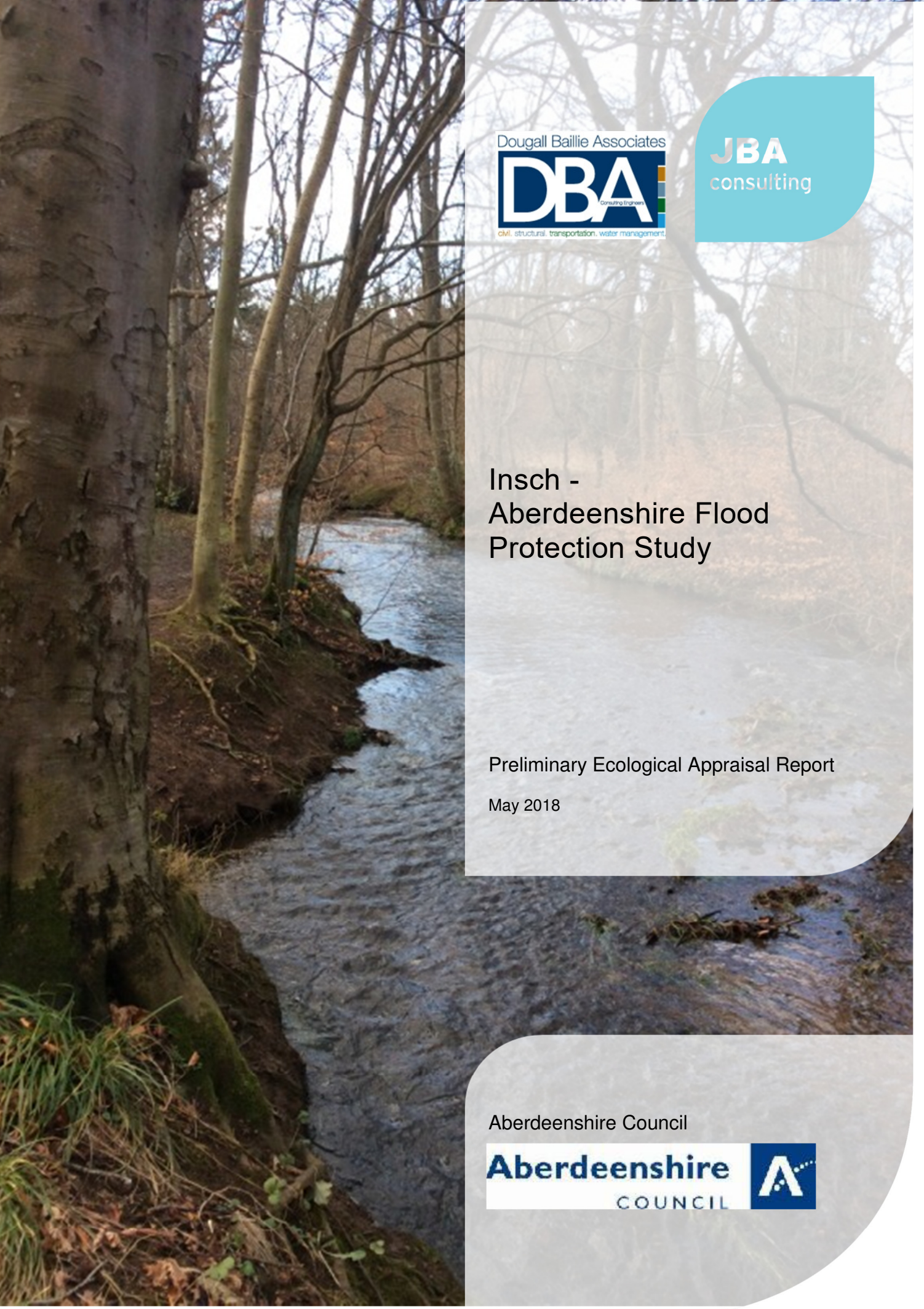

Insch - Aberdeenshire Flood Protection Study

Preliminary Ecological Appraisal Report

May 2018

Aberdeenshire Council

JBA Project Manager

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Contract

This report describes work commissioned by Gavin Penman, on behalf of Aberdeenshire Council on 10 October 2017 by Purchase Order Number 1095192. Dougall Baillie's representative for the contract was Scott Macphail and Aberdeenshire Council's representative for the contract was Alistair Scotland. Carys Hutton, Emma Wright, Laura Hodgkinson and Shantelle Friesen of JBA Consulting carried out this work.

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Purpose

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Acknowledgements

JBA would like to thank North East Scotland Biological Records Centre for the provision of protected species data and site citations for designated nature conservation sites.

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Executive Summary

JBA Consulting were commissioned by Aberdeenshire Council through Dougall Baillie Associates to complete a Preliminary Ecological Appraisal Report (PEAR) to assist with a Flood Protection Study within Insch, Aberdeenshire. The PEAR was commissioned in view of the possible impacts of proposed works on the ecological components of the site; including both protected species and habitats.

A desk-based assessment was undertaken with records from the North East Scotland Biological Records Centre to identify any historical ecological records and any statutory and non-statutory designated nature conservation sites occurring within 2km of the location of proposed works. Further to this, an Extended Phase 1 Habitat Survey was carried out at the site by suitably experienced ecologists between 1 - 8 February 2018.

A range of habitats were identified on the site walkover, including extensive conifer plantations, agricultural and pastural fields, tall ruderal vegetation, marshy grassland and some areas of standing water. The ecological value of the site was determined to be of moderate to high as the structural diversity across the surveyed area offers good foraging and refuge opportunities for birds, mammals, bats and invertebrate assemblages.

The data search identified no statutory designated nature conservation sites or local wildlife sites within a 2km radius of the site extent. However, a Wildcat Priority Area overlaps the 2km buffer at its western extent, and so consultation with Scottish Natural Heritage is advised prior to any works commencing in the western part of the study area.

Some of the mature trees within the site are likely to be protected through a Tree Preservation Order, and details of this can be sought from the local authority. If trees will be impacted by the works (including where roots may be impacted) then an arboricultural survey should be undertaken.

Within a 2km radius of the site, the North East Scotland Biological Records Centre holds several records for protected and notable species. The ecological importance of the site to protected species in its current state was considered high for Badger, Scottish Wildcat, Freshwater Pearl Mussel and birds, and at least moderate for Otter, Red Squirrel, Water Vole, Bats, fish and reptiles, and low for Great Crested Newt.

From a protected species perspective, the works should try to, as far as possible:

- avoid the need for land-take in semi-natural habitats;
- avoid tree and scrub removal (particularly for bats, birds, Red Squirrels);
- minimise in-channel works (Otters, Water Voles, fish);
- avoid in-channel works between October and March (fish);
- avoid night-working in the main active bat season (April - September).

Once the exact nature of the works are confirmed, targeted surveys for protected species are likely to be required. Further protected species surveys could potentially include bat roost assessments, bat activity surveys, nesting bird assessments, fish surveys, Water Vole and Otter surveys and Freshwater Pearl Mussel surveys. These surveys must be carried out in suitable survey seasons and this seasonality is set out in the report.

Precautionary working methods are also advised for Red Squirrels, foraging and commuting bats, and Badger and recommendations are provided with regards to nesting birds and vegetation clearance.

Once detailed work plans are available, a walkover survey should be completed in the summer to map out the location of invasive, non-native species. The locations can be used to determine necessary mitigation measures including removal, herbicide treatment or exclusion zones.

A Water Framework Directive Assessment should be undertaken prior to the works to ensure that the works are in line with European Legislation. Given the potential for in-channel works, pollution prevention measures should be adopted to prevent contamination of the watercourse.

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Abbreviations

AA ..... Appropriate Assessment
BAP ..... Biodiversity Action Plan
BCT ..... Bat Conservation Trust
BOD ..... Biochemical Oxygen Demand
CIRIA ..... Construction Industry Research and Information Association
EPS ..... European Protected Species
HRA ..... Habitats Regulations Appraisal
HSI ..... Habitat Suitability Index
JNCC ..... Joint Nature Conservation Committee
LNR ..... Local Nature Reserve
MAGIC ..... Multi Agency Geographic Information for the Countryside
NESBReC ..... North East Scotland Biological Records Centre
NNR ..... National Nature Reserve
OSGR ..... Ordnance Survey Grid Reference
PEA ..... Preliminary Ecological Appraisal
RBMP ..... River Basin Management Plan
RSPB ..... Royal Society for the Protection of Birds
SAC ..... Special Area of Conservation
SNH ..... Scottish Natural Heritage
SPA ..... Special Protection Area
SSSI ..... Site of Special Scientific Interest
WANE Act ..... Wildlife and Natural Environment Act
W&CA ..... Wildlife and Countryside Act 1981 (as amended)
WFD ..... Water Framework Directive

1 Introduction

1.1 Background

JBA Consulting was commissioned by Aberdeenshire Council through Dougall Baillie Associates to undertake a number of Preliminary Ecological Appraisals (PEA) as part of the Flood Protection Study within Aberdeenshire. There are no specific plans as yet and, therefore, this commission is intended to highlight the likely ecological constraints to developments and/or benefits to the site for protected and notable species, priority habitats and other biodiversity features.

1.2 Site Location

The area surveyed was centred around the village of Insch, approximately 23 miles northwest of Aberdeen (approximate central Ordnance Survey National Grid Reference (OSGR): NJ 63019 28130). The surveyed extent included the Shevock, which flows through Insch, and its associated tributaries (from west to east: Mill of Rothney Tributary, Valentine Burn, and Newton of Rothney Tributary). This area is referred to as "the site" throughout the report (Figure 1-1). The survey focus was on urban areas located along The Shevock and Valentine Burn, as it is considered the works are more likely to be located around urban areas.

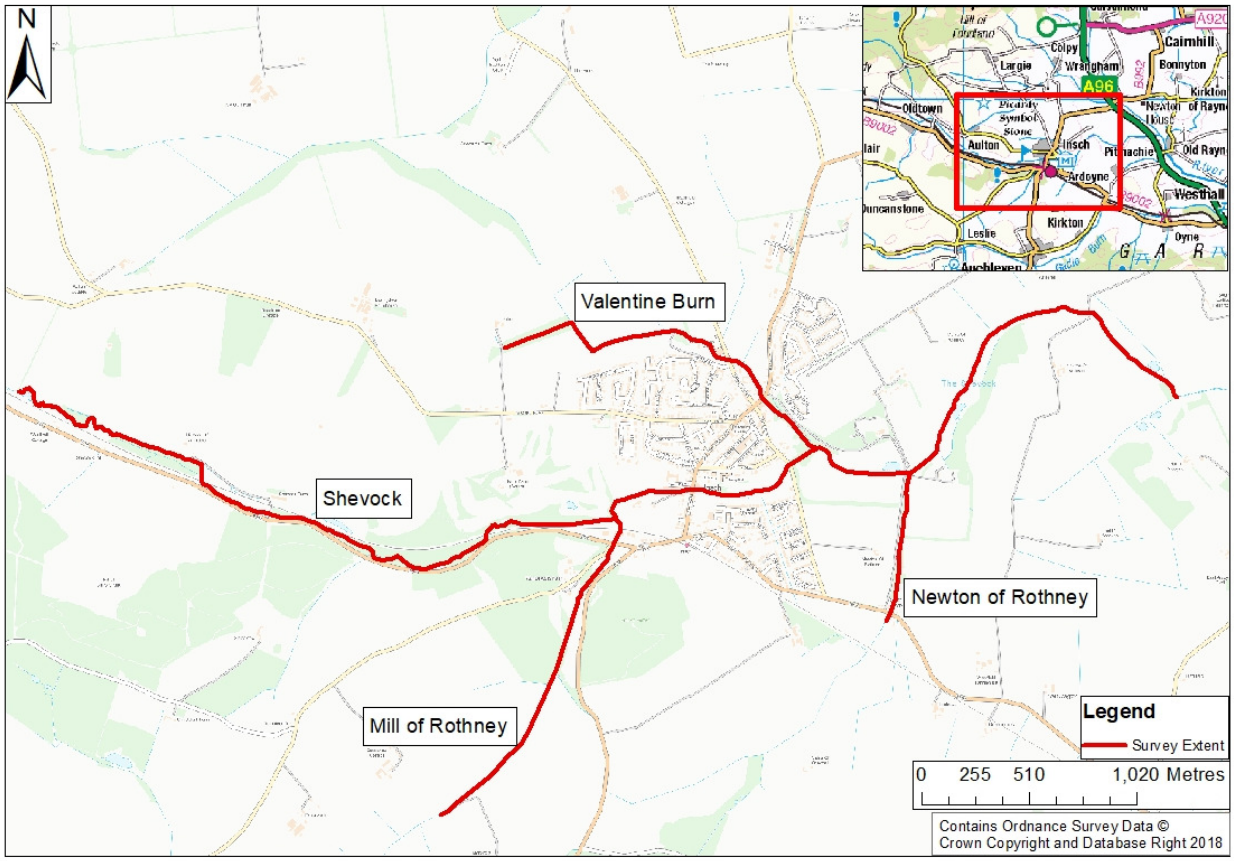

Figure 1-1: Map of survey site and greater area.

2 Legislation

The primary legislation in Scotland covering nature conservation and wildlife protection is outlined below. The legislation makes it an offence to kill or capture certain animals including birds, or to remove certain native plants. The law also protects certain animals from disturbance including disturbance of their nests and / or resting places. This section is not intended as a detailed appraisal of wildlife legislation, or provision of a legal opinion, but aims to provide a summary context to support the impact assessment.

2.1 Habitats Directive and Conservation (Natural Habitats, &c.) Regulations 1994

In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Regulations. These Regulations afford protection to certain species identified in the Habitats Directive, including those requiring strict protection (European Protected Species (EPS)). Section 2.3 below provides further details on specific species.

The Habitats Regulations 1994 (as amended in Scotland) implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). There are various Schedules attached to the Habitats Regulations including Schedule 2 and 4 which relates to European protected species (fauna and flora, respectively) and Schedule 3 with relates to those animals in Annex V of the Habitats and Species Directive whose natural range includes Great Britain.

The designation and protection of domestic and European Sites e.g. Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPA) and Special Areas of Conservation (SAC) falls within these Regulations.

Public bodies (including the Local Planning Authority) have a duty to have regard to the requirements of the Habitats Directive in carrying out their duties i.e. when determining a planning application.

The Habitats Regulations Appraisal requirements protect European sites by requiring that any plan or project which may have a 'likely significant effect' on a site (either individually or in combination with other plans or projects) must be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives. The HRA process is mandatory under the Habitats Directive implemented through The Conservation (Natural Habitats, &c.) Regulations 1994. As part of the process SNH must be consulted.

The HRA is a multi-stage process through which Appropriate Assessment (AA) is carried out, if in the primary Screening stage of the HRA it is determined that the project may have an adverse impact upon a Natura 2000 site. Such plans or projects may only proceed if they will not adversely affect the integrity of the European site concerned, without the decision of the over-riding public interest.

2.2 Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act (W&CA) 1981 (as amended) constitutes an important statute relating to the protection of flora, fauna and the countryside within Great Britain. Part 1 of the Act deals with the protection of wildlife. Most EPS are now covered under the Conservation of Habitats and Species Regulations (as amended) however certain species and activities are still covered by the W&CA. The W&CA also covered possession of species listed in the various schedules. In Scotland, the W&CA is amended by The Nature Conservation (Scotland) Act 2004 and The Wildlife and Natural Environment (Scotland) Act 2011.

2.3 Nature Conservation (Scotland) Act 2004

The Act serves to make provisions in relation to the conservation of biodiversity; to make further provision in relation to the conservation and enhancement of Scotland's natural features; to amend the law relating to the protection of certain birds, animals and plants; and for connected purposes. Under Section 2(4) of the Act a Scottish Biodiversity List, a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, was compiled.

2.4 Wildlife and Natural Environment (Scotland) Act 2011

The Wildlife and Natural Environment (Scotland) Act (WANE Act) is an Act of the Scottish Parliament to make provision in connection with wildlife and the natural environment and for related purposes.

2.5 Protected Species

Certain species and species groups are afforded specific protection under the Conservation (Natural Habitats, &c.) Regulations 1994 and the Wildlife and Countryside Act 1981 (as amended). Furthermore, under these laws provisions are made for control of spread of non-native invasive species. Relevant species and levels of protection are detailed below.

2.5.1 Badger

Badgers *Meles meles* and their setts are protected by the Protection of Badgers Act 1992. This Act has been supplemented by the WANE Act, making it illegal to kill, injure or take a Badger, or to interfere with an active sett, including blocking an active entrance or allowing a dog to enter the sett. Furthermore, under this legislation, it is illegal to dig for, cruelly ill-treat, or tag a Badger.

2.5.2 Red Squirrel

Red Squirrels *Sciurus vulgaris* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- kill, injure or take a Red Squirrel,
- damage, destroy or obstruct access to any structure or place which a Red Squirrel uses for shelter or protection (a drey),
- disturb Red Squirrel when it is occupying a structure or place for that purpose,
- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead Red Squirrel or any derivative of such an animal.

2.5.3 Otter

The European Otter *Lutra lutra* is an EPS protected under the Conservation (Habitats &c) Regulations 1994, making it an offence to:

- deliberately capture, injure or kill an Otter,
- deliberately disturb an Otter such as to affect local populations or breeding success,
- damage or destroy an Otter holt, possess or transport an Otter or any part of an Otter,
- sell or exchange an Otter.

Otters also receive protection under the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:

- intentionally or recklessly disturb any Otter whilst within a holt,
- intentionally or recklessly obstruct access to a holt.

2.5.4 Water Vole

The Water Vole *Arvicola amphibius* is protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- intentionally kill, injure or capture a Water Vole,
- possess or control a Water Vole, living or dead, or any part of a Water Vole,
- intentionally or recklessly damage, destroy or obstruct access to any place of shelter, or disturb a Water Vole within such a place,
- sell or offer for sale a Water Vole living or dead, or part of a Water Vole.

2.5.5 Bats

All UK bat species are EPS under the Conservation (Habitats &c) Regulations 1994. It is an offence to:

- deliberately kill, injure or capture any bat,
- intentionally or recklessly disturb a bat, or deliberately disturb a group of bats,
- damage or destroy, or intentionally or recklessly obstruct access to, a bat roosting place,
- possess, or sell (living or dead) any bat or part of a bat.

Furthermore, amendments to the Regulations (2007-2012) include, under Regulation 40, that it is no longer a defence to state that killing, capture or disturbance of bats or the destruction of their roosts was an incidental or unavoidable result of a lawful activity.

2.5.6 Breeding Birds

All wild birds (with certain exceptions listed in Schedule 2) are protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally:

- kill, injure, or take any wild bird,
- take, damage or destroy the nest of any wild bird whilst it is in use or being built,
- take, destroy or possess the egg of any wild bird.

Furthermore, certain species receive additional protection under Schedule 1, which makes it an offence to disturb these species while they are nest building, or at a nest containing eggs or young, or disturb the dependent young of such birds.

Those species listed on Schedules A1 and 1A receive additional protection which makes it an offence to intentionally or recklessly:

- at any time take, damage, destroy or otherwise interfere with any nest habitually used by any wild bird, when not in use, included in Schedule A1; and
- at any time harass any wild bird included in Schedule 1A.

2.5.7 Great Crested Newt

The Great Crested Newt *Triturus cristatus* is a EPS under the Conservation (Habitats &c) Regulations 1994. This makes it an offence to:

- kill, capture or disturb a Great Crested Newt,
- take or destroy the eggs of a Great Crested Newt,
- damage or destroy the breeding or resting places of Great Crested Newt.

It also receives additional protection under the Wildlife and Countryside Act 1981 (as amended) making it illegal to possess or control any Great Crested Newt, living or dead.

2.5.8 Freshwater Pearl Mussel

Freshwater Pearl Mussels *Margaritifera margaritifera* receive full protection under the Wildlife and Countryside Act 1981 (as amended), this makes it an office to:

- intentionally or recklessly kill, injure or take (capture) a Freshwater Pearl Mussel; or
- damage, destroy or obstruct access to the resting place of a Freshwater Pearl Mussel.

2.5.9 Reptiles and Amphibians

Legal protection varies considerably for different species. Natterjack Toads *Epidalea calamita* are EPS receiving the same protection as Great Crested Newt. Under the Wildlife and Countryside Act 1981 (as amended) Adder *Viperus berus*, Grass Snake *Natrix natrix*, Common Lizard *Zootoca vivipara* and Slow Worm *Anguis fragilis* are protected from intentional killing or injuring, additionally Common Frogs *Rana temporaria*, Common Toads *Bufo bufo* and other newt species are prohibited from sale.

2.5.10 Scottish Wildcat

Scottish Wildcats *Felis sylvestris grampia* receive full protection under the Wildlife and Countryside Act 1981 (as amended), making it an office to:

- intentionally or recklessly kill, injure or take (capture) a Wildcat; or
- damage, destroy or obstruct access to the resting place of a Wildcat.

2.5.11 Invasive Non-native Species

Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) lists 62 plant species, or groups of plants, and 69 animal species. The major amendment to this Act in Scotland is found in the WANE Act (2011). It is an offence to release or cause to spread in the wild any of these species. Of particular note are Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera*, Giant Hogweed *Heracleum mantegazzanum* and Signal Crayfish *Pacifastacus leniusculus*.

3 Methodology

3.1 Desk Study

For the purposes of the desk study, the study area was defined to be the site and a 2km radius from the edges of the site. Information was requested from the North East Scotland Biological Records Centre (NESBReC), including records of protected and notable species, invasive non-native species (INNS), statutory designated conservation sites, and non-statutory designated conservation sites.

In addition, the MAGIC database was searched for statutory designated sites within 2km of the site including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

3.2 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was carried out at the site by JBA ecologists Carys Hutton, Emma Wright, Laura Hodgkinson and Shantelle Frieson between 01 February 2018 and 08 February 2018. The Extended Phase 1 Habitat Survey involves classifying parcels of land using specified habitat types and determining the suitability of these habitats for supporting rare or legally protected species. As part of the survey, the following actions were carried out:

- Mapping of habitats on and adjacent to the site, following the Handbook of Phase 1 Habitat Survey (JNCC, 2010);
- Recording of any evidence of protected species found on the site and assessment of habitat's potential to support protected species;
- Recording of bird species observed and suitable habitat for use by birds; and
- Recording of any invasive non-native species present, such as Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum*.

Key ecological features identified during the Extended Phase 1 Habitat Survey were further categorised as being of either 'negligible', 'low', 'moderate' or 'high' ecological value.

Habitat codes contained within the JNCC Handbook for Phase 1 Habitat Survey (JNCC, 2010) were used to produce a habitat map for the site, as shown under Appendix A. All photographs taken during the Extended Phase 1 Habitat survey are featured under Appendix B.

3.2.1 Protected Species

Badger

The site and immediate vicinity were searched for signs of the presence of Badgers. In addition to the presence of active setts, the following signs of activity were also searched for: latrines, footprints, evidence of feeding activity and well-worn paths through vegetation. Badgers will use a number of setts throughout their territory at different times of year; any large holes with the potential to be used by Badgers, but not showing obvious signs of recent activity, were recorded.

Red Squirrel

Red Squirrels are present in woodland habitat within Scotland and the site was searched for signs of their presence. This involved looking for any dreys, feeding signs (i.e. pine cones that have been eaten by Red Squirrels) and any direct sightings.

Otter

The Otter survey method was based on the standard works of RSPB (1994) and Chanin (2003). This involved walking the survey area, examining banks and prominent features for spraints (droppings) and footprints. A search was also made for possible holt and couch (resting) sites. Otters are extremely difficult to observe, and this method provides the most effective and efficient means of investigating presence or absence.

Water Vole

The standard environmental assessment field survey method outlined in Strachan *et al.* (2011) was used. Field signs were searched for within the survey area, and an assessment made of the

suitability of the habitat for Water Voles. The most important diagnostic field sign for Water Voles is the presence of latrine sites. These are locations repeatedly used by Water Voles to deposit their droppings, often in prominent locations along the bank. Other field signs include the presence of burrows, feeding sites and footprints. Although these other signs provide indications of presence and are useful supporting evidence to latrines, they are of limited value on their own.

Bats

Structures and trees likely to be impacted by the proposed works were inspected to determine their potential value for roosting bats, using the methods specified in the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists - Good Practice Guidelines (3rd edn.) (Collins, 2016).

The roosting potential of buildings, structures and trees on the site were categorised as having either 'negligible', 'low', 'moderate' or 'high' roosting potential and this was determined by applying the definitions given within the BCT Guidelines. Evidence of bat activity associated with potential roost sites includes bat droppings, urine staining, feeding remains and dead/alive bats. Indicators that potential roost locations and access points are likely to be inactive include the presence of cobwebs and general detritus within the apertures.

Potential roosting features on trees include cracks, crevices, loose bark, woodpecker holes and splits. Evidence indicating bat presence, including dark stains running below holes or cracks, bat droppings, odours, or scratch marks.

Furthermore, the value for habitats across the site to support commuting and foraging bats was assessed in terms of habitat type, abundance, connectivity and distribution. These were categorised as having either 'negligible', 'low', 'moderate' or 'high' value for bats which was determined by applying the categories given within the BCT Guidelines.

Breeding Birds

During the site visit, an assessment of the potential for the habitats present to support breeding birds was made and any evidence of former nesting identified.

Great Crested Newt

Where access was possible, any substantial water bodies existing within 500m of the survey area, which retained ecologically connectivity to the site, were assessed for their potential to support newts using the Habitat Suitability Index (HSI) (Oldham *et al.*, 2000; English Nature, 2001). This system involves assessment of ten suitability indices per waterbody and is an accepted method of assessing the likelihood for a particular pond to hold breeding Great Crested Newts.

Other Reptiles and Amphibians

An assessment of the habitat suitability of the area for reptiles was made, involving inspection of the site for key habitat features such as refuges, open sandy areas and interfaces between different habitat types. Any potential refuges found on site (e.g. log piles, large stones) were also noted but given the time of year were not investigated for the presence of any amphibians and reptiles.

Fresh-water Pearl Mussel

A preliminary assessment of habitat suitability for Freshwater Pearl Mussel was made along the watercourses. Freshwater Pearl Mussels require cool, well-oxygenated, soft-water rivers free of pollution and turbidity. They prefer a substrate with sand, pebbles and boulders.

Invasive Non-native Species

Any non-native species observed during the survey were recorded. For stand-forming plant species, the extents of such stands were noted.

Other Protected and/or Notable Species

During the survey, any signs or sightings of other protected or notable species were also recorded.

3.3 Approach to Evaluation

3.3.1 Designated Sites, Habitats and Species

Valuing designated sites

International sites of high ecological value are those designated as SPAs, SACs or Ramsar sites. National sites are NNRs, SSSIs, or sites of equivalent value. Regional/County-level sites of low to moderate ecological value are designated as LNRs or equivalent value.

Valuing habitats

Habitats identified under the UK and local BAP have biodiversity value. This is adjusted for value according to the size of the site, quality of the habitat and its ability to be replaced.

The full assessment of habitat value will depend on a number of factors, including the size of the habitat, its conservation status and quality.

Valuing species

Species of international value are those protected by the Habitats Regulations 1994 (as amended in Scotland). Species of national value are those protected by the Wildlife and Countryside Act 1981 (as amended). Species identified under the UK and local BAP also have biodiversity value, as do other notable species, such as those on the Red Data Book list. The valuation will depend on a number of factors including distribution, status, rarity, vulnerability, and the population size present. The potential value and secondary/supporting value is also considered.

3.4 Limitations

3.4.1 Data Limitations

Data from biological records centres, or on-line databases, is historical information and datasets might be incomplete, inaccurate or missing. It is important to note that even where data is held, a lack of records for a defined geographical area does not necessarily mean that the species is absent; the area may simple be under-recorded.

3.4.2 Access

Some stretches of the Shevock west of Insch (OSGR: NJ 60650 27900 to NJ 61996 27645) were difficult to access due to the positioning of the watercourse between a railway and a main road. The access point to the river through a culvert under the rail line (OSGR: NJ 61996 27645) could not be used due to the presence of the hazardous invasive, non-native plant Giant Hogweed on the south side of the culvert. This stretch of the Shevock was surveyed from the road by car, making several passes of the area. Where safe to do so, the car would stop, allowing photos and more detailed notes to be taken. This level of survey is considered sufficient to inform this report, but it is more likely that some features (*e.g.* evidence of protected species) have been missed in this area.

3.4.3 Surveying Timing and Conditions

The time of year this survey was carried out is sub-optimal for plant species, including invasive non-native species, because many of them die back over winter. Species can be easily missed, which could affect the results of the survey. Wintery conditions during the survey meant that vegetation in some exposed areas was covered by snow, making it more difficult to identify habitats and species, and this is highlighted in the text where relevant. Similarly, standing waterbodies were often frozen over, and covered with a thin snow layer. However, general habitat observations could still be made.

4 Results

4.1 Desk Study

4.1.1 Statutory Designated Sites

There are no statutory designated sites within 2km of the Insch ecological survey area. Therefore, there will be no further discussion of designated sites within this report.

4.1.2 Non-Statutory Designated Sites

The data search from NESBReC returned one record of a non-statutory designated site: Strathbogie Wildcat Priority Area (approx. OSGR NJ 64305 28443), situated to the northwest of the survey site. Wildcat Priority Areas target areas that camera trapping and habitat assessments have identified as providing the best potential territory for the protected Scottish Wildcat *Felix silvestris grampia*. Strathbogie Wildcat Priority Area borders the western edge of the surveyed extent of the Shevock, however only a relatively small proportion of the Wildcat Priority Area falls within the 2km buffer around the survey extent.

Conservation Areas and Priority Habitats

No Conservation Areas were identified within Insch, however, there is a Tree Preservation Order (TPO) within the 2km site buffer: AC (CD) TPO 9 (2003), Drumrossie, Insch (Aberdeenshire Gov., 2017). The exact grid reference for this TPO was not provided, however, the course of the Shevock runs through the Drumrossie Estate. It is possible that this may be a constraint to works, should felling or pruning of trees be required during works on this stretch of the Shevock, or its tributaries.

The following priority habitats were identified within the 2km site buffer, the majority of which are within close proximity, or ecologically connected, to the site:

- National Forest Inventory
    - Woodland, Broadleaved
    - Woodland, Conifer
    - Woodland, Young Trees
- Rivers
- Wet Woodland

4.1.3 Protected Species

The data search from NESBReC returned many recent and historical records for protected species within 2km of the site. Details of these records including key legislative protection and proximity of the record to the surveyed extent (watercourse) is given in Table 4-1 below. Due to the large amount of data returned, the record closest to the site and the most recent record for each species (post-2000) was given greatest consideration.

Table 4-1: Protected and notable species records held by NESBReC within 2km of the Insch survey area.

Common Name	Latin Name	Designation	Location and Date
Riparian Mammals			
European Otter	*Lutra lutra*	W & CA 1981 Sch. 5 SB BAP	2015 1.7km north
Terrestrial Mammals			
Brown Hare	*Lepus europaeus*	UKBAP	2015 0.8km southwest
Eurasian Badger	*Meles meles*	Protection of Badgers Act 1992	Confidential Records
Red Squirrel	*Sciurus vulgaris*	W & CA 1981 Sch. 5	2015 0.2km south
West European Hedgehog	*Erinaceus europaeus*	UKBAP	2015 0.1km south
Bats			

Common Pipistrelle	*Pipistrellus pipistrellus*	W & CA 1981 Sch. 5 W & CA 1981 Sch. 5	2013 0.2km northeast
Soprano Pipistrelle	*Pipistrellus pygmaeus*		2013 0.2km north east
Birds			
Barn Owl	*Tyto alba*	W & CA 1981 Sch. 1	2010 0.02km south
Corn Crake	*Crex crex*	W & CA 1981 Sch. 1	2009 1.9km north
Redwing	*Turdus iliacus*	W & CA 1981 Sch. 1	2014 1.6km west
Snow Bunting	*Plectrophenax nivalis*	W & CA 1981 Sch. 1	2005 1.9km north east
Whooper Swan	*Cygnus cygnus*	W & CA 1981 Sch. 1. Annex 1	2004 0.9km north
Fish			
Brook Lamprey	*Lampetra planeri*	Bern-A3, Scottish_Biodiversity_ List	2010 0.0km (Shevock)

4.1.4 Invasive Non-native Species

The data search from NESBReC returned records of invasive non-native species within 2km of the site. Details of these records including key legislative protection and proximity of the record to the site (watercourse) is given in Table 4-2.

Table 4-2: Invasive Non-native species records held by NESBReC within 2km of the site

Common Name	Latin Name	Designation	Location and Date
Giant Hogweed	*Heracleum mantegazzianum*	W&CA (1981) Sch9	1.2km N; 2003
Himalayan Cotoneaster	*Cotoneaster simonsii*	W&CA (1981) Sch9	0.2km N; 2008

4.2 Extended Phase 1 Habitat Survey

4.2.1 Habitats

The surveyed area is the Shevock Burn and its tributaries, so the main habitats include the river and riparian corridor, which is largely ruderal on the banks before transitioning to woodlands and grasslands. Both the river and its surrounding habitats are heavily managed; the river course is modified and straightened in many places, with occasional short culverted stretches. The surrounding land use is predominantly residential with areas of arable farmland, conifer woodland plantation, and amenity grassland.

A Phase 1 Habitat Map for Insch is provided in Appendix A, along with Target Notes, and all photographic material is given in Appendix B.

A1.1.1 Broadleaved Woodland - Semi-natural

Pockets of woodland mapped as semi-natural broadleaved woodland were located along the Shevock (Photographic Plate 27). These areas of woodland were generally dominated by mature Beech *Fagus sylvatica*. Whilst these trees originate from planting (Beech is not thought to be truly native in the area) they are long-established and form a habitat functionally equivalent to semi-natural woodland. These areas of broadleaved woodland provide suitable nesting features for birds as well as foraging opportunities for mammals and invertebrates.

Along the Newton of Rothney Tributary, the woodland was noticeably wetter and supported Alder *Alnus glutinosa*, Sycamore *Acer pseudoplatanus*, Silver Birch *Betula pendula* and Willow *Salix sp.* The unmanaged appearance of this wet woodland has created suitable features (e.g. resting place) for Otter. There were several fallen trees in the woodland, as well as stacks of felled trunks, that would provide habitat and hibernacula for amphibians, reptiles and invertebrates.

Due to the large areas of coniferous plantation woodland within the wider landscape, and therefore relatively small areas of semi-natural woodland, and the opportunities this habitat provides to birds, mammals, reptiles and invertebrates it is considered that this habitat is of high ecological value. Furthermore, the wet woodland habitat is a priority habitat in its own right, and provides additional features for protected species, including Otter, this habitat is assessed as being of high ecological value.

A1.1.2 Broadleaved Woodland - Plantation

Areas of young plantation broadleaved woodland are located along the surveyed extent (Photographic Plates 14, 15, 44). These areas of woodland comprised of Willow *Salix sp.*, Hazel *Corylus avellana*, Sycamore, Pedunculate Oak *Quercus robur*, Silver Birch, Field Maple *Acer campestre*, and Alder. This habitat can provide suitable features for nesting birds as well as foraging opportunities for mammals and invertebrates.

The opportunities this habitat provides to birds, mammals and invertebrates are of high value, however as the majority of the habitat in the surveyed area is quite young, and therefore more easily replaced, it is considered that this habitat is of moderate ecological value.

A1.2.1 Coniferous Woodland - Semi-natural

There are small areas of semi-natural coniferous woodland, dominated by Scots Pine *Pinus sylvestris*, with some Larch *Larix sp.* and Spruce *Picea sp.* also present. It is possible that these are remnants of old conifer plantations, however these areas appear to have been unmanaged some years and the general appearance of the habitat is naturalised. Although Larch and Spruce are not native species, these areas of woodland did not have the appearance of plantation and contained a higher proportion of native Scots Pine than other coniferous stands. Bird nests could be seen amongst the branches of mature trees. Conifers also provide foraging opportunities for birds and mammals, such as Red Squirrels.

These smaller areas of semi-natural conifer woodland provide important habitat for birds and Red Squirrels, and for this reason, this habitat is assessed as being of high ecological value

A1.2.2 Coniferous Woodland - Plantation

Large areas of coniferous plantation dominated the western extent of the survey site (e.g. Photographic Plates 1, 10, 37), predominantly Spruce with some Scots Pine. The stands varied widely in age and appeared to be managed in a forestry rotation. Some stands appeared to be growing for use as Christmas trees, rather than more general forestry. There are scattered, discrete conifer plantations throughout the survey area. This habitat can offer potential nesting features for birds and suitable foraging opportunities for mammals, such as Red Squirrels.

Within the wider area the large extents of conifer plantation provide substantial habitat for birds and Red Squirrels, and for this reason, this habitat is assessed as being of moderate ecological value.

A1.3.1/A1.3.2 Mixed Woodland - Semi-natural/Plantation

The surrounding area of the Shevock and Valentine Burn has several sections of mixed woodland plantation (Photographic Plate 44), of varying maturity. The trees were planted as part of a larger reforestation scheme in the countryside around Insch. This habitat included, among others, Larch, Ash *Fraxinus excelsior*, Beech, Scots Pine and Spruce *Picea sp.* This habitat can offer opportunities to nesting birds, mammals and invertebrates. There are scattered discrete areas of mixed woodland around the Shevock that appear more naturalised and may be considered semi-natural.

The large extent of these woodlands provides substantial habitat to support nesting birds, mammals and invertebrates and therefore this habitat is assessed as being of moderate ecological value.

A2.1 Scrub - Dense

A small, isolated areas of dense scrub were noted on the banks of the Shevock as it flowed through Insch, as well as a small area on the right bank of the Mill of Rothney Tributary. This comprised of Bramble *Rubus fruticosus agg.*, Broom *Cytisus scoparius*, Hawthorn *Crataegus monogyna*, and Cotoneaster *Cotoneaster sp.* The nature of dense scrub provides suitable nesting and refuge features for birds, whilst creating refuge for small mammals and reptiles.

Although this habitat provides nesting and refuge features for protected species, it has been assessed as being of low ecological value as this habitat is easily re-established.

A2.2 Scrub - Scattered

Scattered scrub was noted along the central and eastern extent of the Shevock, as well as small areas of the Mill of Rothney tributary. The scattered scrub was either primarily Gorse *Ulex europaeus* and Broom, or areas willow scrub and young trees with mixed tall ruderals (Photographic Plates 36, 37). The dense structure of Gorse and Broom, and the branches of small dense trees, can offer refuge for birds, reptiles and small mammals, as well as provide features for invertebrates. Larger features among the scrub can provide habitats for more species, such as a Goat Willow Salix caprea tree in scrub along the Mill of Rothney Tributary, which was assessed as having moderate Bat Roost Potential (BRP).

As the surveyed extent had only a small area of scrub habitat, this habitat is assessed as being of moderate ecological value due to the features it can provide to birds, reptiles, small mammals and invertebrates that are not otherwise available in the landscape.

A3.1/A3.3 Scattered Broadleaved Trees and Scattered Mixed Trees

Along both the Shevock and the Mill of Rothney tributary are a few discrete areas of scattered trees, primarily consisting of broadleaved trees. Species included Beech, Sycamore, Oak, Ash *Fraxinus excelsior* and, on watercourse banks, Alder. The northern extent of the Valentine Burn travels through Insch golf course, which comprised of scattered conifers, primarily Spruce, with broadleaved trees along the burn and an amenity grassland understorey (Photographic Plates 46, 47).

These sections of scattered trees offer suitable features for nesting birds, roosting bats, invertebrates and mammals and mature trees take a long time to replace. Therefore, this habitat is considered to be of high ecological value.

B2.1/B2.2 Unimproved and Semi-improved Neutral Grassland

Unimproved and semi-improved grassland offer higher ecological value relative to the improved grassland on site and boast a higher number of species (both herbs and grasses). Species recorded during the survey included Cock's-foot *Dactylis glomerata*, Tufted Hair-grass *Deschampsia cespitosa*, Marsh Thistle *Cirsium palustre* and Soft-rush *Juncus effusus*. This habitat transitioned into patches of marshy grassland on site.

These fields provided broader range of herbs and forbs and increased foraging opportunities for invertebrates, therefore the ecological value was considered to be moderate. These could constitute priority habitats if managed as 'lowland hay meadows' but due to the time of the year and access constraints it was not possible to make a full assessment of the grassland species.

B4 Improved Grassland

Areas of improved grassland were located within the surveyed area. Areas of this habitat were sheep grazed which creates a low sward. This habitat is generally of low ecological value dominated by Perennial Rye Grass *Lolium perenne*. The intense management of this habitat has created a low vascular plant species diversity.

In light of the low species richness and highly managed nature of this type of grassland, this habitat is assessed as being of negligible ecological value.

B5 Marshy Grassland

The fields bordering the Shevock and its associated tributaries were generally well-drained, however there were small stretches of marshy grassland along the right bank of the eastern extent of the Shevock (Photographic Plate 38), and on both banks of the Mill of Rothney Tributary. This habitat is characterised by Soft-rush *Juncus effusus* and a Sedge *Carex sp*, both of which were common within the marshy grassland.

As this habitat is less common within the surveyed area and the potential it offers to waterfowl and amphibians, this habitat is assessed as being of moderate ecological value.

C3.1 Tall Ruderal Vegetation

Tall ruderal vegetation was dominant along the watercourse banks and the railway boundaries across much of the surveyed area (e.g. Photographic Plates 3,11, 36, 41). This habitat comprised of Rosebay Willowherb *Chamerion angustifolium*, Cow Parsley *Anthricus sylvestris*, Reed Sweet-grass *Glyceria maxima*, Common Reed *Phragmites australis*, Common Nettle *Urtica dioica*, Broadleaf Dock *Rumex obtusifolius*, and Common Hogweed *Heracleum sphondylium*. This habitat can offer suitable opportunities for birds, small mammals and invertebrates.

Due to the large extent of this habitat within the surveyed area and the refuge and foraging opportunities it offers to birds, small mammals and invertebrates, it is considered to be of moderate ecological value.

G1.1/G2.2 Standing Water - Eutrophic/Mesotrophic

One area of eutrophic standing water was identified at approx. OSGR NJ 62467 27392, to the east of the Mill of Rothney Tributary. It may be ephemeral in nature as it doesn't appear on maps or aerial images. This waterbody was located within sparse, unmanaged, scrubby habitat, providing suitable features for waterfowl, amphibians and small mammals.

Other mesotrophic ponds were observed along the Shevock (TN1, TN9, TN18, TN24). Although the habitat immediately surrounding the ponds varies from amenity grassland to pasture and tall ruderals, their close proximity to the watercourse suggests that that may provide habitat for waterfowl as well as amphibians.

These standing waterbodies are considered to be of high ecological value due to the limited presence of this habitat within the wider area and the potential for supporting waterfowl, mammals and amphibians, including Great Crested Newt.

G2.2 Running Water - Mesotrophic

The banks of the Shevock were frequently artificially modified, with the flow of water constrained or diverted (TN6, TN11) (Photographic Plates 7, 19, 23, 46). However, there were more naturalised stretches with earth banks supporting tall ruderal vegetation and forested areas with broadleaved trees, such as Beech, Sycamore, and Alder. Some stretches appeared to support healthy macrophytes within the channel (see TN 12, 35, 49). Small holes, potentially burrows, were observed in the left bank from the opposite bank in an area of semi-natural broadleaved woodland. Although not overly vegetated, this may have been due to the timing of the survey in the year; this area may provide habitat for Water Vole. There were areas of eroded bank noted along the river (e.g. OSGRs: NJ 60214 28148, NJ 61994 27644). Furthermore, the Shevock supports fish, including Brook Lamprey *Lampetra planeri*, see Section 4.1.3.

The natural characteristics of the Shevock provides suitable habitat for commuting and foraging Otter as well as fish and waterfowl, therefore, this habitat is assessed as being of high ecological value.

The Mill of Rothney Tributary is a small narrow watercourse that flows through predominantly arable habitat, potentially exposing it to diffuse pollution. The flow at the time of survey was variable, in some areas fast flowing, whereas in other areas of standing water were observed. Before joining the Shevock this burn flows through more wooded habitat, as such the amount of organic material in the burn could increase at this point. Detailed survey of much of this watercourse was not possible, with surveyors limited to making observations from the top of the right bank due to the steepness of the bank.

Although difficult to assess the value of this watercourse for specific species, due to the variety of habitat that it flows through and the relative wildness of the habitat compared the large areas of residential land and amenity grasslands in the surrounding area, this watercourse is assessed as being of moderate ecological value.

The Valentine Burn comprised of earth and stone brick banks covered by tall ruderal vegetation and woodland at its western extent and amenity grassland to its eastern extent. There was very little vegetation in the water channel at the western extent, although some trees on the banks had grown through the reinforced bank, with exposed roots presenting potential resting habitat for Otter (TN28) (Photographic Plate 45). Macrophytes began to colonise the channel as the burn flowed east through Insch (Photographic Plate 49).

This highly modified section of this watercourse does not provide suitable features for riparian mammals or waterfowl, with limited in-channel vegetation suitable for foraging and refuge, although time of year may have influenced this. This watercourse has been assessed as being of moderate ecological value.

The Newton of Rothney Tributary is a small narrow stream that appears to have been straightened but is becoming more naturalised as fallen trees (Photographic Plate 32) and other debris create variation in morphology and flow. The banks are dominated by ruderals under a woodland canopy at the southern extent, although to the north the right bank transitions to pastural field boundary.

The woodland comprises a mix of trees including Sycamore, Ash, Alder, and Silver Birch. A Dipper *Cinclus cinclus* was observed foraging in the stream.

Although historically modified, this stretch of the survey appears to be becoming more naturalised, with the streams course being altered by falling trees and other debris. Fallen trees and old stumps provide habitat for a reptiles, amphibians and invertebrates, and the woodland provides nesting and foraging resources for birds.

J1.1 Arable

The wider landscape surrounding the Shevock and associated tributaries is dominated by arable fields. This habitat is intensively managed and has low species diversity offering limited features for species to inhabit.

In light of the low species richness and the managed nature of the arable fields, this habitat has been assessed as being of low ecological value.

J1.2 Amenity Grassland

Areas of amenity grassland are located within the urban sections of the surveyed extent (Photographic Plates 22, 25, 46). This habitat contains low species diversity and is intensively managed.

Due to the low species richness and managed nature of this grassland, this area was assessed as being of low ecological value.

J2.1.2/2.3.2 Species-Poor Hedgerows including Hedgerows with Trees

The majority of fields were bounded only by fences, but some fields, often those separating the field from the road, also had hedgerows. These hedgerows were usually monoculture Beech.

Although species poor, these hedgerows provide nesting opportunities for birds and could be used for commuting by invertebrates and small mammals. They may also provide refuge for birds, mammals and reptiles. Therefore, they have moderate ecological value.

J2.4 Fence

Agricultural fields and amenity grassland were frequently bound by fences.

These offer negligible ecological value.

J2.5 Walls

Walls around the Shevock were mainly restricted to the urban environment, and most frequently encountered on bridges crossing the water course. They were predominantly stone, with some brick structures. The majority were in good repair.

The majority are well maintained and offer little ecological value, however the stone Drumrossie House Bridge (Photographic Plate 35) is in disrepair and may offer refuge and habitat to small invertebrates and reptiles.

J3.6 Buildings

The Shevock runs directly through the village of Insch and therefore residential and commercial buildings are present within the wider area of the river and tributaries. The banks of the Shevock are highest in urban areas, so small in channel works may not affect the buildings; however, some buildings (with potential bat roosts and bird nesting sites) may be impacted upon by flood alleviation works. The Shevock and its tributaries were generally only culverted under bridges.

It is possible that the buildings could be impacted upon by the works, therefore further consideration into the ecological value of these buildings may be required once the works are finalised.

J4 Bare Ground

Hardstanding was noted along several areas of surveying extent, primarily forming paths and tarmacked surfaces. These areas did not support any significant assemblages of vegetation.

For the above reasons this habitat was assessed as being of negligible ecological value.

4.2.2 Protected Species

4.2.2.1 Badgers

No recent field signs such as footprints or latrines were recorded, however potential sett entrances were recorded within the surveyed extent (at OSGR: NJ 61937 26444 and NJ 64384 28535). Areas of scrub and woodland across the site provide opportunities for foraging Badger, additionally areas of the woodland could provide suitable sett digging habitat. The data search returned records of Badger within 2km of the site, some of which were in close proximity to the river.

The site has therefore been assessed as moderate to high ecological value to Badger.

4.2.2.2 Red Squirrels

No Red Squirrels were noted on site, nor were any field signs (including, dreys) observed during the walkover. The data search returned several Red Squirrel records, many of which are in close proximity to the watercourses. It is, therefore, likely that Red Squirrels are present within the proposed works area. However, the extent of the woodland is not restricted to the watercourse banks and therefore*, the overall ecological value of the site to Red Squirrels is considered to be moderate.*

4.2.2.3 Scottish Wildcat

No evidence of Scottish Wildcat was found during the survey, however they are known to be highly elusive and secretive. They have previously been recorded within the Strathbogie Wildcat Priority Area, and as they can roam over large territories this may bring them into the study area. In particular, the western extent of the study area has large areas of conifer plantation, and there are further pockets of semi-natural woodlands scattered throughout the study area. Along with scrub vegetation, which is common along the Shevock reach, and hedgerows, which make valuable corridors, there are many habitats in the area that would be suitable for Scottish Wildcat.

It can be difficult to establish whether Scottish Wildcat are present in a given area. However, *if there are Wildcats within the study area, given the vulnerability of the species in the wild, the site would be of high ecological importance to Wildcat.*

4.2.2.4 Water Voles

Much of the Shevock and its tributaries was not considered suitable for Water Voles due to the heavily modified nature of the banks, and pinch points causing fast flow conditions. While small holes, potentially burrows, were found in a short section of naturalised earth bank under semi-natural woodland, no definitive field signs (*i.e.* latrines) were observed along the Shevock, nor were any records for Water Vole returned by the data search. It should be noted that the survey was conducted outside of the optimal survey season (April to September).

Due to small discrete areas that offer habitat to support Water Vole, the site has been assessed as moderate ecological value for Water Voles.

4.2.2.5 Otters

Areas along Valentine Burn were noted as good habitat for Otter holts due to overhanging trees with exposed roots, see TN28 (Photographic Plate 45), although no Otter holts were seen during the walkover. Additionally, the Shevock, Newton of Rothney Tributary, and Mill of Rothney Tributary are considered suitable for foraging and commuting Otters. No Otter holts or field signs were observed during the survey, but the data search did return a record of Otter very close to, or in, the watercourse at the Western extent of the site on the Shevock.

Therefore, the overall ecological value of the site to Otter is considered to be moderate to high.

4.2.2.6 Bats

Mature trees were located across the site, many of these were situated away from the watercourse banks and therefore are unlikely to be impacted upon by future works if these works are restricted to the waterbodies. Mature woodland was quite extensive across the surveyed site and it is considered likely that there will be trees with suitable bat roosting potential within these woodlands.

During the survey, a Beech tree was found to have a large hollow in its trunk that could present suitable roost features for bats (TN16) (Photographic Plate 28); this tree was assessed as having moderate BRP. In addition, several mature broadleaved trees were noted as having low BRP NJ

63439 28194 (TN26) with high Ivy coverage disguising potential bat roosting features (Photographic Plate 50).

Some of the greenkeepers' sheds on Insch Golf Club (Photographic Plate 48), through which the Valentine Burn flows, had cracks and nooks in their structure, presenting refuge opportunities for bats, although as the sheds where often built from metal, and flat roofed, they were assessed as having low BRP. No other structures with BRP were noted during the survey, but residential properties close to the river were not assessed.

The Shevock and associated tributaries offer suitable commuting and foraging opportunities for bats in the local area.

The overall ecological value of the site to bats is moderate to high.

4.2.2.7 Birds

No specific bird surveys were conducted as part of the initial PEA, however, all incidental sightings during the site survey were recorded and included:

- Blackbird *Turdus merula*
- Buzzard *Buteo buteo*
- Carrion Crow *Corvus corone*
- Coal Tit *Periparus ater*
- Dipper *Cinclus cinclus*
- Great Tit *Parus major*
- Greylag Goose *Anser anser*
- Mallard *Anas platyrhynchos*
- Mute Swan *Cygnus olor*
- Oystercatcher *Haematopus ostralegus*
- Pheasant *Phasianus colchicus*
- Robin *Erithacus rubecula*
- Siskin *Spinus spinus*
- Starling *Sturnus vulgaris*
- Woodpigeon *Columba palumbus*

No birds listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) were recorded during the survey. The habitats across the site were considered suitable to provide nesting opportunities for birds, in particular the areas of woodland, scrub, and dense reeds. Additionally, the watercourses provide further nesting and foraging opportunities within marginal/bankside vegetation.

The overall ecological value of the site to birds is high.

4.2.2.8 Great Crested Newts

Five standing waterbodies were noted within the survey area during the site walkover. Three of these (OSGRs: NJ 59825 28310, NJ 63923 27967, NJ 65153 28444) were not accessible. The other two waterbodies (OSGRs: NJ 62396 27794, NJ 64229 28238) were either partially or fully frozen over. Due to these restrictions, a HSI assessment was not carried out for these waterbodies.

No signs of Great Crested Newts were recorded during the survey however the site was visited outside of the optimal survey time for this species. Northern Scotland is not optimal for Great Crested Newt and there are no records for Aberdeenshire.

Across the surveyed area were areas of scrub and woody debris piles which can provide suitable refuges and hibernacula for Great Crested Newts (Photographic Plate 32 - 34). However, the data search returned no records of Great Crested Newts within 2km of the watercourse.

It is considered that the site has low ecological value for Great Crested Newts.

4.2.2.9 Reptiles

No reptiles were observed on site, although this is expected during February which falls within the hibernation period. The areas of scrub and fallen trees in the woodland areas around Newton of Rothney Tributary offer potential refuges and hibernacula for reptiles (Photographic Plates 32 - 34). Furthermore, the areas of ruderal vegetation, scrub and marshy grassland would offer good foraging opportunities for reptiles. Bare ground and tarmacked surfaces also offer suitable basking opportunities, and such surfaces were found scattered throughout the survey site; this does not include the roads and rail line, which are considered to have negligible ecological value. The data search returned no records of reptiles within 2km of the site.

The ecological value of the site is considered to be moderate for reptiles.

4.2.2.10 Freshwater Pearl Mussels

There are no records of Freshwater Pearl Mussels within the study area. The western and central reaches of the survey site of the Shevock was not considered suitable for Freshwater Pearl Mussel (where the river flows within or near to development), and similarly the heavily modified extent of Valentine Burn was also considered unsuitable. The far eastern reaches of the Shevock were more naturalised and could potentially support this species.

If present in the watercourse, the ecological value of the site to Freshwater Pearl Mussels is high.

4.2.2.11 Fish

No fish were observed in the watercourses during the survey, however the data search did return a record of Brook Lamprey *Lampetra planeri* in the Shevock. Furthermore, Sea Trout *Salmo trutta* and Salmon Salmo salar, Eel *Anguilla anguilla* and Lamprey *Petromyzontidae* are known to be present within the River Urie (Spinfish, 2015), of which the Shevock is a tributary, consultation with the River Trust has identified the watercourse to be of suitable spawning habitats. If there are no major obstacles in the watercourse then it is possible that these species will also be in the Shevock, and potentially its larger tributaries.

The ecological value of the site for fish is moderate to high.

4.2.2.12 Other Protected and/or Notable Species

A Brown Hare *Lepus europaeus* was observed amidst the scrub vegetation on the golf course south of Western Road (TN8).

4.2.3 Invasive Non-native Species

During the survey, there were observations of Giant Hogweed *Heracleum mantegazzianum*, or large plants that under winter die-back closely resembled Giant Hogweed, at several locations along the Shevock (approx. OSGRs: NJ 61994 27644, NJ 62450 27737, NJ 64113 28018) (Photographic Plates 18, 21, 37).

In addition, over a short stretch within Insch itself, both banks of the Shevock supported several bushes of Cotoneaster Cotoneaster sp. (approx. OSGR: NJ 63071 27846) (Photographic Plate 24) which, depending on species, could be an invasive non-native plant. No further invasive non-native species were noted during the survey.

5 Conclusions and Recommendations

5.1 Statutory and Non-Statutory Designated Conservation Sites

There are no statutory designated conservation sites within the survey area, however the Strathbogie Wildcat Priority Area is situated to the northwest of the survey site and incorporates the upstream reaches of the Shevock.

It would be advisable to consult with SNH on the works in the western end of the rivers to discuss any potential impacts upon the Wildcat Priority Area.

5.2 Habitats

The habitats across the surveyed extent were, generally, considered to be of moderate to high ecological value due to their structural variety, and potential as connectivity corridors. The habitats offer suitable opportunities for several protected species including Badger, nesting birds, and Water Vole. Therefore, any permanent land-take of semi-natural habitats should be kept to a minimum. Where land-take is unavoidable, further ecological surveys will also be required.

It is likely that the future flood alleviation works will involve bank works, and so it is recommended that this is restricted to as small an area as possible and that any loss of riparian habitat should be compensated. Avoidance and mitigation measures for ecological features along with ecological enhancement should be designed into the works from an early stage. Suitable enhancement measures could include the re-planting of riparian vegetation using native species sourced from local provenance.

Habitats of moderate to high ecological value (e.g. semi-natural woodland) could be targeted with natural flood management (NFM) measures that could also enhance these habitats. Habitats of low or negligible value also offer an opportunity for NFM by significant enhancement and habitat restoration such as through planting (and protecting) riparian trees in over-grazed pasture or creating buffer strips in arable fields.

Should any tree works be proposed to facilitate the works (*e.g.* to provide access), it will be necessary to liaise with the local council regarding TPOs within the local area prior to works commencing. If trees will be impacted by the works (including retained trees where roots may be impacted) then an arboricultural survey should be undertaken.

5.3 Protected Species

5.3.1 Badger

Two potential Badger setts were identified within the survey, and there are records of Badgers within 2km of the site area. There are extensive foraging opportunities within the survey extent, as such the future works may cause disturbances to Badgers who are foraging. To limit disturbance to Badgers it is recommended that all works and excavations should be covered overnight to prevent trapping, and overnight works should be avoided where possible. If, however, overnight works are required a directional cowl should be fitted to all lights to prevent light spill and to be directed away from areas of woodland and scrub. As Badgers regularly develop new setts, it is recommended that a walkover survey is undertaken up to three months before works start to confirm that there are no setts within 30m of the works area.

5.3.2 Red Squirrel

No dreys were identified within the survey area, but due to the records of Red Squirrel it is advised that any tree works which could impact upon them should follow a precautionary approach. Any tree works should not take place between February and September (inclusive), when the kits are born and dependent on their mother. Once specific trees have been identified for removal, they should be inspected by an experienced ecologist to check for the presence of dreys prior to removal. If dreys are present, then further mitigation will be required.

5.3.3 Scottish Wildcat

While no evidence of Wildcats was found within the study area, due to the elusive nature of these creatures, and the importance of habitats within the study area to these species, once works are proposed there should be a consultation with Scottish Natural Heritage and other relevant bodies

to ensure that the plans do not have an impact on Wildcats. The main habitats of importance are plantation and natural woodlands (which make up a large area of the site at its upstream extent, near the Strathbogie Wildcat Priority Area), however the areas of open scrub along much of the Shevock would also be valuable habitat to Wildcats. Any works in woodland or scrub will require consultation, along with any works that may impact on lengths of hedgerow.

5.3.4 Water Vole

The survey was conducted at a sub-optimal time of year to gauge activities of Water Vole, however during the survey one short section of bank containing potential burrows was identified (TN15). It is therefore likely that Water Vole surveys will be necessary between April to September inclusive (Dean *et al*. 2016), once the exact location and nature of the works is known. Water Voles are more likely to be present on the narrower, slower flowing river sections with extensive riparian vegetation. This describes much of the Shevock, especially near the village and at the eastern survey extent.

5.3.5 Otter

An Otter survey of the area will be necessary prior to works in the water or on banks and should include the location of the works and 250m upstream and downstream. Survey effort should focus on potential holt sites and resting places identified during this survey. Depending on the nature of the proposed works, this may require trail camera traps in addition to a search of Otter field signs (e.g. spraints, footprints, etc.).

5.3.6 Bats

Foraging

If works are scheduled between April-September inclusive, when bats are most active, any night time working should be avoided. Should night working be required this should use directional lighting rather than floodlights to avoid causing unnecessary disturbance to foraging or commuting bats. Lights should be fitted with a directional cowl to avoid unnecessary light spill and should be directed away from any potential foraging/commuting habitats; in this case, woodland habitat, the river and its banks. If the works are likely to alter the watercourse significantly, bat activity surveys would be recommended to determine any impacts upon the local bat population using the watercourse. Following these surveys, mitigation measures would be recommended.

Roosting

Works should in the first instance avoid any impact to the trees on site. However, should the trees identified in Section 4.2.2.5 of this report, or any other mature trees, require intrusive arboricultural works, such as loping, pruning or felling, it is advised that these are first assessed at elevation using an aerial tree climber who holds a SNH Bat Survey Licence. If trees cannot be safely climbed, or if potential bat roosts are identified, it will be necessary to undertake infrared and emergence surveys of these trees during the main bat activity season (i.e., May to September, inclusive) in order to characterise the roosts. If works cannot avoid impacting on roosts it will be necessary to apply to SNH for a mitigation licence for works affecting the roost. The assessment for bats should be reviewed once the exact location of the works is known.

If the greenkeepers' sheds identified as having low BRP (TN27) (Photographic Plate 48) are likely to be impacted upon by the works, further bat roosting assessments may be required, which could lead to the requirement of activity surveys. It must be noted that bat activity surveys can only be carried out between May to September, inclusive.

5.3.7 De-vegetation and Nesting Birds

Woodland, dense tall ruderal vegetation, reedbeds and scrub habitats were all suitable for use by nesting birds. Ideally vegetation should be cleared outside nesting bird season. Should de-vegetation be proposed during the main nesting season (i.e., March to September, inclusive), a nesting bird check will be required prior to any clearance works commencing. This should be undertaken by a suitably experience ecologist who will advise on mitigation and progressing works, if nests are found.

5.3.8 Amphibians and Reptiles

Five standing waterbodies were noted on site. Although, no records were returned within the data search for Great Crested Newts, the habitat is considered suitable for supporting this species. If any future works will impact upon these areas of standing water, it is possible that further Great Crested

Newt surveys are conducted to determine presence/absence. The likely absence due to the geographic location means that the most effective method of survey for this site is environmental DNA (eDNA) surveys, which require a single collection of water samples to be sent off for analysis to determine the presence/ absence of Great Crested Newt eDNA.

It is recommended any scrub, brash and debris piles that will be disturbed, undergo a destructive hand search by a suitably experienced ecologist prior to works commencing.

5.3.9 Freshwater Pearl Mussel

The presence of Freshwater Pearl Mussels within the Shevock is possible in sections containing a gravel substrate and where the water generally fast flowing and clean with little input of nutrients and pollutants. Both Salmon and Trout are known to be located at least at the downstream extent of the Shevock, where it joins with the Urie, and this provided juvenile Freshwater Pearl Mussels a habitat for their first year, during which they survive on Salmonids gills. It is recommended that a Freshwater Pearl Mussel survey is conducted prior to any in-channel and/or significant back works.

5.3.10 Fish

Sea Trout, Salmon, Eel and Lamprey are known to be present within the River Urie which supports suitable habitats for spawning, downstream of the Shevock. Furthermore, Brook Lamprey have been reported in the Shevock itself. It is therefore recommended that any in-channel works should avoid the spawning season for these species (October to March, inclusive). Fish surveys may be required where some impacts are unavoidable and should be reviewed once the works details are known and in place.

Short-term adverse impacts could arise should temporary in-channel works be necessary. Impacts could include a potential decrease in water quality, for example through release of contaminative materials (e.g. concrete, oils), silt mobilisation or decreased oxygen levels in the water. To mitigate against potential impacts on fish species, the footprint of the works should be minimised to as small an area as necessary, and any bed materials removed or disrupted as part of the works should be replaced. To ensure there are no long-term adverse impacts upon fish the final works design should be re-assessed to determine there are no obstructions and/or alterations to the channel that could impact negatively upon fish.

To prevent adverse impacts on water quality, an appropriate silt containment system should be implemented throughout the duration of the works to ensure that silt mobilisation does not cause degradation of habitats of value to spawning fish. Relevant pollution prevention measures should be followed (see Section 5.5).

The works also have the potential to decrease dissolved oxygen levels through disturbance of organic material and resulting increased biochemical oxygen demand (BOD). Increased BOD and decreased oxygen can have significant adverse impacts on fish. This can be avoided by not working in excessively high temperatures and maintaining water flow. It is recommended that dissolved oxygen levels are monitored throughout the works

5.4 Invasive Non-native Species

Giant Hogweed and several Cotoneaster species are classified as non-native plants that were introduced into Britain. They are listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and it is an offence to cause the spread of these species into the wild. These species were noted within the surveyed area and measures will need to the be put in place to ensure that there is no further spread of these species because of the works. Once detailed works plans are available a walkover survey should be completed in the summer to map out the location of invasive, non-native species. The location can be used to determine necessary mitigation measures including removal, herbicide treatment, and/or exclusion zones.

5.5 Pollution Prevention

Appropriate mitigation measures should be implemented prior to the construction phase to ensure that the water quality of the river and tributaries is not adversely affected through pollution incidents and silt mobilisation. This mitigation should include:

- Abiding by relevant pollution prevention measures e.g. CIRIA Guidance: Control of water pollution from construction sites. Guidance for consultants and contractors (C532D) (Masters-Williams, 2001). Information useful for Toolbox Talks on working near water and

pollution prevention can be found at: https://www.ciria.org/Resources/All_toolbox_talks/Env_toolbox_talks/Working_on_or_near_watercourses.aspx [Accessed: 18/12/17].

- Preventing accidental oil and fuel leaks can be achieved by the following actions:
    - Any chemical, fuel and oil stores should be located on impervious bases within a secured bund with a storage capacity 110% of the stored volume.
    - Biodegradable oils and fuels should be used where possible.
    - Drip trays should be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles and machinery should be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 10m).
    - Emergency spill kits should be available on site and staff trained in their use.
    - Operators should check their vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately.
    - Daily checks should be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective should be removed from site immediately or positioned in a place of safety until such time that it can be removed.
- Silt run off should be prevented by incorporating the following actions:
    - Silt curtains should be used where appropriate to prevent silt from the construction works entering the watercourse.
    - Exposed bare earth should be covered as soon as possible to prevent soil erosion and silt run-off. Alternatively, geotextile coverings can be used to cover any exposed earth and prevent soil erosion.
- Water quality downstream of the works should be monitored regularly to detect any changes in water quality that could indicate a pollution incident. Should monitoring indicate potential pollution from the construction activities, works should be stopped, and a solution found to prevent the pollution source entering the watercourse. Monitoring could include:
    - Visual monitoring to see if water colour has changed or if a plume is visible indicating sediment input.
    - Water quality meter measurements for Dissolved Oxygen and pH.
- Environmentally sensitive products should be used where possible. For example, this could include the use of less harmful innovative products such as Cemfree™ http://www.cemfree.co.uk/cemfree-product-information [site accessed 4/1/17] in place of concrete.

5.6 Water Framework Directive

A Water Framework Directive (WFD) assessment should be conducted in advance of works to ensure that the proposals are in line with European legislation and to mitigate against any adverse in-channel effects. A WFD assessment is a desk-based assessment which relies on information regarding the status of the waterbodies as detailed within the River Basin Management Plan (RBMP).

5.7 Biosecurity

If in-channel works are necessary, measures will need to be put in place to ensure there is no spread of diseases within the watercourses. The Check-Clean-Dry approach should be followed, ensuring that all PPE and equipment is cleaned before leaving site. For more information go to www.nonnativespecies.org/checkcleandry.

Appendices

A Phase 1 Habitat Maps

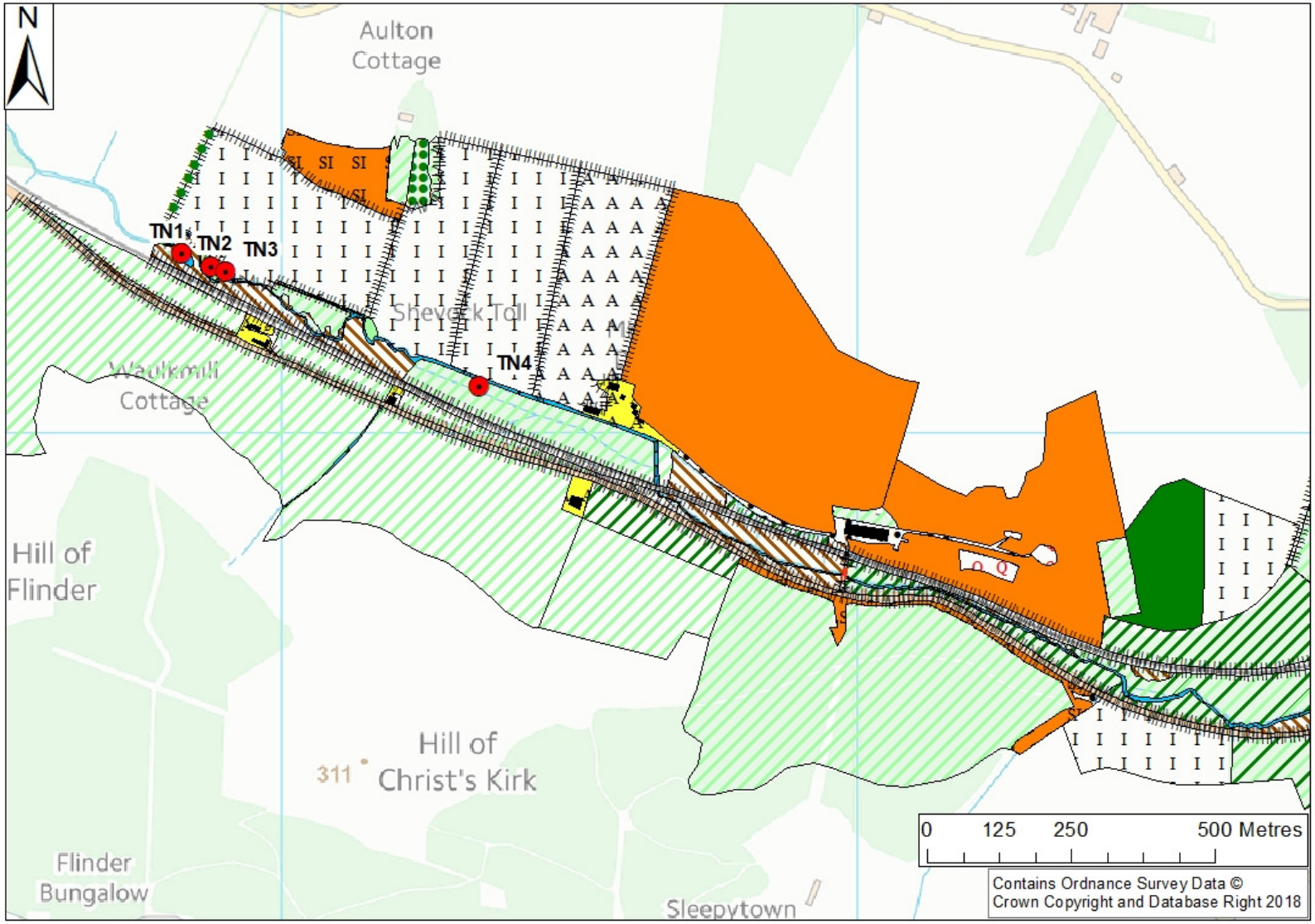

Figure A-1: Phase 1 Habitat Map - Western extent of the Shevock.

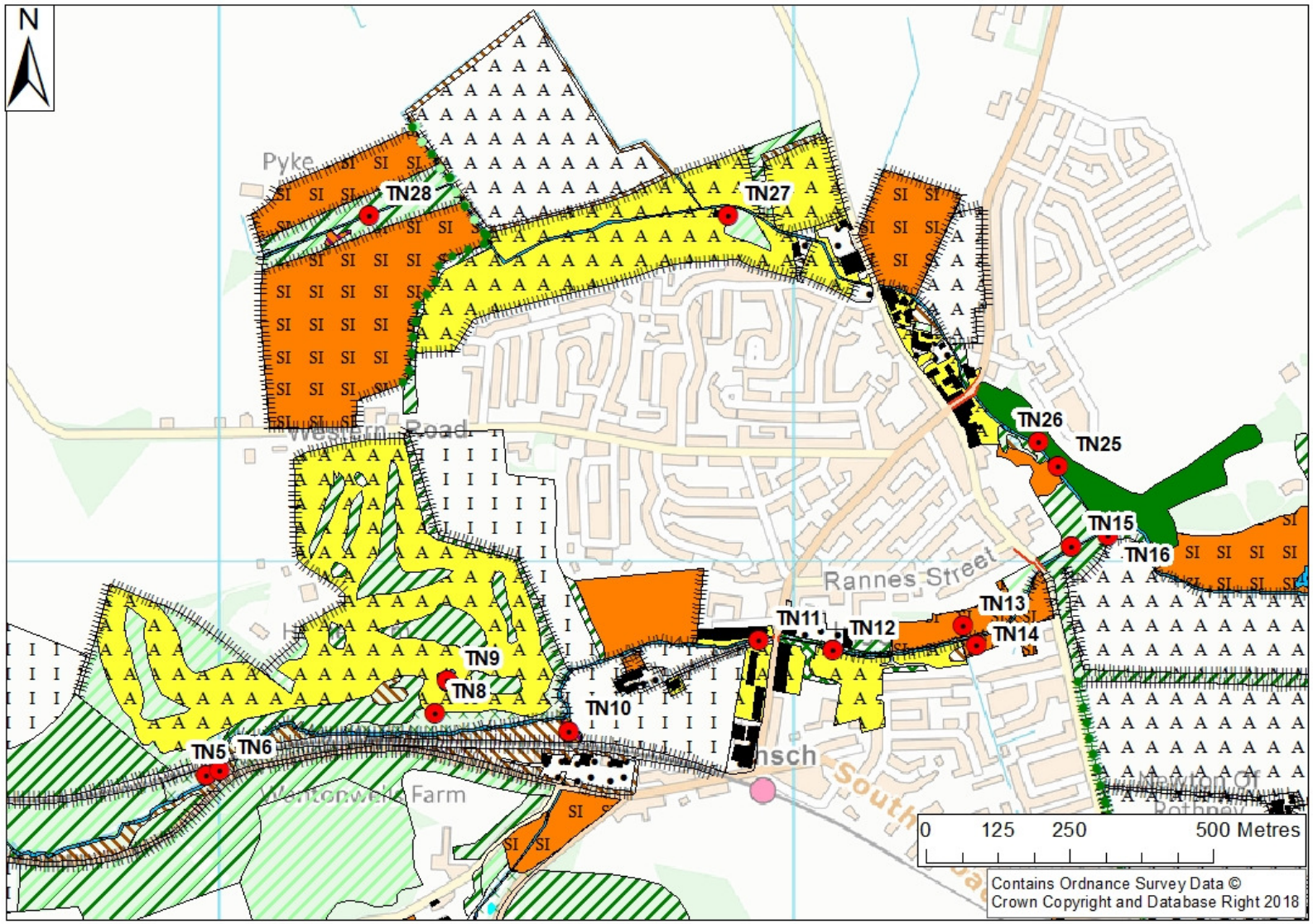

Figure A-2: Phase 1 Habitat Map - Central Shevock and Valentine Burn.

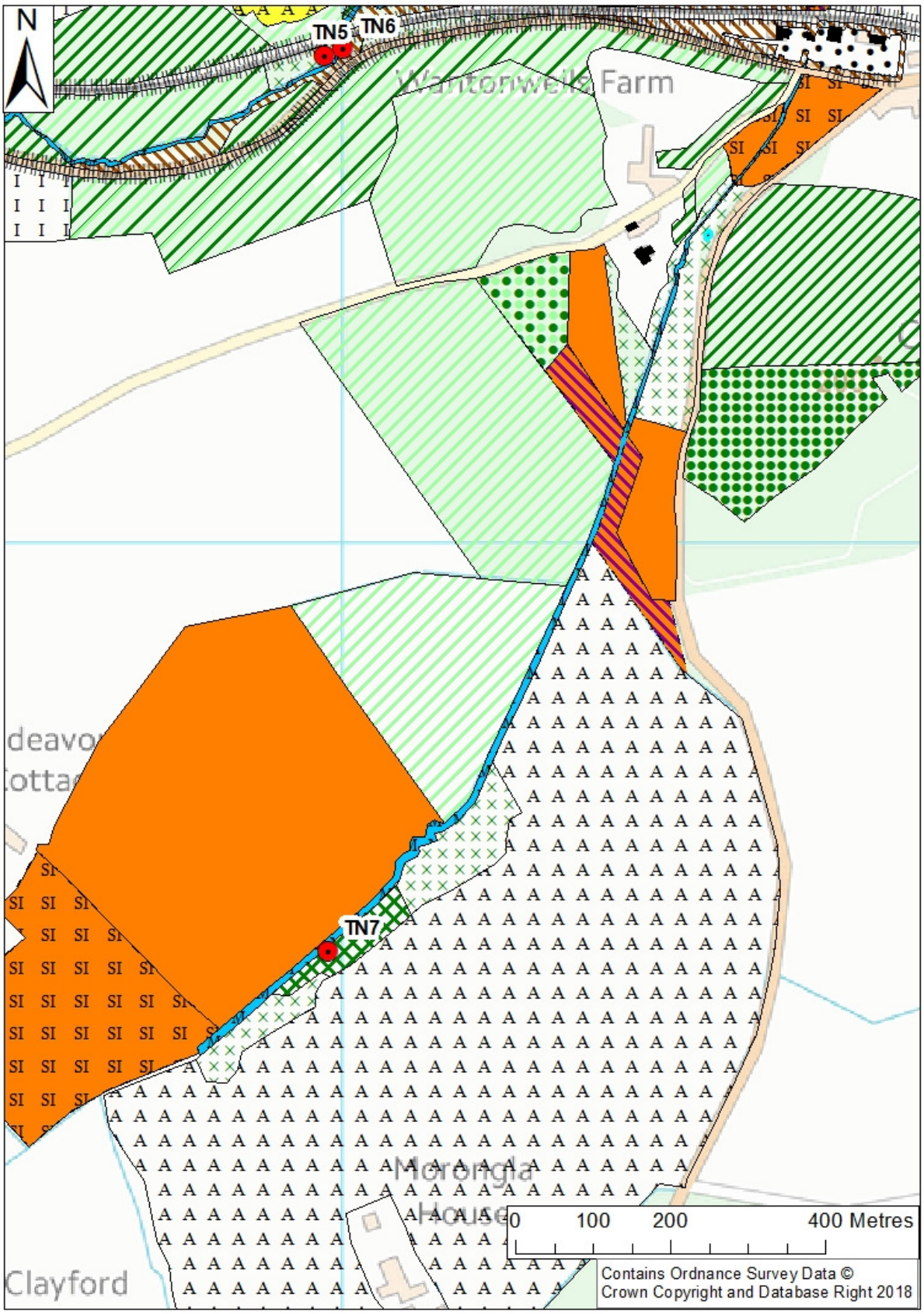

Figure A-3: Phase 1 Habitat Map - Mill of Rothney Tributary.

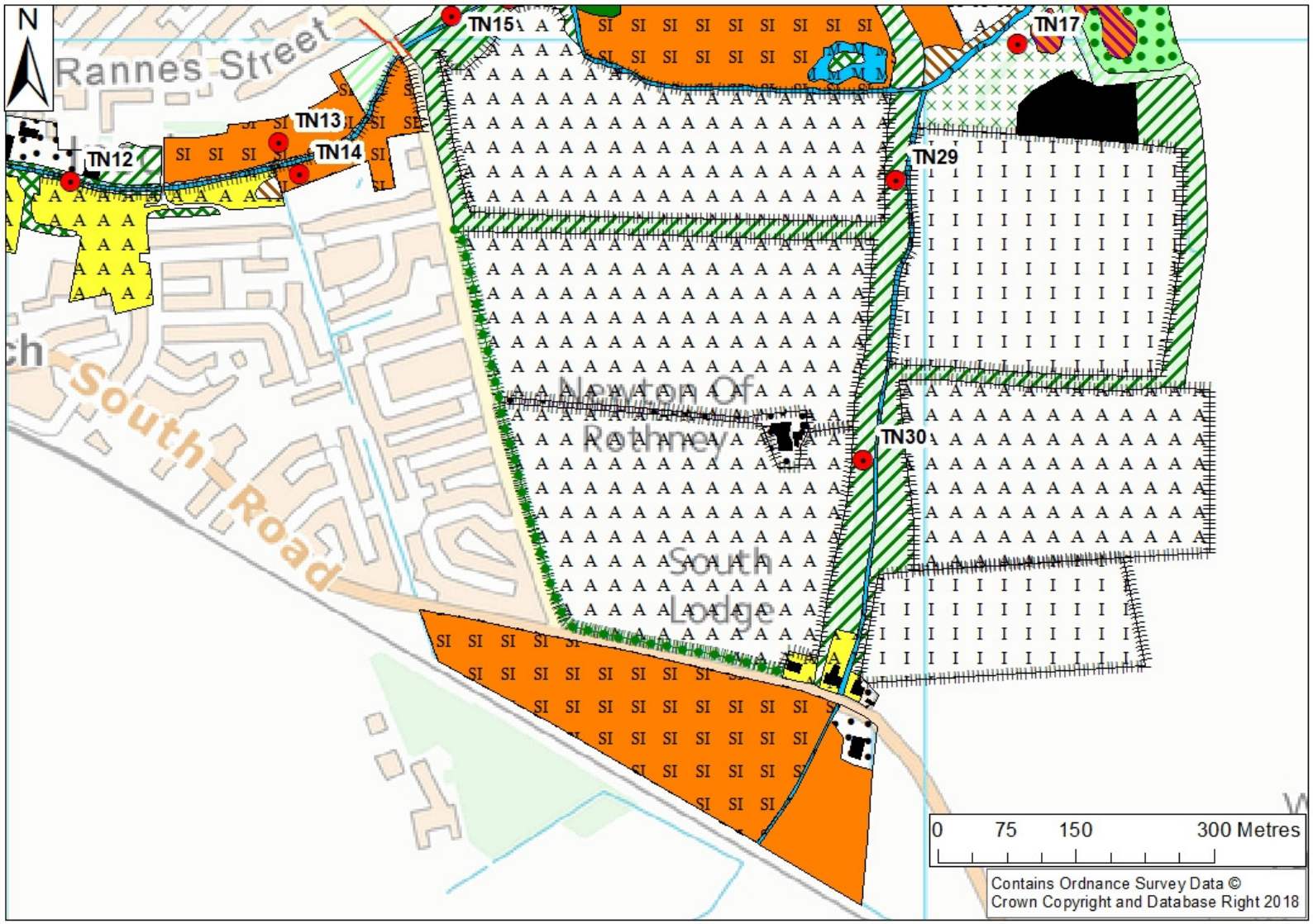

Figure A-4: Phase 1 Habitat Survey - Newton of Rothney Tributary.

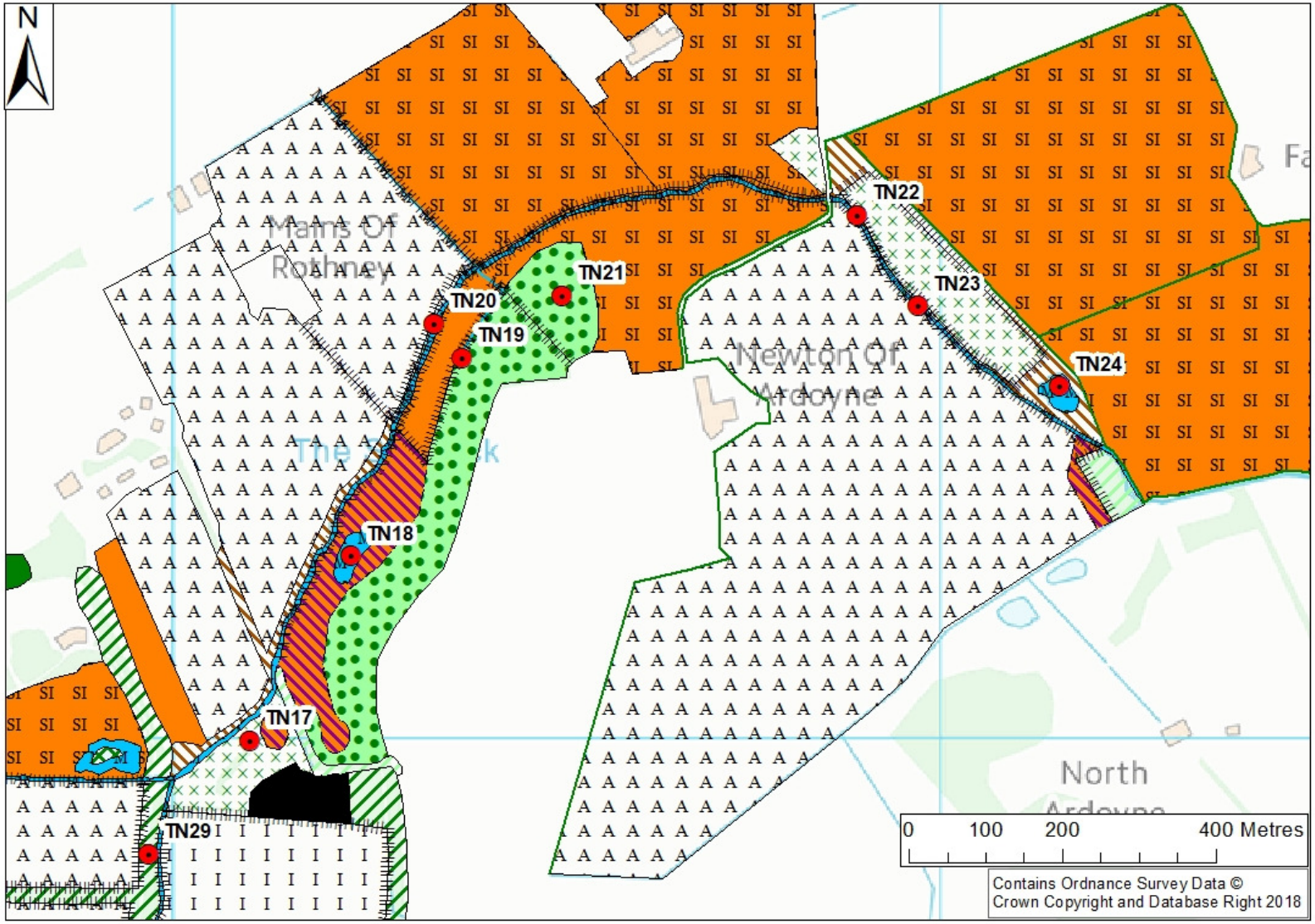

Figure A-5: Phase 1 Habitat Survey - Eastern extent of the Shevock.

Table A-1: Target Note details, refer to Phase 1 Habitat Maps for locations.

Target note number	Comment	Relevant Phase 1 Habitat Maps
TN1	Duck house on island, plant life is predominantly marginal vegetation.	Figure A-1
TN2	Potential Giant Hogweed stand.	Figure A-1
TN3	Poaching on left bank.	Figure A-1
TN4	Unknown usage of clearing within spruce plantation	Figure A-1
TN5	Potential Giant Hogweed stand.	Figures A-2, A-3
TN6	Piling pulling away from bank, diverting waterflow and failing to prevent bank erosion	Figures A-2, A-3
TN7	Badger sett.	Figure A-3
TN8	Brown hare in scrub.	Figures A-2, A-3
TN9	Pond on amenity grassland - mute swan recorded during survey. Potential amphibian habitat.	Figures A-2, A-3
TN10	Grassy field corner dominated by marginal vegetation.	Figures A-2, A-3
TN11	Concrete structures in right river bank. Support structures?	Figure A-2
TN12	Potentially invasive cotoneaster in scrub.	Figure A-2
TN13	Potential flood storage ditch.	Figure A-2
TN14	Potential flood storage ditch.	Figure A-2
TN15	Holes in left river bank. Potential Water Vole or other bank dweller habitat.	Figures A-2, A-5
TN16	Old tree with large hollow - moderate BRP.	Figures A-2, A-5
TN17	Potential giant hogweed stand.	Figure A-5
TN18	Large pond in marshy grassland. Potential habitat for newt and other amphibians.	Figure A-5
TN19	Potential badger sett.	Figure A-5
TN20	Erosion on left bank.	Figure A-5
TN21	Stands of mature trees - low BRP.	Figure A-5
TN22	Rocky bank defences on left bank.	Figure A-5
TN23	Potential Giant Hogweed stand.	Figure A-5
TN24	Pond providing habitat to waterfowl, potential newt habitat.	Figure A-5
TN25	Ephemeral pools and streams - potential herptile habitat.	Figure A-2
TN26	Ivy covered trees - low BRP.	Figure A-2
TN27	Old crooked greenkeepers' sheds - low BRP.	Figure A-2
TN28	Tree with rootzone exposed in channel - potential otter holt. No field signs for otter.	Figure A-2
TN29	Stacked logs providing herptile refugia and hibernacula for reptiles and invertebrates.	Figure A-4
TN30	Hollow tree stump with low BRP.	Figure A-4

B Photographic Plates

Photograph	Comment
	**Photographic Plate 1:** Most western survey extent. The Shevock flows in an easterly direction along the bottom of a shallow valley, bounded on the left by pasture and ruderal vegetation. and on the right by conifer plantation. OSGR: NJ 59882 28522
	**Photographic Plate 2:** Pool of standing water, assumed to be ephemeral, in bottom corner of grassland field. OSGR: NJ 59829 28362
	**Photographic Plate 3:** A pond (circled) surrounded by ruderal vegetation on the right bank of the Shevock may provide habitat to newts and other amphibians. OSGR: NJ 59829 28363

Photographic Plate 4:

Cattle poaching on the left bank of the Shevock has led to erosion of the bank and damage to the fence line.

OSGR: NJ 59927 28265

Photographic Plate 5:

Macrophytes and silt within a side channel, under plantation conifers, that drains into the Shevock.

OSGR: NJ 60050 28248

Photographic Plate 6:

Some erosion on the right bank of the Shevock.

OSGR: NJ 60214 28148

Photographic Plate 7:

At this area of conifer plantation, the Shevock suddenly meanders to the left. The meander is artificial in nature and reinforced.

OSGR: NJ 60245 28139

Photographic Plate 8:

Bank erosion and possible poaching on the left bank of the Shevock.

OSGR: NJ 60273 28124

Photographic Plate 9:

Unknown activity within the Spruce plantation on the left bank of the Shevock. Evidence of barriers and fences within plantation.

OSGR: NJ 60324 28103

Photographic Plate 10:

Within the spruce plantation, the Shevock's course turns south and passes below a railway line, presenting access difficulties.

OSGR: NJ 60645 27999

Photographic Plate 11:

Upstream of the Shevock Farm rail crossing, the habitat at the valley bottom is largely ruderal and marshy grassland, with scattered trees and occasional stands of mixed woodland.

OSGR: NJ 60977 27752

Photographic Plate 12:

Downstream of the Shevock Farm rail crossing, the undergrowth is still mainly ruderal, but there are also planted broadleaf trees, predominantly on the right bank.

OSGR: NJ 60981 27753

Photographic Plate 13:

The habitat on the left bank of the Shevock remains ruderal, but with more mature trees. Old nests were observed in the trees, suggesting that this habitat is used by nesting birds.

OSGR: NJ 60977 27752

Photographic Plate 14:

On the right bank, a young broadleaf plantation woodland is growing between the Shevock and the roadside.

OSGR: NJ 60977 27752

Photographic Plate 15:

Nearer to Insch, the Shevock meanders closer to the roadside. There are larger stands of mixed woodland, and nests were observed in the trees, suggesting this habitat is important to nesting birds.

OSGR: NJ 61418 27553

Photographic Plate 16:

Between areas of conifer plantation, there is a stretch of grassland with patches of gorse becoming dominant further up the hillside.

OSGR: NJ 61418 27553

Photographic Plate 17:

Spruce plantations dominate much of the landscape on the right bank of the Shevock west of Insch.

OSGR: NJ 61418 27553

Photographic Plate 18:

An area of scrub and ruderal vegetation between the rail line and the Shevock. Circled, a stand that may be invasive, non-native Giant Hogweed.

OSGR: NJ 61994 27644

Photographic Plate 19:

Sheet piling on the right bank of the Shevock that has come loose, diverting the water course and failing to prevent bank erosion.

OSGR: NJ 61994 27644

Photographic Plate 20:

A culvert under the rail line. The Shevock flows through the right-hand tunnel. The left-hand tunnel allows pedestrian access.

OSGR: NJ 61991 27667

Photographic Plate 21:

Potential Giant Hogweed identified in the scrub and ruderal vegetation between the golf course and the rail line. Surveyor included for scale (height approx. 160cm).

OSGR: NJ 62450 27737

Photographic Plate 22:

One of the two golf courses along the survey extent. Predominant habitat is amenity grassland. This still provides habitat for wildlife: a Brown Hare and a Mute Swan were seen during the survey.

OSGR: NJ 62545 27726

Photographic Plate 23:

Concrete supports cutting into the right bank of the Shevock.

OSGR: NJ 62930 27859

Photographic Plate 24:

Circled: one of several Cotoneaster plants on both banks of the Shevock as it flows through Insch. Potentially an invasive non-native species, further surveys required for positive identification.

OSGR: NJ 63137 27834

Photographic Plate 25:

A potential flood defence feature in amenity grassland area on the right bank of the Shevock, within Insch.

OSGR: NJ 63173 27834

Photographic Plate 26:

Several small holes (circled) in left bank of the Shevock, observed from opposite bank. Potential habitat for Water Vole and other bank dwellers.

OSGR: NJ 63484 28029

Photographic Plate 27:

Flowing through broadleaved woodland just east of Insch, the Shevock becomes more naturalised.

OSGR: NJ 63509 28031

Photographic Plate 28:

A large hollow within a broadleaved tree on right bank of the Shevock. Hollow extends up inside trunk. While there were no fields signs of bat, this tree has moderate BRP.

OSGR: NJ 63574 28045

Photographic Plate 29:

Poaching at field margin on left bank. At time of survey, the field contained several ponies, but no livestock.

OSGR: NJ 63651 27987

Photographic Plate 30:

Vegetation on island in a pond within private fields/gardens can just be seen on left bank (circled). While not visible from right bank, aerial imaging suggests that it is sizable and may provide habitat for amphibians such as newts.

OSGR: NJ 63724 27947

Photographic Plate 31:

Flooding in field along the Shevock.

OSGR: NJ 63754 27941

Photographic Plate 32:

One of several fallen trees across the channel of the Newton of Rothney tributary. The trunk and stump have been left in situ, providing potential habitats for amphibians and reptiles.

OSGR: NJ 63985 27865

Photographic Plate 33:

Large hollow within a partially felled tree along Newton of Rothney tributary. The open top of the hollow makes it unlikely it provides shelter for animals, assessed as low BRP.

OSGR: NJ 63932 27544

Photographic Plate 34:

Stack of felled logs along the Newton of Rothney tributary, which could provide habitat and hibernacula for amphibians, reptiles and small mammals.

OSGR: NJ 63966 27851

Photographic Plate 35:

Drumrossie House Bridge.

OSGR: NJ 63962 27938

Photographic Plate 36:

Downstream of Insch, the Shevock is mostly surrounded by arable fields (left bank), pasture, and areas of scrub woodland (right bank).

OSGR: NJ 64068 28008

Photographic Plate 37:

Area of wet scrub on right bank of the Shevock. Large umbelliferous stems found - area may contain invasive non-native Giant Hogweed. Positive identification could not be made due to vegetative die-back.

OSGR: NJ 64113 28018

Photographic Plate 38:

Large pond in marshy field adjacent to the Shevock (right bank). Under ice at time of survey. Potential habitat for newts and other amphibians.

OSGR: NJ 64224 28272

Photographic Plate 39:

Burrows under tree roots in broadleaf woodland - potential badger sett.

OSGR: NJ 64384 28535

Photographic Plate 40:

Burrows under tree roots in broadleaf woodland - potential badger sett.

OSGR: NJ 64384 28535

Photographic Plate 41:

The trees and reeds situated amidst large expanses of arable fields presents nesting habitat for birds.

OSGR: NJ 64841 28692

Photographic Plate 42:

Left bank of the Shevock reinforced with large rocks. Possible erosion protection measure.

OSGR: NJ 64870 28691

Photographic Plate 43:

Most easterly extent of Shevock survey. The pond in the midground provides habitat for waterfowl, as it contained a large flock of mallards. It may also provide habitat for newts and other amphibians.

OSGR: NJ 65084 28448

Photographic Plate 44:

Mixed woodland plantation on both banks of Valentine Burn. This photograph was taken from the left bank, and would be mirrored if taken from the right, with mature trees nearer the burn and younger trees on the other side of the path.

OSGR: NJ 62386 28656

Photographic Plate 45:

Straightened channel of Valentine Burn as it flows through plantation woodland. The exposed roots of this tree could be used as a refuge for Otter.

OSGR: NJ 62305 28622

Photographic Plate 46:

Valentine Burn flows though amenity grassland (golf course) past occasional stands of conifer, and downstream lined by planted broadleaf trees.

OSGR: NJ 62478 28547

Photographic Plate 47:

Valentine Burn is increasingly constrained on amenity grassland. Bed of the burn is artificial.

OSGR: NJ 62876 28627

Photographic Plate 48:

Greenkeepers' sheds on golf course presenting cracks and nooks. Low BRP.

OSGR: NJ 62885 28603

Photographic Plate 49:

Increasing macrophyte presence in waterbody of Valentine Burn downstream of amenity grassland (golf course).

OSGR: NJ 63148 28482

Photographic Plate 50:

One of many ivy-covered trees presenting low BRP along Valentine Burn.

OSGR: NJ 63439 28194

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