



**Vattenfall Wind Power Ltd**

**Thanet Extension Offshore Wind Farm**

**Annex 5-2: Water Vole and Otter Survey  
Report**

June, 2018, Revision A

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Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex 5-2: Water Vole and Otter Survey Report

June, 2018

Drafted By:	Amec Foster Wheeler
Approved By:	Helen Jameson
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Revision	A

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## Vattenfall Wind Power Ltd

# Thanet Extension Offshore Wind Farm

### Annex 5-2: Water Vole and Otter Survey Report





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**Report for**

Vattenfall Wind Power Ltd

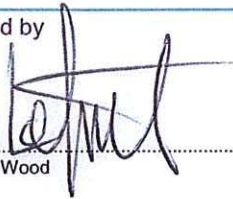
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**Document revisions**

No.	Details	Date
1	Draft Report	08/08/2017
2	Second Draft	07/09/2017
3	Third Draft	19/10/2017
4	Final Report (PEIR)	01/11/2017
5	Final Report update (ES)	12/06/2018



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# 1. Introduction

## 1.1 Purpose of this Report

- 1.1.1 This report is an update of the equivalent PEIR report that was issued in November 2017. It only contains minor updates, which relate to survey information that became available after submission of the PEIR and still represents the prevailing baseline conditions in autumn 2017.
- 1.1.2 This report details the results of water vole (*Arvicola amphibius*) and otter (*Lutra lutra*) surveys undertaken in 2017, in order to inform the Environmental Impact Assessment (EIA) for Thanet Extension Offshore Wind Farm (TEOWF). This report forms a technical annex to Chapter 5 (Onshore Biodiversity) of the Environmental Statement (ES). Recording of any signs of Eurasian beaver (*Castor fiber*) have also been made where they were encountered during the surveys for water vole and otter<sup>1</sup>.

## 1.2 Background

- 1.2.1 GoBe Consultants, on behalf of Vattenfall Wind Power Ltd (VWPL), has commissioned Amec Foster Wheeler Environment & Infrastructure UK Ltd. (hereafter referred to as Amec Foster Wheeler) to undertake water vole and otter surveys for Thanet Extension, located within Thanet and Dover districts, Kent. At the time of commission the proposed development comprised two options for a proposed route for the Thanet Extension (Option 1 (north) and Option 2 (south), as illustrated as illustrated in Thanet Extension scoping report<sup>2</sup> (Figure 1.2) and Figure 5.1: Study area and Aol buffers for the Purpose of Scoping<sup>3</sup>. At that stage, the onshore Area of Interest for ecology surveys (hereafter referred to as the Aol) was the 500 metre (m) buffer zone around the two 25m wide Option 1 and Option 2 routes, above mean High Water Springs (MHWS), plus respective species appropriate buffer zones.
- 1.2.2 The report is based on the Red Line Boundary (RLB) presented in the Preliminary Environmental Information Report (PEIR) submitted in November 2017. Since the publication of the scoping report, all biodiversity receptors have been re-scoped to take account of the revised RLB presented in the PEIR. The report includes receptors located within and, where appropriate, outside the RLB. Consequently, the spatial scope of surveys and results in this report reflects the RLB presented in the PEIR plus a buffer appropriate to the receptor concerned<sup>4</sup>. All references to the RLB in this report are based on the RLB presented in the PEIR

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<sup>1</sup> All signs to be recorded for the purposes of considering impacts on this species should they be encountered for the purpose of best practice.

<sup>2</sup> Royal Haskoning DHV (2016) Thanet Extension Offshore Wind Farm, Environmental Impact Assessment, Report to Inform Scoping.

<sup>3</sup> This figure is appended to the Onshore Biodiversity Chapter 5 in the PEI.

<sup>4</sup> Tables 5.2 of the Onshore Biodiversity Chapter 5 in the PEI demonstrate the consultations on the spatial scope of surveys with relevant stakeholders.

- 1.2.3 For water vole and otter, as the subjects of this technical report, this spatial scope of the study area is illustrated on Figure 5.2.1, Appendix A.

## 1.3 Site Description

- 1.3.1 The proposed development is located within eastern Kent in the Thanet and Dover districts and comprises an assortment of land parcels with terrestrial habitats comprising agricultural land, improved and semi-improved grassland, dense and scattered scrub, woodland stands, extensive networks of drainage ditches and coastal floodplain and grazing marsh.
- 1.3.2 The RLB includes in part, land statutorily designated as Thanet Coast and Sandwich Bay Ramsar, Thanet Coast and Sandwich Bay Special Protection Area (SPA), Sandwich Bay Special Area of Conservation (SAC), Sandwich and Pegwell Bay National Nature Reserve (NNR), and Sandwich Bay to Hacklinge Marshes Sites of Special Scientific Interest (SSSI).
- 1.3.3 Non-statutory sites within the RLB are the Sandwich and Pegwell Bay Kent Wildlife Trust Reserve (KWTR) and the A256 Roadside Nature Reserve (RNR).
- 1.3.4 Habitats comprise semi-improved neutral and improved grassland, scattered and dense scrub and scattered trees, adjacent to an extensive area of mudflats, coastal saltmarsh, coastal sand dune and floodplain grazing marsh to the east; a minor road, residential properties and extensive golf courses to the west. It contains a sports facility dominated by amenity grassland and scattered trees, an area of hardstanding and a section of drainage ditch. The southern area of land within the RLB is largely hardstanding in the vicinity of Richborough Port. West of the A256 (Ramsgate Road), the RLB surrounds land comprising Richborough Energy Park (REP) dominated by man-made structures and hardstanding, with areas of improved grassland, scattered trees, and scattered and dense scrub in its north west.
- 1.3.5 Beyond the RLB to the north, east and west lies reedbed, broadleaved woodland a network of drainage ditches and dense scrub, designated as Sandwich Bay to Hacklinge Marshes SSSI. To the west of the RLB, lies a large network of ditches and arable land including the Woods and Grassland Minster Marshes and the Ash Level and South Richborough Pasture Local Wildlife Sites (LWS).



## 2. Legislative and Policy Context

### 2.1 Water Vole and Otter

- 2.1.1 Water vole and otter are listed in Schedule 5 of The Wildlife and Countryside Act 1981 (as amended). The Act transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (commonly referred to as the 'Bern Convention'). Water vole and otter are afforded full protection under Section 9(4) of the Act, which makes it an offence, inter alia, to:
- ▶ Intentionally or recklessly kill, injure, or take (handle) a water vole or otter;
  - ▶ intentionally or recklessly damage, destroy or obstruct access to any structure or place that a water vole or otter uses for shelter or protection; or
  - ▶ Intentionally or recklessly disturb a water vole or otter while it is occupying a structure or place that it uses for shelter or protection.
- 2.1.2 Otter receives further protection under Regulation 41 of The Conservation of Habitats and Species Regulations 2010, which make provision for the purpose of implementing European Union Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 1992. Otter are listed on Annex IV of the Directive, which means that member states are required to put in place a system of strict protection as outlined in Article 12, and this is done through inclusion on Schedule 2 of the Regulations, which makes it an offence, inter alia, to:
- ▶ Deliberately capture, injure or kill any otter;
  - ▶ Deliberately disturb an otter, in particular any disturbance which is likely:
    - ▶ (a) To impair their ability;
      - ▶ (i) To survive, to breed or reproduce, or to rear or nurture their young, or
      - ▶ (ii) To hibernate or migrate.
    - ▶ (b) To affect significantly the local distribution or abundance of otter; or
    - ▶ Damage or destroy a breeding site or resting place of an otter.
- 2.1.3 Water vole and otter are also listed species of principal importance for the purpose of conserving biodiversity in England under Section 41(1) of the Natural Environment and Rural Communities (NERC) Act 2006. Under section 41(3) of the Act, the Secretary of State must take steps (where they are reasonably practicable), and promote the taking of steps by others, to further the conservation of these species.
- 2.1.4 In Kent, water vole and otter are Local Biodiversity Action Plan (LBAP) Priority Species. In addition, the National Planning Policy Framework (NPPF)<sup>5</sup> states that the effects of development on biodiversity must be identified to ensure that

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<sup>5</sup> Department for Communities and Local Government (2012). *National Planning Policy Framework*. [Online] Available from: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>



significant harm as a result of development is avoided; adequately mitigated or, as a last resort, compensated for.

## 2.2 Eurasian Beaver

- 2.2.1 The Eurasian beaver was once a widespread species in the UK but was extinct by the 16<sup>th</sup> century in Britain.
- 2.2.2 Ten individuals are present within a reserve at Ham Fen, Sandwich where Norwegian originated animals were reintroduced under licence into an enclosed reserve managed by Kent Wildlife Trust.
- 2.2.3 It is listed as an Annex IV species and additionally as an Annex III species of the Bern Convention, interpreted as giving it protection in EU countries where it is considered resident. In England Eurasian beaver is viewed as a non-resident species in the UK, and thus it is not considered to be covered by this legislation.
- 2.2.4 In Scotland, where official reintroductions of the species have been undertaken in 2009, there are now an estimated 250 individuals. It is recognised as a native species in Scotland and is due to receive legal protection under Scottish law (via the Habitats and Species Directive) by the end of 2017.
- 2.2.5 Consequently, Eurasian beaver does not currently receive any legal protection in England, and those animals in populations known to exist in Kent are not officially recognised as a resident, native species.

## 3. Methods

### 3.1 Desk Study and Review of Secondary Data

- 3.1.1 The Water Vole Conservation Handbook<sup>6</sup> is the main source of guidance for water voles in the UK. The Ecology of the European Otter<sup>7</sup>, provided guidance on survey work for otters. Statutory advice guidance documents from Natural England are available for both water vole and otter<sup>8</sup>. Information on field signs for Eurasian beaver<sup>9,10</sup> was also reviewed. These guidelines have been taken into account when designing the survey methodology and programme of survey work.
- 3.1.2 At the time of the original desk study in March 2017, the initial study area for otter and water vole was defined as the onshore Aol for ecology surveys plus an additional 200m buffer beyond the onshore Aol in respect of both water vole and otter.
- 3.1.3 To inform the survey design and provide context for future assessment, records of water vole, otter and Eurasian beaver presence were requested from Kent and Medway Biological Records Centre (KMBRC) for a 2km buffer from the onshore Aol.
- 3.1.4 The Multi-Agency Geographic Information for the Countryside (MAGIC)<sup>11</sup> website, Ordnance Survey mapping and aerial photographs<sup>12</sup> were utilised to identify any water bodies present within the onshore Aol and a 200m buffer beyond the onshore Aol.
- 3.1.5 Further to the 200m, a buffer of up to 500m from the RLB was considered to include those water bodies, connected into, but extending beyond the 200m buffer from the RLB (and up to a 500m buffer from the RLB) along watercourses and terrestrial habitat that were potentially suitable for water vole commuting and dispersal.
- 3.1.6 Additionally, a review was undertaken of relevant contextual information provided by available ecological survey reports<sup>13</sup> for projects on land within and adjacent to the onshore Aol and up to 2km from it, in order to inform the scope of the field

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<sup>6</sup> Strachan, Moorhouse and Gelling (2011). *Water Vole Conservation Handbook*. 3<sup>rd</sup> Ed.

<sup>7</sup> Chanin, P. (2003) *Ecology of the European Otter*. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

<sup>8</sup> Natural England (2014). *Otters: surveys and mitigation for development projects*. [Online] Available from: <https://www.gov.uk/guidance/otters-protection-surveys-and-licences>

Natural England (2014). *Water voles: surveys and mitigation for development projects*. [Online] Available from <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>.

<sup>9</sup> Scottish Wild Beaver Group (2017). *Beaver Surveying – what to look for*. [Online] Available from: <http://scottishwildbeavers.org.uk/survey-field-signs/>

<sup>10</sup> Campbell, R.D., Harrington, A., Ross, A and Harrington, L. (2012) *Distribution, Population Assessment and Activities of Beavers in Tayside*. SNH Commissioned Report No. 540. [Online] Available from: [http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/540.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/540.pdf)

<sup>11</sup> DEFRA (2017) *Magic Map Application* [Online] Available from: <http://www.magic.gov.uk/MagicMap.aspx>

<sup>12</sup> Google (2017). Google maps [Online] Available from: <http://maps.google.co.uk>

<sup>13</sup> Greengage Ecology (2017). *Richborough Energy Park Richborough A Ltd. Riparian Mammal Survey Report* AECOM.

survey work, as well as the overall assessment of the status of water vole, otter and beaver using the site.

## 3.2 Defining Survey Scope

- 3.2.1 In line with Chartered Institute of Ecological and Environmental Management (CIEEM) guidance<sup>14</sup>, surveys were focussed on those areas in which works associated with the proposed development could contribute to significant adverse effects on water vole and otter populations, or could result in contravention of the legislation protecting water voles and otters. After scoping the potential effects of the works, it was considered that across much of area where proposed development could occur, works would have relatively low impacts due to the nature of the habitats affected, the small works footprint (a 25m wide corridor), and the limited amount of vegetation present, the short timescale of the works and the subsequent re-establishment of previously disturbed/removed habitats.
- 3.2.2 These potential effects were reassessed throughout the survey period in response to the design amendments during project development.
- 3.2.3 Based on the RLB presented in the PEIR, the potential habitats were re-scoped, and where impacts of the proposed development could result in likely significant effects, they have been included in the data collation, survey and assessment process. Consequently, the results in this report ultimately reflects the RLB presented in the PEIR plus a buffer of up to 100-200m (proportionate to impact) were screened and surveyed, including sections up to 200m up and downstream of potential impact area. In total a buffer to 500m from the RLB was initially considered to include those water bodies connected into, but extending beyond the 200m from the RLB (and up to a 500m buffer from the RLB) along watercourses and terrestrial habitat that were potentially suitable for water vole commuting and dispersal.

## 3.3 Field Surveys

### Screening

- 3.3.1 In early 2017, 451 water bodies comprising ponds, ditches, tidal pools and rivers had been identified as being within 500m of the original onshore Aol (comprising both Option 1 (north) and Option 2 (south)) during the desk-based screening exercise. For ditches it was necessary to divide them into sections for the purposes of numbering and mapping. Divisions were defined by physical boundaries such as culverts or roads, significant changes to the water body such as becoming very shallow/dry or scrubbed over, or where the water body lay across a land ownership boundary, or connected to a 'new' ditch/network of ditches. .
- 3.3.2 Since the publication of the scoping report, the RLB has been refined.. Following that, a re-screening exercise was undertaken to take account of the revised RLB presented in the PEIR and a total of 137 water bodies have been recorded within

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<sup>14</sup> Institute of Ecology and Environmental Management (IEEM) (2016). Online – available from: [https://www.cieem.net/data/files/Publications/EciA\\_Guidelines\\_Terrestrial\\_Freshwater\\_and\\_Coastal\\_Jan\\_2016.pdf](https://www.cieem.net/data/files/Publications/EciA_Guidelines_Terrestrial_Freshwater_and_Coastal_Jan_2016.pdf)

the RLB and 500m buffer of which, 104 are within the RLB and the 200m buffer, for consideration of impacts (Figure 5.2.2, Appendix A).

3.3.3 Where access was possible, those water bodies within a 200m buffer from the RLB, plus those within 500m from the RLB where habitats were connected to those within the 200m buffer from the RLB<sup>15</sup>, were visited to assess whether they were likely to support water vole, otter and Eurasian beaver. Key features that were considered during the screening process included:

- ▶ Whether they were receiving discharge of pollutants at excessive levels or containing anoxic waters;
- ▶ Whether the watercourse had a fast flow rate;
- ▶ A bank structure of a suitable height and substrate to support burrows/holts;
- ▶ Waterside vegetation sufficiently wide, luxuriant and dense to provide adequate cover for commuting water vole, foraging and burrows, cover for lie up sites for otter;
- ▶ Intensive management regime (e.g. bank management);
- ▶ Whether the presence of a significant barrier to movement between the water body and the RLB was present; and
- ▶ Access considerations – whether field signs can be observed in and in the vicinity of the water body.

3.3.4 The presence/absence of American mink (*Neovison vison*) and brown rat (*Rattus norvegicus*) field signs were also recorded.

### Water Vole Survey

3.3.5 The watercourses and water bodies that were highlighted as being suitable for water vole during the screening process were scoped in and subject to further survey for evidence of water voles following guidance provided in the Water Vole Conservation Handbook<sup>6</sup>. Surveys of watercourses were carried out along both/all banks and were focussed primarily on searching for the following signs of water voles:

- ▶ Latrines – comprising a concentration of droppings in discrete locations, often near nest sites, at range boundaries or often use places to enter and exit the water;
- ▶ Feeding stations – comprising neat piles of chewed lengths of vegetation, usually up to 10 cm in length, on pathways or haul-out locations;
- ▶ Burrows – these are typically found along the water's edge and on top of the bank (up to 5m from the water's edge) and are 4-8cm in diameter. Holes on top of the banks often have 'lawns' around them (areas of grazed vegetation): and
- ▶ Footprints – located in soft mud or silt.

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<sup>15</sup> Where territories could extend from inside study area (the 200m buffer) up to the 500m buffer from the RLB.

- 3.3.6 All the surveys were undertaken at an appropriate time of year for detecting water vole presence, i.e. between March and October when water voles are more active and mark home ranges using latrines more often.
- 3.3.7 The approximate depth and speed of water flow, the waterway width, bank side vegetation and surrounding land use was also recorded at each watercourse surveyed, all of these being factors that may determine the suitability of habitat for supporting water voles.
- 3.3.8 Once distinctive water vole signs were recorded in a watercourse section and presence of the species had been established, the remainder of the survey along that section was carried out as spot checks at random points where safe access was possible.
- 3.3.9 **N.B.** Any single field sign recorded in isolation, especially when ambiguous (i.e. a burrow, or footprints) would not be definitive in confirming presence.

### Otter Survey

- 3.3.10 During the water vole survey, each section of watercourse was also searched for the following field signs of otter (as described in Chanin<sup>7</sup> above):
- ▶ Spraints - which are often located on prominent features within the channel or on the bank (e.g. bridges, rocks etc.);
  - ▶ Footprints - located in soft mud or silt: and
  - ▶ Otter slides (into water).
- 3.3.11 Additional evidence of otter presence such as the remains of dead fish or potential holt or resting up places were also looked for, but these signs can be difficult to attribute to otter rather than other species such as American mink. The potential for holt or resting sites was also considered in more detail during this survey, as well as potential foraging and commuting routes from other watercourses in the surrounding area (particularly from the River Great Stour and River Stour).
- 3.3.12 The otter surveys were undertaken at the same time as the water vole surveys. Otters are active throughout the year, therefore otter surveys can be undertaken all year round.

### Eurasian Beaver Survey

- 3.3.13 Records of any field signs of Eurasian beaver were noted along the banks for watercourses if observed whilst water vole surveys were being undertaken and during any of the scoping surveys for other protected species and the Phase 1 habitat survey.
- 3.3.14 Such field signs included:
- ▶ Beaver footprints;
  - ▶ Feeding remains including de-barked tree branches by the water's edge, and cutting of herbaceous feed, and food caches, feeding stations and refuse from aquatic feeding;
  - ▶ Scent mounds and scent sites (>1 scent mound at a single site);



- ▶ Teeth chisel marks on felled tree stumps;
- ▶ Well-worn paths;
- ▶ Areas cleared of trees and samplings: and
- ▶ Signs of beaver lodges – piles of wood by the water's edge or within the watercourse.





## 4. Results

### 4.1 Desk Study

4.1.1 The desk study data from KMBRC provided a total of 192 records of water vole, the majority of which were beyond the 2km buffer from the RLB. Of those, 20 records were within the 2km buffer from the RLB. One record was within the RLB, but is a historical record (older than 10 years) and is provided here for contextual purposes only; and 19 further records made beyond the 200m buffer and within a 2km buffer of the RLB. Details of these records are provided for contextual purposes only in Table 4.1 below.

Table 4.1 Records of Water Vole within 2km of the RLB (from KMBRC)

Grid Reference	Location	Year	No. of records	Distance to the RLB (m)
TR332620	River Stour, Richborough Power Station MR38	2005	1	Within the RLB
TR336634	Stonelees main stream, Pegwell Bay	2011	2	455 west
TR325635	Brook Lane lead Dyke	2010	1	1203 north west
TR337604	Backsand Scrape	2010	1	1254 south
TR357 632	N/a	2010	1	1293 north east
TR317616	Richborough	2011	1	1406 south west
TR317616	Valley Wall Lead Dyke	2011	1	1406 south west
TR319613	Ash Levels	2009	1	1414 west
TR319634	Minster Marshes	2008	1	1527 south east
TR313621	Ash Levels	2012	1	1647 west
TR329600	N/a	2012	1	1737 north west
TR330599	N/a	2012	1	1760 south west
TR333598	N/a	2012	1	1786 south
TR325600	N/a	2012	2	1875 south west
TR330598	N/a	2012	1	1876 south west
TR332597	N/a	2012	1	1916 south

Grid Reference	Location	Year	No. of records	Distance to the RLB (m)
TR327599	N/a	2012	1	1931 south west
TR328598	N/a	2012	1	2004 south west

Note. Of the large number of species records received, only post 2007 records were considered for further assessment, as these are likely to be most relevant to the current conditions in relation to the land within and in the vicinity of the RLB.

4.1.2 One record of otter was provided, 2.8km to the south west of the RLB. Details of this record is provided for contextual purposes only in Table 4.2 below.

Table 4.2 Records of Otter within 2km of the RLB (from KMBRC)

Grid Reference	Location	Year	No. of records	Distance to the RLB (km)
TR327589	N/a	2016	1	2.8 south west

4.1.3 One record of Eurasian beaver was provided, 1.75km to the north east of the RLB. Details of this record is provided for contextual purposes only in Table 4.3 below. Other anecdotal reports of beavers on the River Stour have been made in recent years but have not been officially recorded<sup>16</sup>.

Table 4.3 Records of Eurasian Beaver within 2km of the RLB (from KMBRC)

Grid Reference	Location	Year	No. of records	Distance to the RLB (km)
TR360640	Pegwell Bay	2014	1	1.75 north east

## 4.2 Secondary Data

4.2.1 Secondary data provided by GoBe from Greengage Ecology<sup>13</sup> provided no records of water vole made for a survey area within 200 m of the RLB, which comprised the grazing marshes to the south of the Great Stour, west of Richborough Energy Park. However, it did indicate the potential for riparian mammals including water vole within this area, and the potential presence of an otter holt within the eastern bank of the Great Stour at TR 32733 62415, ~256m west of the RLB.

<sup>16</sup> <http://www.kentonline.co.uk/canterbury/news/rare-beaver-sighting-in-kent-95960/>

4.2.2 Other data considered in respect of contextual water vole and otter populations, was that available from the Richborough Connection Project<sup>17</sup>. Two additional historical record of water vole was provided here; 176m west of the RLB in 2005 and 378m south of the RLB in 2002; no records of otter were provided by the desk study. Survey results provided no additional records of water vole; ditches that were surveyed within 200m of the RLB were recorded to be either dry or of negligible potential to support water vole. No field signs of otter were recorded; however the River Stour and Great Stour (within 200m of the RLB) were recorded to have habitats with potential to support otter.

## 4.3 Screening Results

### Desk Based Screening

4.3.1 With reference to OS 1:10,000 scale maps and aerial mapping, 137 sections of water bodies within a 500m, and 104 sections of water bodies within a 200m buffer of the RLB were identified as requiring a screening visit to assess for their suitability to support water vole. These are shown in the overview Figure 5.2.2, Appendix A; with initial surveys undertaken from March through to July 2017.

4.3.2 Forty water bodies within the 200m buffer could not be accessed for scoping assessment due to landowner permission being withheld or not yet permitted: these were 156, 167, 171, 178, 181, 191, 200, 212, 217, 218, 219, 221, 259, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 399, 401, 403, 404, 407, 408, 417, 419, 424, 426, and 434. As it was not possible to gain access to the water bodies to assess them, they could not be scoped in or out.

4.3.3 Of the 97 remaining water bodies screened for potential, 64 water bodies that lay within the 200m buffer to the RLB were scoped in for presence/absence surveys. 92, 157, 158, 159, 161, 163, 165, 169, 170, 172, 174, 179, 180, 184, 187, 188, 194, 195, 201, 202, 204, 206, 207, 208, 209, 210, 215, 216, 226, 236, 237, 239, 240, 242, 285, 333, 390, 392, 393, 394, 395, 396, 397, 398, 400, 402, 409, 411, 412, 413, 414, 415, 418, 420, 421, 422, 425, 428, 429, 430, 438, 439, 441, and 442.

4.3.4 Of these, the following waterbodies lie within the RLB: 161, 169, 172 and 195.

4.3.5 Additionally, the following 33 water bodies located beyond the 200m buffer to the RLB, but within the 500m buffer were scoped in for presence/absence surveys due to their connectivity to the above water bodies: 162, 164, 166, 173, 182, 183, 186, 189, 190, 193, 197, 198, 199, 203, 217, 223, 229, 230, 231, 232, 233, 235, 238, 241, 343, 349, 391, 406, 410, 416, 423, 440, and 443.

## 4.4 Field Based Screening

4.4.1 Following an initial site visit of the 97 water bodies, a total of 50 were found to have the following characteristics making them unsuitable to support water vole, and no further survey was undertaken. Of those within the 200m buffer to the RLB 39 were scoped out; of those beyond the 200m but within the 500m buffer to the

<sup>17</sup> National Grid (2016) Richborough Connection Project Environmental Impact Assessment.

RLB a total of 11 water bodies were scoped out. The justification for scoping out the water bodies are as follows:

- ▶ The following 30 water bodies were found to be dry or with very shallow water levels and due cattle poaching, the channel was very congested or trampled, thereby lacking suitable bank profile for burrows, or an absence of aquatic/marginal vegetation: 169, 172, 174, 179, 190, 201, 202, 204, 207, 208, 209, 210, 217, 226, 229, 230, 242, 285, 349, 390, 392, 395, 397, 398, 414, 420, 421, 422, 429, and 430;
- ▶ Very shallow banks preventing use for burrows for the following two water bodies: 400, and 412;
- ▶ The presence of a man-made bank structure at the following six water bodies: 215, 216, 394, 396, 423, and 425;
- ▶ The presence of deep shade and/or a lack of food plants was recorded at the following three water bodies: 161, 173, and 186;
- ▶ The following eight water bodies were scoped out on the basis that they were found to be tidal or had a strong current: 92, 158, 163, 184, 195, 333, 391, and 428. These included tidal lagoons within Sandwich and Pegwell Bay NNR, and sections of the River Stour;
- ▶ One water body that lies beyond the 200m buffer to the RLB but within the 500m buffer was scoped out as it did not provide commuting habitat to permit animals to disperse: 183.

4.4.2 Of the four waterbodies located within the RLB, all four were screened out of further assessment as they were unsuitable to support water vole and otter.

4.4.3 Full details of the screening assessment for all water bodies within the initial 500 m, and subsequent 200 m buffer for survey that have been identified to date are provided in Table 4.4, Appendix B, with all results are presented in Figure 5.2.3 (Appendix A).

## 4.5 Water Vole Survey Results

4.5.1 A total of 48 water bodies were surveyed for positive/negative field signs of water vole comprising 25 within the 200m buffer to the RLB and 23 water bodies lying between 200m and 500m buffer to the RLB which had connectivity to those water bodies within the 200m buffer from the RLB.

4.5.2 Of the 25 water bodies within the 200m buffer to the RLB, positive field signs of water vole comprising of latrines, feeding remains, pathways and/or burrows were recorded in 9 water bodies: 159, 187, 194, 206, 237, 239, 240, 415, 441.

4.5.3 No field signs were observed in the following 15 water bodies: 157, 165, 170, 180, 188, 236, 393, 402, 409, 411, 413, 418, 438, 439, and 442. In some cases access for survey was restricted by dense vegetation, steep banks and the presence of breeding birds (the birds and nests are protected during nesting season). Given their connectivity and/or proximity to further suitable water bodies it is therefore considered highly likely that water vole may use these habitats. Consequently a second survey was undertaken at these locations in October 2017. The second

survey identified positive field signs of water vole (runs) at 2 water bodies: 157 and 165; continued limited access resulted at one still suitable location, 236. No field signs were observed at 170, 180, 188; the remainder remained suitable but inaccessible.

4.5.4 Of the 23 water bodies located beyond the 200m buffer but within the 500m to the RLB which had connectivity to those water bodies within the 200m buffer from the RLB) positive field signs were recorded in the following 11 water bodies: 164, 189, 193, 198, 199, 231, 233, 235, 238, 241, and 440.

4.5.5 No field signs were recorded in the remaining 12 water bodies (located beyond 200m but within the 500m buffer to the RLB).

4.5.6 .

4.5.7 Of those 40 water bodies where access permission restricted spring surveys (see survey limitations below), screening and where required, presence/absence surveys, 15 of these water bodies were undertaken in autumn 2017 where access permitted. These include 335, 336, 337, 338, 339, 340, 341, 342, 344, 345, 346, 347, 348, 350 and 424. Positive field signs were found at 7 locations: 336, 337, 338, 340, 346, 350, and 424. The remaining 8 all remain suitable for water vole, with several having been subject to recent ditch management which may have removed field signs.

4.5.8 The water vole survey results for water bodies within 200m of the RLB, plus those water bodies located beyond the 200m buffer but within the 500m to the RLB (which had connectivity to those water bodies within the 200m buffer from the RLB) are summarised in Table 4.5, Appendix C and Table 4.6, Appendix D, with positive results displayed in bold and are illustrated on Figure 5.2.3, Appendix B.

## 4.6 Otter and Eurasian Beaver Survey Results

4.6.1 No field signs of otter or Eurasian beaver were recorded. Along some sections of the River Great Stour, and River Stour that could be accessed, the presence of mature bank side trees, dense willow, hawthorn and bramble dominated scrub and dense stands of common reed provide potential opportunities for otter holts, and foraging and commuting otter.

## 4.7 Survey Limitations

4.7.1 Although the 2017 surveys were undertaken at suitable times of year, some of the watercourses quickly become overgrown in the late spring and summer due to their small size, and shallow depth). Additional surveys were therefore undertaken in autumn 2017 where such limitations had been encountered (See section 4.5 above for those results).

4.7.2 Once distinctive water vole signs were recorded in a watercourse section and presence of the species had been established, the remainder of the survey along that section was carried out as spot checks at random points where safe access was possible.

- 4.7.3 Where the initial (spring) survey was undertaken during the bird breeding season, when surveying dense vegetation and reed bed where breeding birds were likely to be encountered, surveyors took extra care and if birds are heard or seen displaying breeding behaviour then a wide berth was taken, at least 5m of that area.
- 4.7.4 A total of ten water bodies with suitable habitat had some access limitations due to dense vegetation or the presence breeding birds. Therefore, surveys had to be configured to avoid areas occupied by nesting birds in order to comply with legislation relating to breeding birds in the UK. It is possible therefore, that positive field signs of water vole were missed. Where accessible, these water bodies were accessed in autumn 2017 for further presence/absence survey, after the breeding bird season had ended.
- 4.7.5 At the time of the spring field based screening and the presence/absence surveys it was not possible to gain access to the following 40 water bodies, due to land owner permission being withheld or not yet permitted: 156, 167, 171, 178, 181, 191, 200, 212, 217, 218, 219, 221, 259, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 399, 401, 403, 404, 407, 408, 417, 419, 424, 426, and 434. As it was not possible to gain access to the water bodies to assess them, they could not be scoped in or out. Screening and potentially presence/absence surveys of 15 of these water bodies were subsequently undertaken where access permitted in autumn 2017. These include 335, 336, 337, 338, 339, 340, 341, 342, 344, 345, 346, 347, 348, 350 and 424 (see section 4.5 above for results). The remainder of these 40 water bodies remain unscreened or surveyed due to lack of permissions to access.
- 4.7.6 It should be noted that further as yet unidentified water bodies may exist within land parcels located to the north, west and south of that could not be accessed in spring and autumn of 2017.

## 5. Conclusions

- 5.1.1 A total of 192 records of water vole were provided by the desk study, the majority of which were historical records made beyond a 2km buffer of the RLB. One record was within the RLB; none were within 200m, one record was within a 500m buffer of the RLB and 19 further records within a 2km buffer of the RLB.
- 5.1.2 One record of otter was provided, 2.8km to the south west of the RLB, with a single record for Eurasian beaver made 1.75km to the north east of the RLB.
- 5.1.3 Secondary data provided by GoBe from Greengage Ecology<sup>13</sup> provided no records of water vole, however, it did indicate the potential for riparian mammals including water vole within the 200m buffer to the RLB, and the potential presence of an otter holt 200m west of the RLB.
- 5.1.4 Of the 122 water bodies within the 200m buffer to the RLB screened in for scoping, 48 were scoped in for presence/absence surveys.
- 5.1.5 Of the four waterbodies located within the RLB, all four were screened out of further assessment as they were unsuitable to support water vole and otter.
- 5.1.6 Positive field signs of water vole comprising of latrines, feeding remains, pathways and/or burrows were recorded in the following water bodies up to 200 m: 157, 159, 165, 187, 194, 206, 237, 239, 240, 340, 350, 415, and 441. .
- 5.1.7 Of 15 water bodies within a 200m buffer to the RLB where field signs were not evident in spring, October surveys resulted in positive signs at 2, negative results at 3, and access restrictions limited surveys of the remainder.
- 5.1.8 Between 200m and 500m 23 water bodies which had connectivity to those water bodies within the 200m buffer from the RLB) positive field signs were recorded in 11 water bodies: 164,189, 193, 198, 199, 231, 233, 235, 238, 241, and 440.
- 5.1.9 Continued lack of access permissions in autumn 2017 mean some sites remain unscoped and thus not surveyed.
- 5.1.10 No positive field signs for otter or Eurasian beaver were recorded during field surveys.





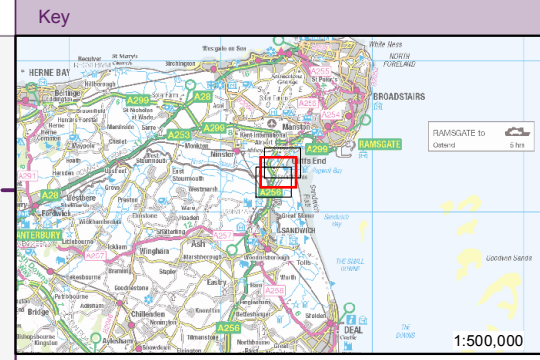
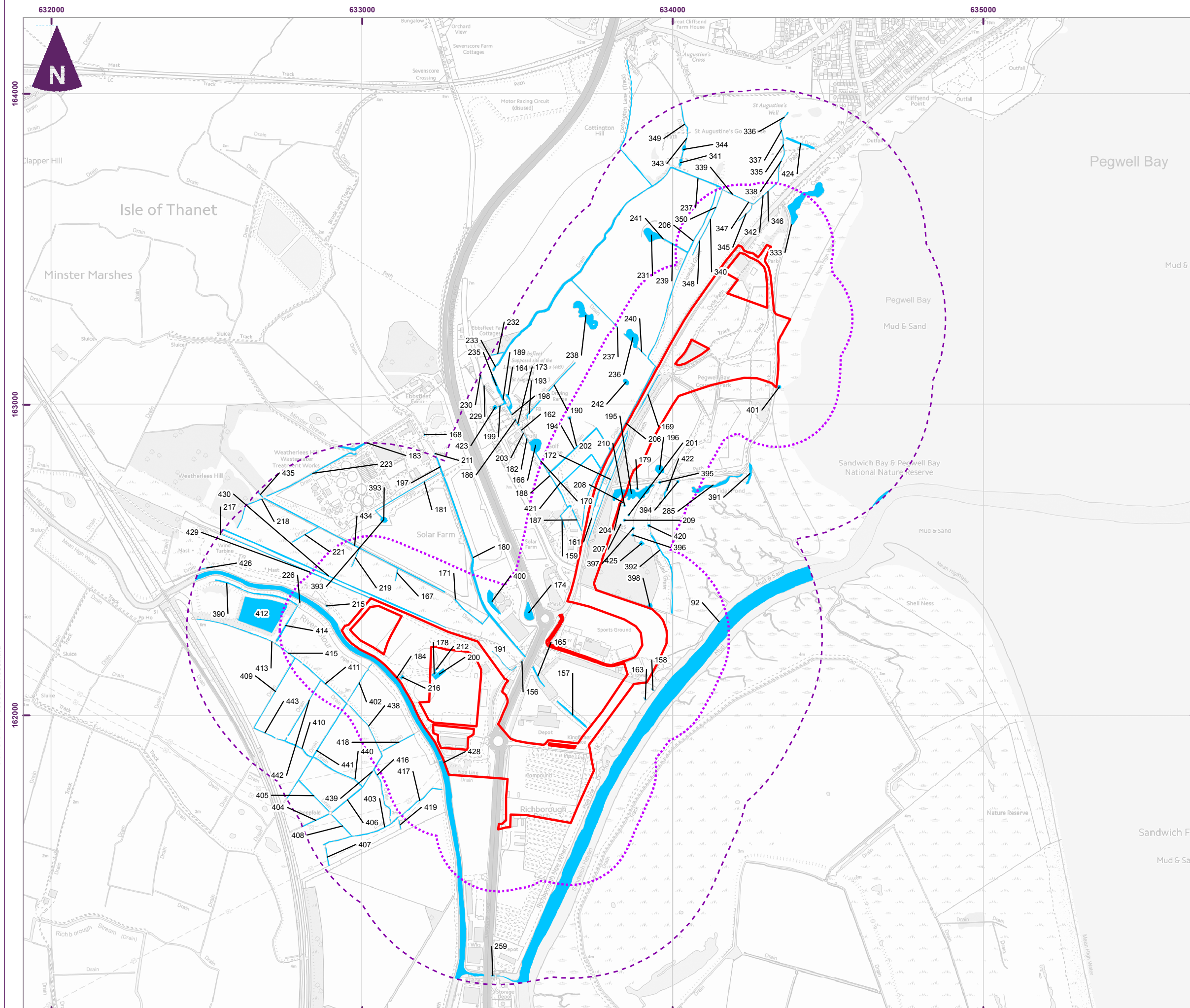






# Appendix A

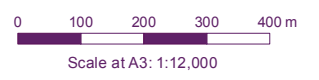
## Figures

- 5.2.1 Water Vole and Otter Study Area
- 5.2.2 Water Bodies Scoped for Water Vole and Otter
- 5.2.3 Water Vole and Otter Survey Results





-  Thanet Extension Onshore Development Area
-  200m buffer from onshore development area
-  500m buffer from onshore development area
-  Water bodies



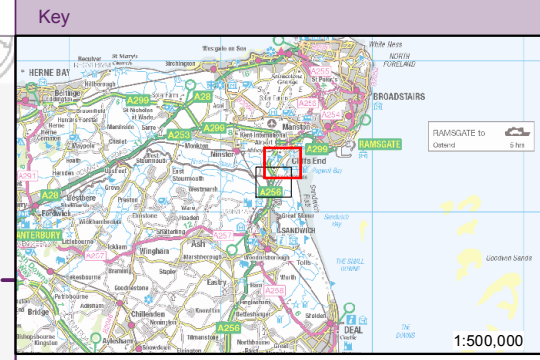
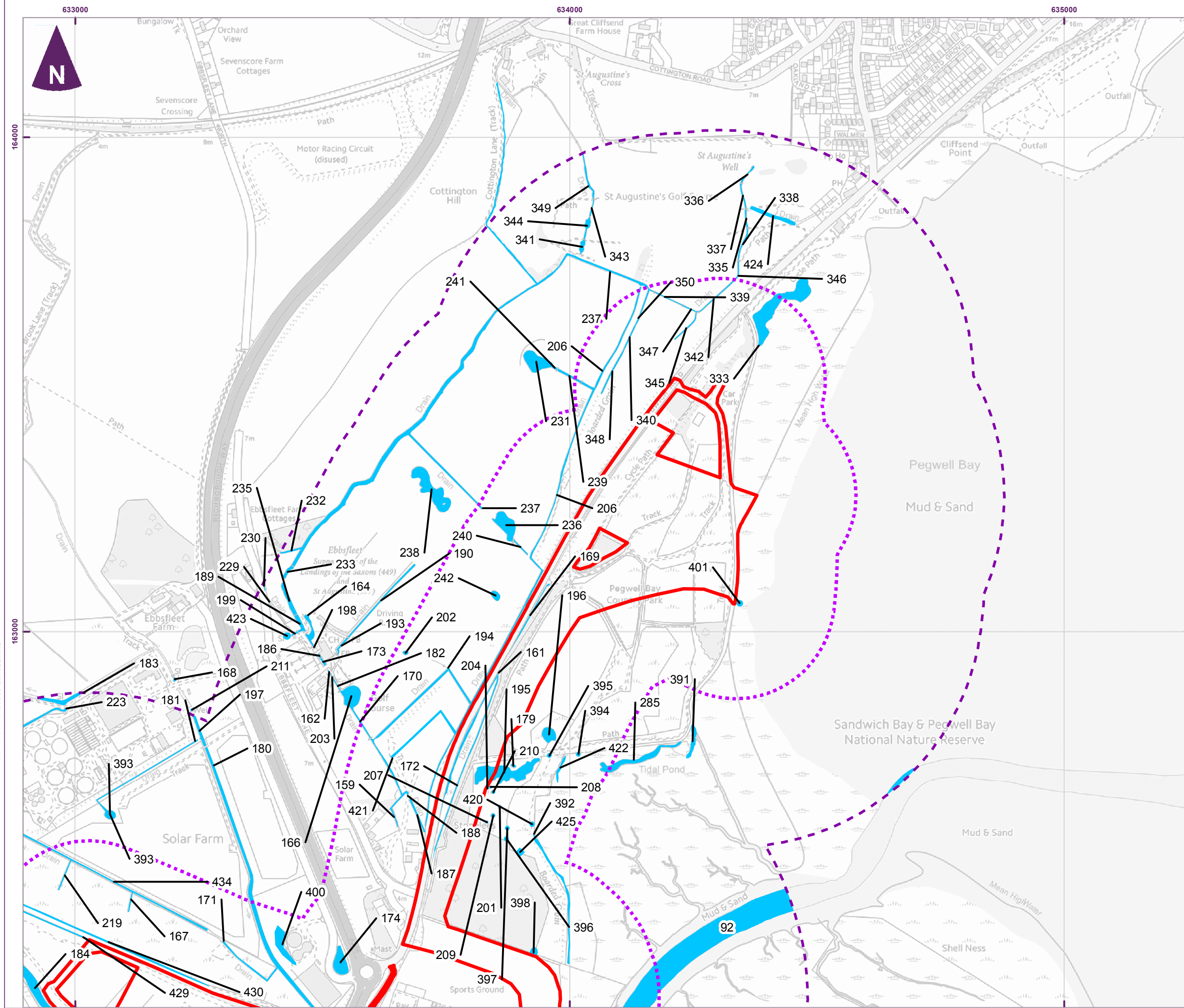
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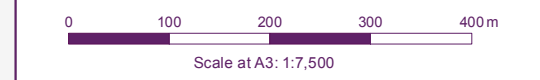
Thanet Extension Offshore Wind Farm Water Vole and Otter Survey



**Figure 5.2.1a**  
Water Vole and Otter Study Area



- Key**
- Thanet Extension Onshore Development Area
  - 200m buffer from onshore development area
  - 500m buffer from onshore development area
  - Water bodies



Client

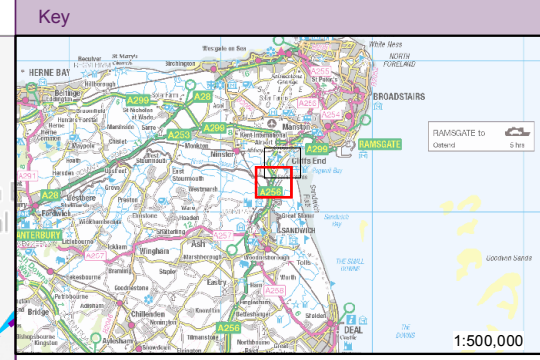
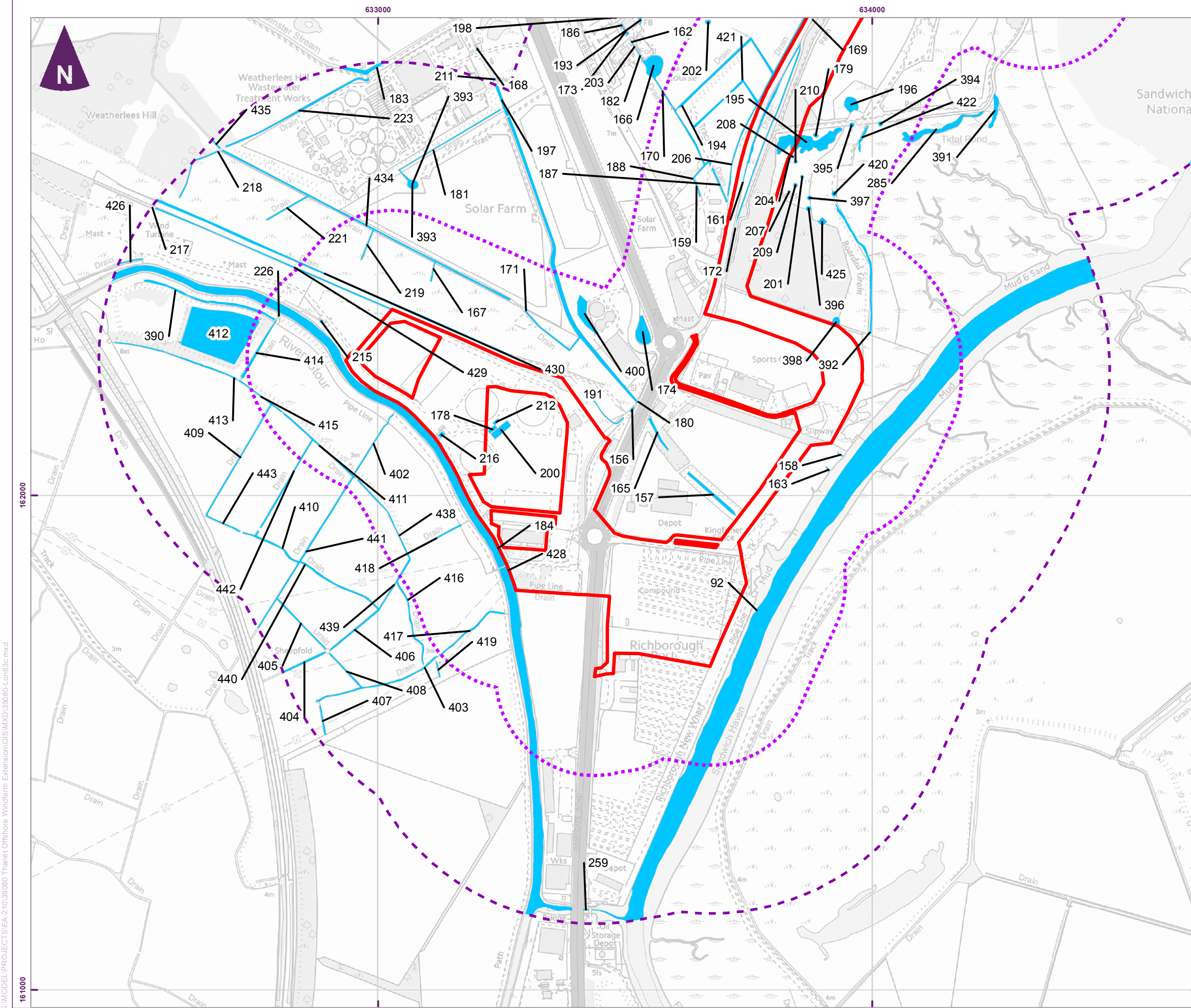
**VATTENFALL**

Thanet Extension  
Offshore Wind Farm  
Water Vole and Otter  
Survey

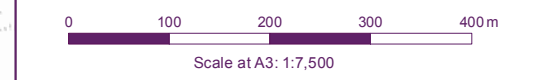
amec  
foster  
wheeler

**Figure 5.2.1b**  
Water Vole and Otter Study Area

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- Thanet Extension Onshore Development Area
- 200m buffer from onshore development area
- 500m buffer from onshore development area
- Water bodies



Client

**VATTENFALL**

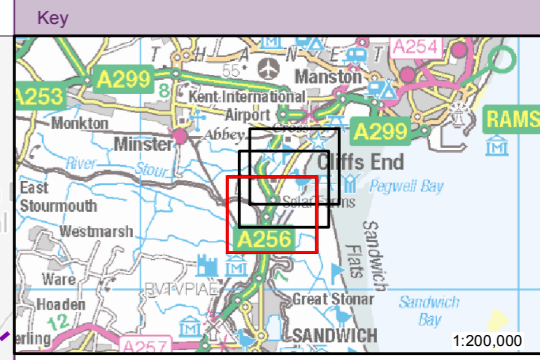
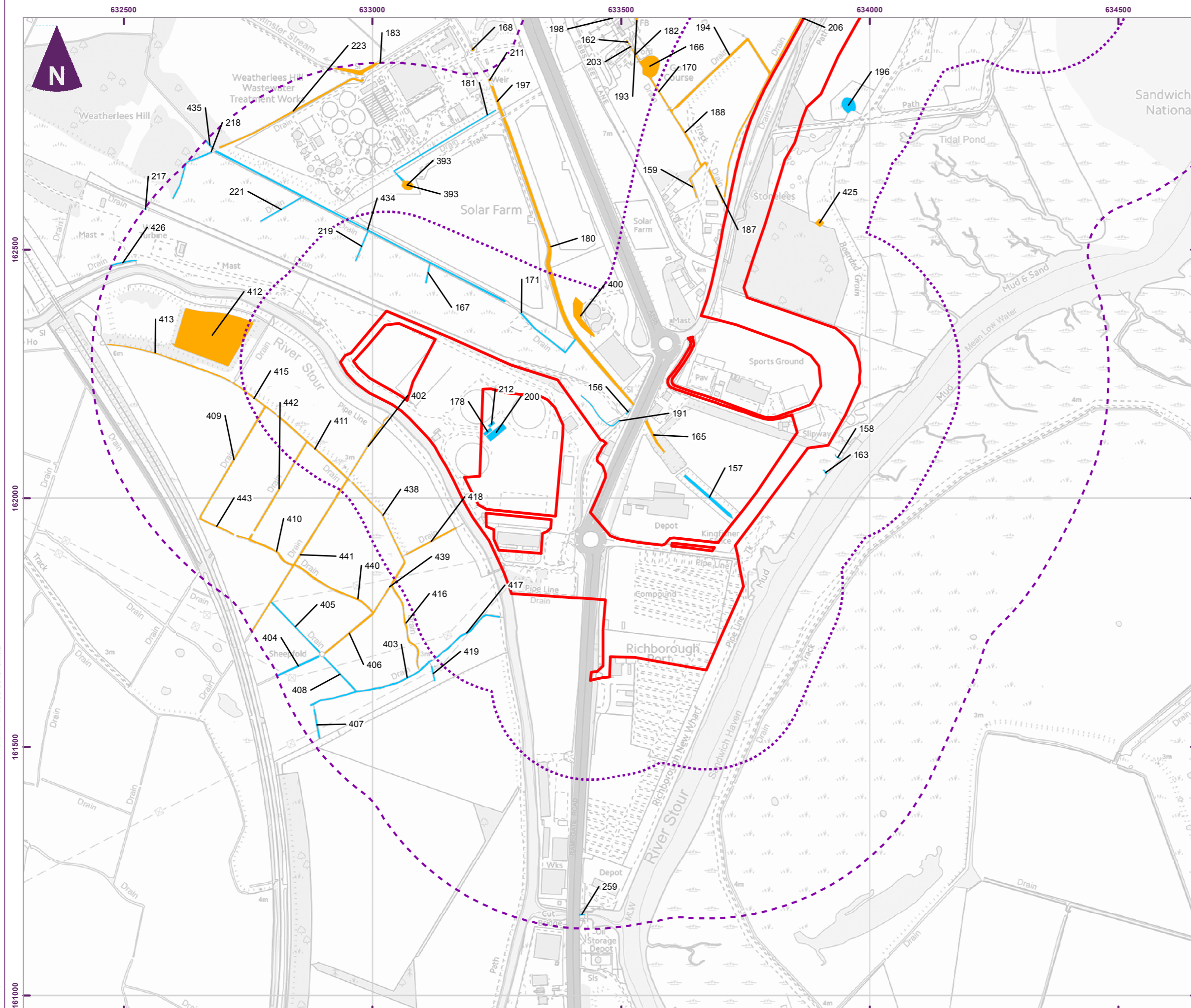
Thanet Extension  
Offshore Wind Farm  
Water Vole and Otter  
Survey

amec  
foster  
wheeler

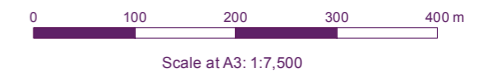
**Figure 5.2.1c**  
Water Vole and Otter Study Area







- Key**
- Thanet Extension Onshore Development Area
  - 200m buffer from onshore development area
  - 500m buffer from onshore development area
  - Water body not accessed for scoping - scoping required
  - Water body scoped in for survey



Client

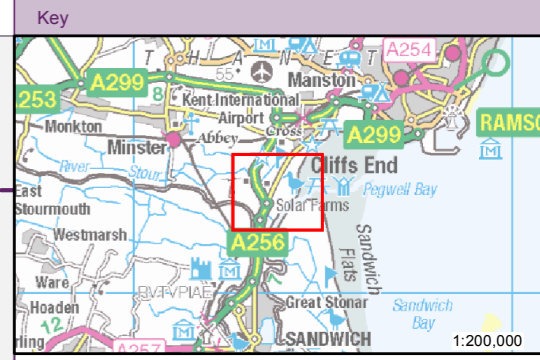
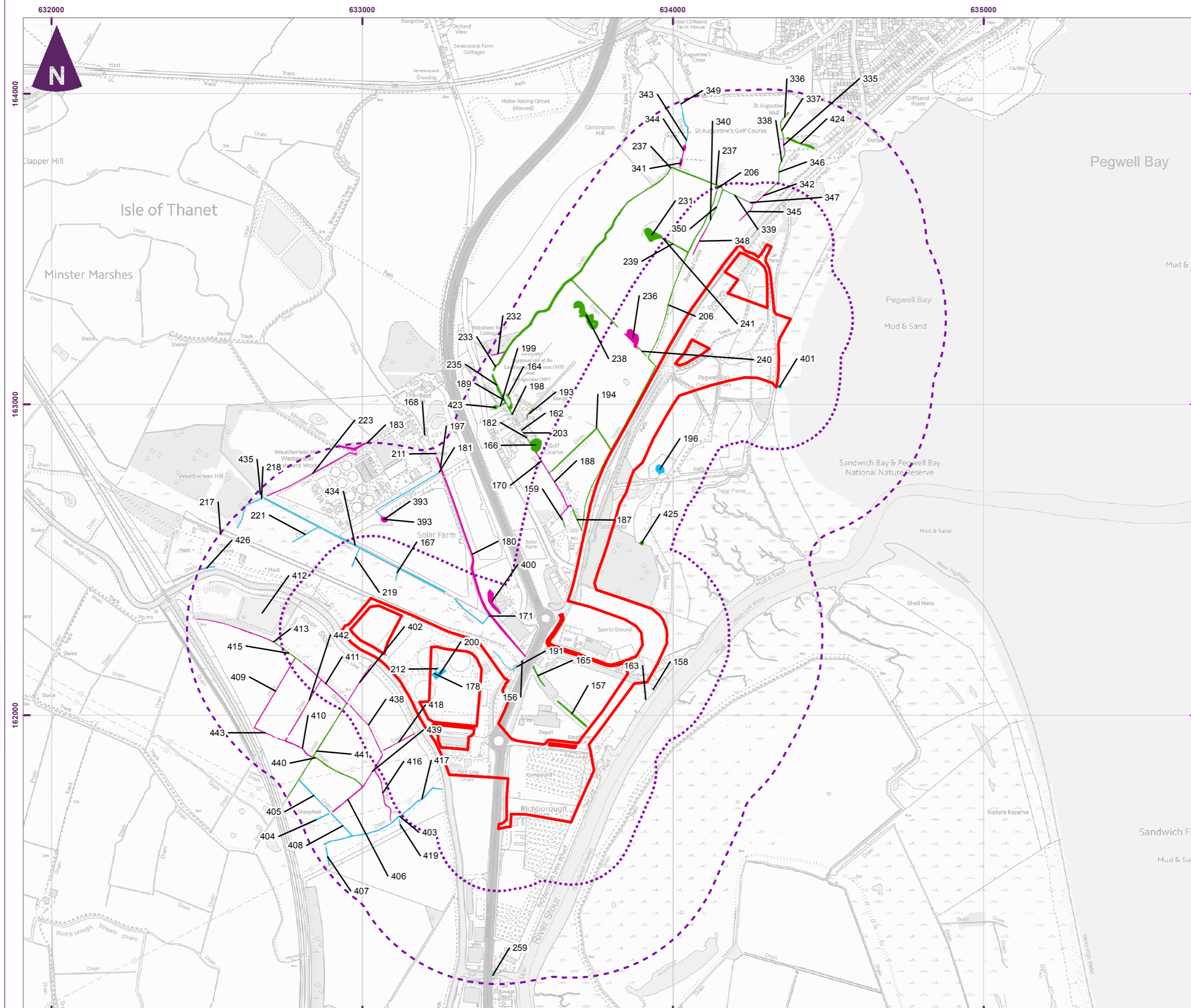
**VATTENFALL**

Thanet Extension  
Offshore Wind Farm  
Water Vole and Otter  
Survey

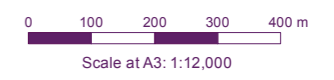
**Figure 5.2.2c**  
Water Vole and Otter Water Body  
Screening Results

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- Key**
- Thanet Extension Onshore Development Area
  - 200m buffer from onshore development area
  - 500m buffer from onshore development area
  - Water bodies not accessed for scoping - scoping required
  - Water bodies surveyed: positive field signs
  - Water bodies surveyed: negative field signs



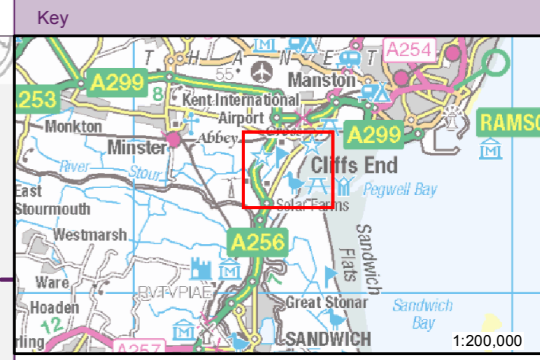
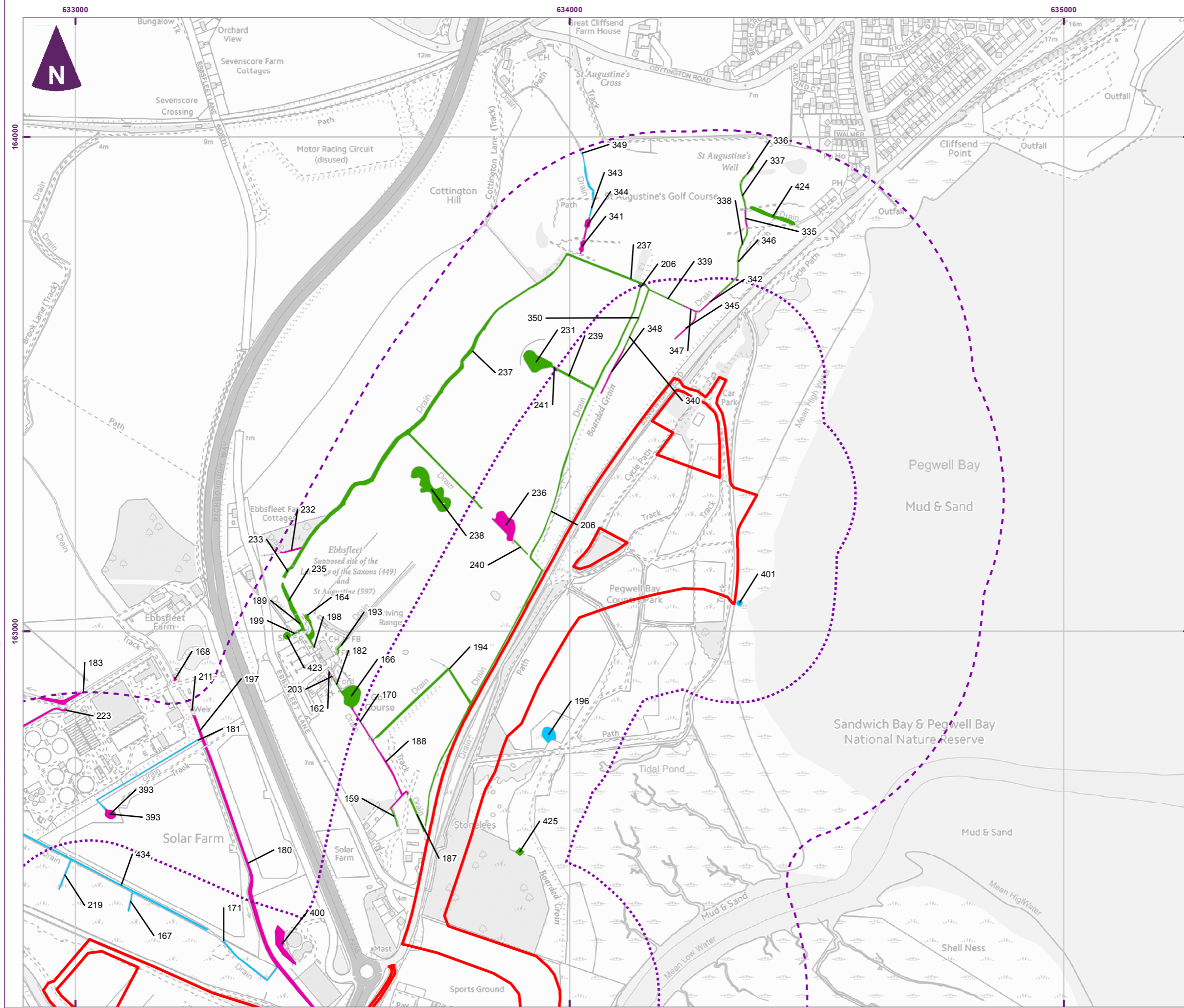
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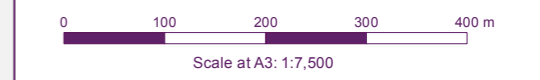
Thanet Extension  
Offshore Wind Farm  
Water Vole and Otter  
Survey



**Figure 5.2.3a**  
**Water Vole and Otter Survey Results**



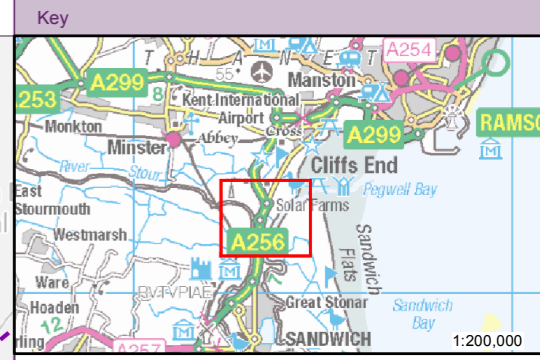
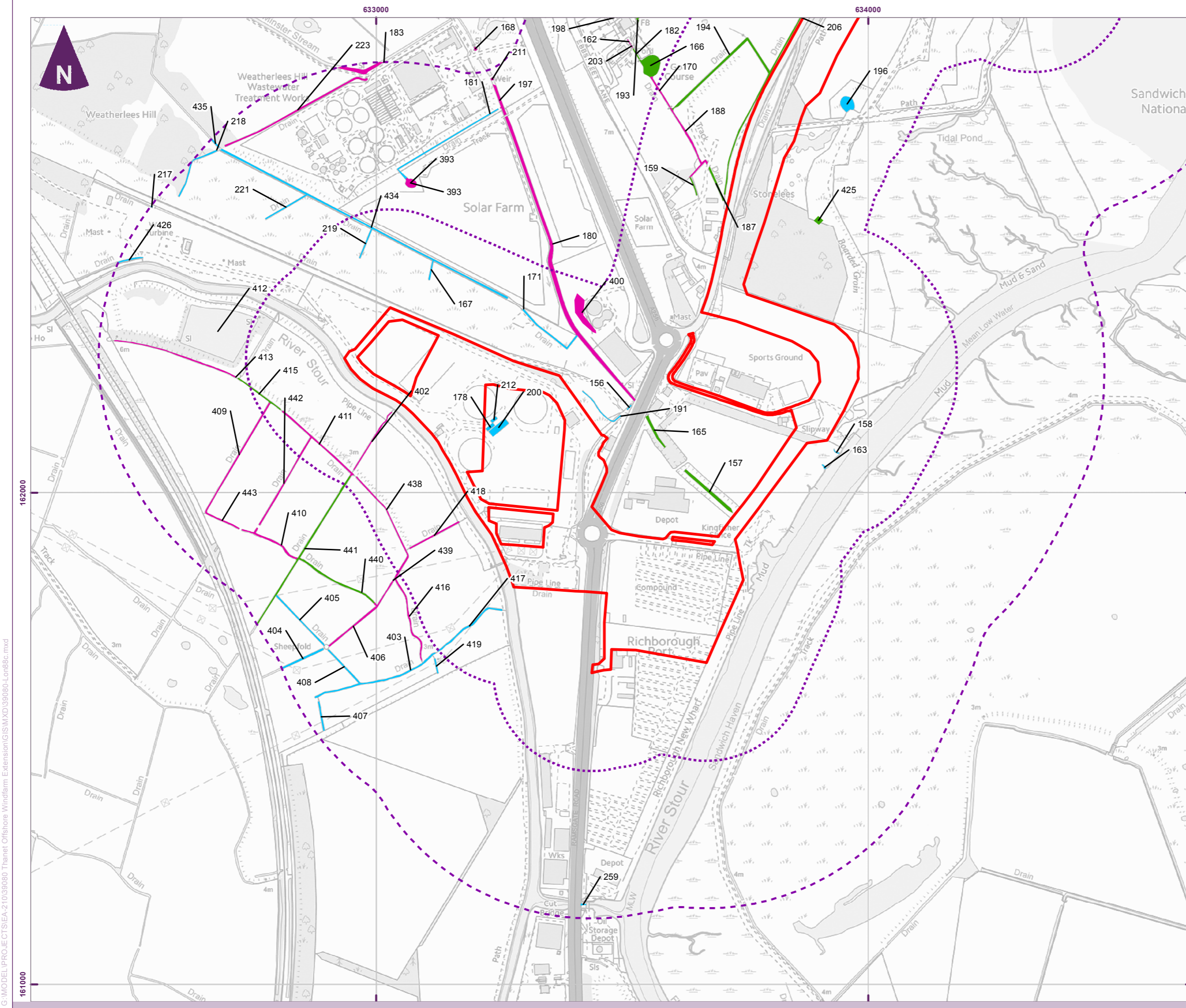
- Key**
- Thanet Extension Onshore Development Area
  - 200m buffer from onshore development area
  - 500m buffer from onshore development area
  - Water bodies not accessed for scoping - scoping required
  - Water bodies surveyed: positive field signs
  - Water bodies surveyed: negative field signs



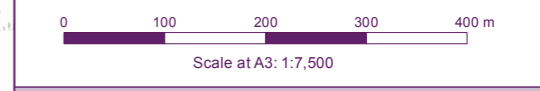
**Figure 5.2.3b**  
**Water Vole and Otter Survey Results**

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- Key**
- Thanet Extension Onshore Development Area
  - 200m buffer from onshore development area
  - 500m buffer from onshore development area
  - Water bodies not accessed for scoping - scoping required
  - Water bodies surveyed: positive field signs
  - Water bodies surveyed: negative field signs



**Figure 5.2.3c**  
Water Vole and Otter Survey Results

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# Appendix B

## Table 4.4: Screening Results



**Table 4.4 Screening Results**

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>92</b>	River	Large, fast flowing and tidal river	Out	Fast flowing, tidal
<b>156</b>	Ditch	No access – unknown.	In	
<b>157</b>	Ditch	Ditch 125m long; common reed with tall ruderal vegetation, and improved grassland along western bank and dense scrub along eastern bank.	In	
<b>158</b>	Tidal inlet	No access –unknown.	Out	Tidal
<b>159</b>	Ditch	Drainage ditch- stagnant ponded area approximately 30m <sup>2</sup> adjacent to a vehicle track.	In	
<b>161</b>	Ditch	Ditch in heavily shaded tree and scrub line, flowing water. No commuting value.	Out	Heavy shade
<b>162</b>	Ditch	Ditch 10m in length, adjacent to clubhouse and shop at Stonelees Golf Centre. 2m wide, heavily shaded by dense introduced shrub, scattered scrub and trees. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>163</b>	Inlet	No access, likely to be a tidal inlet	Out	Tidal

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
164	Ditch	2 -4m wide pooled ditch with gently grading earth banks. Vegetation dominated common reed, waterfowl present. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
165	Ditch	Ditch 75m long; common reed with improved grassland and dense scrub above	In	
166	Pond	50m x 50m circular pond with a joining ditches on east and west bank (20m in length each). Dense reed beds along entire perimeter. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
169	Ditch	Dry ditch in scrubby woodland verge. No commuting value.	Out170,	Dry Deep shade
170	Ditch	Ditch 100m in length, east of pond 166. Dense reed beds along entire perimeter. Some commuting value. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
172	Ditch	Ditch 500m long in scrubby woodland/tall herb verge. Wet in southern limit, flowing. Small isolated sections on north were wet only after rainfall in late July.	Out	Dry in northern half Deep shade



<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>173</b>	Ditch	Culverted section of ditch adjacent to clubhouse and shop at Stonelees Golf Centre. Reinforced steep banks with wooden panels with some steep natural banks.	Out	Deep shade Man-made banks prevent burrow formation but connectivity to suitable ditch
<b>174</b>	Pond	Pond next to roundabout and dual carriageway. Likely dry by spring, dominated by reeds and willow saplings. Pipes from road for run off. 30m x 30m circular shape.	Out	Dry
<b>178</b>	Pond	No access-unknown	In	
<b>179</b>	Pond	Shallow depression in tussocky grassland.	Out	Dry
<b>180</b>	Ditch	Flowing drainage ditch approximately 620m long. Steep vegetated banks, scattered scrub and tussocky grassland above banks. Occasional common reed.	In	
<b>181</b>	Ditch	Ditch approximately 240m long, with dense scrub and common reed – limited access, viewed from western and eastern ends only. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
182	Ditch	Ditch 20m in length. Dense reed. Some commuting value. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
183	Ditch	Flowing drainage ditch 2m wide, 885m long. No	Out	Beyond 200m buffer to RLB but connected
184	River Stour	Large flowing and tidal river	Out	Beyond 200m buffer to RLB Fast flowing Tidal
186	Ditch	Culverted section of ditch adjacent to clubhouse and shop at Stonelees Golf Centre. 2m wide. Reinforced steep banks with wooden panels.	Out	Manmade bank structure Beyond 200m buffer to RLB but connected Absence of foodplant Heavy shade in places
187	Ditch	Drainage ditch – stagnant ponded area approximately 40 m <sup>2</sup> beyond a vehicle track	In	
188	Ditch	Drainage ditch section with scattered scrub along western bank, connecting to pond and further section of ditches.	In	

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>189</b>	Ditch	Drainage ditch section with scattered scrub along western bank, connecting to pond and further section of ditches. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>190</b>	Ditch	Dry ditch- very shallow line of sprayed grass	Out	Dry Beyond 200m buffer to RLB but connected
<b>193</b>	Ditch	Ditch dominated by reed, no flow and steep banks. 40m long x 2m wide. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>194</b>	Ditch	Drainage ditch section with scattered scrub along western bank, connecting to pond and further section of ditches	In	
<b>195</b>	Pond	Tidal pool, dry at time of survey	Out	Tidal Dry
<b>196</b>	Pond	Wildlife pond surrounded by fencing (not possible to access banks to survey) with dense common reed and reedmace; measuring approximately 330m <sup>2</sup> .	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
197	Ditch	Flowing drainage ditch approximately 620m long. Steep vegetated banks, scattered scrub and tussocky grassland above banks. Occasional common reed. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
198	Ditch	Flowing 2m wide ditch. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
199	Ditch	Drainage ditch section, in deep shade, connecting to further sections of ditches. Suitable commuting habitat. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
200	Pond	No access-unknown	In	
201	Pond	Dry	Out	Dry
202	Depression	Shallow depression in improved grassland	Out	Dry
203	Ditch	Ditch 10m in length. Dense reed. Commuting value. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
204	Pond	Dry	Out	

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>206</b>	Ditch	Ditch overgrown with dense scrub casting heavy shade, wet and flowing in sections, dry in other areas.	In	
<b>207</b>	Depression	Shallow depression in tussocky grassland	Out	Dry
<b>208</b>	Depression	Shallow depression in tussocky grassland	Out	Dry
<b>209</b>	Depression	Shallow depression in tussocky grassland	Out	Dry
<b>210</b>	Depression	Shallow depression in tussocky grassland	Out	Dry
<b>212</b>	Unknown	No access-unknown	In	
<b>215</b>	Tank	Metal tank, filled with water – possible equipment cleaning/damping down water supply tank	Out	Man-made banks/unsuitable structure
<b>216</b>	Tank	Metal tank, filled with water – possible equipment cleaning/damping down water supply tank	Out	Man-made banks/unsuitable structure
<b>217</b>	Ditch	Shallow dry ditch in dense scrub line. No commuting value.	Out	Dry Beyond 200m buffer to RLB but connected
<b>218</b>	Ditch	No access-unknown Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>219</b>	Ditch	No access-unknown Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
220	Depression	Dry depression on grassland and scrub	Out	Dry Beyond 200m buffer to RLB
221	Ditch	No access-unknown Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
222	Ditch	Dry scrubby depression	Out	Dry Beyond 200m buffer to RLB
223	Ditch	Flowing ditch with steep banks. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
226	Ditch	Dry, shallow depression between drainage ditch and bank of River Stour	Out	Dry Beyond 200m buffer to RLB
227	River Stour	Large flowing and tidal river	Out	Fast flowing Tidal
229	Ditch	Dry ditch	Out	Dry Beyond 200m buffer to RLB but connected
230	Depression in verge	Dry depression	Out	Dry Beyond 200m buffer to RLB but connected
231	Pond	Large pond connected to ditch, banks dominated by common reed. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
232	Ditch	Drainage ditch connecting to network of ditches. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
233	Ditch	Large flowing ditch. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
234	Ditch	Drainage ditch with scattered scrub, adjacent to arable fields.	Out	Beyond 200m buffer to RLB
235	Ditch	Drainage ditch connecting to network of ditches. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
236	Pond	Large water body joined to ditches that form eastern boundary. Dense vegetation along banks dominated by common reed.	In	
237	Ditch	Flowing, low water level. Marsh frog recorded here on the 19 <sup>th</sup> April 2017. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
238	Pond	Large lake/pond. All banks dominated by reed. 300m long x 50m wide. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
239	Ditch	Ditch	In	
240	Ditch	Ditch	In	
241	Ditch	Ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
242	Depression	Sand bunker	Out	Dry
259	River Stour	Large flowing and tidal river – not accessed	Out	Fast flowing Tidal Beyond 200m buffer to RLB
285	Shallow depression	Shallow depression in tussocky grassland adjacent to saltmarsh –likely to be tidal. Dry at the time of scoping and later into July	Out	Dry Tidal Beyond 200m buffer to RLB
333	Lagoon	Tidal lagoon	Out	Tidal, brackish Beyond 200m buffer to RLB
335	Ditch	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
336	Ditch	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
337	Ditch	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	



Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
338	Ditch	Suitable ditch	In	
339	Ditch	Suitable ditch	In	
340	Ditch	Suitable ditch	In	
341	Pond	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
342	Ditch	Suitable ditch	In	
343	Ditch	Ditch blocked at one end and not flowing. 25m in length. Some commuting value. Shallow bank profile-no opportunities for burrows	In	
344	Pond	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
345	Ditch	Suitable ditch	In	
346	Ditch	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
347	Ditch	Suitable ditch	In	
348	Ditch	Suitable ditch	In	
349	Ditch	Dry	Out	Dry Beyond 200m buffer to RLB
350	Ditch	Suitable ditch	In	

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>390</b>	Ditch	Tussocky grassland with small earth bank between scrub line and river bank	Out	Dry Beyond 200m buffer to RLB
<b>391</b>	Tidal pool	Tidal ditch in saltmarsh – not accessible. Ground nesting birds	Out	Tidal Beyond 200m buffer to RLB
<b>392</b>	Ditch	Dry	Out	Beyond 200m buffer to RLB Dry
<b>393</b>	Pond	Pooled end of ditch (not connected). Sheep poached banks. Dominated by common reed and occasional lesser reedmace. 30% of perimeter accessible. 30m wide x 10m long. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>394</b>	Depression	Concrete pipe section in rough grassland, full of rainwater.	Out	Beyond 200m buffer to RLB Man-made structure, no banks for burrowing
<b>395</b>	Depression	Shallow depression in tussocky, cattle poached grassland	Out	Beyond 200m buffer to RLB Absence of bank structure
<b>396</b>	Water trough	Water trough between path and fence	Out	Beyond 200m buffer to RLB Man-made structure, no banks for burrowing

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>397</b>	Depression	Depression with mounded earth banks three quarters of the way around depression; metal waste.	Out	Beyond 200m buffer to RLB Dry
<b>398</b>	Depression	Depression in scrubby grassland	Out	Dry Beyond 200m buffer to RLB
<b>399</b>	Tidal pool	Tidal pool in saltmarsh. Ground nesting birds	Out	Tidal Beyond 200m buffer to RLB
<b>400</b>	Pond	Dense common reed bed for biogas outflow. Poor bank structure but offers opportunities for commuting water vole.	In	
<b>401</b>	Tidal pool	Tidal pool in saltmarsh. Ground nesting birds	Out	Tidal Beyond 200m buffer to RLB
<b>402</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>403</b>	Ditch	Unknown –no access	In	
<b>404</b>	Ditch	Unknown – no access Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>405</b>	Ditch	Unknown – no access Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>406</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>407</b>	Ditch	Unknown – no access Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>408</b>	Ditch	Unknown – no access Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>409</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>410</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>411</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Choked with New Zealand pigmyweed.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
412	Reservoir	Reservoir, approximate area of 6,400m <sup>2</sup> , located within cattle grazed fields and dense scrub. Poor bank structure but offers opportunities for commuting water vole.	In	
413	Ditch	Ditch with dense and scattered scrub along eastern bank	In	
414	Ditch	Dry, heavily poached shallow ditch. Limited commuting value.	Out	Dry Beyond 200m buffer to RLB
415	Ditch	Drainage ditch with scattered scrub along eastern bank.	In	
416	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Choked with New Zealand pigmyweed. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
417	Ditch	Unknown – no access	In	
418	Ditch	Drainage ditch, with steep banks in west, very shallow or entirely absent banks in southern extent, scattered scrub on north eastern bank	In	
419	Ditch	Unknown – no access Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	

Water body reference	Feature	Description	Screening for Water vole	Justification to screen out (and any other contextual information)
420	Depression	Depression in scrub – measuring approximately 6m <sup>2</sup>	Out	Dry
421	Ditch	No longer present – extensive earth movement, spoil, tall ruderal vegetation and improved grassland	Out	Dry
422	Ditch	Shallow depression in cattle grazed field.	Out	Dry Water less than 10cm around banks
423	Pond	Man-made plastic lined pond surrounded by rocks and tussocky improved grassland, with some self-seeded vegetation around margins. No commuting value.	Out	Man-made bank structure
424	Pond	Suitable ditch Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
425	Water trough	Small water trough overgrown with vegetation. No commuting value.	Out	Man-made bank structure
426	Ditch	Unknown – no access	Out	Beyond 500m buffer to RLB
428	River	River Stour – large flowing and tidal river	Out	Tidal Fast flowing Beyond 200m buffer to RLB
429	Ditch	Dry drainage ditch under scrub. No commuting value.	Out	Dry

<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
430	Ditch	Dry drainage ditch under scrub No commuting value.	Out	Dry
431	Ditch	Dry drainage ditch under scrub Some commuting value.	Out	Dry Beyond 500m buffer to RLB
432	Depression	Shallow depression in tussocky tall herb and grassland. No commuting value.	Out	Dry Beyond 200m buffer to RLB
433	Depression	Shallow depression in tussocky tall herb and grassland. No commuting value.	Out	Dry Beyond 200m buffer to RLB
434	Unknown	Unknown – no access	In	
435	Unknown	Unknown – no access	Out	Beyond 500m buffer to RLB
437	Ditch	Ditch by golf course car park. Dry by spring. No commuting value.	Out	Dry Beyond 200m buffer to RLB
438	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Choked with New Zealand pigmyweed. Some commuting value.	In	
439	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Choked with New Zealand pigmyweed. Some commuting value.	In	



<b>Water body reference</b>	<b>Feature</b>	<b>Description</b>	<b>Screening for Water vole</b>	<b>Justification to screen out (and any other contextual information)</b>
<b>440</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Some commuting value. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	
<b>441</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Some commuting value.	In	
<b>442</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Some commuting value.	In	
<b>443</b>	Ditch	Shallow drainage ditch in cattle grazed fields. Banks heavily poached in places. Some commuting value. Beyond 200m to the RLB but connected to network of suitable ditches within the 200m buffer to the RLB.	In	





## Appendix C

### Table 4.5: Watercourse Habitat Characteristics



**Table 4.5 Watercourse Habitat Characteristics**

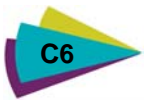
NOTE: Water bodies that lie within the 200m buffer to the RLB are shown in bold.

<b>Water body number</b>	<b>Bordering land uses</b>	<b>Bank profile<sup>18</sup></b>	<b>Depth (m)</b>	<b>Width (m)</b>	<b>Principal bankside vegetation</b>
<b>157</b>	<b>Urban/Industrial</b>	<b>Steep</b>	<b>&gt;2</b>	<b>2-5</b>	<b>Herbs; Reeds/Sedges; Tall grass</b>
<b>159</b>	<b>Park/Garden and Urban/Industrial</b>	<b>Steep</b>	<b>1-2</b>	<b>1-2</b>	<b>Submerged weed, Reeds/sedges, Tall grass</b>
162	Park/Garden	>45	>2	2-5	Bushes
164	Park/Garden	Shallow	0.5-1	5-10	Reeds/Sedges; Short grass
<b>165</b>	<b>Urban/Industrial</b>	<b>Steep</b>	<b>&gt;2</b>	<b>2-5</b>	<b>Herbs; Reeds/Sedges; Tall grass</b>
166	Park/Garden	Shallow	>2	20-40	Reeds/Sedges
168	Urban/ Industrial	Steep	1-2	2-5	Short grass
<b>170</b>	<b>Park/Garden</b>	<b>Shallow; Steep; Vertical/undercut</b>	<b>0.5-1</b>	<b>2-5</b>	<b>Bankside trees; Bushes; Herbs</b>
<b>180</b>	<b>Urban/Industrial Park/Garden</b>	<b>Steep</b>	<b>&gt;2</b>	<b>2-5</b>	<b>Reeds/sedges, Bushes; Tall grass</b>
<b>182</b>	Park/Garden	Steep; Shallow	0.5-1	2-5	Herbs; Reeds/Sedges; Tall grass
183	Arable crop Urban/ Industrial	>45	>2	2-5	Tall grass
183	Arable crop	Steep	0.5-1	2-5	Submerged weed, Reeds/sedges, Tall grass

<sup>18</sup> Bank profile: flat <10°, shallow <45°, steep >45°, vertical/undercut.

Water body number	Bordering land uses	Bank profile <sup>18</sup>	Depth (m)	Width (m)	Principal bankside vegetation
187	Park/Garden and Urban/Industrial	Steep	1-2	1-2	Bankside trees, Tall grass
188	Park/Garden	Shallow	1-2	1-2	Bushes
189	Park/Garden	Shallow	0.5-1	2-5	Reeds/Sedges
193	Park/Garden	Steep	1-2	1-2	Reeds/Sedges Tall grass
194	Park/Garden Urban/Industrial	Shallow on southern bank Steep northern bank	0.5-1 and >2	1-2	Bushes, Tall grass Reeds/Sedges
197	Urban/ Industrial Park/Garden	Steep	>2	2-5	Reeds/sedges, Bushes; Tall grass
198	Park/Garden	Steep	0.5-1	5-10	Short grass
199	Park/Garden	Shallow	0.5-1	2-5	Reeds/Sedges
203	Urban/ Industrial; Park/Garden	Steep	0.5-1	1-2	Herbs
206	Park/Garden	Flat; Shallow	1-2	2-5	Reeds/Sedges; Tall grass
223	Arable crop; Urban/ industrial	Steep	0.5-1	2-5	Reeds/sedges
231	Park/Garden	Shallow	0.5-1	>20	Reeds/sedges
232	Park/Garden; Arable crop	Shallow	0.5-1	<1	Bushes
233e	Park/Garden	Steep; Shallow	>2	2-5	Reeds/Sedges
235	Park/Garden	Shallow	0.5-1	2-5	Reeds/Sedges
236	Park/Garden	Flat; Shallow	>2	10-20	Reeds/Sedges
237	Park/Garden; Arable crop	Steep; Shallow	>2	5-10	Herbs; Reeds/Sedges

Water body number	Bordering land uses	Bank profile <sup>18</sup>	Depth (m)	Width (m)	Principal bankside vegetation
238	Park/Garden	Shallow; Steep; Vertical/undercut	>2	10-20	Herbs; Reeds/Sedges
<b>239</b>	<b>Park/Garden</b>	<b>Steep</b>	<b>0.5-1</b>	<b>2-5</b>	<b>Short grass Reeds/Sedges</b>
<b>240</b>	<b>Park/Garden; Arable crop</b>	<b>Steep; Shallow</b>	<b>&gt;2</b>	<b>5-10</b>	<b>Herbs; Reeds/Sedges</b>
241	Park/Garden	Steep	0.5-1	2-5	Short grass Reeds/Sedges
255	Arable crop	<45 (N) >45 (S)	0.5-1	2-5	Reeds/Sedges
<b>393</b>	<b>Urban/ Industrial Arable crop</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>&lt;1</b>	<b>Short grass Reeds/Sedges</b>
<b>402</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
406	Cattle/grazing	Shallow	<0.5	1-2	Bushes, Short grass Reeds/Sedges
<b>409</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
410	Cattle/grazing	Shallow	<0.5	1-2	Bushes, Short grass Reeds/Sedges
<b>411</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
<b>413</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
<b>415</b>	<b>Cattle/ grazing</b>	<b>&lt;45</b>	<b>0.5-1</b>	<b>2-5</b>	<b>Bushes, Short grass Reeds/Sedges</b>



Water body number	Bordering land uses	Bank profile <sup>18</sup>	Depth (m)	Width (m)	Principal bankside vegetation
416	Cattle/grazing	Shallow	<0.5	1-2	Bushes, Short grass Reeds/Sedges
<b>418</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
<b>438</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
<b>439</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
440	Cattle/grazing	Shallow	<0.5	1-2	Bushes, Short grass Reeds/Sedges
<b>441</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
<b>442</b>	<b>Cattle/ grazing</b>	<b>Shallow</b>	<b>&lt;0.5</b>	<b>1-2</b>	<b>Bushes, Short grass Reeds/Sedges</b>
443	Cattle/grazing	Shallow	<0.5	1-2	Bushes, Short grass Reeds/Sedges



## Appendix D

### Table 4.6: Water Vole Survey Results





**Table 4.6 Water Vole Survey Results**

NOTE: Water bodies that lie within the 200m buffer to the RLB are shown in bold.

<b>Water body reference</b>	<b>Latrine/ droppings</b>	<b>Feeding Station</b>	<b>Burrow/ Pathways</b>	<b>Comment (where no field signs found)</b>
<b>157</b>	x	x	✓	<b>Sub optimal but cannot rule out, as runs were found</b>
<b>159</b>	✓	✓	<b>X</b>	
162	X	X	X	Shade becoming dense, limited foodplant on banks
<b>164</b>	✓	✓	✓	
<b>165</b>	<b>X</b>	<b>x</b>	✓	<b>Sub optimal but cannot rule out, as runs were found</b>
166	X	✓	x	
<b>170</b>	<b>None</b>			<b>Shaded by scrub, limited foodplant</b>
<b>180</b>	<b>None</b>			<b>Some potential but limited access due to steep banks and dense vegetation</b>
182	x	✓	X	Shaded by scrub, limited foodplant
183	None			Limited access
<b>187</b>	✓	✓	<b>x</b>	<b>Possible water vole- ‘plop’ into water heard during survey but no animal seen</b>
<b>188</b>	<b>None</b>			<b>Shaded by scrub, limited foodplant</b>
189	X	X	✓	
193	x	Possible	Possible	Some potential but limited access due to steep banks
<b>194</b>	✓	✓	<b>Possible</b>	
197	None			Some potential but limited access due to steep banks and dense vegetation
198	✓	✓	✓	
199	x	x	✓	



Water body reference	Latrine/droppings	Feeding Station	Burrow/ Pathways	Comment (where no field signs found)
203	None			Unsuitable, no signs
<b>206</b>	<b>x</b>	✓	✓	
223	None			Some potential but limited access due to steep banks and dense vegetation
225	None			Some potential but limited access due to breeding bird and dense vegetation
231	✓	✓	x	
232	None			Limited access – potential as connected to highly suitable ditches to east and south
233	✓	✓	✓	
235	x	Possible	Possible	Some potential but limited access due to breeding bird and dense vegetation
<b>236</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>Limited access: remains suitable, banks too steep to inspect fully but connected to positive ditch</b>
<b>237</b>	✓	✓	✓	
238	✓	✓	x	Limited access
<b>239</b>	✓	✓	<b>x</b>	
<b>240</b>	<b>x</b>	✓	<b>x</b>	
241	✓	✓	x	
335	None			No positive signs recorded, however recent channel management recorded which may have removed field signs, ditch is suitable to support water vole and suitable for dispersal
336	x	x	✓	
337	X	x	✓	
338	x	x	✓	
<b>339</b>	✓	✓	✓	



Water body reference	Latrine/droppings	Feeding Station	Burrow/ Pathways	Comment (where no field signs found)
340	✓	✓	x	
341	None			No field signs, but suitable for dispersal
342	None			<b>No positive signs recorded, however recent channel management recorded which may have removed field signs, ditch is suitable to support water vole and suitable for dispersal</b>
344	None			No field signs, but suitable for dispersal
345	None			No positive signs recorded, however channel highly congested with vegetation obscuring view, ditch is suitable to support water vole and suitable for dispersal,
346	X	✓	x	
347	None			<b>No positive signs recorded, however channel highly congested with vegetation obscuring view, ditch is suitable to support water vole and suitable for dispersal,</b>
348	None			<b>No positive signs recorded, however channel highly congested with vegetation obscuring view, ditch is suitable to support water vole and suitable for dispersal</b>
350	✓	✓	✓	
393	None			<b>Limited access due to breeding birds and dense vegetation</b>
402	None			<b>Bank structure poor as a results of cattle poaching</b>
406	None			Bank structure poor as a results of cattle poaching
409	None			<b>Bank structure poor as a results of cattle poaching</b>



Water body reference	Latrine/droppings	Feeding Station	Burrow/ Pathways	Comment (where no field signs found)
410	None			Bank structure poor as a results of cattle poaching
<b>411</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
<b>413</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
<b>415</b>	✓	✓	x	
416	None			Bank structure poor as a results of cattle poaching
<b>418</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
424	✓	✓	✓	
<b>438</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
<b>439</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
440	✓	x	x	
<b>441</b>	✓	✓	x	
<b>442</b>	<b>None</b>			<b>Bank structure poor as a results of cattle poaching</b>
443	None			Bank structure poor as a results of cattle poaching



## Appendix E

### Species Referred to in this Report

Common name	Scientific name
<b><u>Mammals</u></b>	
American mink	<i>Neovison vison</i>
Brown rat	<i>Rattus norvegicus</i>
Eurasian Beaver	<i>Castor fiber</i>
European Otter	<i>Lutra lutra</i>
Water vole	<i>Arvicola amphibius</i>
<b><u>Plants</u></b>	
Bramble	<i>Rubus fruticosus</i> agg.
Common reed	<i>Phragmites australis</i>
Duckweed	<i>Lemna</i> sp.
Hawthorn	<i>Crataegus monogyna</i>
Lesser reedmace	<i>Typha angustifolia</i>
New Zealand pigmyweed	<i>Crassula helmsii</i>
Reedmace	<i>Typha latifolia</i>
Willow	<i>Salix</i> spp.

