

Dougall Baillie Associates



JBA
consulting

Inverurie - Aberdeenshire Flood Protection Study

Preliminary Ecological Appraisal Report

May 2018

Aberdeenshire Council

Aberdeenshire
COUNCIL



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Contract

This report describes work commissioned by Gavin Penman, on behalf of Aberdeenshire Council on 09/10/2017 by Purchase Order Number 1095192. Dougall Baillie's representative for the contract was Scott Macphail and Aberdeenshire Council's representative for the contract was Jennifer Pullen, Catherine Porter, Emma Wright and Carys Hutton 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, invasive non-native 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 along the Rivers Urie and River Don around Inverurie and Port Elphinstone, Aberdeenshire. The PEAR was commissioned to determine the possible impacts of the proposed works upon the ecological components of the site; including protected sites, habitats and species.

A desk-based assessment was carried out with records provided by the North East Scotland Biological Records Centre, identifying any historical ecological records of protected, notable and invasive non-native species data post 2000 and any records from statutory and non-statutory designated nature conservation sites within 2km of the site. In addition, an Extended Phase 1 Habitat Survey was undertaken by suitably experienced ecologist on 30 November 2017 and 29 January to 1 February 2018.

A variety of habitats were identified on the site walkover, including tall ruderal, fen, mixed and semi-natural woodlands, arable and neutral semi-improved grassland. Priority habitats recorded on the site include coniferous and broadleaved woodlands, Lowland Fens, Rivers and Streams (Mesotrophic running water) and Neutral Grassland (Lowland Meadows), these should be avoided during works, or mitigation and compensation may be required. The ecological value of the site was determined to be of moderate to high value, as the structural diversity across the surveyed area provided foraging and refuge opportunities for Otters, Bats, small mammals, Badgers, Red Squirrel, Fish, Freshwater Pearl Mussels and invertebrate assemblages. In addition, the fen, the river corridor, marginal habitats and the connected floodplain developed a good habitat connectivity corridor at a landscape scale.

There are no statutory and non-statutory designated conservations sites within 2km of the site. There are existing records of a range of protected species within a 2km radius. The ecological importance of the current site was deemed to be of high value for Otter, bats, fish, Freshwater Pearl Mussels and Red Squirrels, whilst it was considered to be of moderate value for Badgers, Birds, Great Crested Newts and reptiles and low for Water Voles.

Any proposed works should avoid or mitigate disturbance to protected species as far as possible using the following measures:

- No in-channel working between October and March (fish, including Salmon, Sea Trout and Trout)
- Avoidance of night-working within the main active bat season (April to September)
- Minimise in-channel works (Otters, fish and bats)
- Avoid reducing the floodplain and land-take of semi-natural habitats
- Avoid tree removal (bats, birds, Badgers and Red Squirrels)

Additionally, ecological enhancement measures should be designed into the works plan at an early stage to help with flood-management measures by using Natural Flood Management (NFM) strategies. NFMs can be used at a catchment scale to aid flood management, for example riparian planting and/or buffer strip planting, reactivation of paleochannels, in-stream structures (e.g. large leaky woody dams), offline storage ponds and non-floodplain wetlands. This increases ecological value whilst helping with management of flood risk.

On confirmation of the exact works, a series of targeted protected species surveys are likely to be necessary. These could include targeted surveys for Otters, fish and Freshwater Pearl Mussels, bat activity surveys and nesting bird surveys. The surveys must be undertaken in suitable survey seasons. If mature trees are to be removed then nesting bird, bat roost assessments and Red Squirrel surveys may be necessary.

Invasive, non-native species are present, and a detailed mapping survey should be undertaken in the summer once the works plans are finalised but before they start. The locations can be used to determine the mitigation measures including removal of the species or marking out exclusions 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 nature of the 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
(B)OD	(Biochemical) Oxygen Demand
BRP	Bat Roosting Potential
CIEEM.....	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
EPS	European Protected Species
HRA	Habitats Regulations Appraisal
HSI	Habitat Suitability Index
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LBS	Local Biodiversity Site
LNR.....	Local Nature Reserve
MAGIC	Multi Agency Geographic Information for the Countryside
NFM	Natural Flood Management
NESBReC	North East Scotland Biological Records Centre
NNR	National Nature Reserve
OSGR	Ordnance Survey Grid Reference
PEAR	Preliminary Ecological Appraisal Report
PRF	Potential Roosting Features
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
TN	Target Note
WANE Act.....	Wildlife and Natural Environment Act
WCA.....	Wildlife and Countryside Act 1981 (as amended)
WFD.....	Water Framework Directive

1 Introduction

1.1 Background

JBA Consulting was commissioned by Aberdeenshire Council to undertake a number of Preliminary Ecological Appraisals Reports (PEAR) as part of the Flood Protection Study for Inverurie and Port Elphinstone in 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.

The town of Inverurie is bounded by the River Don to the south and the River Urie to the north. The confluence of the two rivers is to the southeast of Inverurie.

1.2 Site Location

The surveyed area was the River Don and its tributary the River Urie, around Inverurie and south to Kintore, north of Aberdeen (approx. central OSGR: NJ 775 214). The surveyed extent is along the River Urie and the River Don is shown in Figure 1-1, with a focus on urban areas, as it is considered the works are more likely to be located in them. The red line marks the areas referred to as "the site" throughout the rest of this report.

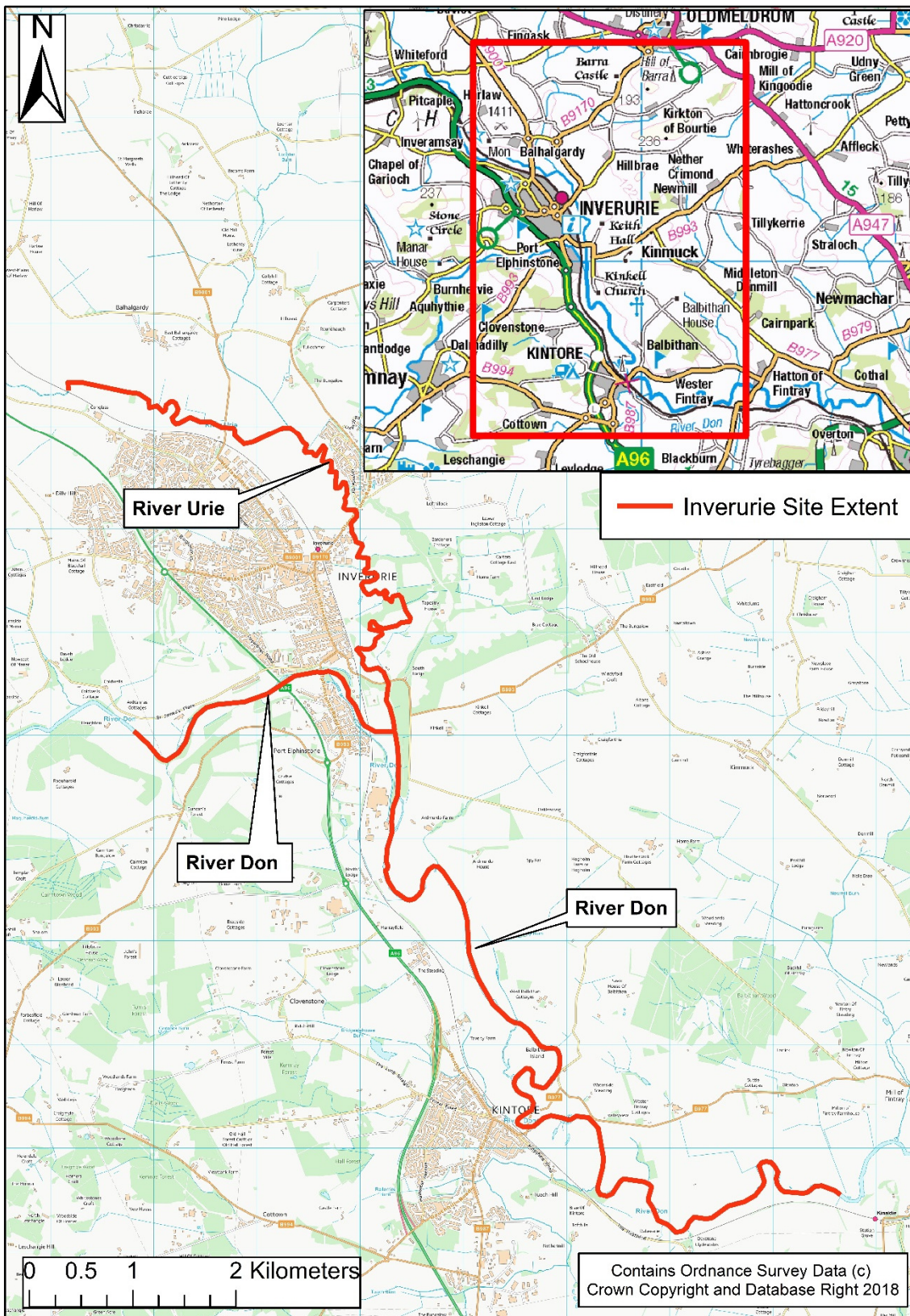


Figure 1-1: Site extent from Inverurie to Kintore.

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 which 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 (HRA) 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 Scottish Natural Heritage (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 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 Wildlife and Countryside Act. The Wildlife and Countryside Act 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 connected 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 offence 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 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, notable species, and invasive non-native species data, 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 suitably experienced Ecologists Jennifer Pullen (Ecologist) and Catherine Porter (Assistant Ecologist) on 30 November 2017 and Carys Hutton (Ecologist) and Emma Wright (Assistant Ecologist) on 29 January 2018 to the 1 February 2018. The Extended Phase 1 Habitat Survey includes the following elements:

- Mapping of habitats on and adjacent to the site, following the Handbook for 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 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 habitats or ecological features identified during the Extended Phase 1 Habitat Survey were further categorised as being of either 'negligible', 'low', 'moderate' or 'high' ecological value (see Section 3.3).

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 in Appendix A. Photographs taken during the Extended Phase 1 Habitat survey are shown in Appendix B.

3.2.1 Protected Species

Badger

The site and a 30m buffer were searched for signs of the presence of Badgers. In addition to the presence of active setts within a works area, 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 therefore also recorded.

Red Squirrel

Red Squirrels are present in woodland habitat within Scotland and the site areas were 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), Chanin (2003) and Strachan *et al.* (2011). 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 (PRFs) 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 and nesting 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 Great Crested Newts using the Habitat Suitability Index (Oldham *et al.*, 2000; Natural England, 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 (Froglife 1999, English Nature 2004). Any potential refuges found on site (e.g. log piles, large stones) were also investigated, where possible, 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. Assessment should also take account of connected off-site habitat that may increase the value of the on-site habitat through association.

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 simply be under-recorded.

3.4.2 Access

There was limited access in the fields between NJ 78228 21410 and NJ 78100 21015 due to flooding/boggy ground.

There was limited access to the fields and the river between NJ 76786 20297 to NJ 76241 19784 due to being restricted to walking along a cliff top. The river and surrounding area was observed, but the data is restricted for Otter signs and invasive species.

3.4.3 Surveying Conditions

Plant species identification was limited by the time of the survey, as some species die back over winter.

4 Results

4.1 Desk Study

4.1.1 Statutory designated sites

There are no statutory designated sites within 2km of the search area. The closest are the Hill of Barra SSSI (3.9km North-East of the site) and the Picaple and Legatsden Quarries SSSI (3.2km North of the site).

4.1.2 Non-statutory designated sites

There is one non-statutory designated site within 2km of the search area, the Kinkell Belt Local Nature Conservation Site (LNCS) within the survey reach centred at OSGR NJ 78320 19462 (Refer to Figure 4-1).

Site Name	Site Name	Designation	Description	Proximity to Site
Kinkell Belt	Kinkell Belt	LNCS	A broadleaved woodland with a coniferous woodland present to the north of the site. Species present include Lime (<i>Tilia cordata</i>), Birch (<i>Betula pendula</i>), Oak (<i>Quercus petraea</i>), Beech (<i>Fagus sylvatica</i>) and Elm (<i>Ulmus glabra</i>). The ground flora contains a variety of species including Creeping Soft Grass (<i>Holcus molis</i>), Greater Wood Rush (<i>Luzula sylvatica</i>), Broad Buckler-fern (<i>Dryopteris dilatata</i>) and Cowslip (<i>Primula vulgaris</i>). There are areas of wet woodland due to the presence of streams. The river banks contain Reed Canary Grass (<i>Phalaris arundinacea</i>), Reed Sweet Grass <i>Glyceria maxima</i> , Water Avens (<i>Geum urbanum</i>) and Wood Cranesbill (<i>Geranium sylvaticum</i>). Grassland areas which are not shaded by trees contain Meadowsweet (<i>Filipendula ulmaria</i>), Yorkshire fog (<i>Holcus lanatus</i>), Meadow cranesbill (<i>Geranium pratense</i>), Hardhead (<i>Centaurea nigra</i>), with occasional willow (<i>Salix alba</i>) and Hazel (<i>Corylus avellana</i>).	Within site area - the confluence of the River Urie and River Don.

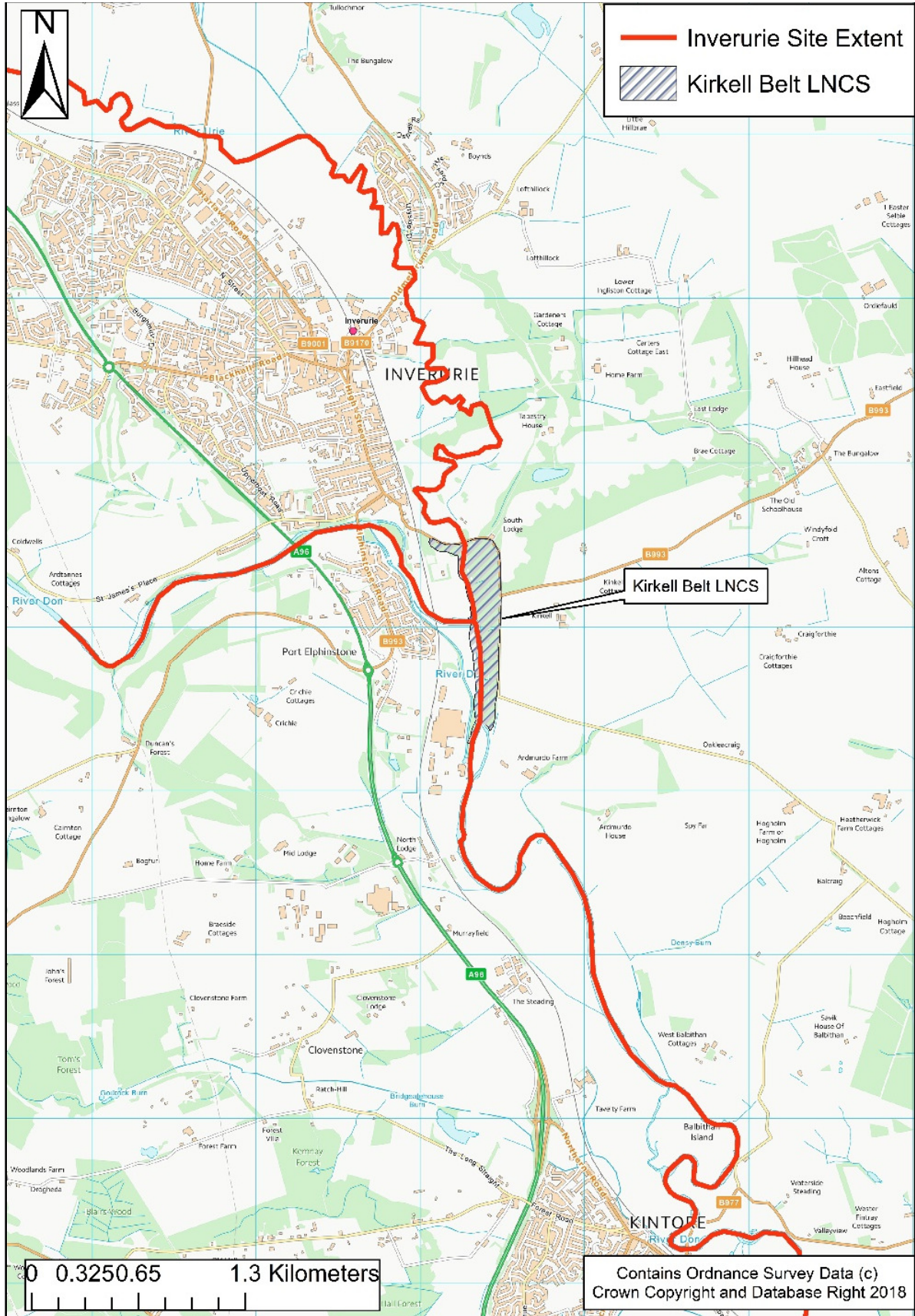


Figure 4-1: Non-statutory designations within 2km of the survey area.

- 4.1 Additional Local Nature Conservation Sites located outside of the 2km search area, however due to their close proximity to watercourses which drain into the River Urie and/or River Don, may provide opportunities for natural flood management.

Site Name	Designation	Description	Proximity to site
Fetternear	LNCS	A semi-natural broadleaved woodland adjacent to the River Don.	2.5km W
Toms Forest	LNCS	Wet woodland with Birch, draining into the River Ron.	2.6km W
Cottown Woods	LNCS	A mixed woodland	3km W
Sunnybrae Moss	LNCS	A small area of wet rush pasture.	2.4km NE
Pitscurry Moss	LNCS	A small wet woodland and rush pasture, draining into the River Urie.	4km N
Wartle Moss (part SSSI)	LNCS	Wetland and wet woodland upstream of the Urie.	8km N

Conservation Areas and Priority Habitats

The area around Inverurie, and the survey extent on the Rivers Urie and Don, contains several priority habitats. The most extensive priority habitats are the Rivers and Streams, Lowland Fens, Neutral grassland (Lowland Meadows) and coniferous and broadleaved woodlands. Other woodland types, including shrub, young and felled were found within 2km of the site.

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 site (watercourse) is given in Table 4-1. 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. Due to the large number of bird species records returned, only birds protected under Schedules 1 and 2 of the Wildlife and Countryside Act (1981) are presented in Table 4-1. Consultation with the Rivers Trust has provided fish species data within the River Don and River Urie. It was concluded that Salmon, Trout, Eels and Lamprey and their spawning locations would be identified throughout the entire region. Specific locations of spawning locations could not be provided as these are likely to alter yearly, therefore any in-channel works required the Rivers Trust should be further consulted once the design details are finalised.

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

Common Name	Latin Name	Designation	Location and Date
Riparian Mammals			
European Otter	<i>Lutra lutra</i>	W&CA (1981) Sch.5	2013; on river
European Water Vole	<i>Arvicola amphibius</i>		2013; 0.14 km N
Terrestrial Mammals			
Eurasian Badger	<i>Meles meles</i>	Protection of Badgers Act 1992	2016; confidential
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>	W&CA (1981) Sch.5	2015; 0.01 km S
Pine Marten	<i>Martes martes</i>	UKBAP Priority Species	2017; 0.60 km W
West European Hedgehog	<i>Erinaceus europaeus</i>		2014; 0.08 km W
Bats			
Common Pipistrelle	<i>Pipistrellus</i>		2014; over river

	<i>pipistrellus</i>	W&CA (1981) Sch.5	
Daubenton's Bat	<i>Myotis Daubentonii</i>		2015; 0.06 km NE
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>		2015; 0.60 km NE
Birds			
Barn Owl	<i>Tyto alba</i>	W&CA (1981) Sch.1	2016; 0.45 km SW
Black-tailed Godwit	<i>Limosa limosa</i>		2008; 0.04 km SW
Brambling	<i>Fringilla montifringilla</i>		2008; 0.95 km SW
Goldeneye	<i>Bucephala clangula</i>	W&CA (1981) Sch2.1	2010; 0.04 km W
Golden Plover	<i>Pluvialis apricaria</i>	W&CA (1981) Sch2	2009; 0.81 km E
Green Sandpiper	<i>Tringa ochropus</i>	W&CA (1981) Sch. 1	2008; 0.04 km W
Greylag Goose	<i>Anser anser</i>	Sch2	2009; on river
Kingfisher	<i>Alcedo atthis</i>	W&CA (1981) Sch. 1	2008; 0.04 km W
Merlin	<i>Falco columbarius</i>	W&CA (1981) Sch. 1	2008; 0.04 km W
Osprey	<i>Pandion haliaetus</i>		2010; 0.32 km W
Peregrine	<i>Falco peregrinus</i>		2008; 0.19 km SW
Pink-footed Goose	<i>Anser brachyrhynchus</i>	W&CA (1981) Sch2	2010; 0.04 km W
Pochard	<i>Aythya ferina</i>	W&CA (1981) Sch2	2009; 1.10 km NE
Red Kite	<i>Milvus milvus</i>	W&CA (1981) Sch. 1	2016; 1.89 km SE
Redwing	<i>Turdus iliacus</i>		2008; 0.04 km W
Ruff	<i>Calidris pugnax</i>		2004; 0.98 km W
Snipe	<i>Gallinago gallinago</i>	W&CA (1981) Sch2	2009; 0.07 km W
Whooper Swan	<i>Cygnus cygnus</i>	W&CA (1981) Sch. 1	2010; 0.04 km W
Woodcock	<i>Scolopax rusticola</i>	W&CA (1981) Sch2	2013; 1.04 km NE
Amphibians			
Common Toad	<i>Bufo bufo</i>	W&CA (1981) Sch.5	2015; 0.40 km W
Reptiles			
Common Lizard	<i>Zootoca vivipara</i>	W&CA (1981) Sch.5	2008; 1.35 km SW

4.1.4 Invasive species

The data search from NESBReC returned many recent and historical 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. 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 4-2: Invasive Non-native species records held by NESBReC within 2km of the site

Common Name	Latin Name	Designation	Location and Date
Giant Hogweed	<i>Heracleum mantegazzianum</i>	W&CA (1981) Sch9	On the River Don and River Urie Banks, 2014
Himalayan Balsam	<i>Impatiens glandulifera</i>	W&CA (1981) Sch9	Presence on the banks of the River Don, before the confluence with the River Urie. 2014
Himalayan Cotoneaster	<i>Cotoneaster simonsii</i>	W&CA (1981) Sch9	2008, 1.7km W
Montbretia	<i>Crocsmia x crocosmiiflora</i>	W&CA (1981) Sch9	2005, 1.9 km SW
Japanese Knotweed	<i>Fallopia japonica</i>	W&CA (1981) Sch9	2017, 0.44km E of the River Urie, but also

			older records on the River Don.
Yellow Archangel	<i>Lamiasrum galeobdolon subsp. argentatum</i>	W&CA (1981) Sch9	008, 0.6km SW
Rhododendron	<i>Rhododendron ponticum</i>	W&CA (1981) Sch9	2008, 0.2km E

4.2 Extended Phase 1 Habitat Survey

4.2.1 Habitats

The site is situated within a rural setting to the north-west of the city of Aberdeen. Land within the immediate vicinity is characterised by both urban developments (residential properties/local amenities within Inverurie itself) and open countryside (peripheral to this urban area). Woodland and agricultural land (both pastoral and arable) feature heavily in this area with the former composed of each of the main woodland types.

The river corridor was largely flanked by marginal vegetation and a scattered tree line. The remnant channel of the Aberdeen to Inverurie Canal was visible around the area of Port Elphinstone. The main river was sinuous and natural in planform, although some small sections did appear to have been straightened along the surveyed reach.

In places, the river had burst its banks and marshy grassland, or swamp was present in the floodplain. Standing water was also present in some fields, although the shallow depth and lack of aquatic vegetation suggest this is transient in nature.

A Phase 1 Habitat Map, giving the location and distribution of habitats, in the context of the local landscape, is provided in Appendix A and photographs, referred to within the following sub-sections, are displayed in Appendix B.

A.1.1.1/A3.1 - Broadleaved Semi-Natural Woodland/ Scattered Teeline

Areas of broadleaved woodland are located on both banks of the watercourse. The woodland comprised the following canopy species: Alder *Alnus glutinosa*, Sycamore *Acer pseudoplatanus*, Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Hawthorn *Crataegus monogyna*, Lime *Tilia x europaea*, Silver Birch *Betula pendula* and Goat Willow *Salix caprea*. The woodland understorey comprised the following species: Cow Parsley *Anthriscus sylvestris*, Cock's-foot *Dactylis glomerata* and Lesser Celandine *Ficaria verna*. In some sections close to the watercourse, the woodland had flooded. The trees present varied in age which was reflected in the number and suitability of potential bat roosting features present. Deadwood and/or dead limbs were present within many of the woodland areas providing features which can be utilised by birds, squirrels, small mammals and bats with a low BRP. The ecological value of this woodland was high because of its diversity of species and provides additional valuable features including bank stabilisation and flood management extent.

A1.1.2 - Broadleaved Plantation Woodland

Small areas of broadleaved plantation can be identified along the watercourse, the plantations were relatively old and densely planted with no signs of thinning. This habitat provides potential foraging habitats for bats and refuge for small mammals and nesting birds. Its ecological value is considered to be low considering its small scale across the site and homogenous species composition.

A1.2.2 - Coniferous Plantation Woodland

A small area of coniferous woodland flanked the eastern bank of the River Urie, and the northern banks of the River Don. One plantation was majority dominated by Scots Pine *Pinus sylvestris*, relatively mature, and closely planted to provide a screen for the industrial works behind. This habitat provides potential foraging habitat for bats, as well as refuge for small mammals, nesting birds and Otters, with Otter spraints identified with close proximity to the woodland. Its ecological value is considered low considering its small scale across the site and homogenous species composition.

A1.3.1 - Mixed Semi-Natural Woodland

Mixed woodland was widespread along the River Urie, particularly along the eastern and western bank. Species present included Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Pedunculate Oak *Quercus robur*, Scots Pine *Pinus sylvestris*, European Larch *Larix decidua* and Alder *Alnus glutinosa*. The ecological value of the woodland was considered high owing to its significant extent, maturity of trees and suitability of habitat for a wide range of species e.g. bats, birds, small mammals and badgers with a potential holt on the eastern bank of the River Don (Target Note 17).

A1.3.2 Mixed Plantation Woodland

Small areas of mixed plantation wood flanked both the western and eastern side of the River Urie and River Don. Species present included Sycamore *Acer pseudoplatanus*, Fir *Abies* sp., Scots Pine *Pinus sylvestris*, Ash *Fraxinus excelsior*, Silver Birch *Betula pendula* and Alder *Anus glutinosa*. The ecological value of the woodland was considered moderate for birds and small mammals. A few mature trees provided a low BRP, with the presence of standing deadwood/dead limbs (Target Note 25).

A2.1 Dense Scrub

Small isolated areas of dense scrub flanked the eastern, western and northern banks of the River Don. The scrub consisted of mature mixed species including Brambles *Rubus* sp., Common Gorse *Ulex europaeus*, Common Broom *Cytisus scoparius*. The ecological value of the scrubland was considered to be low.

A2.2 Scattered Scrub

Small areas of scattered scrub were identified along the banks of the River Don, and within mid-channel bars. The ecological value was considered to be of high value, owing to its suitability for otter refuge within the channel and providing protection from predators (Target Note 13). Standing dead wood provides a suitable habitat for invertebrates, small mammals and a low BRP (Target Note 14).

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

Small areas of broadleaved and mixed parkland offered low ecological value with spaced out mature trees in a good condition situated on amenity grassland, with no visible signs of BRP.

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*, False Oat-grass *Arrhenatherum elatius*, Tufted Hair-grass *Deschampsia cespitosa*, Soft-rush *Juncus effusus* and Creeping Buttercup *Ranunculus repens*. This habitat transitioned with the marshy grassland on site. 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 determine a full assessment of the grassland species.

B4 - Improved Grassland

Improved grassland flanked the River Urie and the River Don in sections and was not actively grazed at the time of survey. The grassland was principally composed of Perennial Rye-grass *Lolium perenne*. Areas of improved grassland on site were of low ecological value due to a limited number of species present and easily re-creatable nature.

B5 - Marshy Grassland

Areas of marshy grassland, dominated by rushes *Juncus* spp. (e.g. *Juncus effusus*) are widespread within the floodplain of the River Urie. They offer suitable habitat for marshland birds, amphibians, small mammals and invertebrate and are therefore considered to be of moderate ecological value.

C3.1 - Tall Ruderal Vegetation

Tall ruderal vegetation was prevalent along much of the watercourse banks and consisted of Rosebay Willowherb *Chamerion angustifolium*, Broadleaved Dock *Rumex obtusifolius*, Cow Parsley *Anthriscus sylvestris*, Common Nettle *Urtica dioica*, Creeping Thistle *Cirsium arvense*, Broom *Cytisus scoparius*. Tall ruderal vegetation provides suitable habitat for ground nesting birds as well as cover for small mammals and invertebrates. The tall ruderal vegetation on site has moderate ecological value in view of the diversity of species present and large extent of this habitat.

E3 - Fen

Fen habitats was extensive along the River Urie and River Don, consisting predominately of Reed Canary Grass *Phalaris arundinacea*, with the occasional stand of Reed Sweet-grass *Glyceria maxima* and Tufted Hair-grass *Deschampsia cespitosa*. The fen habitat is suitable for small mammals and birds of prey and offers as its provides refuge and layup sites. The fen is an BAP Priority Habitat which has a high ecological value due to its extent of the habitat providing a good habitat connectivity corridor at a landscape scale.

F2.1 - Marginal/ inundation Vegetation

Small areas of marginal/inundation vegetation were present along the watercourse. The marginal vegetation is considered to be of moderate ecological value, due its suitability for Otters and their holts (Target Note 26 and 27).

G1.1 - Eutrophic Standing Water

Several of the fields adjacent to the River Urie were flooded with standing, eutrophic water. Several ponds were identified along the River Don with eutrophic standing water, these transient waterbodies offer suitable habitat for water birds but are unlikely to support Great Crested Newts on account of their transient nature.

A remnant section of the Aberdeen to Inverurie Canal can be seen between the River Don immediately north of Port Elphinstone and the River Don downstream of the town, where it runs parallel to the old paper mill before re-joining the river.

The northern section of the canal was extensively choked with emergent vegetation, Reed sweet-grass, and appears to be relatively stagnant and eutrophic, with large blankets of Common Duckweed *Lemna minor*. There are however some small areas of open standing water. The banks are mostly dominated by coarse grasses and ruderal vegetation (including Broad-leaved Dock, and Greater Willowherb) but with some marginal species present including Reed Canary Grass and *Carex* sp. Towards the southern extent of the canal, the banks are heavily tree-lined and shaded, including species such as Ash, Goat Willow, Beech, and Sycamore. There is a high amount of sediment within the canal, as is often typical of this feature.

The canal habitat is considered to be particularly valuable for Otter due to the presence of a relatively undisturbed water channel, suitable vegetation cover, and connectivity with the wider river system. The sloping earth banks and vegetation cover is also considered to be suitable for Water Vole, although this habitat is largely limited to the northern extent where the channel is unshaded and open water is present. The canal may be an important resource for foraging bats, and the trees present at the southern extent could provide roosting features (although these were not inspected in detail at this stage).

G2.2 - Mesotrophic Running Water

Both the River Urie and River Don appeared to be mesotrophic rivers. The Rivers were typically wide (approximately 7m), with the expectation of the upper reaches of the River Urie. They contained a diverse in-channel structure and associated vegetation. Mid-channel bars were present supporting scattered scrubland, tall ruderal vegetation and trees. The watercourses were extensively flanked with the invasive, non-native plant Giant Hogweed *Heracleum mantegazzianum*, large stands are marked separately the Phase 1 Habitat Map with a purple line to show the extent of the spread, whilst notable stands are Target Noted, including Target Notes 6, 7, 8 and 10. Himalayan Balsam *Impatiens glandulifera* was present along the water course in dense but isolated patches (Target Note 12, Figure 5-21). The river was flanked by narrow strips of marginal vegetation including Reed Canary-grass *Phalaris arundinacea*. The river also had a wide floodplain on either side, providing suitable habitats for small mammals, invertebrates and birds. In the urban sections of the river, gabion baskets were present along the bank. The river was high at the time of the survey so macrophytes were not visible (see Figure 5-1). A gravel bed substrate was observed during the survey providing suitable breeding habitats for Salmon and Trout (See Target Note 31). The mesotrophic water is considered to be of high ecological value, due its diverse river morphology.

J1.1 - Arable

The arable fields present within the survey area were mainly left as over-winter stubble which is of value to foraging birds (see Figure 5-5). However, the habitat is widespread and easily replaceable, so ecological value of these fields was considered to be low.

J1.2 - Amenity Grassland

Amenity grassland was limited to isolated patches, often as private gardens. A larger area of amenity grassland is present within the cemetery adjacent to South Lodge, to the west of the River Urie. Scattered trees were present but on the whole this habitat was low in species diversity and highly managed with a relatively short sward (see Figure 5-11). It was considered to be of low ecological value.

J2.4 - Fence

Agricultural fields and amenity grassland were frequently bound by fences. These offer negligible ecological value.

J2.5 - Wall

Drystone walls were often identified at field boundaries. These walls appear to support a diverse community of lichens and provide habitats for a range of species including amphibians, reptiles seeking refuge. The walls are considered to be of high ecological value due providing refuge with the surrounding hostile agricultural environment.

J3.6 - Buildings

Buildings were present along the water course and in general offer negligible ecological value. However, a collapsed stone building on the River Don provides a moderate BRP and a suitable habitat for Barn Owls *Tyto alba* (Target Note 35, Figure 5-16), so is considered to have a moderate ecological value.

J4 - Bare Ground

Hardstanding was relatively uncommon within the surveyed area, although flanked the margins of the surveyed reach in urban areas. Where present, this largely comprised surfaced roads. Areas of hardstanding were of negligible ecological value.

4.2.2 Protected Species

4.2.2.1 Badgers

The woodland and semi-neutral grassland habitat on site offers habitat of high ecological value for Badgers, in terms of providing suitability for setts and foraging habitats. In particular, the sloped embankments and steep-sided river banks present at the confluence of the River Urie and Don offers suitable features for excavating setts. Evidence of Badger setts was identified within the survey areas, in particular within the broadleaved semi-natural woodland along the River Don, (Target Note 36, Figure 5-17). This confirms the data search results that included records of Badger in the locality, however the survey revealed new locations of Badger activity. Areas of arable land offer a moderate ecological value for foraging activities and urban areas have a low/negligible value.

4.2.2.2 Red Squirrels

The data search showed recent records of Red Squirrel close to the survey area. No field signs (e.g. dreys) or sightings of Red Squirrel were made during the survey. However, it is considered likely that Red Squirrels are present on site. The best habitat for Red Squirrel is the woodland habitat adjacent to the river (particularly at the confluence between the Rivers Urie and Don) which was assessed as being of high ecological value for this species. Other habitats including arable land and urban habitats offer a low ecological value, however, urban parkland areas provide a moderate ecological value, through scattered trees providing foraging habitats.

4.2.2.3 Water Voles

The watercourses surveyed were considered sub-optimal for Water Voles because of the large and fast flowing nature of the river. A small section of the river bank was reinforced (at therefore totally unsuitable) adjacent to the confluence of Rivers Urie and Don at approximately NJ 78106 20041. A potential Water Vole burrow was identified within the eastern bank of the River Urie (see Target Note 30). No other evidence of Water Vole activity (including prints, latrines and feeding lawns) was recorded. It should be noted, however, that the survey was conducted at a sub-optimal time of the year and outside of the standard survey season for this species (i.e., April to September, inclusive). The data search indicated that Water Voles were present just upstream of the site in 2013. It is, therefore, considered possible that Water Voles could still be present, but most likely in the smaller

tributaries, including the remnant Aberdeen to Inverurie Canal. The site was assessed as being of low value for Water Voles.

4.2.2.4 Otters

There are records of Otters within the survey area in 2013 (see Table 4-1). Definitive signs of Otters were recorded during the survey including spraints, footprints, holts and couches (Target Note 15, 16, 17, 19, 20, 23, 27, 26 and 38 (Figure 5-18, Figure 5-19, Figure 5-20 and Figure 5-22); confirming their presence in the area. In addition, several stretches of this river, and its tributaries (including the remnant Aberdeen to Inverurie Canal), were flanked with overhanging and mature trees. These features offer good potential resting and holt sites for Otters where there are large sheltered voids in tree root systems. The watercourse was considered to be of high ecological value for Otters, due to the presence of wooded margins and areas with protruding rocks at the river edges which could provide refuge. In addition, the river supports a diverse morphology providing suitable habitats for fish for Otter foraging. The adjacent fen habitat also provides areas of refuge, with locations noted as suitable couches/layup sites (see Target Note 23). It is therefore the fen habitat that is considered to be of high ecological value for Otters. Arable, and areas of bare ground, were considered to offer low ecological value for Otters.

4.2.2.5 Bats

Mature trees with potential bat roost features were present across the site; although many of these were situated away from the watercourse banks. Mature woodland was quite extensive across the site and it is highly likely that there will be trees with suitable bat roosting potential within these woodlands. Woodlands and treeline habitats are considered to be of high ecological value bats, providing suitable foraging, roosting and commuting habitats. Arable areas with sparsely located trees and urban habitats are considered to be of low ecological value. During the walkover several mature trees were noted as having Moderate BRP including two areas of mature mixed trees (see Target Note 2 and Figure 5-7 and Figure 5-9 and Target Note 7 and Figure 5-10) an Ash tree (see Target note 4 and Figure 5-13) and Beech and Alder (see Target Note 3 and Figure 5-15) with splits and lifted bark. Additionally, several trees were noted as having a Low BRP including a Scots Pine (see Target Note 29), a Willow (see Target Note 24), a Mature standing dead wood Oak (see Target Note 25) and Beech (see Target Note 37). All three bridges within the surveyed reach (crossing both the Rivers Urie and Don) were considered to have either Negligible or Low BRP with at most minor cracks in the stone supports (see Target Notes, 1, 5 and 9 and Figure 5-4, Figure 5-14 and Figure 5-2). Other structures within survey area have a Moderate BRP (see Target Note 35 and Figure 5-16). The River Urie and Don 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 high.

4.2.2.6 Birds

No specific bird surveys have been carried out as part of this survey, however, incidental sightings were recorded. During the survey, a small number of bird species were observed; these were:

- Blackbird *Turdus merula*
- Buzzard *Buteo buteo*
- Cormorant *Phalacrocorax carbo*
- Goldeneye *Bucephala clangula*
- Great Tit *Parus major*
- Greenfinch *Chloris chloris*
- Grey Heron *Ardea cinerea*
- Mallard *Anas platyrhynchos*
- Mute Swan *Cygnus olor*
- Oystercatcher *Haematopodidae*
- Pheasant *Phasianus colchicus*
- Robin *Erithacus rubecula*
- Skylark *Alauda arvensis*
- Snipe *Gallinago gallinago*
- Woodpigeon *Columba palumbus*

The data search returned a large number of records of birds listed under Schedule 1 of the Wildlife and Countryside Act (1981, as amended), a large proportion of which are likely to utilise this site for breeding and nesting.

The site offers a variety of habitats and features which could be utilised for nesting and feeding birds. Woodland on site offers roosting, nesting and feeding opportunities for a variety of birds including small passerines and medium-sized birds as well as raptors, and several of the grassland and arable areas could support ground nesting birds. In addition, the running water on site is attractive for wetland birds. The site was, therefore, assessed as being of high value for birds.

4.2.2.7 Great Crested Newts

No signs of Great Crested Newts were recorded during the survey. Standing water was present within the agricultural fields flanking the watercourse (see Figure 5-6). It is thought that this water was likely to be the result of winter flooding and would not persist into the spring Great Crested Newt breeding season. The remnant Aberdeen to Inverurie Canal appears to support standing water for the majority of the year and may offer suitable breeding habitat for this species. Other ponds and areas of standing water may be present within the vicinity (e.g. 500m) of the river, but these were not assessed as part of this study due to access constraints and their location away from the river corridor. Suitable refugia and terrestrial habitat was widespread within the survey extent and could offer winter refuge for this species. Although there are suitable habitats present for this species, Great Crested Newts are relatively absent in the north of Scotland and it is considered unlikely that they are present within the area surveyed. Reptiles

Areas stacked brash and old drystone walls (see Figure 5-3) offer potential hibernaculum for reptiles, and neutral semi-improved grassland, scrub and swamp offer good foraging habitat, therefore providing a moderate ecological value. Bare ground and tarmacked surfaces also offer suitable basking opportunities; however, this does not include roads which offer a negligible ecological value. The data search returned records of reptiles within 2km of the site, albeit not very recent.

4.2.2.8 Freshwater Pearl Mussels

The data search returned no records of Freshwater Pearl Mussels within the study area. The rivers were considered suitable for Freshwater Pearl Mussels throughout most of the reach, although the water quality may be sub-optimal. The channel substrate composed of gravels providing suitable habitats for Freshwater Pearl Mussels. However, both rivers largely by-pass urban areas and were relatively naturalised suggesting this species could be present. If present the river would be of high ecological value for this species.

4.2.2.9 Fish

Sea Trout, Trout, Salmon, Eel and Lamprey are known to be present within the River Urie and Don (SpinFish, 2015). Pools and riffles were present within these Rivers, the river bed largely consisted of gravels. Consultation with the Rivers Trust have confirmed that the River Don and River Urie are utilised as spawning habitats. The ecological value of the site for fish is high.

4.2.3 Invasive Non-native Species

Data returned from NESBReE for invasive non-native plant species revealed a number present within the study area, including Giant Hogweed, Himalayan Balsam, Himalayan Cotoneaster, Montbretia, Japanese Knotweed, Yellow Archangel and Rhododendron. These species were primarily present along the river banks of the River Urie and River Don. The field survey detected the presence of two INNS; Giant hogweed and Himalayan Balsam. Giant Hogweed was identified in extensive stands along the watercourse (see Appendix A - Phase 1 Habitat Map - Target Notes 6, 7, 8 and 10 and highlighted sections and Figure 5-12). Areas of Himalayan Balsam were recorded; in some areas the spread was extensive (see Target Note 18 and 28 and Figure 5-21). No further invasive non-native species were noted during the site walkover. Both of these two species were also identified alongside the remnant Aberdeen to Inverurie Canal.

5 Conclusions and Recommendations

5.1 Habitats

Across the site the habitats were considered to be of moderate to high ecological value due to the river habitat corridor connectivity and structural variety. The habitats identified provide and offer suitable habitats for several protected species including Otter, Bats and Badgers. Consequently, any permanent alterations to the habitats should be kept to a minimum and will require further, targeted, surveys.

The proposed future flood alleviation works are likely to involve bank works; therefore, it is recommended that bank works are restricted to the smallest possible area to reduce the loss of riparian and floodplain habitats. If any losses are to occur, they should be compensated for by replacing and/or recreating this habitat elsewhere in a suitable location. Avoidance measures, mitigation, and ecological enhancements for ecological features should be designed into the works from an early stage. Ecological enhancement measures could include Natural Flood Management (NFM) strategies since the River Urie and River Don is still relatively well-connected to the floodplain. NFM measures, for example including riparian planting, maintaining buffer strips in agricultural fields, reactivation of old paleochannels, in-stream structures (e.g. large woody leaky dams), offline storage ponds and non-floodplain wetlands, all offer potential ecological benefits while contributing to the aim of reducing flood risk.

5.2 Protected Species

5.2.1 De-vegetation and Nesting Birds

Tall ruderal, scrub, woodland habitats, riparian trees were determined to be suitable for nesting birds, as well as some arable and grassland areas suitable for ground nesting birds. If de-vegetation is required as part of the works during the main nesting season (i.e. March to September inclusive), a nesting bird check is required prior to commencing clearance works. This should be undertaken by a suitably experienced ecologist who will advise if a nest is found.

5.2.2 Bats

Foraging

Bats are most active between April to September inclusive, if the works are scheduled in this period, any night time works should be avoided. If it is however required, any works should use directional lighting rather than floodlights to avoid unnecessarily disturbance to commuting or foraging bats. A directional cowl should be fitted to all lights to avoid and reduce light spill and should be directed away from any potential commuting/foraging habitats; for example, the river, banks and woodlands. If the works involve altering the watercourse significantly, for example moving a section of the watercourse to a paleo-channel, bat activity surveys are recommended to determine any impacts upon the local bat community. Following these surveys, mitigation may be recommended.

Roosting

If any trees are to be impacted by the works, for example intrusive arboricultural works including pruning, loping and felling, it is advised that the trees are inspected at elevation using an aerial tree climber holding a Scottish Natural Heritage Bat Survey License. If trees cannot be safely climbed, or if potential bat roosts are identified, it will be necessary to undertake surveys of these trees to characterise the roost. This should be done 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 stone structure identified as having a moderate BRP (Target Note 35, Figure 5-16) will be impacted by the works, a further bat roosting assessment will be required, leading to an activity survey. However, it must be noted that activity surveys can only be carried out between May to September inclusive.

5.2.3 Badgers

Several 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. The future works

may cause disturbances to Badgers who are foraging. It is recommended that, to limit disturbances to Badgers, all workings and excavations should be covered overnight to prevent accidental trapping, and overnight works should be avoided. 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. Additionally, Badgers regularly develop new setts, therefore it is recommended that a walkover survey is undertaken up to three months before works start to confirm that no new Badger setts have been created within 30m of the works area.

5.2.4 Red Squirrels

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 to 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 prior to removal by an experienced ecologist to check for the presence of dreys. If dreys are present, then further mitigation will be required.

5.2.5 Water Vole

The survey was conducted at a sub-optimal time of year to gauge activities of Water Vole. During the survey one potential Water Vole Burrow was identified (Target Note 30), and there are background records identified Water Voles in close proximity to the survey area. It is therefore recommended that Water Vole surveys are undertaken 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, for example the upper reaches of the River Urie and remnant canal.

5.2.6 Otter

An Otter survey of the area will be required prior to the works once the exact location is known. Depending on the proposed works this may require trail camera traps in addition to a search of Otter field signs including spraints, footprints, layups and couches.

5.2.7 Amphibians and Reptiles

If the dry-stone walls are to be disturbed during the proposed works, it is recommended to undergo a destructive hand search by a suitably experienced ecologist prior to the works commencing. The rough grassland habitat and fen provide a refuge and foraging habitat for both amphibians and reptiles. The sections of the watercourse which contained embankments have the potential to be basking sites. There were no records of Great Crested Newts identified within the area, and the pond identified are likely to dry out in the summer, however there are ponds within 500m of the river channel therefore providing a moderate habitat.

If any future works impact upon these areas of standing water, it is recommended that further Great Crested Newt surveys are undertaken to determine their presence or absence. The method of survey recommended for this site is environmental DNA (eDNA) surveys, which require the collection of water samples to be sent off for analysis to determine the presence/ absence of Great Crested Newt eDNA.

5.2.8 Freshwater Pearl Mussel

The presence of Freshwater Pearl Mussels within the River Don and River Urie is probable due the rivers containing a gravel substrate, with a generally fast flowing, clean river system with little input of nutrients and pollutants from the surrounding fields. Both Salmon and Trout are known to be located within the rivers, thereby providing juvenile Freshwater Pearl Mussels a habitat for their first year, as they survive on Salmonids gills. However, not the entire reach of the site was suitable for Freshwater Pearl Mussels due to the scale and extent, but regions showed favourable habitats. It is recommended that a Freshwater Pearl Mussel is conducted prior to any in-channel and/or significant back works.

5.2.9 Fish

Sea Trout, Trout, Salmon, Eel and Lamprey are known to be present and spawn within the River Urie and Don. It is therefore recommended that any in-channel works should avoid the spawning season for these species. Additionally, in-channel works should not be scheduled for between October and March inclusive, to avoid impacting upon migrating and spawning Atlantic Salmon.

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 5.4).

The works also have the potential to decrease dissolved oxygen levels through disturbance of organic material and resulting in 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 (DO) levels are monitored throughout the works and if the DO levels drop below 5mg/l works should stop until DO levels have recovered

5.3 Invasive Non-native Species

Giant Hogweed and Himalayan Balsam are non-native, invasive plant species 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 spread of this species into the wild. The presence of this species across the surveyed area, predominantly along the watercourse, will require measures to be put in place to remove this plant and to ensure that there is no further spread of this species as a result of carrying out the works. The production of an Invasive Species Management Plan is recommended prior to the commencement of works.

5.4 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: 06/02/17].
- 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 06/02/17] in place of concrete.

5.5 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 given of the status of the waterbodies as detailed within the River Basin Management Plan (RBMP).

5.6 Biosecurity

Biosecurity measures should be put in place to ensure there is no spread of INNS or diseases within the watercourses. The Check-Clean-Dry approach should be followed, ensuring that all PPE and equipment is cleaned before leaving site. As an additional measure, the use of Virkon disinfectant should be used on all PPE and equipment that comes into contact with the water. For more information go to www.nonnativespecies.org/checkcleandry.

Appendices

A Phase 1 Habitat Map

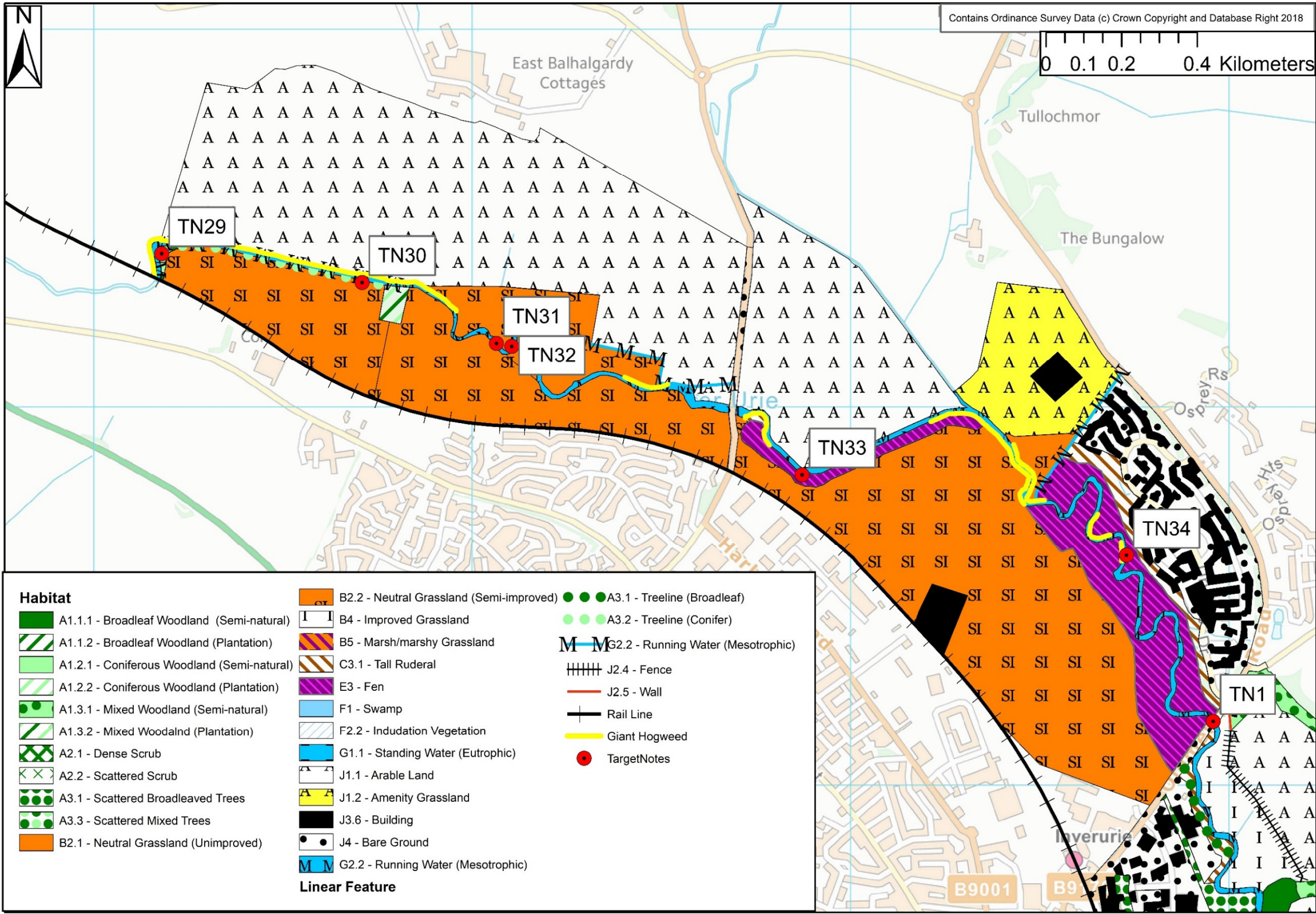


Figure A-1: Phase 1 Habitat Map - North western extent of the River Urie

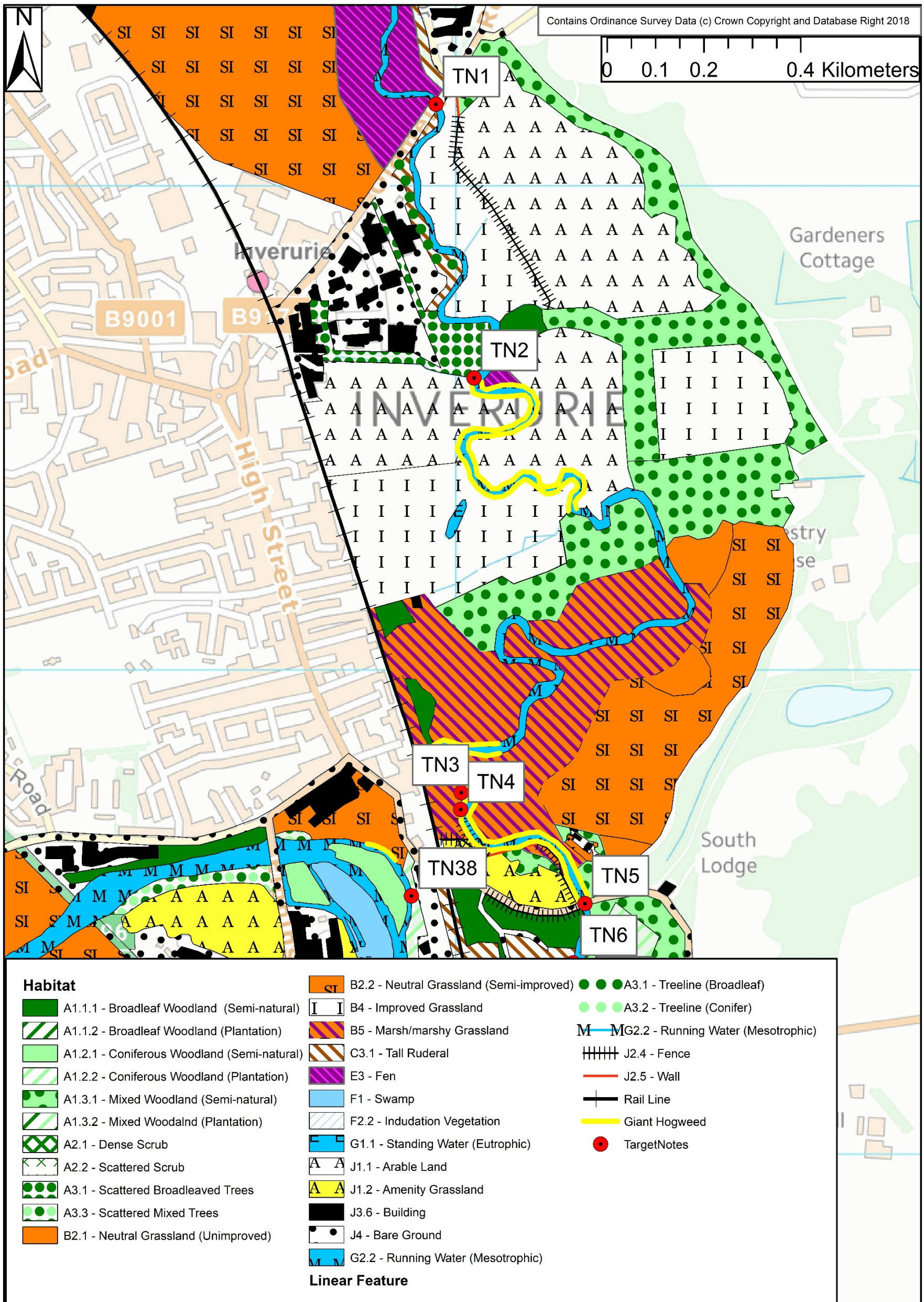


Figure A-2: Phase 1 Habitat Map - Central extent of the River Urie

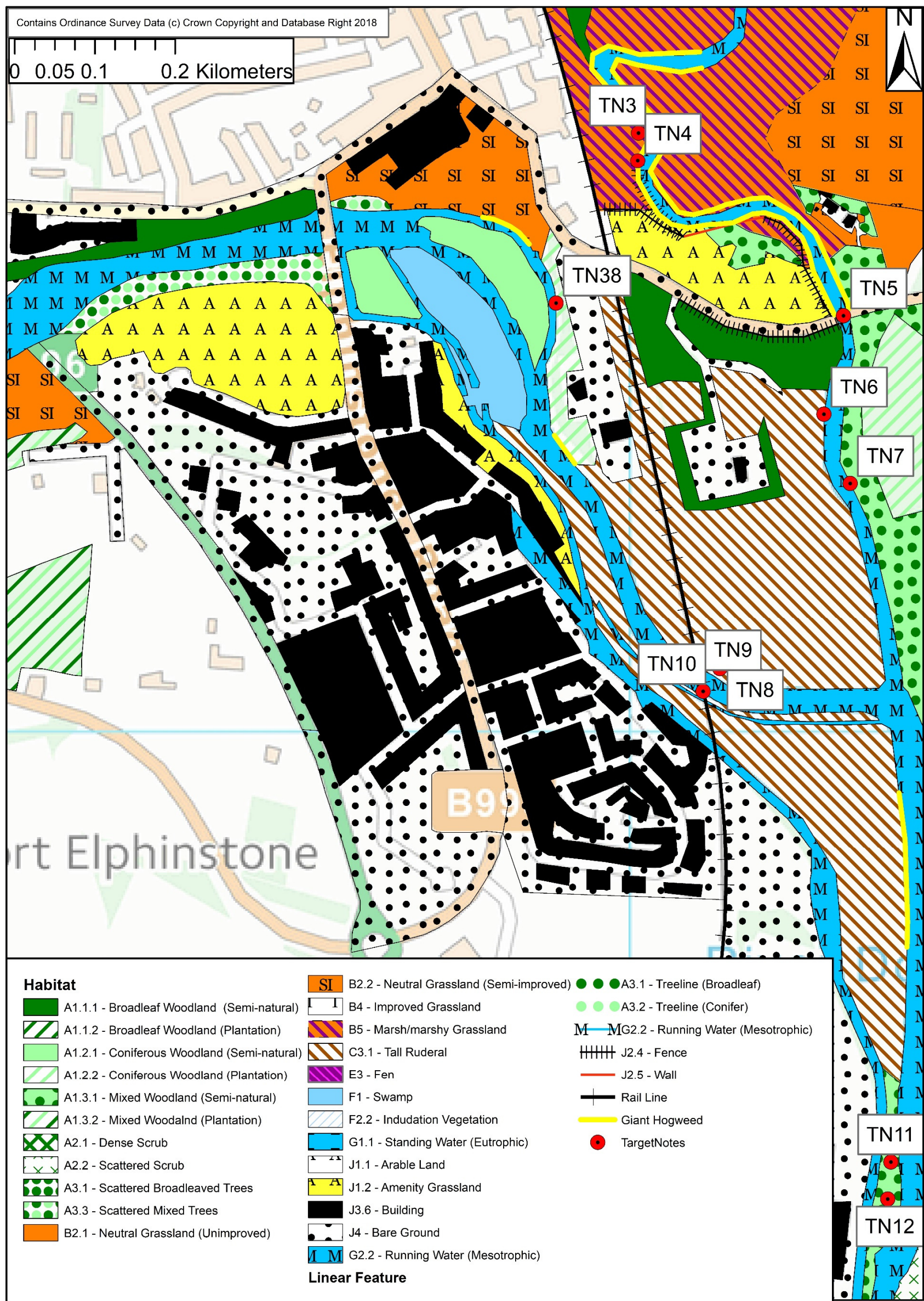


Figure A-3: Phase 1 Habitat Map - River Don joining the River Urie

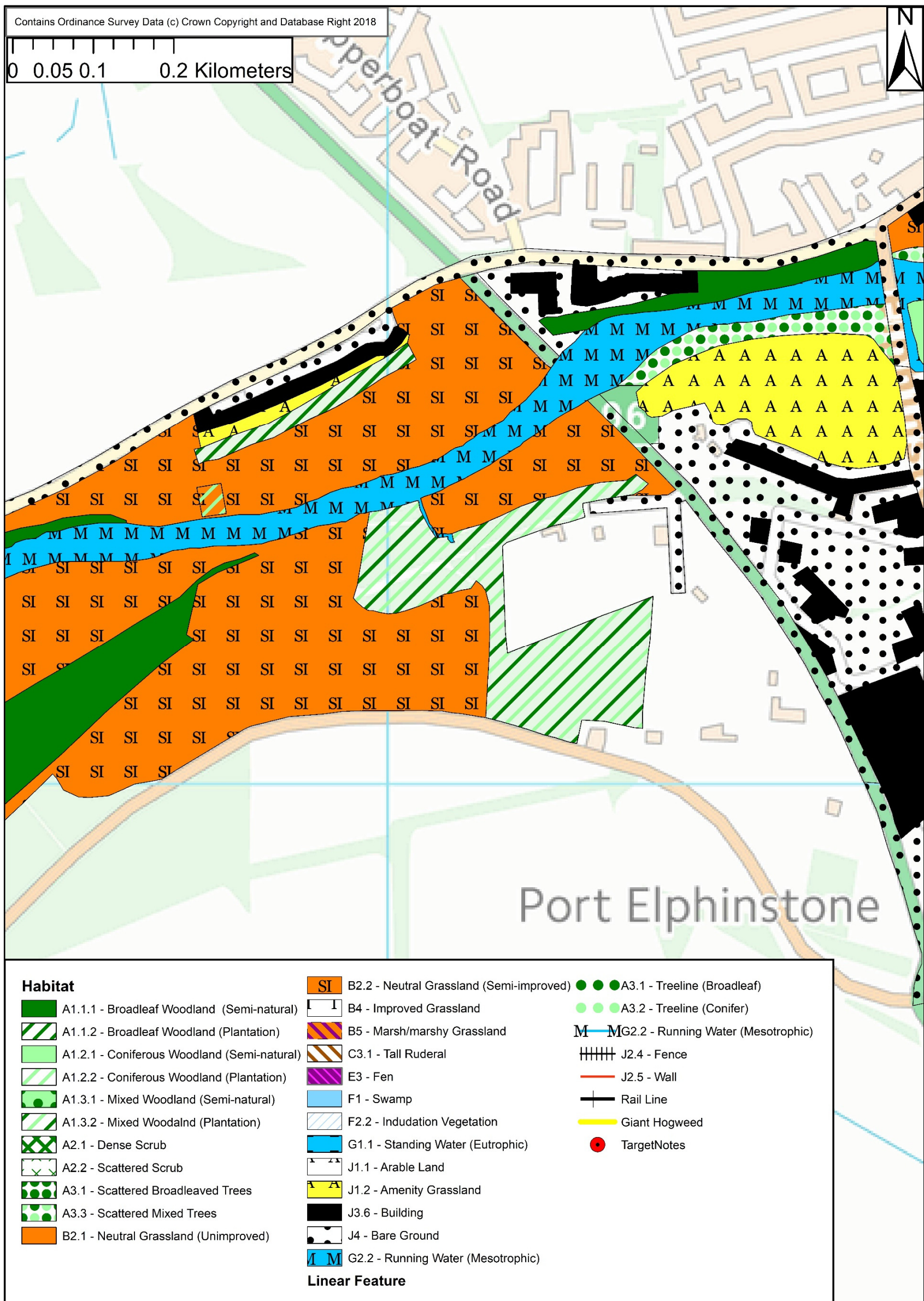


Figure A-4: Phase 1 Habitat Map - Western extent of the River Don

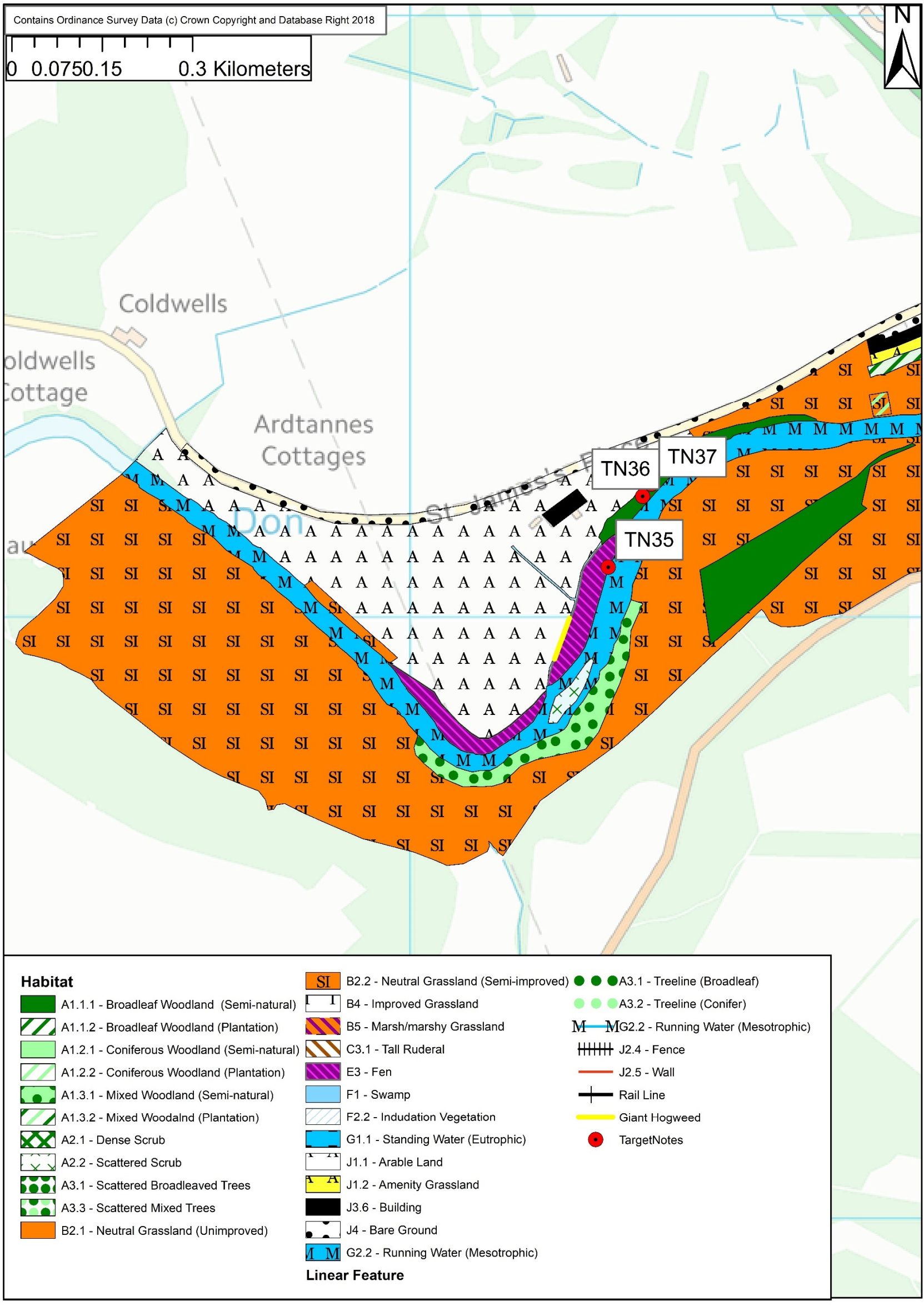


Figure A-5: Phase 1 Habitat Map - The beginning of the River Don on the western extent

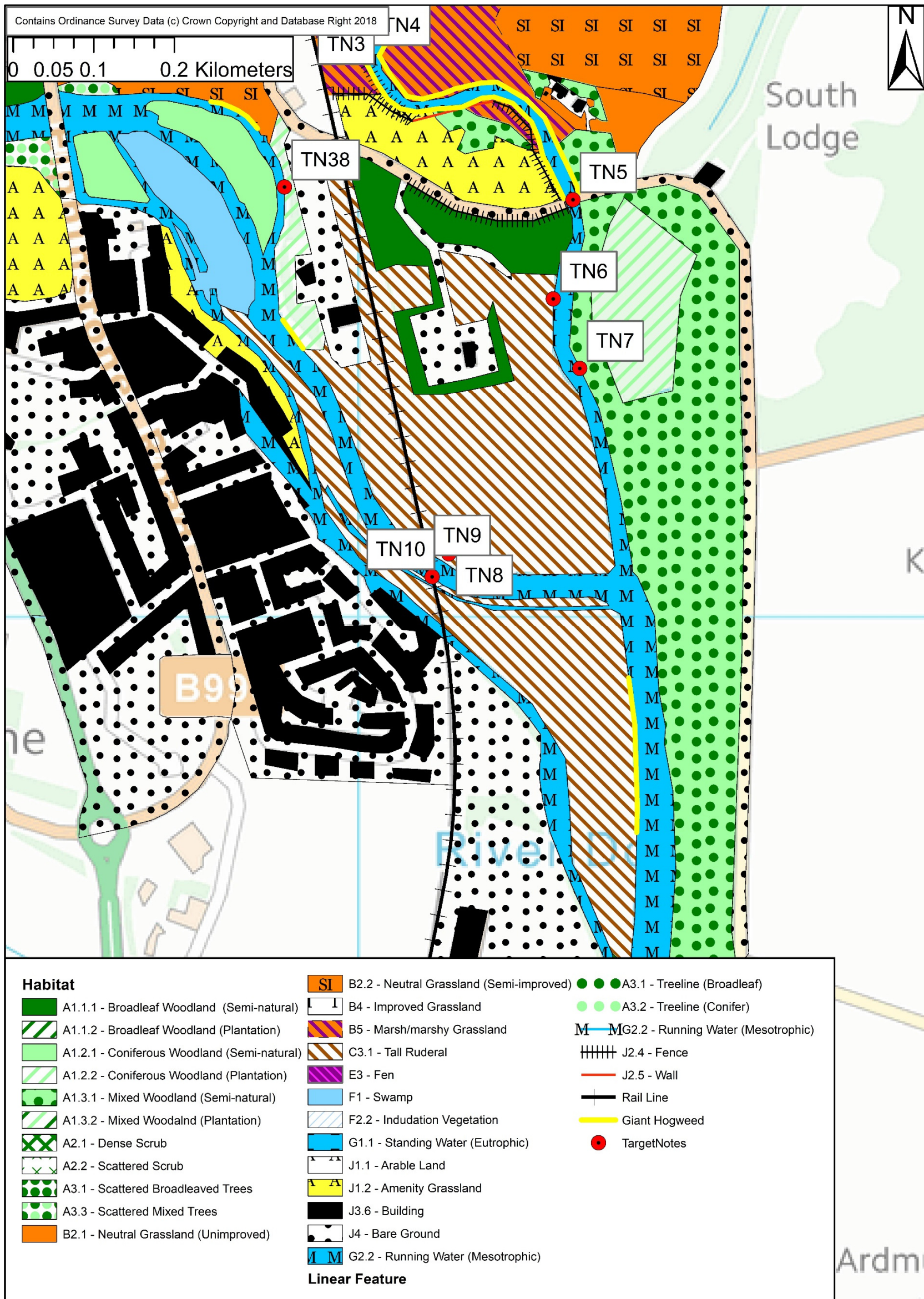


Figure A-6: Phase 1 Habitat Map - Confluence of the River Don and River Urie

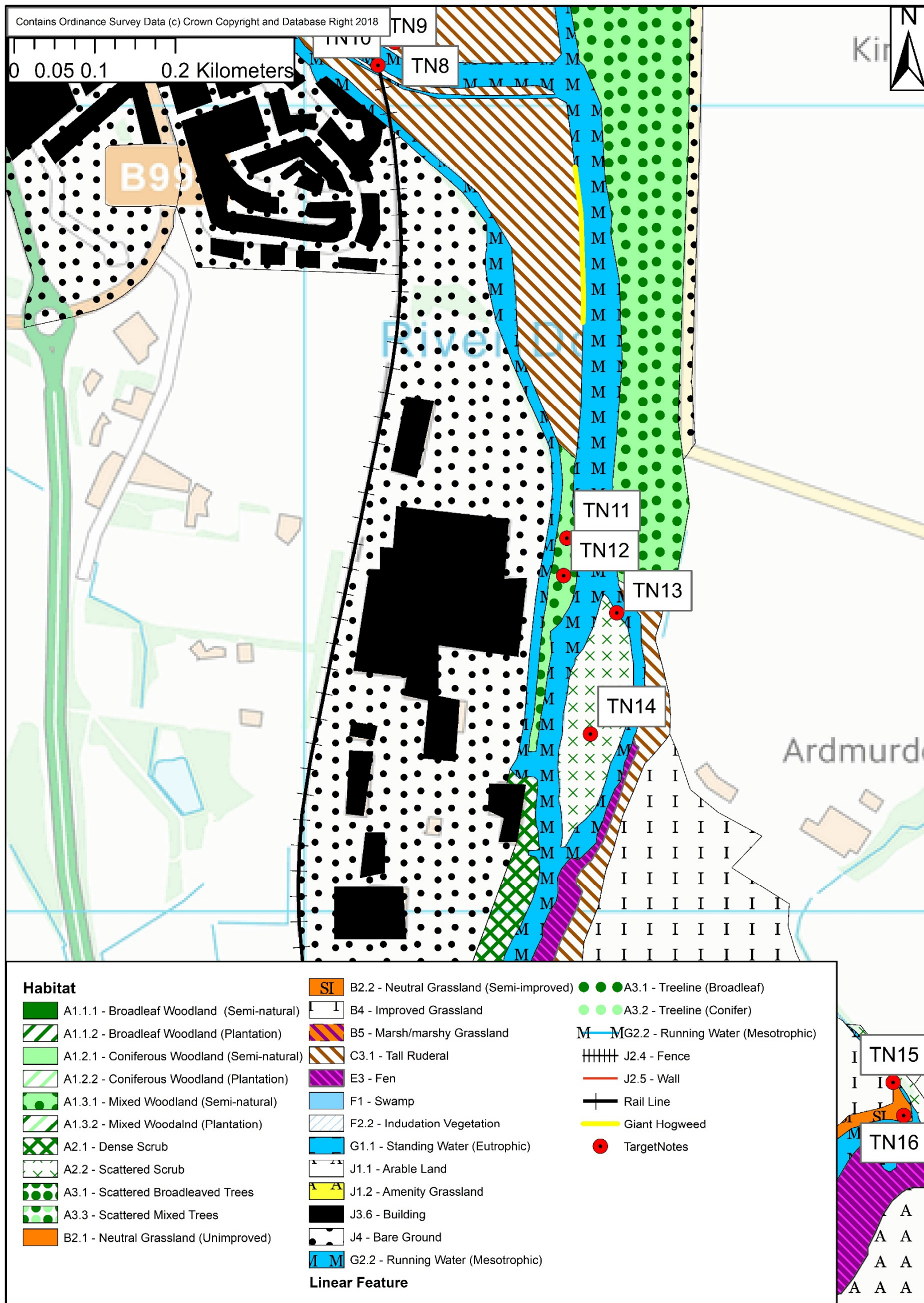


Figure A-7: Phase 1 Habitat Map - Southern extent of the River Don

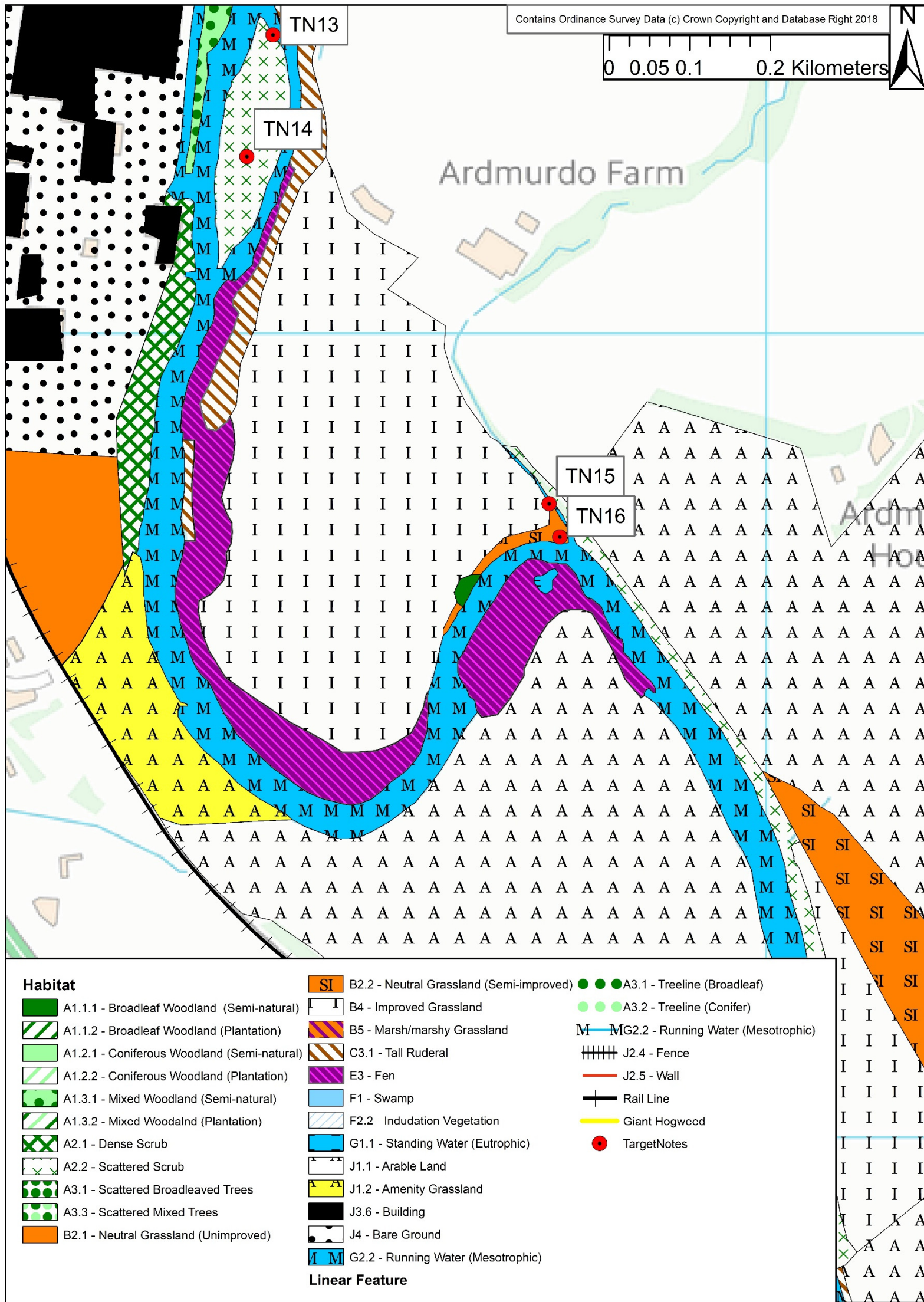


Figure A-8: Southern extent of the River Don

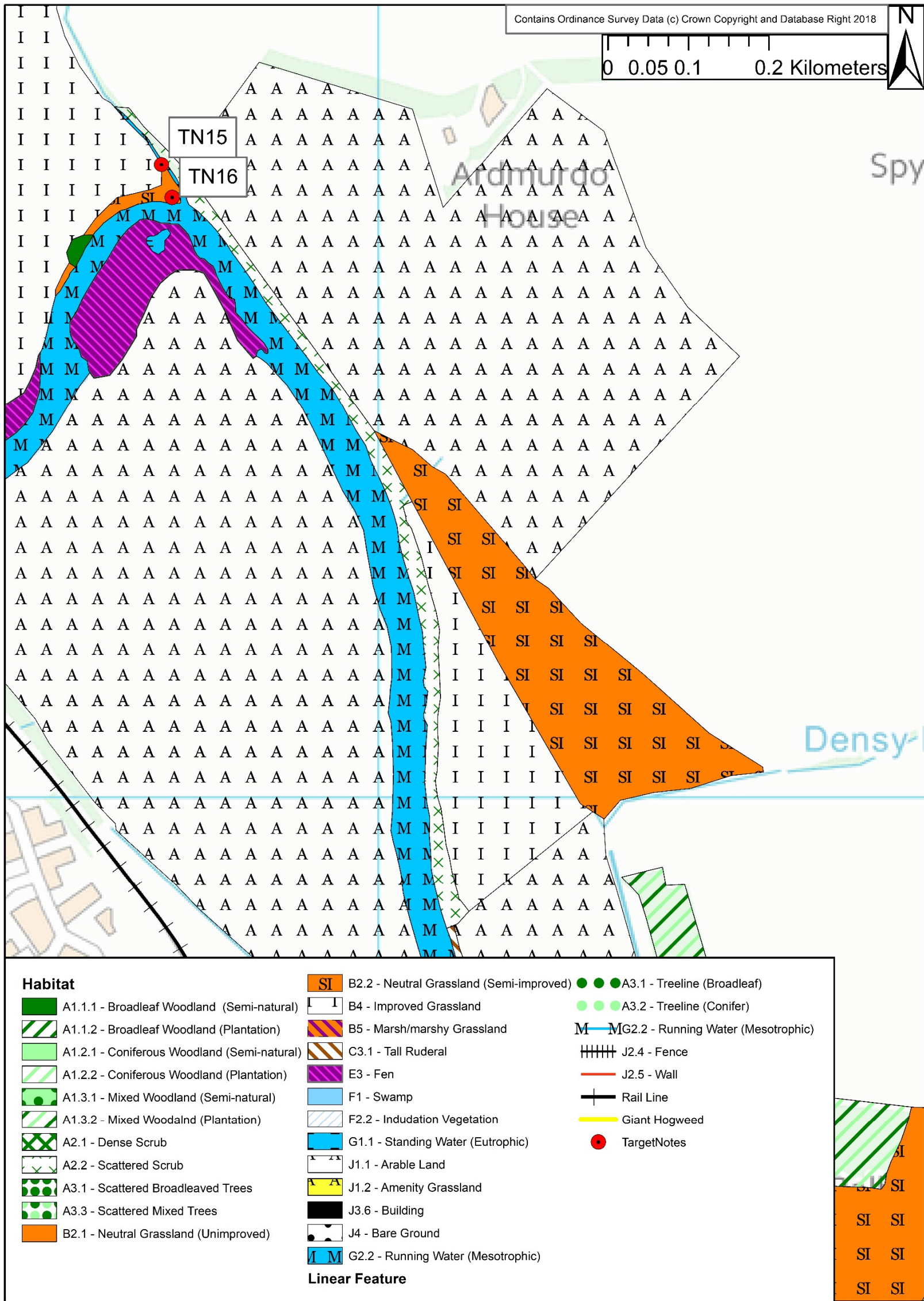


Figure A-9: Southern extent of the River Don

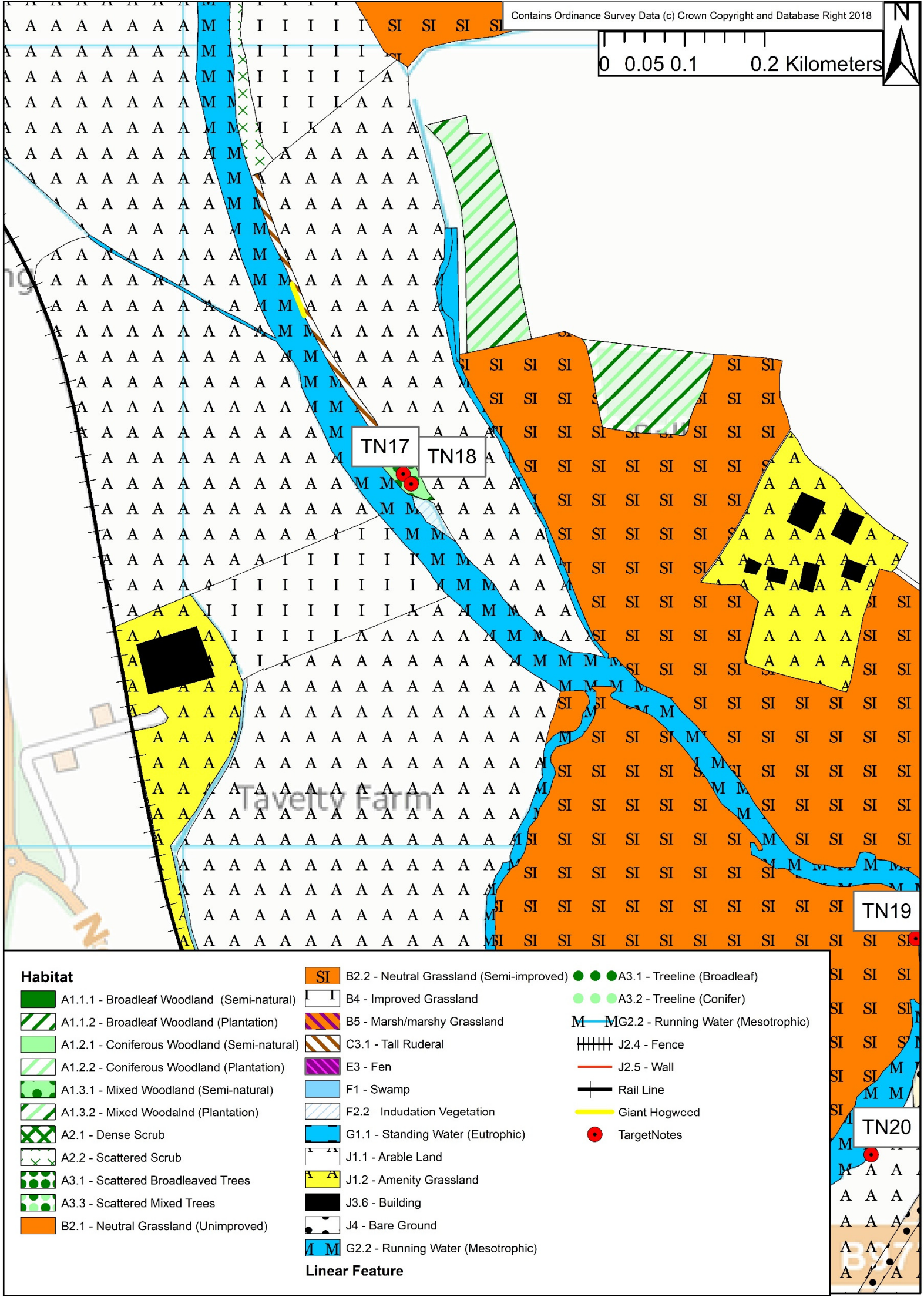


Figure A-10: Central extent of the River Don

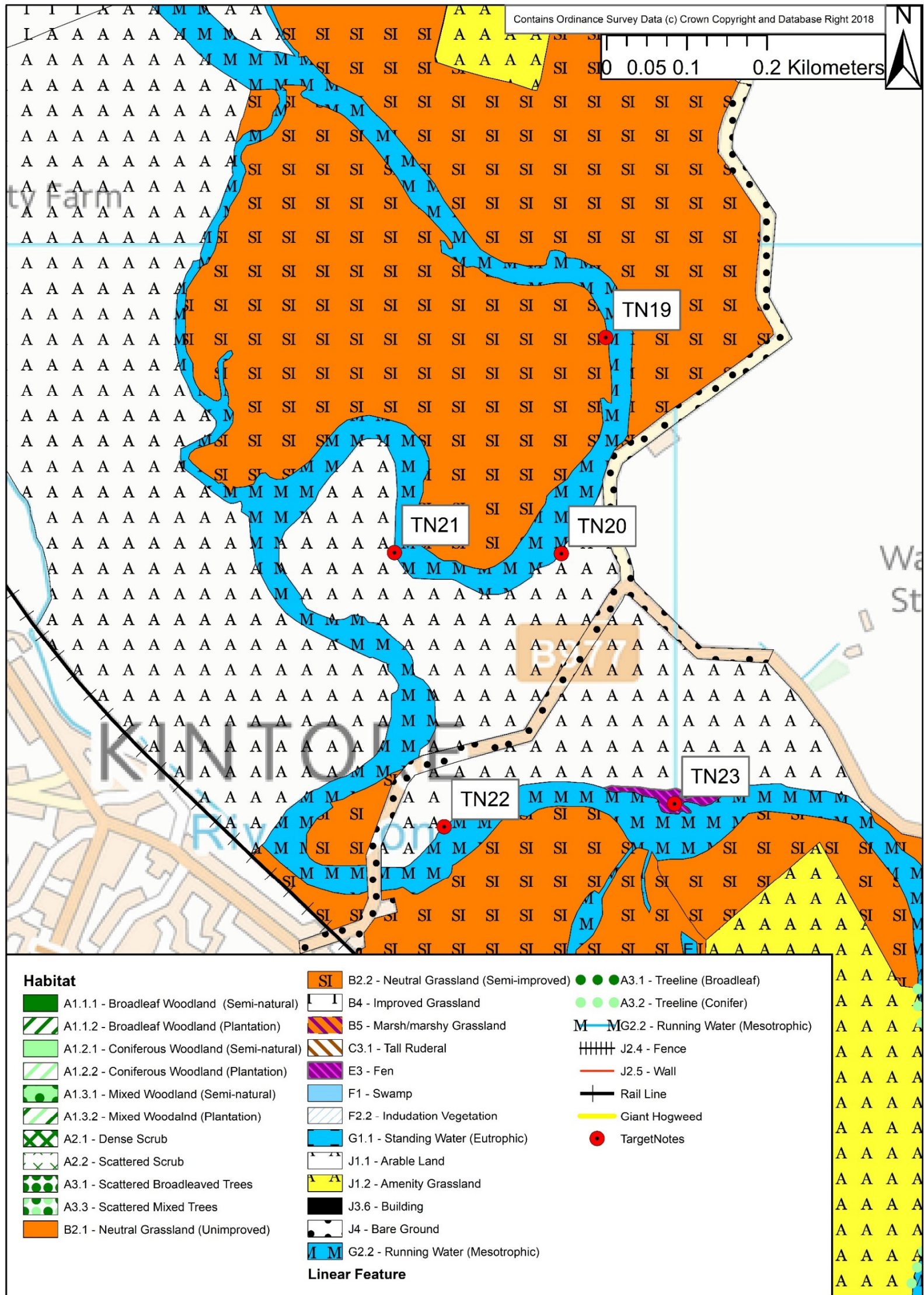


Figure A-11: Central extent of the River Don

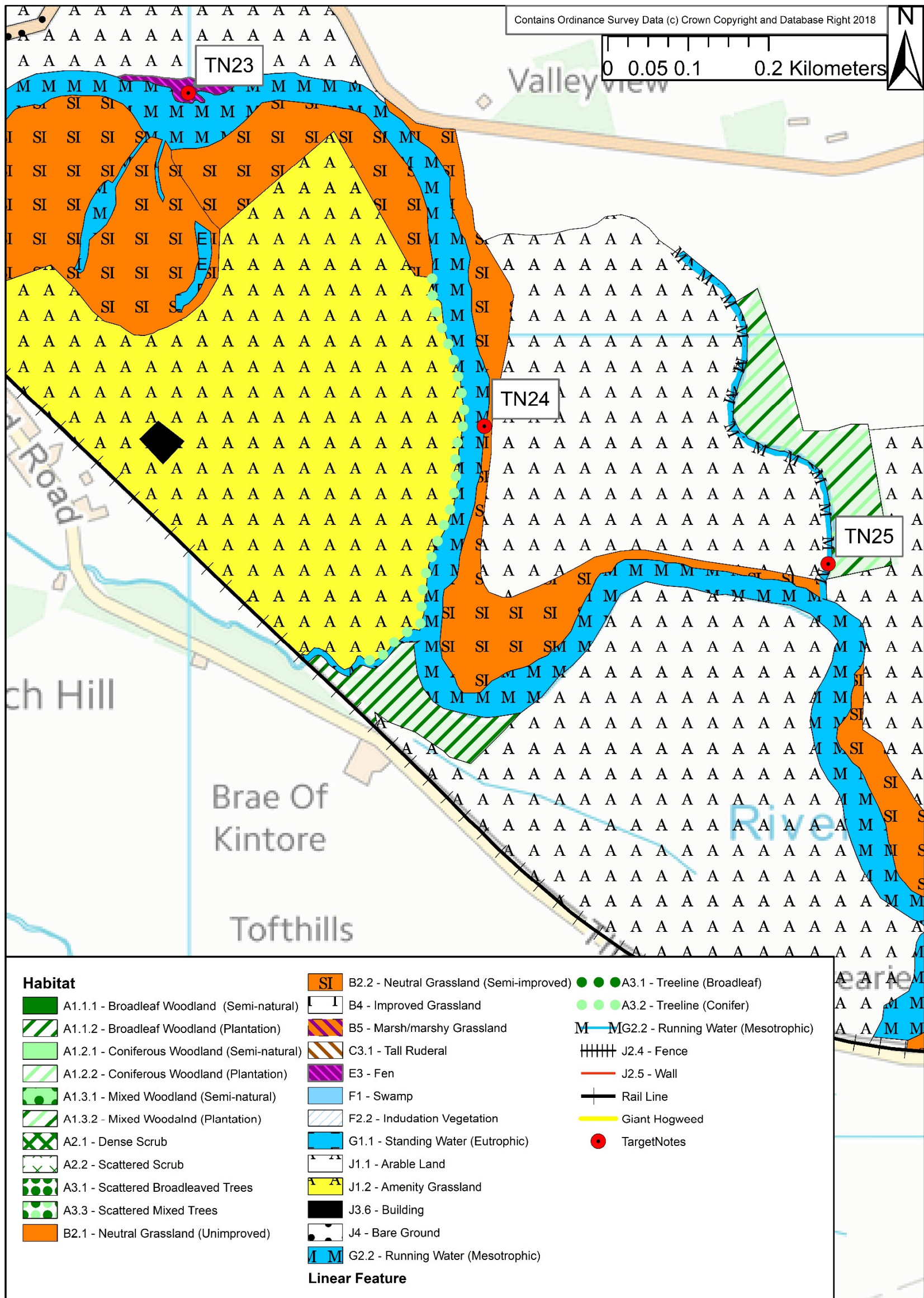


Figure A-12: Eastern extent of the River Don and drain

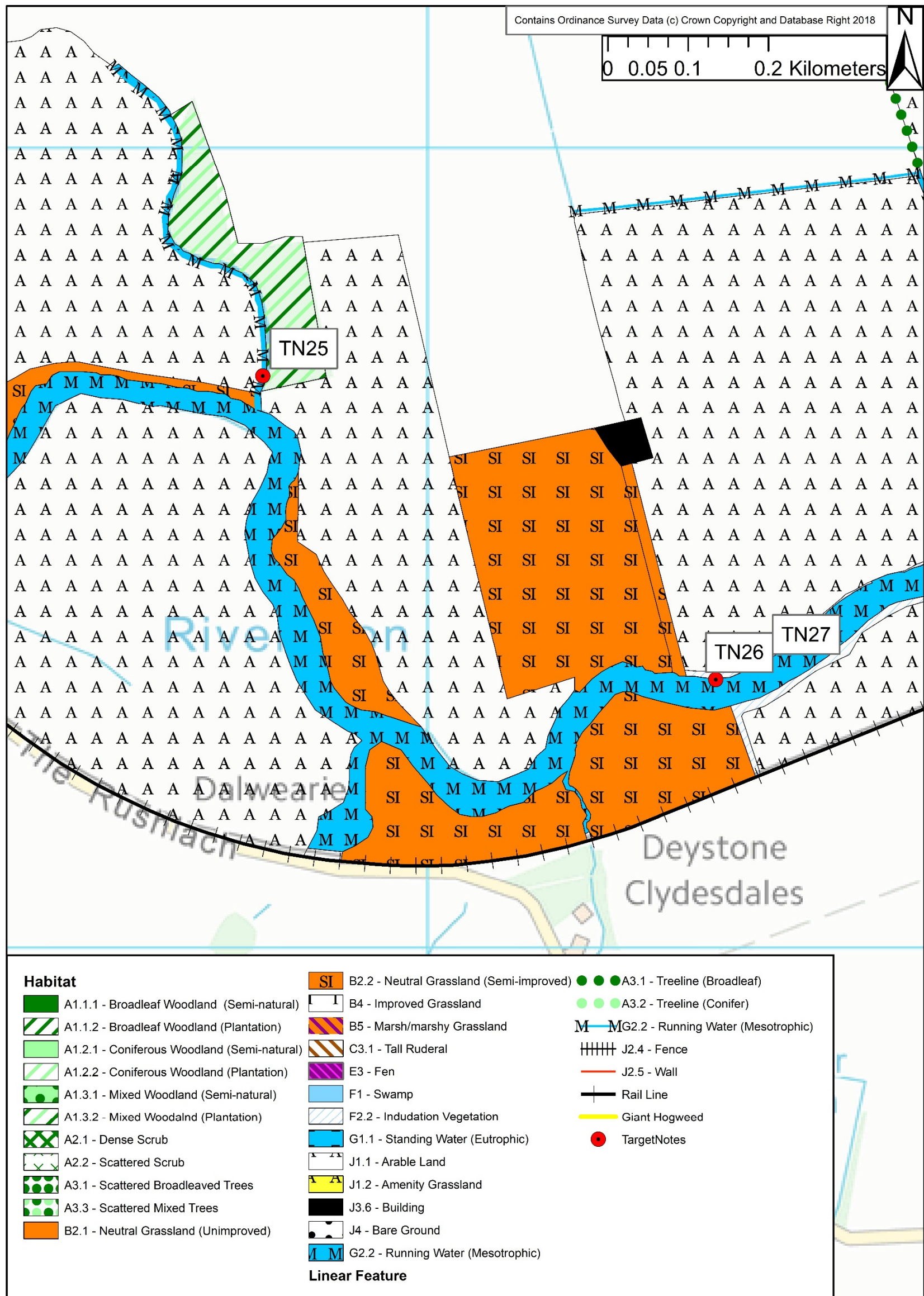


Figure A-13: Eastern extent of the River Don

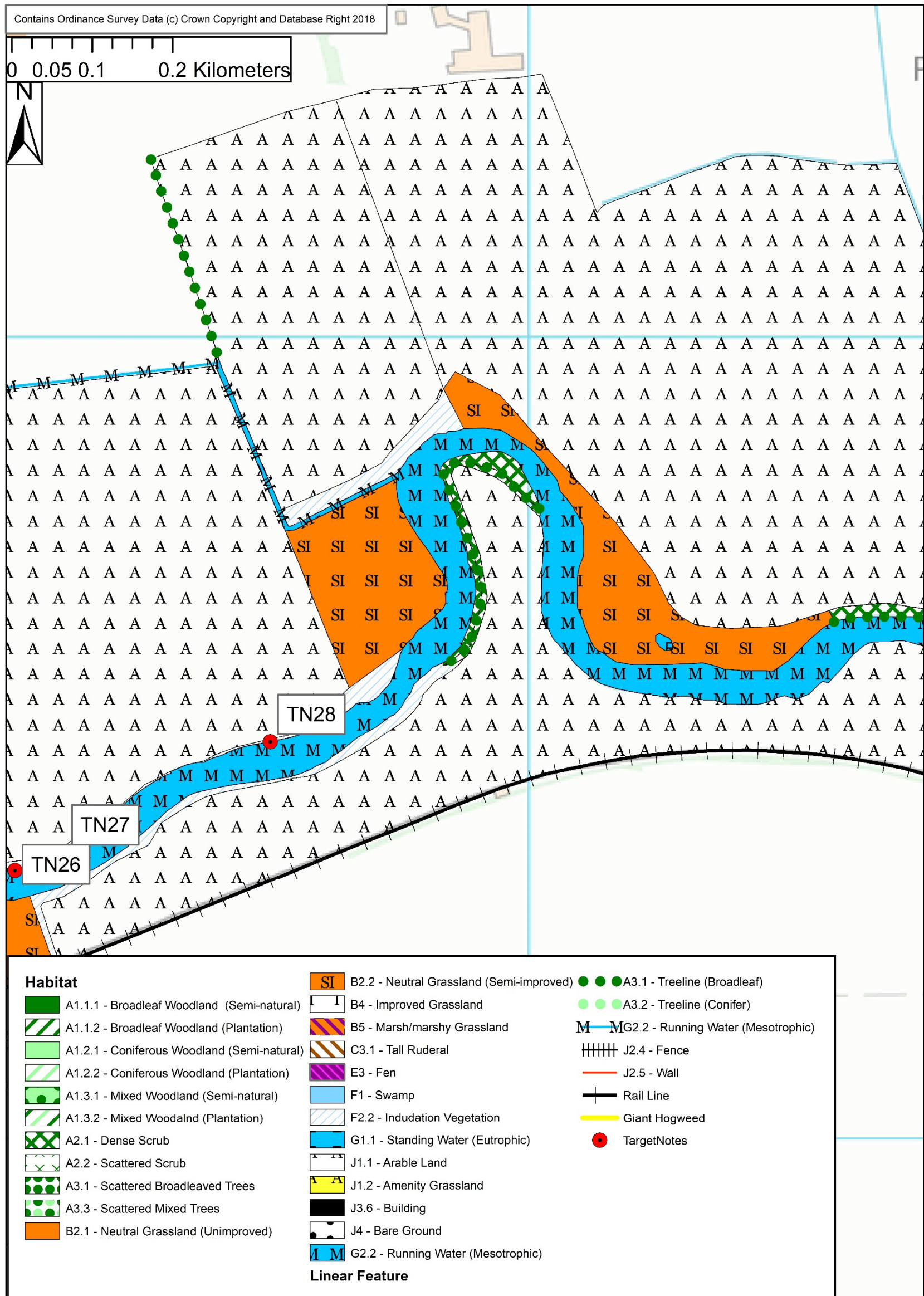


Figure A-14: Eastern extent of the River Don

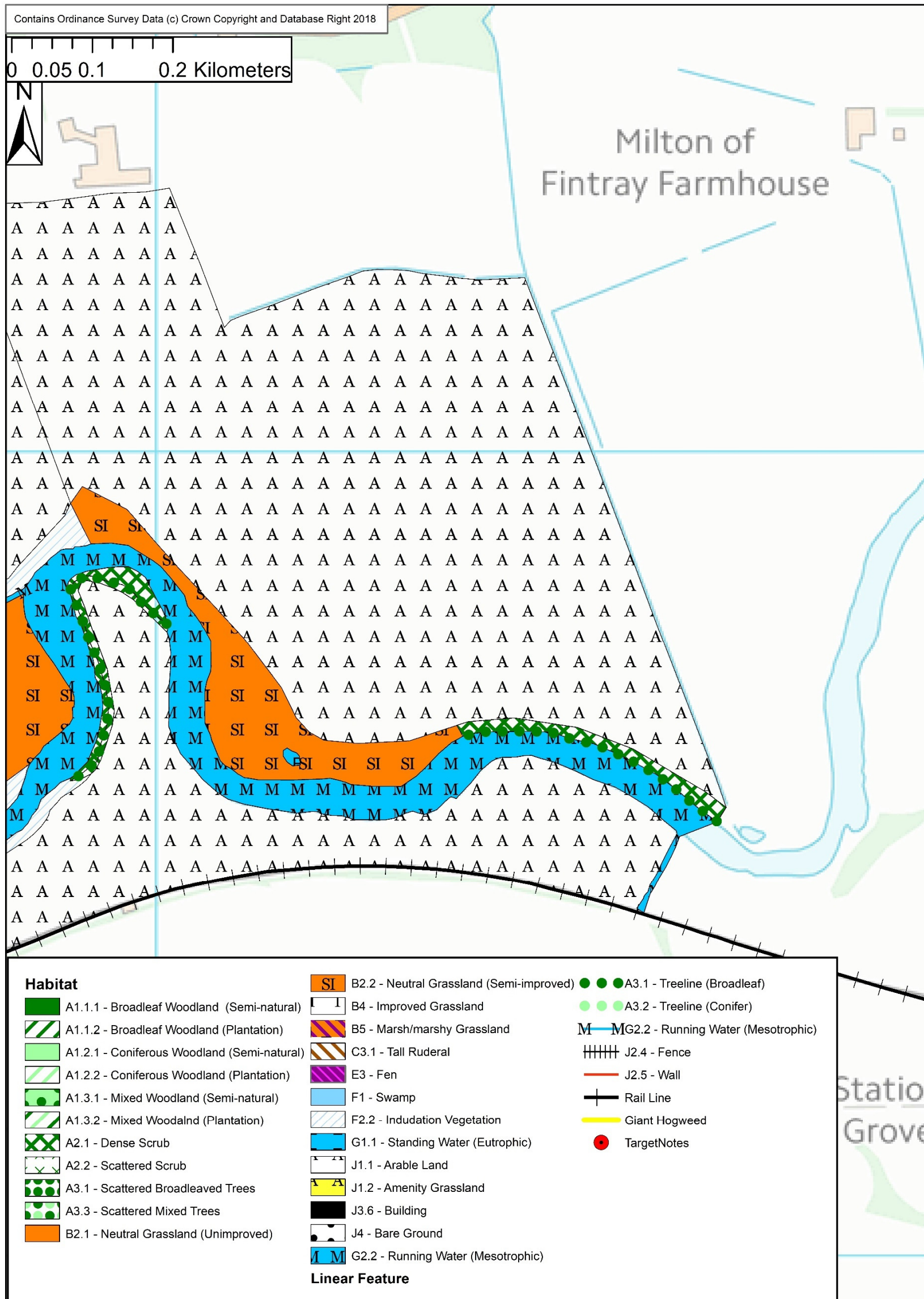


Figure A-15: End extent of the River Don

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

Target Note Number	Comment
1	Bridge-Negligible BRP (Right bank)
2	Mature tree suitable for Bats (Right bank)
3	A mature Beech and Alder tree with a Moderate Bat Roost Potential (Right bank)
4	Ash with a moderate Bat Roost Potential (Right bank)
5	A stone bridge with a Low Bat Roost Potential (Right bank)
6	Giant Hogweed (Right bank)
7	Giant Hogweed (Left bank)
8	Giant Hogweed
9	A stone bridge with a Low Bat Roost Potential (Right Bank)
10	Giant Hogweed (Right bank)
11	Standing dead wood and dead limbs with a Low Bat Roost Potential (Right bank)
12	Extensive Himalayan Balsam (Right bank)
13	Scattered scrub a good habitat for otters (Left bank)
14	Standing dead wood have a Low Bat Roost Potential (Left bank)
15	Potential otter holt upstream of the tributaries (Left bank)
16	Otter spraint (Left bank)
17	Potential Otter holt (Left bank)
18	Himalayan Balsam (Left bank)
19	Artificial rocks have the potential for an otter holt (Right bank)
20	Otter spraint (Left bank)
21	Loose boulders, potential otter holt (Left bank)
22	Brash Piling suitable habitat for Otters (Left bank)
23	Otter couch (Left bank)
24	Willow tree with a Low Bat Roost Potential (Left bank)
25	Mature standing dead wood oak with Low Bat Roost Potential (Left bank)
26	Potential holt site within the loose boulders (Left bank)
27	Otter footprint and spraint (Left bank)
28	Himalayan Balsam (Left bank)
29	Scots Pine with a Low Bat Roost Potential due to peeling bark (Right bank)
30	Potential Water Vole Burrow (Right bank)
31	Good river habitat for salmon and Trout due to gravel beds and diverse river morphology (Left bank)
32	Good habitat for invertebrates (Left bank)
33	Structure with a Low Bat Roost Potential (Left bank)
34	Possible Crayfish Burrow (Left Bank)
35	Stone structure with a Moderate Bat Roost Potential and suitable barn owls (Left bank)
36	A minimum of three badger setts in close proximity to each other (Left bank)
37	A Beech tree with a Low Bat Roost Potential (Left bank)
38	Otter spraint (Left bank)

B Photographs



Figure 5-1: River Urie with high water levels
 Photograph taken 30 November 2017 11:31
 Photograph location: NJ 77961 22183



Figure 5-2: Rail bridge with Low BRP and Giant Hogweed at base. See Target Note 9
 Photograph taken 30 November 2017 15:41
 Photograph location: NJ 78108 20079



Figure 5-3: Dry stone wall offering reptile refugia
 Photograph taken 30 November 2017 11:36
 Photograph location: NJ 77989 22166



Figure 5-4: Bridge with Negligible BRP. See Target Note 1.
 Photograph taken 30 November 2017 11:37
 Photograph location: NJ 77979 22155



Figure 5-5: Woodland bordering arable farmland

Photograph taken 30 November 2017 11:55
Photograph location: NJ 78191 21698



Figure 5-6: Standing water in agricultural fields

Photograph taken 30 November 2017 11:44
Photograph location: NJ 78064 21961



Figure 5-7: Wood with trees with bat roosting potential. See Target Note 2

Photograph taken 30 November 2017 11:53
Photograph location: NJ 78182 21739



Figure 5-8: Wood with trees with bat roosting potential. See Target Note 2

Photograph taken 30 November 2017 11:53
Photograph location: NJ 78184 21736



Figure 5-9: Wood with trees with bat roosting potential. See Target Note 2. Ash tree with lifted bark.

Photograph taken 30 November 2017 11:58
Photograph location: NJ 78143 21639



Figure 5-10: A lot of mature and dead trees with bat roosting potential.

Photograph taken 30 November 2017 15:30
Photograph location: NJ 78290 20220



Figure 5-11: Cemetery with scattered trees

Photograph taken 30 November 2017 13:00
Photograph location: NJ 78029 20644



Figure 5-12: Giant Hogweed (INNS) on the bank of the River Urie

Photograph taken 30 January 2018 10:34
Photograph location: NJ 75236 23441



Figure 5-13: Ash tree with Moderate BRP. See Target Note 4.
Photograph taken 30 November 2017 13:00
Photograph location: NJ 78029 20644



Figure 5-14: Bridge with Negligible to Low BRP.
See Target Note 5.
Photograph taken 30 November 2017 15:23
Photograph location: NJ 78270 20490



Figure 5-15: Alder tree with Moderate bat roosting potential. See Target Note 3.
Photograph taken 30 November 2017 13:02
Photograph location: NJ 78004 20711



Figure 5-16: Stone structure with a moderate bat roosting potential and potential site for barn owls.
See Target Note 35.
Photograph Taken 30 January 2018 12:06
Photograph Location: NJ 76366 20024



Figure 5-17: Three Badger setts within the area.
See Target Note 36.
Photograph taken 30 January 2017 16:29
Photograph location: NJ 76436 20254



Figure 5-18: Otter spraint. See Target Note 16.
Photograph taken 31 January 2017 09:37
Photograph location: NJ 78746 18742



Figure 5-19: Otter Spraint. See Target Note 20
Photograph Taken 31 January, 11:59
Photograph location: NJ 79781 16574



Figure 5-20: Potential Otter Holt. See Target
Note 19
Photograph Taken 31 January, 13:55
Photograph location: NJ 79887 16972



Figure 5-21: Himalayan Balsam. See Target Note 12.
Photograph taken 31 January 2017, 10:24
Photograph location: NJ 78292 19312



Figure 5-22: Otter footprint. See Target Note 27.
Photograph taken 1st February 2017, 10:43
Photograph location: NJ 81351 15331

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