A12 Chelmsford to A120 widening scheme

TR010060

9.18 Supplementary Riparian Mammal Survey Report

Rule 8(1)(k)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Regulations 2010

Volume 9

January 2023

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Examination Procedure) Rules 2010

A12 Chelmsford to A120 widening scheme

Development Consent Order 2022

Supplementary Riparian Mammal Survey Report

Regulation Number	Rule 8(1)(k)
Planning Inspectorate Scheme Reference	TR010060
Application Document Reference	TR010060/EXAM/9.18
Author	A12 Project Team and National Highways

Version	Date	Status of Version
Rev 1	January 2023	Section 51 Additional submission

CONTENTS

APPENDICES

LIST OF TABLES

Acronyms and Abbreviations

CIEEM	Charted Institute of Ecology and Environmental Management
DCO	Development Consent Order
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
LNR	Local Nature Reserve
LWS	Local Wildlife Site
NERC	Natural Environment and Rural Communities Act 2006
NNNPS	National Networks National Policy Statement
NSIP	Nationally Significant Infrastructure Project

1 Executive Summary

1.1.1 This report presents an evaluation of otters (*Lutra lutra*) and water voles (*Arvicola amphibious*) based on supplementary surveys undertaken in 2022 which updates the Environmental Statement (ES) Appendix 9.10 Riparian Mammal Survey Report [TR010060/APP/6.3] included in the DCO submission. It also presents the policy and legislative context within which the environmental impact assessment has been carried out. Likely significant effects on, and mitigation for otters and water voles, are considered in Chapter 9 of the ES.

1.1.2 Otter and water vole are both protected under UK legislation. Both are species of principal importance and Essex BAP Species (Essex Field Club). Their populations have declined in numbers due to habitat loss, fragmentation, use of pesticides or predation. However, their populations have recovered slightly in the UK and Essex (Chanin, 2003a and McGuire *et al.,* 2017).

1.1.3 The supplementary surveys in 2022 followed best practice guidance in Chanin (2003a), Chanin (2003b) and Dean (2016). Two surveys were undertaken on 20 July 2022 and 22 August 2022. Monitoring of suitable features for riparian mammals using field cameras was undertaken between 20 July 2022 and 4 October 2022.

1.1.4 Otter and water vole surveys were completed along the River Blackwater 200m up and downstream of the Order Limits where crossed by the gas main diversion to the south of Whetmead Local Nature Reserve (LNR) and Local Wildlife Site (LWS).

1.1.5 Otter signs, including live sightings on cameras, spraints, feeding remains, a potential holt within a black poplar (*Populus nigra*), a potential couch and a confirmed sprainting location were recorded within the study area. In addition, the landowner has reported use of the potential holt by otters and Essex Wildlife Trust survey data also indicates that the black poplar is a potential holt.

1.1.6 No potential water vole burrows and signs of activity were found along the River Blackwater and associated waterbodies despite the sub-optimal habitat present during the surveys. Water voles are therefore likely absent from this part of the proposed scheme.

1.1.7 National Highways is working with the owner of the gas main to develop the design and construction methodology for the gas main diversion which could impact this part of the proposed scheme. Where practicable impacts will be avoided or otherwise mitigated.

2 Introduction

2.1 Background

2.1.1 The A12 Chelmsford to A120 Widening Scheme (the 'proposed scheme') comprises improvements to the A12 between junction 19 (Boreham) at TL 741094, and junction 25 (Marks Tey) at TL 917238, a distance of approximately 24km, or 15 miles. The proposed scheme involves widening the A12 to three lanes throughout. It also includes safety improvements, including closing of existing at grade accesses, and reducing access to cyclists along the dual carriageway by providing an alternative route for walkers, cyclists and horse riders.

2.1.2 The proposed scheme would require new crossings of watercourses and potential improvements to existing culvert and bridge crossings. There are eight crossings of main rivers, six of which comprise existing crossings and two of which comprise new crossings on proposed offline sections of road. Three of the crossings would require minor realignments at the crossing points.

2.1.3 There are various gas mains that would be affected by the proposed scheme and would therefore need to be diverted from their existing location to avoid clashes with the proposed scheme. The asset referred to as Little Braxted to Springfield – A1A2 is of particular importance due to the extent of the diversion required (this is referred to as 'the gas main diversion' through the ES. The works to widen the A12 as part of the proposed scheme would cause two principal pinch-points that would require diversion of the existing gas main into a new corridor. The two pinch-points are:

a. where the gas main passes between the A12 and existing housing and church by Maldon Road

b. where the gas main passes between the A12 and Whetmead Local Nature Reserve (LNR).

2.1.4 The proposed scheme is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act (2008), triggering the need to apply for a Development Consent Order (DCO). A DCO application was submitted to the Planning Inspectorate (PINS) by National Highways in August 2022 and was accepted by the Planning Inspectorate on 12 September 2022. The application was supported by an Environmental Statement (ES) which included numerous appendices. Appendix 9.10 (Riparian Mammal Survey Report) of the ES summarised the baseline data collected with respect to otters and water vole.

2.1.5 Due to the iterative nature of the design process in the lead up to DCO submission there were changes in the Order Limits. Some of the changes occurred subsequent to the end of the optimal survey season for protected species and therefore a small number of surveys could not be completed prior to the DCO submission hence their inclusion in supplementary reports.

2.2 Purpose of the report

2.2.1 This report presents the results of these additional riparian mammal surveys of the gas main diversion (Little Braxted to Springfield A1A2, Chapter 2 of the ES [TR010060/APP/6.1]) undertaken in 2022, on sections of watercourse not covered by the original suite of surveys reported in Appendix 9.10 of the ES. Likely significant effects on, and mitigation for otters and water voles are considered in Chapter 9 of the ES, and this report concludes whether the results of the surveys affect the results of that assessment. It presents the policy and legislative context within which the environmental impact assessment (EIA) has been carried out.

2.3 Survey Objectives

2.3.1 The key objectives of these surveys were to:

c. determine the presence or likely absence of otter and water vole within the study area

d. identify foraging habitat suitable for otter and water vole within the study area

e. identify otter and water vole commuting routes and habitats of importance to otter and water vole within the study area

f. record any sites used by otter and water vole for refuge, shelter, protection and other field signs indicative of activity to identify distribution and status in the study area

g. identify the likely breeding status of otter and water vole in the study area

h. provide an evaluation for the water vole population in the study area

i. verify or update the assessment of potential impacts on otter and water vole (as detailed within the ES)

j. determine requirements for additional mitigation if necessary.

3 Riparian mammal ecology

3.1.1 Many mammals live in close association with rivers and streams, including otter, water vole, water shrew *Neomys fodiens* and the reintroduced beaver *Castor fiber*. The American mink *Neovison vison* is also present in the UK, although this is an introduced species.

3.1.2 Otter and water vole are riparian mammals and are the primary focus of this report. These species are known to be present in the study area from historical records and are of conservation concern nationally.

3.1.3 American mink are present within the study area and their presence is known to impact water vole populations (Dean, 2016). American mink are no considered further in this report.

3.1.4 There are two records of water shrew near the proposed scheme (junction 19), identified within the River Chelmer. Little is known about the water vole distribution and population status in Essex.

3.1.5 Specific water shrew surveys are not proposed within this study due to the limited legal protection afforded to this species. Any impacts to water shrew will be mitigated through generic waterway, otter, and water vole mitigation measures. Water shrew are not considered further within the report.

3.1.6 Brown rat *Rattus norvegicus* is a common and widespread riparian mammal throughout the UK and the local area and as such is also not considered further in this report.

Otter

3.1.7 Otters are members of the Mustelidae family of carnivores, which include badger *Meles meles*, polecat *Mustela putorius*, American mink, ferret *Mustela putorius furo*, stoat *Mustela ermine*, weasel *Mustela nivalis*, and pine marten *Martes martes*.

3.1.8 Otters are solitary animals, usually active at dusk and throughout the night, although they are sometimes active during the daytime. They are very territorial and can travel over large areas; male otters can have a home range encompassing up to 50km of river (Chanin, 2003a).

3.1.9 Otters mainly eat fish, although crustaceans, frogs, voles, and aquatic birds may also be a food resource (Chanin, 2003a). Otters produce a characteristic sweet-smelling, musky, faecal pile known as a spraint. Spraints can often be found deposited in prominent places such as on logs, tree roots, rocks, and berms.

3.1.10 In addition to rivers, otters are encountered on small streams, ditches, ponds, lakes, canals, marshes, coastal areas, and estuaries (Chanin, 2003a). An otter's resting site is described as any site that an otter uses to stop when not engaged in foraging or commuting, which are often referred to as holts. Otter holts may be in a tree root system, a hole in a bank, or under a pile of rocks. Drains and caves have also been recorded as otter holts (Natural England, 2011). Otters can rest above ground, in vegetation, creating flattened areas known as couches (Chanin, 2003a).

3.1.11 Tunnels, cavities, or other covered structures have been recorded as potential holts; however, it is not always possible to determine how many of these are used by otters. This is because spraints are not always found beside the potential holt (Chanin, 2003a).

3.1.12 Breeding can occur at any time of year with one to four pups being born; the pups remain dependent on their mother for one year (Natural England, 2011).

3.1.13 Females use a breeding site within their home range that is undisturbed, away from flooding, and close to a good food supply (Liles, 2003). A distinction is made between the breeding site and the natal den (see Table 5-2). Identifying the location of natal den appears to be extremely difficult (Chanin, 2003a) and may be some distance from major rivers.

3.1.14 Otter populations declined rapidly in the 1960s due to the pollution of watercourses by pesticides. A ban on certain pesticides has resulted in an increase in otter numbers and they are now widely distributed across England, but still rare and uncommon in some areas of the UK (Chanin, 2003a).

Water vole

3.1.15 Water voles are members of the Cricetidae family of the Muroidea superfamily, which include bank voles *Myodes glareolus* and field voles *Microtus agrestis* in the UK. The water vole is the largest vole species in Britain and can be found along well vegetated banks of slow moving, relatively deep watercourses. These watercourses include rivers, ditches, dykes and lakes (Strachan *et al.*, 2011).

3.1.16 Water voles excavate extensive burrow systems into the banks, with entrances close to water level, however they do not need to be above water level (Dean, 2016). Burrows have also been found behind stonework with suitably sized gaps or behind sheet piling where water voles can access the banks. Water voles can create burrows within distance from the water's edge, where the substrate at the toe of the bank is unsuitable (Dean, 2016).

3.1.17 Water voles are herbivorous, primarily feeding on the aerial stems and leaves of waterside plants. Their diet is varied and includes fruit, underground roots, tubers and bark in the autumn and winter (Strachan *et al.*, 2011).

3.1.18 The water vole breeding season is from March to October and females can have two to five litters per season. During the breeding season water voles live in colonies (Strachan *et al.*, 2011). They do not hibernate but spend a lot of time sheltering in their burrows in the winter months.

3.1.19 Water voles are found throughout Britain but have undergone an estimated decline of 70% between the 1980s and 1990s and an estimated 30% decline between 2006 and 2015 across England and Wales (McGuire *et al.,* 2017). Recent records show a slight increase in distribution between 2011 and 2015.

4 Legislation and policy

4.1.1 The provisions of international legislation, incorporated into UK law and relevant to the assessment, are identified in Section 4.1.

4.1 Legislation

4.1.1 Water voles are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 and are a priority conservation species. It is an offence to intentionally capture, kill, or injure water voles; damage, destroy, or block access to their places of shelter or protection (on purpose or by not taking enough care); disturb them in a place of shelter or protection (on purpose or by not taking enough care); possess, sell, control, or transport live or dead water voles or parts of them (not water voles bred in captivity).

4.1.2 Otters are fully protected under Section 43 of the Conservation of Habitats and Species Regulations 2017 as a European Protected Species (EPS) and also under Section 9(4) of the Wildlife and Countryside Act 1981. It is an offence to capture, kill, disturb, or injure otters (on purpose or by not taking enough care); damage or destroy a breeding or resting place (deliberately or by not taking enough care); obstruct access to their resting or sheltering places (deliberately or by not taking enough care); possess, sell, control, or transport live or dead otters, or parts of otters.

4.1.3 Licences can be granted by Natural England, the licensing authority in England, to allow activities that would otherwise be illegal (e.g. the destruction of otter and water vole habitats as a result of development activity) to take place. The activities must be carried out in accordance with the provisions of the licence whereby the favourable conservation status of the species is maintained.

4.1.4 Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC) places a duty on all public bodies to have regard to the conservation of biodiversity in England, when carrying out their normal functions (the biodiversity duty).

4.1.5 Section 41 of NERC lists otter and water vole as species of principal importance for the purpose of conserving biodiversity.

4.1.6 Otters and water voles are included in the UK post 2010 biodiversity framework and the Essex BAP, which identify them as being the most threatened species which require conservation.

4.2 National Networks National Policy Statement

4.2.1 The National Networks National Policy Statement (NNNPS) sets out the Government's policies to deliver the development of nationally significant infrastructure projects (NSIP) on the national road and rail networks in England. The Secretary of State uses the NNNPS as the primary basis for making decisions on DCO applications.

4.2.2 Paragraph 5.22 of the NNNPS states that the applicant's assessment should describe any likely significant effects on internationally, nationally, and locally designated sites of ecological conservation importance; protected species;

habitats (including irreplaceable habitats such as ancient woodland and veteran trees); and other species identified as being of principal importance for the conservation of biodiversity. The surveys described in this report will inform the assessment of significant effects within the ES.

4.3 Priority species

4.3.1 Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC) places a duty on all public bodies to have regard to the conservation of biodiversity in England, when carrying out their normal functions (the biodiversity duty).

4.3.2 Section 41 of NERC lists otter and water vole as species of principal importance for the purpose of conserving biodiversity.

4.3.3 Otters and water voles are included in the UK post 2010 biodiversity framework and the Essex BAP, which identify them as being the most threatened species which require conservation.

5 Methodology

5.1 Desk Study

5.1.1 A desk study was undertaken in 2020 to obtain information pertaining to riparian mammal species in the study area and surrounding landscape. The desk study provided sufficient coverage of the gas main diversion.

5.1.2 The methodology and the results of the desk study are presented in detail in Appendix 9.10 Riparian Mammal Survey Report [TR010060/APP/6.3].

5.1.3 During a site meeting on 14 July 2022, the landowners reported an otter holt within a black poplar tree on the bank of the River Blackwater. Consultation with Essex Wildlife Trust in January 2023 confirmed their knowledge of the use of the site by otters.

5.2 Field Study

5.2.1 Surveys were undertaken for the gas main diversion where access had previously been refused by landowners. The survey area comprised the section of the River Blackwater within and downstream of the Order Limits, and a wet ditch which directly connects to the River Blackwater. It was not possible to survey 200m to the north of the Order Limits due to instability of the terrain.

5.2.2 Surveys were conducted in suitable weather conditions. Weather conditions prior to the surveys did not include heavy rainfall which would have affect the water level and potentially washed away evidence of otter and water vole.

Otter

5.2.3 Otter surveys were undertaken on 20 July 2022 and 22 August 2022 which is within the optimal survey season (May to September) for otters (Chanin, 2003b). Habitats within the study area were subject to survey in accordance with best practice guidance (Chanin, 2003a).

5.2.4 The otter survey comprised a thorough assessment of all suitable water features and terrestrial environs to visually inspect and assess them for their potential to support otter.

5.2.5 For features not previously visited, otter survey requirement was assessed during the first visit based on the surveyor's professional judgement, habitat suitability and surrounding hydrological or terrestrial connectivity.

5.2.6 Where access was restricted to potential resting sites they were visually assessed from the opposite bank without the need to enter the water.

5.2.7 Evidence of otters was recorded on the 'Otter Signs' layer of the Collector App on the ipad and included potential or confirmed resting sites (holts and couches), footprints, spraints, urination sites, feeding or prey remains, slides and pathways. Extra effort was made to search features considered to be good sprainting stations (i.e. bridges, culverts) and terrestrial habitat deemed suitable for otter holts.

5.2.8 The most diagnostic field sign left by otter are spraint. When recorded, these were assigned a category according to their age as listed in Table 5-1 below.

Table 5-1. Description of otter spraints

Spraint type	Description
Fresh	Wet spraints likely to have been deposited in the past 48 hours
Recent	Spraints in good condition (i.e. have retained shape and smell) but are likely to have been deposited in the last two weeks
Old	Spraints with a degraded structure and little or no smell are likely to be more than two weeks old

5.2.9 Otter resting sites recorded during field surveys were assigned a 'type' and a 'status' in accordance with Tables 5-2 and 5-3.

Table 5-2. Description of otter resting sites (Roper et al., 2007)

Resting site type	Description
Natal holt (or den)	Discreet holt site that is used by the female to birth cubs, often on small feeder streams or some distance from water. Mother and cub remain for three months after birth before moving onto secondary holt. Natal holts are extremely difficult to locate without radio-telemetry / long term surveillance as minimal signs of activity except for bedding.
Breeding site	An area of land, or open water and land, large enough to provide a breeding otter with the following: security from disturbance; one or more potential natal den sites; play areas for cubs; no risk of flooding; and access to a good food supply. Breeding sites may be large and are particularly sensitive to disturbance as young cubs are at risk out of the natal holt. Nursery areas within breeding sites show high levels of cub activity, e.g. evidence of play and learning, paths around or over obstacles, flattened patches of vegetation, grooming hollows, spraint stations, signs heaps and feeding remains. Holts in these areas are unlikely to be the primary natal holt where cubs where born.
Non-breeding holt	Cavity or hole in river / ditch bank; can be some distance from water, often within 50m but sometimes much further away. Located in the ground, under tree roots, with rocks or caves, in or under man-made structures. Back of holt cannot be readily seen. Otters may excavate ground if it is soft enough or take over a rabbit warren or sheep lay. Considered of suitable seclusion usually located away from direct disturbance where otter can rest undisturbed for long periods. Active holts contain field evidence such as spraints or prints and may occasionally have bedding material.
Grooming hollow	Depressions from otter cleaning and grooming activity. Often located in soft sand / fine gravel / bracken, although rabbit warrens or old badger setts can be used too.
Couch	Above ground area where otter can lie up / groom. Often a simple swirl or depression in tall grasses or may be covered in grass / bracken / reeds and sometimes contain bedding. In very isolated locations, females have been known to birth cubs in some couches although this is considered rare.
Hover	Bolt holt / ledge along bankside used for temporary cover when exiting the water. Distinguishes a site from a secluded holt where they are likely to rest up for long periods (during the day in river systems or at night in coastal areas). Back of the hover can be readily seen, footprints, feeding evidence and/or spraints often visible.

Table 5-3. Guidance for assigning status of otter resting sites (Bassett et al., 2010)

Resting site status (level of use)	Definition
Potential	Feature with absence of evidence of otter activity. Affords a suitable degree of cover and is linked to key features such as freshwater and abundance of prey. May be suitable for temporary 'stop off' for otters when commuting through their territory.
Low	Feature with limited evidence of otter activity – low number of spraints, not all classes present. Insufficient seclusion to be a breeding site or key resting site, unlikely to have links to the key otter requirements. Most likely to provide a temporary 'stop off' for otters when commuting through their territory.
Moderate	Feature containing sprainting with a range of age classes, but not in significant quantities. Availability may be limited by season, tides or flow. Unlikely to be suitable as a breeding / natal site but will be a key resting site and may be linked to other important features within the territory.
High	Feature has a high level of otter activity, including an abundance of sprainting of all age classes, large spraint mounds, well used grooming hollows, paths and slides. Affords a high degree of cover and is linked to key features such as fresh water and abundance of prey. May be suitable as a breeding area (spraints may be absent from natal holts). The site is usually available at all times of year and at high / low flow.

Water vole

5.2.10 Water vole surveys were conducted on 20 July 2022 and 22 August 2022. Habitats within the study area were subject to survey in accordance with best practice guidance (Dean, 2016).

5.2.11 The initial water vole survey comprised a thorough assessment of all suitable water features and terrestrial environs to visually inspect and assess them for their potential to support water vole.

5.2.12 Each water feature was assessed for eight habitat characteristics as described in Table 5-4 (Harris, 2002). The method is based upon that developed by Halcrow Group Ltd on behalf of Broadland Environmental Services (Halcrow, 2007).

Table 5-4. Water vole habitat suitability criteria (Halcrow, 2007)

Water vole habitat suitability criteria	Description
Well developed (>60%) bankside and emergent vegetation to provide cover	The vegetation should ideally be of a height greater than 30cm and should provide a relatively continuous cover. If the water level is obviously at a high point give thought to the position of the vegetation on the bank and imagine the water body at a time of normal water levels.
Year-round availability of food sources	Good mixture of vegetation types (grasses, reed and reed rhizomes, sedge and limited areas of scrub such as hawthorn or bramble) and plenty of currently green vegetation.

Water vole habitat suitability criteria	Description
Suitable refuge areas above extremes in water levels	Good refuge (i.e. an area of dense rush or grass tussocks) within 10m of the water margin and situated on higher ground, which would not become flooded at high water levels.
Steep banks suitable for burrowing	Banks are of a height of greater than 40-50cm freeboard, are of an angle between 30˚-50˚, appear stable and with a substrate suitable for burrowing. The criteria also apply if the banks are below 30cm in height above the current water level or are at a very low angle.
Permanent open water	Permanent open water. The criteria should be considered if the water body is choked with emergent vegetation but management works could enhance the habitat.
Presence of berm	Presence of a continuous berm along the water body. Care should be taken to give consideration to the current state of the water level; if it is very high the berm may be flooded. If water levels are low then ensure that you have a thorough investigation for the presence of a berm and take the opportunity to check for latrine, pathway and feeding remains.
Lack of disturbance through poaching and grazing	Few signs of hoof imprints and poaching damage, no sign of recent cutting / slubbing out of the water body, or the provision of stock proof fencing.
Nest building opportunities in vegetation above water level	Presence of numerous, dense grass, rush or sedge tussocks within 5m of the water body margin. Where there are low or unsuitable bank levels, the presence of nearby nest building opportunities provides an alternative refuge habitat.

5.2.13 Data collected alongside the UK Habitat Classification assessment was analysed to obtain an indicative suitability score (Halcrow, 2007) as described in Table 5-5. The score, from one to eight is given by meeting each habitat suitability criteria and was used in correlation with the water feature connectivity, to complete the scoping assessment and focus the survey effort.

Table 5-5. Guidance for assigning water vole habitat suitability score

Score	Suitability	Comment
1	Unsuitable	Very little if any vegetation, poor shallow or low banks, no berm and with no rush / grass tussocks in close proximity of the water body. It is possible that this type will have been recently dredged out and will have scored the one point from having open water present.
2	Unsuitable	Lack of well-developed vegetation cover.
3	Sub optimal	Small number of positive features. These water bodies may rarely be of enhancement potential.
4	Sub optimal	Common waterbodies and often characterised by suitable open water, steep banks and good vegetation coverage. A score 4 will often have good enhancement potential to make it an optimal water body.
5	Sub optimal	Water body can often appear suitable for water voles and will often have a number of field signs on them. Enhancement potential to make it an optimal water body is almost certain.

Score	Suitability	Comment
6, 7 & 8	Optimal	It will often have dense and varied vegetation, tall and structurally sound banks, permanent open water, a lack of disturbance (often due to the exclusion of cattle) and the presence of one or more of a berm, suitable refuge sites or nest building opportunities. The water body will often be lined with a 5-10m band of grass or rush tussocks.

5.2.14 The score was revised during the second visit of the water vole surveys. Water features assessed as unsuitable (score 0, 1 or 2) or as sub-optimal with poor connectivity, and if no water vole evidence was found were scoped out for a second visit as per Dean, 2016 guidance.

5.2.15 Evidence of water voles was recorded on the 'Water Vole Signs' layer of the Collector App on the iPad and included live sightings, burrows, latrines, feeding stations and waterside runways in vegetation. The search for evidence was undertaken, along the strip of marginal vegetation at the toe of the bank of the waterbody, extending at least 1m out into the water and at least 1m up the bank. Surveyors walked along the toe of the banks or by wading in the channel, where safely appropriate (water depth below 0.3m).

5.2.16 All records, even inconclusive evidence, were added to the 'Water Vole Signs' layer of the Collector App on the iPad.

5.2.17 For each section, and in order to manage overall survey effort, standard field survey techniques (Dean, 2016) were followed, as described below:

a. each waterbody was searched for water vole signs along one bank only, the one supporting the most favourable habitat conditions as assessed by surveyors

a. depending on their size, ponds or lakes were either fully inspected (if deemed feasible) or a sample of the habitats present was recorded every 2m to 5m depending on the presence of dense vegetation

b. whilst surveying, any obvious field signs on the opposite bank were also noted, using binoculars if necessary.

5.2.18 Spot check water vole surveys were conducted where vegetation was considered too dense to safely walk along the bank toe.

5.2.19 If found, the number of latrines recorded during the water vole survey was deemed to give an indication of relative population size and therefore, the study area can be divided into areas supporting water voles at 'high', 'medium' or 'low' density which could be interpreted as detailed in Table 5-6.

Table 5-6. Water vole results interpretation (Dean, 2016)

Relative population density	Approximate number of latrines per 100m of bankside habitat	
	First half of survey season (mid-April to end of June)	Second half of survey season (July to September)
High	10 or more	20 or more
Medium	3 to 9	6 to 19
Low	Below 2 (or none, but with other confirmatory field signs)	Below 5 (or none, but with other confirmatory field signs)

Camera Monitoring

5.2.20 Four field cameras were deployed between 20 July 2022 and 04 October 2022. Camera monitoring locations were determined by likely areas of activity for either water voles or otters from features identified during the initial riparian mammal survey on 20 July 2022. These surveys were conducted to ascertain the level of use of habitat features, to refine the type of feature category assigned, and to obtain information to inform the proposed scheme. Field cameras were placed by the potential otter sprainting site (C1), potential otter holt (C2), along the river edge on a weeping willow (*Salix babylonica*) (C3) and a wet ditch (C4).

5.2.21 Field cameras were secured to a nearby tree or onto a wooden stake if no appropriate trees were nearby. Cameras were positioned so that, between each location, all possible access and egress points were within view. Where possible, all vegetation that might have obscured or triggered the trap was removed before deployment and during checks conducted weekly between the period of deployment.

5.2.22 Camera deployment and collection was undertaken by experienced ecologists with prior experience in camera monitoring for otter and other mammals. Locations and features covered by the field cameras are included in Table 5-7.

Table 5-7. Camera trap locations and features within survey area.

Waterbody ID	Dates Monitored	Number of cameras	Feature (based on initial surveys)	Approx. Grid Reference of Cameras
River Blackwater	20/07/2022 -04/09/2022	3	Potential sprainting site (C1) Potential holt (C2) Suitable commuting route (C3)	C1: TL 83157 13354 C2: TL 83262 13621 C3: TL 83270 13555
Wet ditch	20/07/2022 -04/09/2022	1	Suitable water vole commuting habitat (C4)	C4: TL 83282 13441

5.2.23

5.2.24 Footage was collected and reviewed by a suitably qualified ecologist.

5.3 Limitations

General limitations

5.3.1 The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document.

5.3.2 This report should be read in full, and excerpts may not be representative of the findings.

5.3.3 This report has been prepared exclusively for Jacobs' client and no liability is accepted for any use or reliance on the report by third parties.

Otter specific limitations

5.3.4 Most water features within the study area were accessible for means of survey. However, some sections of the wet ditch had very dense vegetation, steep banks and / or unstable ground. It is therefore possible but unlikely that field signs such as couches, and spraints were not recorded in these areas.

Water vole specific limitations

5.3.5 Best practice guidance (Dean, 2016) suggest it is preferable that the two survey visits are spread so that one is undertaken in the first half of the season (mid-April to the end of June) and the other in the second half of the season (July to September). Due to restrictions with access both surveys were undertaken in the second half of the season although they were spread two months apart in accordance with the guidance. As preconstruction surveys would be undertaken this is not considered to be a significant limitation.

Camera monitoring specific limitations

5.3.6 During the peak ecological season vegetation is typically very dense and grows rapidly, especially for ephemeral species such as nettles (*Urtica dioica*). Cameras can be obscured by dense vegetation growing over time which can block the view of the lens and prevent capture of any species which may otherwise be recorded. This occurred on sprainting site C1 (04 September 2022 to 13 September 2022), this is not considered a significant limitation as otter had already been recorded when vegetation was not obscuring the view.

5.3.7 Two cameras (C1 and C2) had memory card malfunctions and failed to record footage for a two-week period between 02 August 2022 and 15 August 2022. This is not thought to have limited the interpretation of the sprainting site (C1) as the feature was confirmed as having frequent use regardless of the loss of data. However, this could have resulted in missing confirmation of the potential otter holt (C2) being used as a spraint was found nearby within this time period showing otter had passed through the area.

6 Results

6.1 Desk Study

6.1.1 The results of the desk study for riparian mammal species for the proposed scheme are presented in Appendix 9.10 Riparian Mammal Survey Report.

6.1.2 In an email dated 13 January 2023, Essex Wildlife Trust confirmed that during their surveys of the site in the summer of 2022, otter spraints were recorded at grid reference TL 83173 13386 and the black poplar (TL 83264 13617), which also had signs of wear from the passage of an animal over a branch between the tree and the channel indicating regular movement of an animal over that location. On this basis they have identified the black poplar (*Populus nigra*) as a potential active holt. They also advised that the River Blackwater is prone to flooding which may render some of the holts unsuitable over the winter.

6.2 Field Study

Otter

6.2.1 Riparian mammal field surveys were conducted on the River Blackwater where impacted by the gas main diversion south of Whetmead Local Nature Reserve (LNR) and Local Wildlife Site (LWS) on 20 July 2022 and 22 August 2022.

6.2.2 The site surveyed had suitable habitat features for otter resting places (holt and couch), otter waterbody entrance point (slide) and offers suitable commuting route opportunities for otters further north and south of the River Blackwater.

6.2.3 Six spraints (fresh and old) and eaten fish scales were found on one particular location along the River Blackwater (TL 83157 13354) which was confirmed as an otter sprainting site through the field camera surveys (C1). This area was also used by the otter to commute to the associated wet ditch to the west of the confirmed sprainting spot. This location is within 130m south-east of the proposed Order Limits.

6.2.4 No confirmatory evidence of use of the potential holt was found during the survey period, however the camera did fail to record during a period an otter passed through the site (as shown by fresh spraint nearby).

6.2.5 Camera C3 facing the width of the River Blackwater did not capture any sightings of otter during the survey period.

6.2.6 In summary, over the duration of the riparian mammal and monitoring surveys the following were identified (see Appendix A):

c. A potential otter holt within a black poplar (TL 83264 13617) (Photographs 1, 2 and 3) (coincides with the location recorded by Essex Wildlife Trust)

d. A potential otter slide at gride reference TL 83189 13422 (Photographs 4 and 5)

e. A potential otter couch (TL 83173 13386) (Photographs 6 and 7) (coincides with one of the spraints recorded by Essex Wildlife Trust)

f. A confirmed sprainting site at grid reference TL 83157 13354 (Photographs 8 and 9). Five dry otter spraints observed on 20 July 2022 and 1 fresh otter spraint recorded on 23 August 2022 (Photographs 10, 11 and 12). Field cameras recorded otters using the sprainting site

g. One confirmed otter spraint 5m from potential holt (TL 83264 13617) (Photographs 13 and 14).

h. Feeding remains (fish scales) on confirmed otter sprainting site (TL 83157 13354)

i. Four confirmed sightings of otter via field cameras on C1 (Photographs 15 and 16) (TL 83157 13354).

Water vole

6.2.7 A first visit was conducted on 22 July 2022 to assess the habitat suitability for water voles. A second visit was completed on 22 August 2022 to re-assess habitat suitability and search for field signs. Both surveys were conducted at the same time as the otter surveys.

6.2.8 The River Blackwater was deemed as 'optimal' for water vole due to the presence of well-developed bank-side and emergent vegetation, year round availability of food resources, steep banks for burrowing, permanent open water, a lack of disturbance and, nest building opportunities in vegetation above the water level. The wet ditch to the east of the proposed site which is well connected to the River Blackwater was identified as a potential habitat for water vole and scoped in for use during the surveys.

6.2.9 Despite the suitable habitat there were no water vole burrows, evidence of feeding, latrines or other field signs recorded during the surveys or identified on any of the field cameras. Water vole are therefore likely absent from the site despite the lack of suitable habitat. The presence of American mink which predate water vole, as recorded on cameras during the monitoring surveys (see below), may account for this absence.

Incidental sightings

6.2.10 During the field survey there were multiple sightings of kingfisher (*Alcedo atthis*) along the River Blackwater along the southern section of the proposed site. However, there was a lack of earth cliffs and bank were heavily vegetated and therefore kingfisher are unlikely to be nesting within this section of the watercourse.

6.2.11 While reviewing camera trap footage, two species of interest were recorded around the otter sprainting site covered by C1. These species were American mink (Photograph 17) and badger (Photograph 18, omitted from this report due to the confidential nature of such information).

7 Discussion

7.1 Summary

7.1.1 The habitat for water vole recorded within the 2022 survey area is optimal, however, no evidence of water vole was identified during the two field surveys and American mink are known to be present. Water vole are therefore assessed to be likely absent from this part of the proposed scheme and therefore there is no change to the assessment of effects and mitigation proposed in Chapter 9 Biodiversity of the Environmental Statement [TR010600/APP/6.3].

7.1.2 Many signs of otter activity were recorded within the survey area along the River Blackwater. Signs included: a potential holt, confirmed sprainting site, a potential couch, a potential slide, feeding signs and camera trap sightings. Evidence from Essex Wildlife Trust also suggests the black poplar is a potential holt. Should otters utilise the holt there is potential for disturbance impacts to otter during diversion of the gas main. These impacts would be temporary in duration but could potentially result in the holt being unsuitable for use for the duration of the works. Due to the distance from the Order Limits, disturbance impacts to the potential couch are unlikely.

7.1.3 National Highways is working with the owner of the gas main to develop the design and construction methodology for the gas main diversion which could impact this part of the proposed scheme. Where practicable impacts will be avoided or otherwise mitigated.

8 References

a. Bassett E and Wynn J (2010). *Otters in Scotland: How vulnerable are they to disturbance?* CIEEM In Practice No. 70, Winchester.

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

c. Chanin P (2003b). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough.

d. Dean M, Stratchan R, Gow D and Andrews R (2016). *The Water Vole Mitigation Handbok (The Mammal Society Mitigation Guidance Series).* Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.

e. Essex Wildlife Trust. Email dated 13 January 2023.

f. Halcrow Group Ltd (2007). Broadland Flood Alleviation Project: Water Vole Habitat Suitability assessment.

g. Harris J (2002). *Blakeney Freshes Flood Defences Baseline Ecological Surveys: water vole and otter*. Report to Environment Agency.

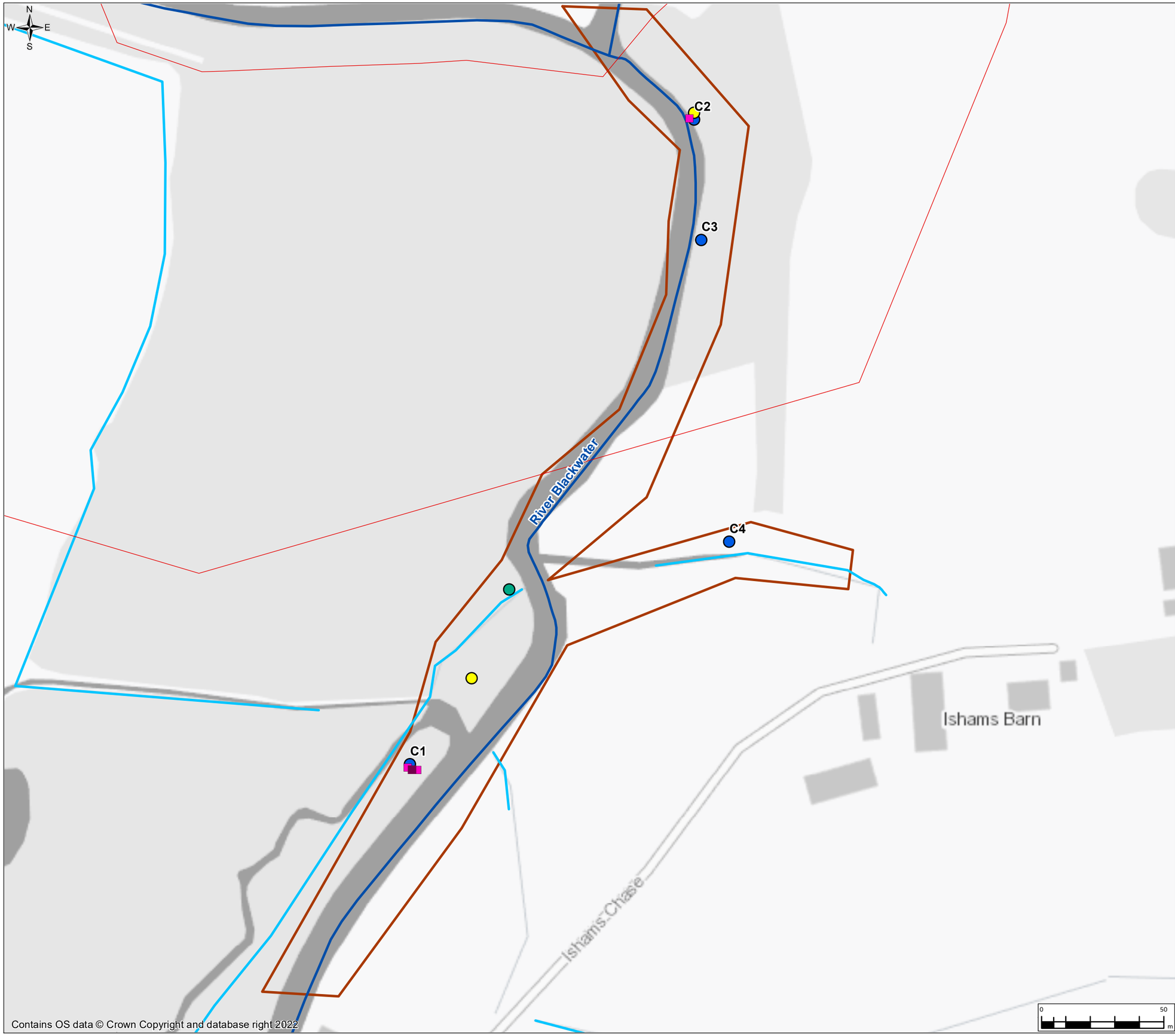
h. McGuire C and Whitfield D (2017). *National Water Vole Database and Mapping Project. Part 1: Project Report 2006-2015*. Hampshire and Isla of Wight Wildlife Trust, Curdridge.

i. Roper E and Basset S (2007). *Otter Resting Site Status*. Unpublished.

j. Strachan R, Moorhouse T and Gelling M (2011). *Water Vole Conservation Handbook*. Third Edition. Wildlife Conservation Research Unit, Oxford.

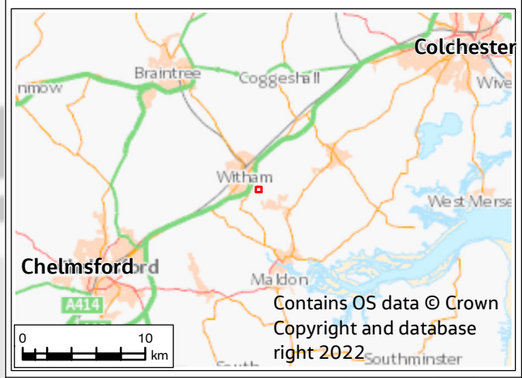
Appendix A - Riparian Mammal Results

FIGURE 1



Legend

- Survey Area
- Order Limits
- Field Cameras
- Potential resting site
- Potential otter slide
- Sighting
- Spraint
- Main River



Rev.	Rev. Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
P1.0	17/01/2023	FINAL	JC	KL	AJ	SL

Client

national highways

Project

REGIONAL DELIVERY PARTNERSHIP
A12 CHELMSFORD TO A120 WIDENING SCHEME

Drawing Title

RIPARIAN MAMMAL SURVEY REPORT – RESULTS

Drawing Status: S4 – SUITABLE FOR STAGE APPROVAL

Scale @ A3	1:1500	DO NOT SCALE
Jacobs No.	B366601D4	
Client No.	HE551497	Rev P1.0

Drawing Number: HE551497-JAC-EBD-5_SCHME-SK-LE-0007

Appendix B - Photographs

Description	Photograph
Photograph 1: Potential access pathway for otter leading to potential otter holt	

Description	Photograph
Photograph 2: Potential otter holt at base of black poplar, extends into base of tree	

Description	Photograph
Photograph 3: Wider view of potential otter holt at base of black poplar	

Description	Photograph
Photograph 4: Potential otter slide	

Description	Photograph
Photograph 5: Potential otter slide, claw marks on bankside	

Description	Photograph
Photograph 6: Potential otter couch	

Description	Photograph
Photograph 7: Potential otter couch, debris present	

Description	Photograph
Photograph 8: Sprainting site at TL 83157 13354, River Blackwater in background	

Description	Photograph
Photograph 9: Sprainting site at [TL 83157 13354, River Blackwater in background	

Description	Photograph
Photograph 10: Close up of old spraint	

Description	Photograph
Photograph 11: Close up of old spraint	

Description	Photograph
Photograph 12: Fresh spraint found on 26/08/2022	

Description	Photograph
Photograph 13: Otter spraint on log nearby to potential otter holt	

Description	Photograph
Photograph 14: Otter spraint on log nearby to holt	

Description	Photograph
Photograph 15: Otter on C1, actively defecating	

Description	Photograph
Photograph 16: Otter on C1, defecating at night	

Description	Photograph
Photograph 17: American mink on C1