at any time of year.

Water voles

- 2.2.4. Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and they are a priority conservation species under the NERC Act 2006 and listed as a Priority Species on the Local BAP (LBAP). This protection makes it illegal for any person to:
- Intentionally capture, kill, disturb or injure water voles
 - Destroy or damage or block access to their places of shelter or protection
 - Disturb them in a place of shelter or protection
 - Possess, sell, control or transport live or dead water voles, or parts thereof
- 2.2.5. Natural England is responsible for issuing licences where it is necessary to interfere with water vole places of shelter or protection (i.e. their burrows) in the course of development, which can include demolition, building, construction, mining and engineering operations and material changes of use.
- 2.2.6. In addition, material considerations in the planning decision include; the likelihood of destroying otter or water vole breeding or resting places; adversely affecting otter commuting corridors or links between them; and significantly increasing the likelihood of road or rail casualties amongst otter populations.

National Planning Policy Framework (NPPF)

- 2.2.7. The NPPF outlines government planning policies and how they should be applied within local authorities. The framework places an emphasis on sustainable development, encouraging the re-use of land that has previously been developed using land that has a higher environmental value and by minimising impacts on biodiversity. The NPPF states that developments should aim to conserve or enhance biodiversity and encourages opportunities to incorporate biodiversity in and around developments using the principles of the mitigation hierarchy. Paragraphs 170, 174 and 175 of the NPPF give policy support to the provision of measurable net gains in biodiversity. Paragraph 174

specifies that plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including locally designated sites; and promote the conservation, restoration and enhancement of priority habitats and ecological networks and the protection and recovery of priority species.

National Policy Statement for National Networks (2014)

- 2.2.8. The National Policy Statement for National Networks (2014) states “*development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.*”

3. Methodology

3.1. Introduction

- 3.1.1. Otter and water vole surveys can be undertaken simultaneously. All field surveys referred to methodologies outlined in Chanin (2003) and Strachan *et al.* (2011). Signs for both species were surveyed for along the River Tud, its tributaries and surrounding waterbodies that could be impacted by the Proposed Scheme. Evidence of otters, water voles and other riparian mammal activity, such as invasive American mink *Neovison vison*, was looked for during the course of the surveys.
- 3.1.2. The survey was completed by Ishbel Campbell ACIEEM (Consultant Ecologist, Sweco who has over six years survey experience), Adam West GradCIEEM (Ecologist, Sweco who has over four years surveying experience), Diane Wood MCIEEM (Principal Ecologist, Sweco who has over twelve years survey experience), Beth Mell GradCIEEM (Ecologist, Sweco who has over three years survey experience), as well as Lydia Waite and Lewis Gospel (two field assistants). The surveys were undertaken over five days, on the 15, 21, 22 and 30 October 2019 and 30 June 2020 in dry, clear weather conditions.

3.2. Otters

- 3.2.1. Otter field signs surveyed for included spraints, tracks, feeding remains, otter slides, holts (underground dens and breeding sites) and couches (above ground sites where otters rest during the day). Otters are known to be present on the River Tud and the survey boundary of the Proposed Scheme includes a large section of the River Tud, as well as the Proposed Scheme footprint crossing the river at one point. A survey extent of 250m upstream and downstream of the survey boundary to check for otter shelters that may be impacted by the works and constrain the Proposed Scheme was carried out rather than a wider search for all otter activity. Where only works within the survey boundary of the Proposed Scheme may impact the watercourse, a survey extent of 100m upstream and downstream was undertaken.
- 3.2.2. There are a number of different shelters or resting places used by otters. Below is a brief description of the terminology used in this report.

Holts

- 3.2.3. Otter holts are places or structures used by otters for shelter on a 'permanent' basis. Holts are covered structures, usually a hole or burrow along the river bank amongst riparian vegetation and the root system of river side trees, or behind boulders set in to the bank. Usually a holt will also have other associated otter

field signs such as footprints or an accumulation of spraint. Holts may also be connected to lying-up areas and have more than one entrance as with badger setts.

Laying-up areas and couches

- 3.2.4. Lying-up areas or couches are 'temporary' areas used by otters for resting, grooming or feeding whilst on the move. Lying-up areas usually do not form a full covered structure, rather they are partially hidden bankside shelves amongst riparian vegetation, or 'nest-like' structures amongst reeds and grasses. As with holts, lying-up areas usually have other field signs to demonstrate use by otters.

Natal dens

- 3.2.5. Natal dens are holts which are used by otters to give birth and rear their young. Natal dens usually have inconspicuous entrances and have little or no evidence of otter activity around the entrance. Natal dens can be located some distance from the watercourse, sometimes being set back in woodland amongst log piles, tree roots, rubble or even amongst reed beds.

3.3. Water voles

- 3.3.1. Water vole evidence searched for during the surveys included latrines, feeding evidence, feeding stations, burrows, grazed lawns, footprints and runways through vegetation. The survey area included 250m of each watercourse on either side of the Proposed Scheme, where accessible, and 100m either side, as summarised in Table 3-1 (**TR010038/APP/6.1**).
- 3.3.2. Relative water vole population size for each 100m of surveyed watercourse was estimated using current guidance from Dean *et al.* (2016) based on the number of latrines recorded. Results were then recorded as "high", "medium" or "low" relative population size. In watercourses, or stretches of watercourses, where no water vole latrines were identified (where other water vole field signs were recorded to confirm presence), water voles were recorded as present with no relative population size estimated.
- 3.3.3. Results are presented in Appendix A (Otter and Water Vole Surveys Results Map) (**TR010038/APP/6.3**). This interpretation acts as an aid for devising water vole mitigation strategies.

Table 3-1: Survey areas and justification for undertaking the survey

Point of Potential Impact	Watercourse Type	Justification for Survey	Bank Substrate	Water Depth (cm)
Point 1	Ditch	Adjacent to Proposed Scheme footprint	Earth and stone	<25cm
Point 2	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	<0.5m – 1.5m
Point 3	River Tud	Within Proposed Scheme DCO boundary	Earth	<0.5m – 1.5m
Point 3a	River Tud	Within Proposed Scheme DCO boundary	Earth	<0.5m – 1.5m
Point 3b	River Tud	Within Proposed Scheme DCO boundary	Earth	<0.5m – 1.5m
Point 4	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	>0.5m
Point 5	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	>0.5m
Point 6a	River Tud	Proposed Scheme crosses River Tud	Earth	>0.5m
Point 6b	River Tud	Proposed Scheme crosses River Tud	Earth	0.5m -1.0m
Point 6c	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	0.5m -1.0m
Point 6d	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	0.5m -1.0m
Point 7	River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	>0.5m
Point 8	Ditched to north of River Tud	Within 100m of Proposed Scheme DCO boundary	Earth	0.25m -1.0m

3.4. Limitations

- 3.4.1. Throughout the survey area, there were sections that could not be surveyed due to the water depth or dense vegetation. These sections were bypassed, and the survey continued in areas that were accessible further along the water courses. This is a significant constraint, as an accurate density of water voles on each water course could not be calculated.
- 3.4.2. In October 2019, a section of the River Tud, was inaccessible due to cattle being present with their calves and could not be surveyed for health and safety reasons. In addition, during this time the river was also in spate, and survey conditions were suboptimal due to the likelihood that signs will have been washed away and entrances to burrows flooded. Surveys were completed in this location in June 2020.
- 3.4.3. Due to the large stretch of the River Tud requiring survey it was sometimes difficult to record water vole latrines in their exact location. As such, for areas

two, three, 3a and 3b, for the population size class estimates, the number of latrines recorded in these areas was divided by the number of 100m stretches within the total length of the area. For example, for area three – six (the number of latrines) / 3.32 (the total length 332m) = 4.5 water vole density per 100m. As such, this population size estimate for the entire stretch of each area surveyed may not accurately demonstrate stretches of watercourse within areas which have a higher density (or lower density, or absence) of water vole.

- 3.4.4. Construction is programmed to begin in 2023. The ecology of a site is subject to change and as mammals are highly mobile it is recommended that an update survey is undertaken in 2021 to 2022 (or before this time should works be re-programmed to start earlier) to update the information collected in this survey. This would allow time for the consideration of matters related to planning and licensing as required.

4. Results

4.1. Field survey results

- 4.1.1. The results of the otter and water vole survey are outlined below. Site photographs are included in Appendix B (**TR010038/APP/6.3**).
- 4.1.2. There are eight points at which the River Tud and its tributaries are at risk of being directly impacted by the Proposed Scheme. All which are situated in rural areas with surrounding land used for either livestock, or arable farming, and are relatively undisturbed by human activities. The immediate habitat surrounding the watercourses generally comprises hedgerows, grassland and scrub, which is suitable for supporting both otters and water voles.
- 4.1.3. The watercourse banks generally have a substrate composed of earth and are covered with dense marginal vegetation suitable for supporting water voles and otters, as this vegetation creates bank-side cover. The water depth was generally low throughout these eight points and emergent vegetation was present thereby providing further cover to any water voles.
- 4.1.4. The River Tud is connected to the River Wensum Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC), designated for its chalk stream aquatic floral habitats and presence of white-clawed crayfish *Austropotamobius pallipes*.

4.2. Otters

- 4.2.1. One potential otter holt was found at Point 3.
- 4.2.2. Fresh otter spraint (less than 24hrs old) was recorded in five locations over the site:
- Point 2 – Mattishall lane – 1 spraint
 - Point 3a – Area 43 – 3 spraints
 - Point 3b – Area 43 – 1 spraint
 - Point 6a – River Tud, Easton Estates – 1 spraint
 - Point 6b – River Tud, Easton Estates - 1 spraint
 - Point 6c – River Tud, Easton Estates - 1 spraint
 - Point 7 – Church House Farm - 1 spraint
- 4.2.3. Other signs include otter footprints, which were found in Points 6a, 6b and 6c, and Point 7. Fresh otter anal jelly was also found at Point 7. Otter feeding remains comprising of signal crayfish *Pacifastacus leniusculus* were at 2

locations, at Points 2 and 6. One potential otter slide was also found at Point 2 and one at Point 7.

4.2.4. This shows that otter presence is site-wide and it is likely that the River Tud is an important commuting and foraging corridor for this species. Figures 1-8 in Appendix A (Otter and Water Vole Survey Results) illustrates these results (TR010038/APP/6.2, TR010038/APP/6.3).

Water Voles

4.2.5. Signs of water vole activity were recorded on site and are displayed in Table 4-1 below (TR010038/APP/6.1). Results are also illustrated on Figures 1-8 in Appendix A (Otter and Water Vole Survey Results) and in Photographs 1-4 of Appendix B (Site Photographs) (TR010038/APP/6.2, TR010038/APP/6.3).

Table 4-1: Summary of water vole signs and water vole density

Location	Water Vole Signs	Water Vole Density (per 100m)	Estimate Population Size (per 100m)	Notes (if any)
Point 2 - Mattishall lane (200m)	5 water vole latrines 1 water vole feeding remains	2.5	Low	River in spate therefore potential latrines no longer present
Point 3 - Area 43 (332m)	6 water vole burrows 15 water vole latrines 6 water vole footprints 4 water vole feeding remains (bent)	4.5	Low	River in spate
Point 3a - Area 43 (525m)	6 water vole burrows 9 water vole latrines 12 water vole footprints 1 water vole feeding remains (bent)	1.7	Low	River in spate
Point 3b - Area 43 (535m)	4 water vole burrows 10 water vole latrines 1 water vole footprints 4 water vole feeding remains (bent)	1.8	Low	River in spate
Point 4 - Church Lane (100m)	1 water vole latrine 1 water vole footprint	1	Low	River in spate
Point 6a - Easton Estates	1 water vole burrows 1 water vole footprints 1 water vole feeding remains	N/A	N/A	River in spate
Point 6b - Easton Estates	1 water vole burrows 2 water vole footprints	N/A	N/A	River in spate
Point 6c - Easton Estates	1 water vole burrows 2 water vole footprints	N/A	N/A	River in spate

Point 6d – Easton Estates	8 water vole burrows 1 water vole latrine	N/A	N/A	None
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4.3. Other Notable Species

- 4.3.1. In addition, Himalayan balsam *Impatiens glandulifera* was observed on the banks of the River Tud at Points 4 and 7, as illustrated in Figure 1 in Appendix A (Otter and Water Vole Survey Results) (**TR010038/APP/6.2, TR010038/APP/6.3**). This plant is listed on Schedule 9 of the WCA 1981 (as amended) and as such it is an offence to cause the spread of this species in the wild.
- 4.3.2. In addition, signal crayfish was observed within otter feeding remains at Point 2, as illustrated in Figure 1 (**TR010038/APP/6.2**). This species is listed on Schedule 9 of the WCA 1981 (as amended) and as such it is an offence to cause the spread of this species in the wild.

5. Conclusions and requirements

5.1. Habitat

- 5.1.1. Mitigation measures will be implemented to prevent any reduction in water quality or increase in sediment loadings to the watercourses. During construction, best practice for pollution prevention and water management would be implemented by the Delivery Partner as part of the overall Environmental Management Plan (EMP). Guidance on best practice in relation to pollution prevention and water management is set out in Construction Industry research and Information Association (CIRIA) Guidelines (Soubry, M. (2001), Murnane, E. *et al.*, (2006), and Charles and Edwards (2015)), and the Environment Agency's approach to groundwater protection (2017a) and groundwater protection guides (2017e), as required under the Water Framework Directive. These guidelines should be adhered to where works are being undertaken near or within watercourses.
- 5.1.2. Particular attention should be made to watercourses connecting to the River Wensum SSSI and SAC, namely the River Tud. Consultation with Natural England regarding potential impacts to this site is to be undertaken prior to construction and mitigation measures included within the Environmental Management Plan (EMP).

5.2. Otters

- 5.2.1. Otter presence has been confirmed to occur within 2km of the site and on-site for commuting and foraging. Several signs of otter presence (including spraint, feeding remains, a slide and a potential holt) were recorded throughout the areas of the River Tud that were surveyed, which confirms that otter use this site. No direct habitat loss is predicted to occur.
- 5.2.2. As a potential holt was found at area 3b which lies within the Proposed Scheme DCO boundary, camera trapping should be undertaken to ascertain whether this is in fact an otter holt. This will inform mitigation design and the requirement for a licence from Natural England.
- 5.2.3. In light of the above, the proposed works must not limit the ability of otters to move freely up and down the River Tud during construction or operation. The construction work where the Proposed Scheme crosses the River Tud must be fenced off with temporary wire mesh (50mm) and post and rail fencing along the road and around the works area to prevent any otters from crossing the roads and entering the works area, during construction. Permanent fencing must be installed after the works have been completed, to prevent otters from crossing the roads during operation and being killed. In addition, any excavations and

trenches that are created as part of the works should be covered at night (or an exit ramp provided) to minimise the likelihood of otters being injured, and all lighting should cease at night so that otters are not disturbed.

- 5.2.4. Otter ledges are to be installed at new culverts and the River Tud crossing will have wide banks underneath for otter to move along and prevent them trying to go over the road.
- 5.2.5. Access was not possible to the west of the bridge at Point 5 due to health and safety reasons. Dense vegetation should be cut to an appropriate length thereby allowing the surveyors to enter the watercourse and carry out an otter survey.

5.3. Water Voles

- 5.3.1. Water vole presence has been confirmed to occur within 2km of the site and on-site. Several signs of water vole presence (including burrows, latrines, feeding remains and footprints) were recorded throughout the areas of the River Tud that were surveyed, which confirms that water vole use this site.
- 5.3.2. No permanent direct habitat loss is predicted, and habitat will be enhanced for this species.
- 5.3.3. In areas where the Proposed Scheme does not cross the River Tud, works must be more than 5m from the top of the banks of the River Tud. Dependent on the length of any areas of the River Tud where water voles are present that may have to be temporarily disturbed by works, these are likely to require that the water voles are displaced by habitat manipulation (if 50m long or less) or a full science, education and conservation licence (if over 50m long). Displacement can be undertaken by an ecologist that holds a Natural England licence to displace water voles for development projects between 15 February and 15 April.
- 5.3.4. Part of the River Tud lies within the Proposed Scheme DCO boundary (Points 3a, 3b and 3c, and Point 6) and a further six areas of the River Tud, at Points 1, 2, 4, 5, 7 and 8 lie within 100m of the Proposed Scheme DCO boundary. Where the Proposed Scheme footprint will cross the River Tud, it is likely that works must be undertaken under a full science, education and conservation licence (translocation of water voles with a method statement and mitigation plan) after consultation with NE for the relocation of water voles, due to these works being of a permanent nature and over 50m in length.
- 5.3.5. Translocation means the capture and relocation of water voles from the area to another suitable area of habitat for supporting water voles. This should only be done when there is no reasonable alternative (i.e. displacement of water voles). In order for translocation to occur, compensatory water vole habitat must be

created first into which the water voles can be relocated permanently, once the habitat is of optimum condition for supporting water voles. Trapping and translocation must be completed in the spring where the water voles can become accustomed to the new habitat, prior to the peak of the breeding season and when food sources are in abundance.

- 5.3.6. Trapping and translocation must be undertaken under a science, education and conservation licence from Natural England permitting this activity.
- 5.3.7. Access was not possible to the western part of the bridge at Point 5, due to health and safety reasons. It is necessary that the dense vegetation is cut to an appropriate length thereby allowing the surveyors to enter the watercourse and carry out a water vole survey.

5.4. Other Notable Species

Himalayan Balsam

- 5.4.1. Occasional Himalayan balsam was observed on the banks of the River Tud at points 4 and 7, and it is possible that the works will disturb this species.
- 5.4.2. It would be an offence under Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended) to cause invasive species to spread. If taken away from the site, viable material containing these species is also identified as 'controlled waste' under the Environment Protection Act 1990 and must be disposed of properly at permitted landfill sites.
- 5.4.3. Invasive non-native plants can cause problems for native UK species and reduce biodiversity. Should this species spread onto the site, it is recommended that the Himalayan balsam should be removed prior to the commencement of work, which should be undertaken by hand pulling before June when it flowers. This is due to the plant being capable of projecting its seeds several metres upon disturbance. The plant can also be strimmed down in early spring and kept at a low height to prevent flowering occurring.
- 5.4.4. Chemical control near water can be carried out with herbicides containing glyphosate or 2, 4-D amine. Glyphosate will also kill grasses, but 2, 4-D amine will kill only broadleaved weeds; for best effect, use when the plant is small and actively growing, particularly in springtime. Further details can be found on the GB Non-native Species Secretariat website (GB Non-native Species Secretariat, 2016) and in the guidance on the UK Government website (Gov.UK, 2016).

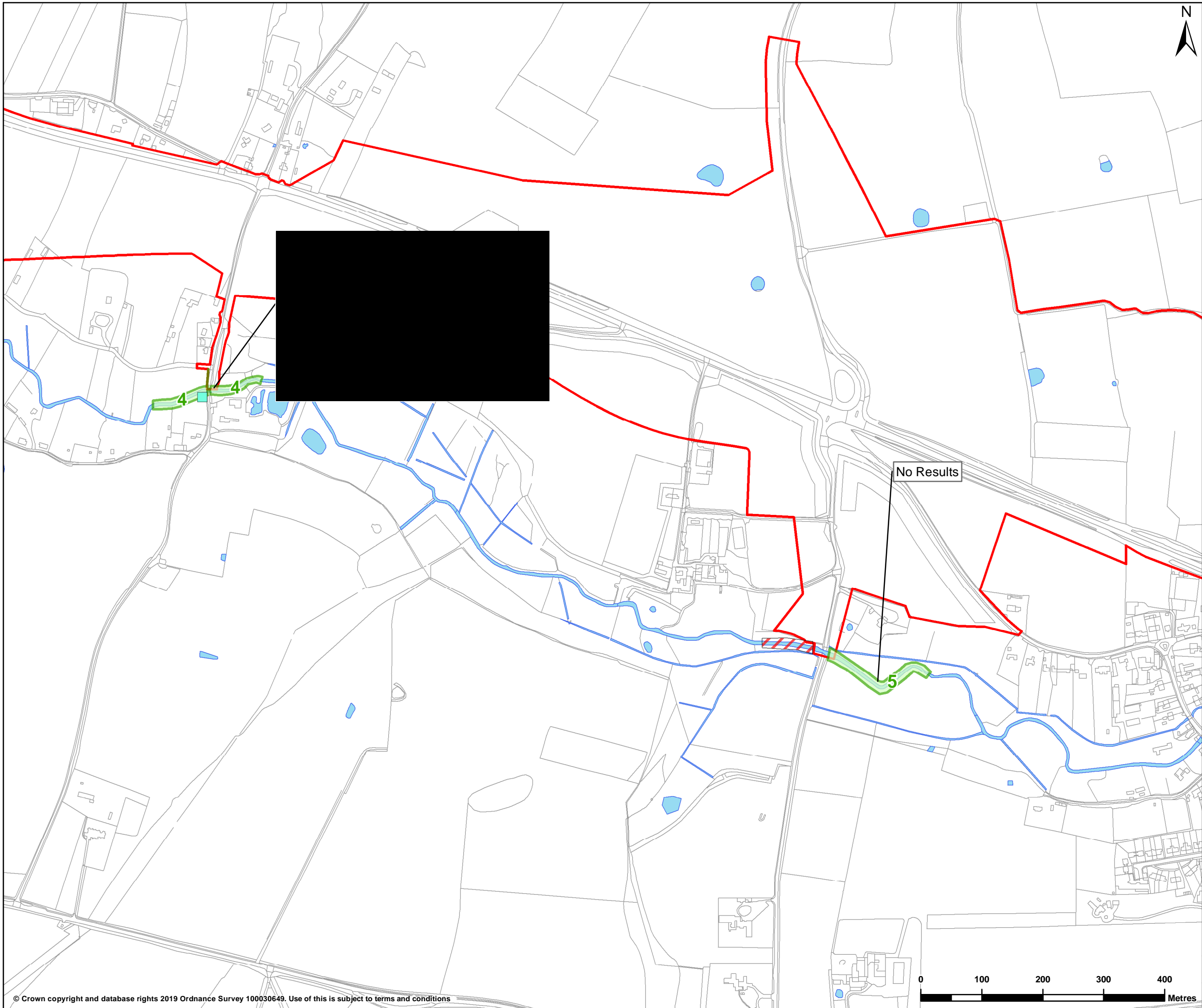
Signal Crayfish

- 5.4.5. In addition, signal crayfish was observed within otter feeding remains at Point 2. This species is listed on Schedule 9 of the WCA 1981 (as amended) and as such it is an offence to cause the spread of this species in the wild.
- 5.4.6. Biosecurity is known to be the best defence against further spread of the signal crayfish. The GB Non-native Species Secretariat website (GB Non-native Species Secretariat, 2016) Clean, Check, Dry Policy should be adhered to for any contractors working in the water. If a signal crayfish is found, it should be brought ashore or for humane destruction.

6. References

- 6.1.1. Amey (2017). Road Investment Strategy. East Area 6. A47 North Tuddenham to Easton. Interim Environmental Assessment Report. A47IMPS2-AMY-TE-ZZ-DO-J0024.
- 6.1.2. Chanin, P. (2003). Monitoring the otter. Conserving Natura 2000, Rivers Monitoring Series No. 10, English Nature, Peterborough, UK.
- 6.1.3. Charles, P. and Edwards, P. (2015) Environmental good practice on site guide (Fourth Edition). CIRIA C741
- 6.1.4. Dean *et al.*, (2016). The Water Vole Mitigation Handbook (*The Mammal Society Guidance Series*). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.
- 6.1.5. Environment Agency. (2017d). Protect groundwater and prevent groundwater pollution. [online] Available at: <https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution>
- 6.1.6. Environment Agency. (2017e). Groundwater protection technical guidance. [online] Available at: <https://www.gov.uk/government/publications/groundwater-protection-technical-guidance>
- 6.1.7. A47 Schemes. North Tuddenham to Easton Otter and Water Vole Survey Results (HE551489 -AMY-EBD-TE_STG2-DR-EN-0006 (Amey, 2017)).
- 6.1.8. Morris *et al.* (1998). Estimating numbers of the water vole *Arvicola terrestris*: a correction to the published method. *Journal of Zoology*, **246**: 61.62.
- 6.1.9. Murnane, E., Heap, A. and Swain, A. (2006) Control of water pollution from linear construction projects. Technical guidance. CIRIA C648
- 6.1.10. Soubry, M. (2001) Bridge Detailing Guide. CIRIA C543
- 6.1.11. Strachan, R., Moorhouse, T. & Gelling, M. (2011). Water Vole Conservation Handbook (3rd Edn). Wildlife Conservation Research Unit, Oxford.

Appendix A. Otter and water vole survey results



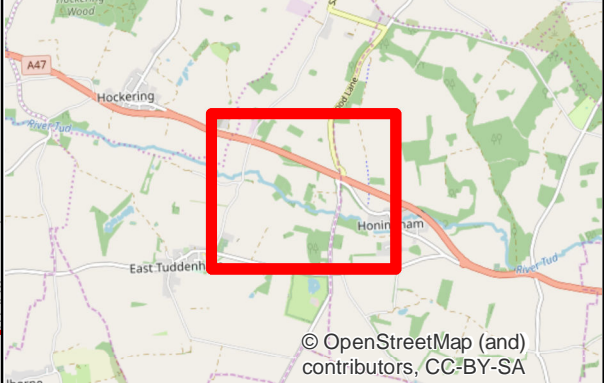
LEGEND

- Scoping Boundary
- Himalayan balsam
- Suvey area
- Inaccessible area
- Waterbody

- Otter field signs:**
- H - Holt
 - FP - Footprints
 - FR - Feeding remains
 - SL - Otter slide
 - SP - Otter Spraint

- Water Vole Survey:**
- B - Burrow
 - FP - Footprint
 - FR - Feeding remains
 - L - Latrines

REFERENCE MAP



P02	05/02/2020	First Edition	AC	BM	FB
REV	DATE	REVISION NOTE	ORG	CHK'D	APP'D

DESIGNER

CONTRACTOR

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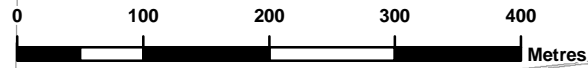
PROJECT TITLE
A47 NORTH TUDDENHAM TO EASTON
TR010038/APP/6.2

PROJECT STAGE
PCF STAGE 3

DRAWING TITLE
ANNEX A OTTER AND WATER VOLE SURVEY
RESULTS
SHEET 2 OF 3

SUITABILITY
FOR INFORMATION

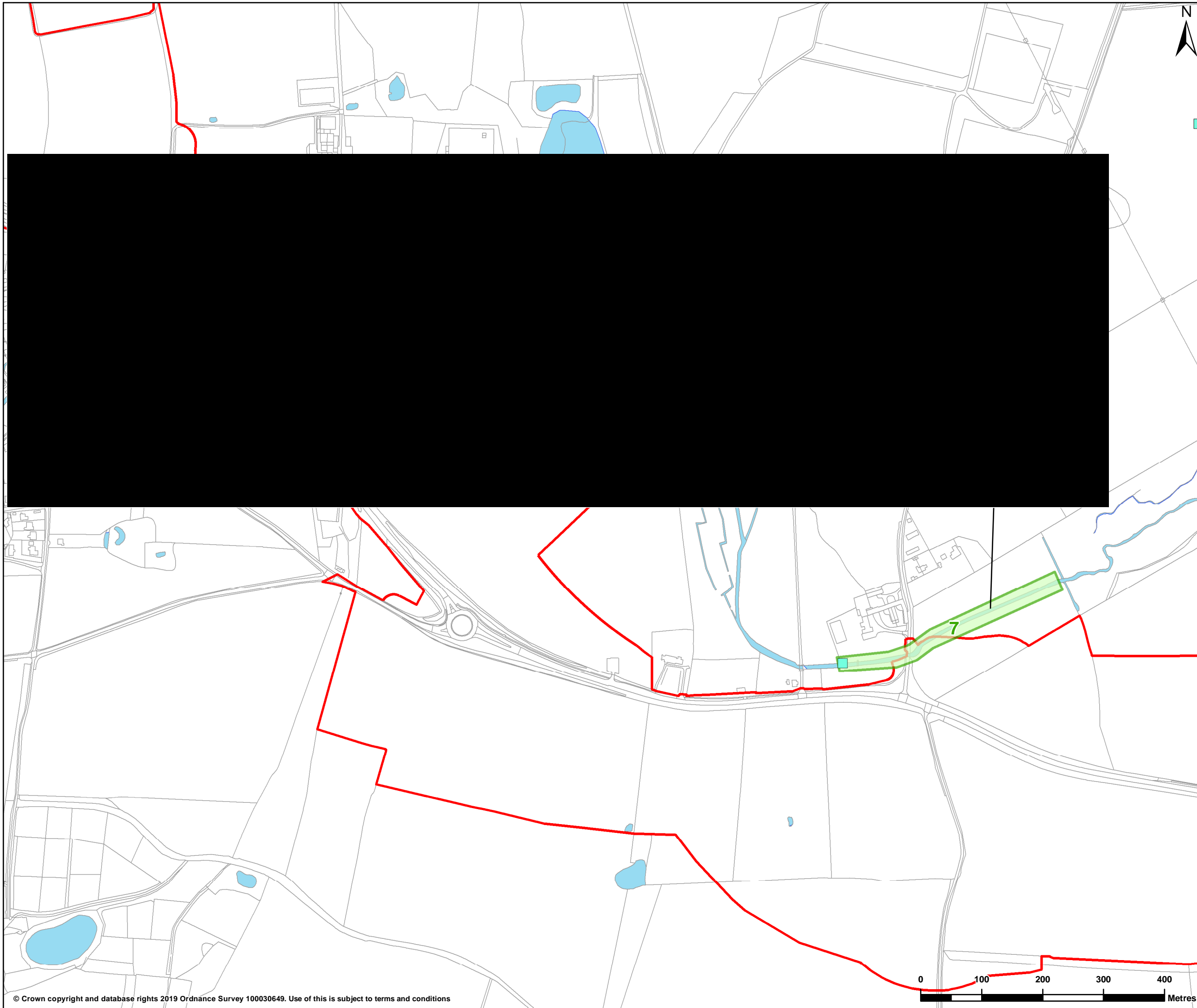
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HE551489-GTY-EDB-000-DR-LB-30016



LEGEND

- Suvey area
- Scoping Boundary
- Waterbody
- Himalayan balsam

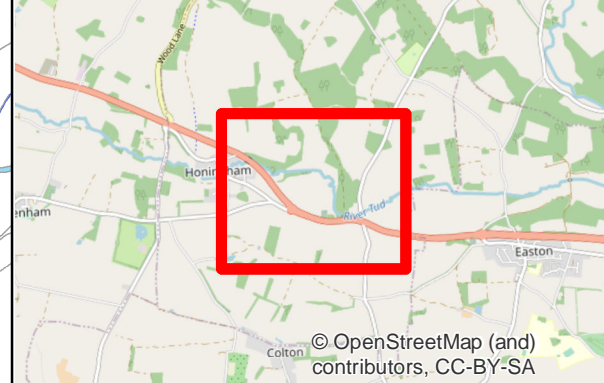
Otter field signs:

- H - Holt
- FP - Footprints
- FR - Feeding remains
- SL - Otter slide
- SP - Otter Spraint

Water Vole Survey:

- B - Burrow
- FP - Footprint
- FR - Feeding remains
- L - Latrines

REFERENCE MAP



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DESIGNER

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PROJECT TITLE
A47 NORTH TUDDENHAM TO EASTON
TR010038/APP/6.2

PROJECT STAGE
PCF STAGE 3

DRAWING TITLE
ANNEX A OTTER AND WATER VOLE SURVEY
RESULTS
SHEET 3 OF 3

SUITABILITY
FOR INFORMATION

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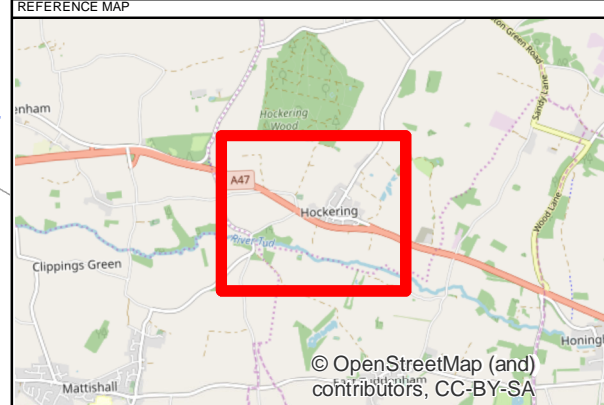


LEGEND

- Scoping Boundary
- Survey area
- Waterbody

Otter field signs:
 H - Holt
 FP - Footprints
 FR - Feeding remains
 SL - Otter slide
 SP - Otter Spraint

Water Vole Survey:
 B - Burrow
 FP - Footprint
 FR - Feeding remains
 L - Latrines



P01	11/02/2020	First Edition	AC	BM	FB
REV	DATE	REVISION NOTE	ORG	CHKD	APPD

DESIGNER

SWECO

CONTRACTOR

GallifordTry

CLIENT

**highways
england**

PROJECT TITLE

A47 NORTH TUDDENHAM TO EASTON
TR010038/APP/6.2

PROJECT STAGE

PCF STAGE 3

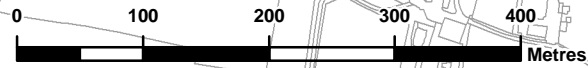
DRAWING TITLE

ANNEX A OTTER AND WATER VOLE SURVEY
RESULTS
SHEET 1 OF 3

SUITABILITY

FOR INFORMATION

SHEET SIZE	SCALE	STATUS
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DRAWING NUMBER

HE551489-GTY-EDB-000-DR-LB-30015

Appendix B. Site photographs

Figure B.1 Photograph of potential otter holt at Point 3b – Area 43.



Figure B.2 Photograph of otter feeding remains Point 2 – Mattishall Lane.

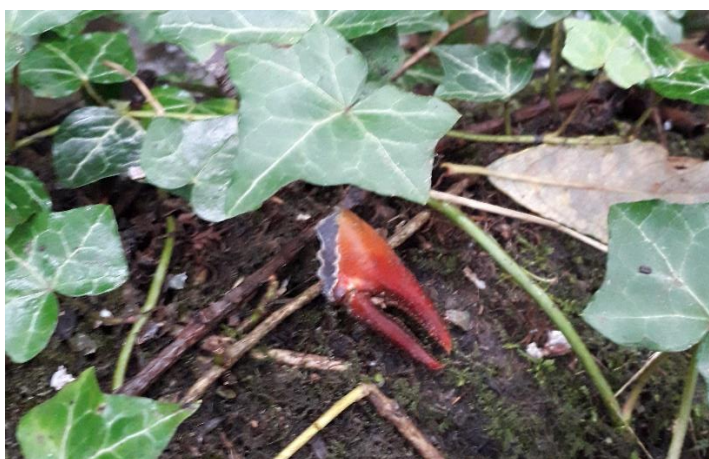


Figure B.3 Photograph of otter spraint at Point 6 – Easton Estates.



Figure B.4 Photograph of water vole footprint at Point 6 – Easton Estates.



Figure B.5 Photograph of a water vole latrine at Point 3b – Area 43.



Figure B.6 Photograph of a water vole burrow at Point 6 – Easton Estates.

