



Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

**Annex 5-4: Baseline Onshore and Intertidal
Ornithology Report**

June 2018, Revision A

Document Reference: 6.5.5.4

Pursuant to: APFP Reg. 5(2)(a)(2)(a)

Vattenfall Wind Power Ltd

Baseline Onshore and
Intertidal Ornithology Report

Thanet Extension Offshore Wind Farm

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June, 2018 2018

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Date of Approval	June, 2018 2018
Revision	A

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Vattenfall Wind Power Ltd - GoBe Consultants

Thanet Extension Offshore Wind Farm

Annex 5-4 Baseline Onshore and Intertidal Ornithology Report



November 2017

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Doc Ref. 39080CR023i1

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Document revisions

No.	Details	Date
1	Draft version	10/08/2017
2	Revised Draft v2	10/10/2017
3	Final Report	01/11/2017



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1. Introduction

1.1 Purpose of Report

- 1.1.1 This report details the results of a desk study and programme of ornithological field surveys undertaken in 2016-17, in order to inform the Environmental Impact Assessment (EIA) for the Thanet Extension Offshore Wind Farm (Thanet Extension), the proposed development. This report forms a technical annex to Chapter 5 (Onshore Biodiversity) of the Environmental Statement (ES). A list of the bird species mentioned in this report, with their scientific names is provided in **Appendix 5-4A**, and the legislation and designations pertaining to birds is in **Appendix 5-4B**.

1.2 Background

- 1.2.1 GoBe Consultants, on behalf of Vattenfall Wind Power Ltd (VWPL), commissioned Amec Foster Wheeler Environment & Infrastructure UK Ltd (hereafter referred to as Amec Foster Wheeler) to undertake ornithological surveys and desk based review for Thanet Extension project. At the time of commission the proposed development comprised two options for the proposed route for Thanet Extension (Option 1 (north) and Option 2 (south) as illustrated in the scoping report (Figure 1.2¹).
- 1.2.2 Wintering bird surveys and desk study were undertaken on both (Option 1 (north) and Option 2 (south)), breeding season surveys were undertaken in Option 1 (north) only due to the northern route being the preferred option taken forward for the proposed development.

1.3 Study Area Definition and Description

- 1.3.1 Ornithological surveys were undertaken prior to the finalisation of the proposed development Red Line Boundary (RLB), to ensure that the findings could inform the design, and to comply with good practice guidance relating to optimal survey timings. To allow scheme variation and adequate survey coverage of any potential route variation, surveys were undertaken over an Onshore Area of Interest (OAoI) which refers to the 500 m buffer zone around the 25 m Option 1 route (Figure 1.2 in the scoping report) above Mean High Water Springs (MHWS) and Intertidal Area of Interest (IAoI) extending from the MHWS line to the Mean Low Water Springs (MLWS) line of the intertidal area. Including all the intertidal habitat for surveys ensured that any intertidal habitat along any potential cable route, plus a suitable 500 m buffer either side, to take account of disturbance during construction, is included in this study area. This entire area consisting of the OAoI and IAoI is referred to as the study area in this report, the location of which is shown on **Figure 5.4.1**.

¹ Royal Haskoning DHV (2016) Thanet Offshore Extension Wind farm, Environmental Impact Assessment, Report to inform Scoping.

- 1.3.2 The study area (covering approximately 440 ha onshore and 418 ha intertidal) comprises a diverse range of habitats, including intertidal habitats (saltmarsh and mudflats), heavily managed short grassland (golf courses), extensive areas of scrub, open farmland (lined by water-filled ditches), flowing and standing water bodies, commercial buildings/ industrial areas, residential housing and gardens and isolated patches of mixed/ deciduous woodland.
- 1.3.3 In the north is the village of Cliffsend, which forms the only substantial area of residential housing and gardens in the study area (covering approximately 30 ha). To the south of Cliffsend and to the west of Sandwich Road are the St Augustine and Stonelees golf courses, which form the bulk of the central-western part of the study area (85 ha). These comprise a mix of areas of short grassland, planted trees and small areas of woodland (copses), ponds and water-filled ditches.
- 1.3.4 To the east of Sandwich Road is the Pegwell Bay Country Park (25 ha), a mixed area with some non-native scrub with areas of grassland/chalk grassland and woodland intersected by numerous tracks, which receive a high level of use by the public. Adjacent and to the east of the Country Park is the intertidal area of Pegwell Bay, firstly tidal saltmarsh (of which approximately 50 - 55 ha are within the study area), and then open mudflats (covering approximately 300 ha). The intertidal habitat is dissected by the River Stour which runs north-east through this area, and is fringed on either side by tidal saltmarsh, with scrub on the higher ground. All of this intertidal area is within the Thanet Coast and Sandwich Bay Special Protection Area (SPA)/ Ramsar site.
- 1.3.5 The western section of the study area comprises a sewage treatment works and adjacent solar farm (south of Ebbsfleet Farm) and the now disused Richborough Power station, which has been partly re-developed into Richborough Energy Park (in total, covering nearly 40 ha). There is also a large area of mixed scrub and in places reedbed between the A256 (Ramsgate Road) and Westerlees Hill (covering 35 ha). This area is located to the north of the River Stour, which flows in a north-west to south-east direction. The farmland to the south and west of the River Stour and east of the railway line (covering 80 ha within the study area) is seasonally flooded grassland (grazing marsh) dissected by water-filled ditches. Much of the farmland to the west of the railway is arable, given over to the cultivation of winter wheat in winter 2016/17.
- 1.3.6 The southern part of the study area primarily comprises industrial areas either side of the Ramsgate Road, with Richborough Port to the east, all of which is dominated by buildings and hardstanding (covering approximately 30 ha). This industrial area is flanked on its eastern side by the River Stour.

2. Methodology

2.1 Desk Study

2.1.1 A data-gathering exercise (results presented in **Appendix 5-4C**) was undertaken to obtain information relating to statutory and non-statutory nature conservation sites of ornithological importance, and legally protected or otherwise notable bird species (for details of the legislation and designations pertaining to birds, please see **Appendix 5-4B**), including species listed on:

- ▶ Annex I of the Birds Directive;
- ▶ Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- ▶ Species of Principal Importance (SPI), listed on Section 41 of Natural Environment and Rural Communities Act 2006 (NERC);
- ▶ Birds of Conservation Concern (BoCC) Red listed (Eaton *et al.*, 2015); and
- ▶ Priority bird species listed on the Kent Local Biodiversity Action Plan (LBAP): <http://www.kentbap.org.uk/habitats-and-species/priority-species/>.

2.1.2 Data were requested from the Kent and Medway Biological Records Centre (KMBRC) in March 2017 and a review of the Multi-Agency Geographic Information for the Countryside (MAGIC)² website, open access aerial mapping resources³, aerial photographs and Ordnance Survey maps⁴ was undertaken of the study area and surrounding area. Data were gathered for:

- ▶ Statutory designated sites of ornithological importance within a 20 km radius of the study area;
- ▶ Non-statutory designated sites of ornithological interest located on, or within 2 km of the study area; and
- ▶ Records of legally protected, SPI and otherwise notable bird species made on, or within 2 km of the study area (also requested in July 2017).

2.1.3 Analysis of species data focused only on records from post 2000, as older records may not give an accurate picture of the current ornithological interest in the search area. This contextual information is important as it may point to notable species that could occur within the study area itself. Further ornithological data and contextual information was obtained from the following sources:

- ▶ British Trust for Ornithology (BTO):
 - ▶ Wetland Bird Survey (WeBS) Core Count Survey data for 1995/96 - 2014/15 inclusive, was purchase from the BTO for their Pegwell Bay Core Count sector (which also covers Sandwich Bay), these data being derived from surveys undertaken at, or close to high tide;

² <http://magic.defra.gov.uk/MagicMap.aspx>

³ <http://maps.google.co.uk>

⁴ <https://www.ordnancesurvey.co.uk/osmaps>

- ▶ WeBS Low Tide survey data for 2008/09 (the most recent winter for which data was available) was purchased from the BTO, for their Pegwell Bay Low Tide count sector (which also covers Sandwich Bay); and
- ▶ Further core count and low tide data for Pegwell Bay was from obtained from the BTO website (www.bto.org).
- ▶ Natural England (NE): studies commissioned by NE into the numbers and distribution of golden plover in the Sandwich Bay and Thanet area, the results of which are reported in Griffiths (2004) and Henderson & Sutherland (2017);
- ▶ Sandwich Bay Bird Observatory (SBBO): annual wildlife reports for 2008-2015 inclusive;
- ▶ RSPB: bird records within 2 km of the study area;
- ▶ Kent Ornithological Society (KOS): bird records were extracted from their online database, for all species within 2 km of the study area (<http://birdgroups.co.uk/kos/default.asp>);
- ▶ Kent Bird Reports 2013 and 2014: an annual report published by the Kent Ornithological Society (Privett [ed] 2005, 2016); and
- ▶ Kent Breeding Bird Atlas 2008 - 13 (Clements *et al.*, 2015). Results from a county-wide survey, mapping the distribution of all breeding bird species at a tetrad (2 x 2 km) resolution.

2.1.4 Further information on the use by birds in the area was obtained from other relevant development proposal documents (submitted within the last 10 years), including:

Richborough Connection

2.1.5 A series of ornithological surveys were undertaken to provide baseline data to inform the Development Consent Order (DCO) Environmental Statement (ES) for the overhead line Richborough Connection Project (RCP), including:

- ▶ Breeding bird walkover surveys in 2014;
- ▶ Breeding waders surveys in 2015;
- ▶ Winter flight line surveys in 2012/13 and 2014/15; and
- ▶ Winter bird surveys in 2012-15.

2.1.6 The RCP route extended from Canterbury to the Richborough Power Station and only intersects with the proposed development ornithological study area in a small section of the south eastern area of the Ash Level and the Richborough Power Station (which is covered separately below). Data from the Ash Level relevant to golden plover distribution is now superseded by the NE 2017 report (Henderson & Sutherland 2017). Results of which are presented in section 3.1.



Richborough Power Station Estate

2.1.7 A programme of ornithological surveys have been undertaken to provide baseline data to inform EIAs for development proposals on land at the former Richborough Power Station Estate (much of which is within the study area), including:

- ▶ Breeding bird survey in 2016;
- ▶ Winter bird survey in 2014/15;
- ▶ Breeding bird survey in 2012; and
- ▶ Winter bird survey in 2010/11.

St Augustine Golf Course

2.1.8 K. B. Ecology were commissioned by the Lee Evans Partnership to undertake bird surveys at the St Augustine's Golf Course (wholly within the study area), including:

- ▶ Breeding bird survey in 2014; and
- ▶ Non-breeding bird survey in winter 2014/15.

Nemo Link

2.1.9 National Grid International Limited commissioned bird surveys to investigate the ornithological interest of Pegwell Bay. The surveys were undertaken to inform a feasibility study looking into the constraints, risks and opportunities for installing an electricity interconnector cable (to link Belgium with the UK) within the Bay (the project named, the Nemo Link). The following bird surveys were carried out, the results of which are provided in TEP (2010):

- ▶ A generic breeding bird survey in 2009 (of land at Stonelees and within Pegwell Bay Country Park (all within the study area));
- ▶ A breeding redshank survey in 2009 (of the saltmarsh surrounding Pegwell Bay); and
- ▶ Winter bird survey in 2008/09 (counts of wildfowl and waders within Pegwell Bay).

2.2 Field Survey

Winter Bird Survey

2.2.1 A programme of winter bird surveys within the OAol and IAol was undertaken by APEM Limited (APEM) from November 2016 to March 2017 inclusive, involving once monthly onshore transect surveys, and observation point watches over Pegwell Bay across a tidal cycle. Full details of the methods employed are provided in **Appendix 5-4.D**.

Breeding Bird Survey

2.2.2 A habitat appraisal survey consisting of an assessment of the habitats adjacent and outside the study area boundary was undertaken using Ordnance Survey

maps and aerial photographs to determine its potential to support breeding Schedule 1 species that have bred in the Sandwich Bay area in the recent past (based on information provided in Clements *et al.*, 2015). A site visit was also undertaken to publicly accessible areas, roads, tracks and paths. For species known to be particularly sensitive to disturbance (e.g. scarce bird of prey species), suitable habitat up to 500 m from the OAol boundary was assessed, this being reduced to 100 m for species less likely to be disturbed by construction works associated with the scheme (e.g. Cetti's warbler and kingfisher). These distances were based on the findings of various studies into the response of different bird species to disturbance, such as Ruddock & Whitfield (2007). Limited suitable habitat for sensitive Schedule 1 species to breed within 500 m of the OAol boundary was identified from the habitat appraisal, although there was suitable habitat for kingfisher and Cetti's warbler within 100 m of the boundary. In view of this, the area surveyed for breeding birds survey was set to include all of the land within, and up to 100 m from the study area OAol boundary (from here referred to as the Common Bird Census (CBC) Survey Area). The CBC Survey Area, and 500 m habitat appraisal search area are shown on **Figure 5.4.2**.

- 2.2.3 A territory mapping survey based on the BTO CBC methodology (Marchant 1983, Gilbert *et al.* 1998) was carried out within the CBC survey area, where access permitted, from March to June 2017 inclusive. Full access was not obtained to all areas within the study area or 100 m buffer area around it, however access to these areas was considered sufficient to record the territories likely to be present and areas with limited access were also surveyed from the closest available boundary.
- 2.2.4 Transects (no further than 50 m apart) were walked across all open terrestrial habitats, while all field boundaries and the edges of woodland and scrub were also walked. Surveys were undertaken until midday (at the latest), and in appropriate weather conditions (not during periods of strong wind and/ or heavy rain). While eight to ten visits are the norm for CBC sites being monitored over the long-term, however where territory mapping is being used for the purpose of assessing potential environmental impacts, it is generally accepted that six visits are sufficient to determine the numbers and distribution of breeding bird territories with reasonable accuracy. The six visits adheres to the guidance for breeding bird surveys and wind farms produced by NE (NE, 2010).
- 2.2.5 In the analysis of the survey data collected, the presence of a singing/ displaying bird, a pair of birds or an adult male or female bird in potential nesting habitat (on a minimum of two survey dates) were all treated as a breeding territory being present. The term territory (as used within this report) denotes that a pair of breeding birds was present, or that a male was holding territory in that area.

3. Results

3.1 Desk Study

Statutory Designated Sites of Importance to Birds

3.1.1 There are 16 statutory designated nature conservation sites within a 20 km search area around the study area for which birds form at least part of the reason for their designation. Summary descriptions of these, with the approximate distances from the study area are provided in **Table 3.1**, and their locations in relation to the study area are shown on **Figure 5.4.3.1a** (for sites of international importance) and **Figure 5.4.3.1b** (for sites of national and local importance).

Table 3.1 Statutory Designated Nature Conservation Sites within 20 km of the Study Area

Site name and designation	Site interest features	Approximate distance and (direction) from study area
<i>International</i>		
Thanet Coast and Sandwich Bay – Ramsar	The Ramsar site (covering 2,169 ha) is designated for supporting internationally important numbers of non-breeding turnstone (under Ramsar Criterion 6), and 15 Red Data Book invertebrate species associated with wetlands (under Criterion 2). In addition, the Ramsar site supports nationally important numbers of ringed plover and greenshank during spring/autumn passage, and golden plover, sanderling, red-throated diver and great crested grebe in winter.	Partly within
Thanet Coast and Sandwich Bay – SPA	The SPA (covering 1,838 ha) is designated for populations of European importance of turnstone (non-breeding); golden plover (non-breeding) and little tern (breeding).	Partly within
Outer Thames Estuary – Marine SPA	This marine Sea inlet (covering 379,824 ha) regularly supports internationally important numbers of the Annex I Species (red-throated diver) in winter. Not relevant to intertidal and onshore assessment.	6.0 km (north)

Site name and designation	Site interest features	Approximate distance and (direction) from study area
Stodmarsh – Ramsar	The Ramsar site (covering 481 ha) is designated under Ramsar Criterion 2 for supporting: six British Red Data Book wetland invertebrates; two nationally rare and five nationally scarce plant species; and its diverse assemblage of rare wetland birds which includes gadwall during passage and the breeding season, and bittern, shoveler and hen harrier in winter.	8.0 km (west)
Stodmarsh - SPA	The SPA (covering 481 ha) is designated for its populations of European importance of bittern, gadwall, shoveler and hen harrier (during winter), and gadwall during the breeding season.	8.0 km (west)
<i>National</i>		
Sandwich and Pegwell Bay – National Nature Reserve (NNR)	The NNR (covering 629 ha) contains a complex mosaic of habitats including inter-tidal mudflats, saltmarsh, shingle beach, sand dunes, ancient dune pastures, chalk cliffs, wave cut platform and coastal scrubland. It supports the only ancient dune pasture in Kent. The reserve is of international importance for its wader and wildfowl populations. 615 Hectares (ha) of the NNR is managed as a Kent Wildlife Trust Reserve.	Partly within

Site name and designation	Site interest features	Approximate distance and (direction) from study area
Sandwich Bay to Hacklinge Marshes – Site of Special Scientific Interest (SSSI)	The SSSI (covering 1,790 ha) contains the most important sand dune system and sandy coastal grassland in South East England. There are also a wide range of other habitats such as mudflats, saltmarsh, chalk cliffs, freshwater grazing marsh, scrub and woodland are found here. This SSSI comprises grazing marsh habitats within Minster Marshes and often supports large wintering populations of waders, some of which regularly reach levels of national importance. Associated with the SSSI are outstanding assemblages of both terrestrial and marine plants and invertebrates. Notified features include: non-breeding populations of golden plover, grey plover, ringed plover and sanderling, and the assemblage of breeding birds within areas of lowland open waters and their margins.	Partly within
Thanet Coast – SSSI	The SSSI (covering 817 ha) is notified for its coastal habitats and the plant and invertebrate communities they support; geological features and breeding and non-breeding bird populations. Non-breeding populations of golden plover, grey plover, ringed plover and sanderling; breeding little tern; and the variety of passage bird species all form notified features of the SSSI.	4.1 km (north-east)
Stodmarsh – NNR	The NNR (covering 249 ha) supports internationally important habitats including reedbeds, fens, ditches, wet grassland and open water which provide an ideal habitat for breeding and wintering birds, invertebrates and rare plants.	7.7 km (west)

Site name and designation	Site interest features	Approximate distance and (direction) from study area
Stodmarsh – SSSI	The SSSI (covering 623 ha) is notified for its wetland habitats and the plant and invertebrate communities they support. The SSSI is also notified for its breeding bird assemblage associated with open waters and their margins, and specifically for nationally important breeding populations of bearded tit, Cetti's warbler, gadwall, pochard and shoveler.	7.7 km (west)
Ileden and Oxenden Woods - SSSI	The SSSI (covering 86 ha) is primarily notified for its woodland habitats, but also its breeding bird assemblage associated with mixed scrub and woodland, including nightingale and hawfinch.	13.2 km (south-west)
Dover to Kingsdown Cliffs - SSSI	The SSSI (covering 208 ha) is notified for a wide variety of features including geological and biological, such as the cliff-top calcareous grassland communities and the plant and invertebrate interest they support. The SSSI is also notified for its breeding bird assemblage associated with mixed scrub and woodland habitats, and breeding cliff-face colonies of kittiwake, fulmar, lesser black-backed gull and house martin. In the Citation for the SSSI, The South Foreland valley at St Margaret's is noted as a significant landfall for migrant birds in spring and autumn, plus an important breeding area for warblers, including: whitethroat, blackcap and grasshopper warbler. Old wartime fortification-systems, of which there are several within the SSSI, attract breeding black redstart.	13.4 km (south)
West Blean and Thorndon Woods - SSSI	The SSSI (covering 781 ha) is notified for its woodland and grassland habitats and the invertebrate communities they support. The SSSI is also notified for its breeding bird assemblage associated with mixed scrub and woodland, with breeding hobby, woodcock, long-eared owl, nightjar, tree pipit, nightingale, grasshopper warbler and willow tit mentioned in the citation.	14.2 km (west)

Site name and designation	Site interest features	Approximate distance and (direction) from study area
Chequers Wood & Old Park – SSSI	The SSSI (covering 107 ha) is notified for its geological and biological interest, including woodland and grassland habitats and a breeding bird assemblage associated with mixed scrub and woodland. In the SSSI citation, breeding lesser spotted woodpecker, Cetti's warbler and nightingale are noted as breeding.	14.3 km (south-west)
Local		
Prince's Beachlands Local Nature reserve (LNR)	A narrow coastal site located between two sections of Sandwich and Pegwell Bay NNR and within the Sandwich Bay to Hacklinge Marshes SSSI. A complex mosaic of habitats of international importance for its bird populations.	1.1 km (south-east)
Bishopstone Cliffs LNR	A clifftop grassland important for insects, with some rare varieties, and birds, such as sand martin (nesting in the cliffs), skylark, meadow pipit and corn bunting. The LNR is part of Reculver Country Park.	12.7 km (north-west)

Non-Statutory Designated Sites of Ornithological Importance

- 3.1.2 There are no non-statutory designated sites within 2 km of the study area, for which birds are the primary reason for their identification and designation. However, the Ash Level and South Richborough Pasture Local Wildlife Site (LWS reference DO21) is located partly within the study area (see **Figure 5.4.3.1c**). The LWS covers an area of 1,039 ha and primarily comprises low-lying (stock grazed) grassland, with the fields being dissected by water-filled ditches. This area provides suitable habitat for foraging golden plover (a qualifying species of the Thanet Coast and Sandwich Bay SPA), and lapwing (an SPI).

Other Sources of Data

British Trust for Ornithology (WeBS Data)

WeBS Core Count Data

- 3.1.3 WeBS Core Count data (obtained around the high tide period) was obtained from the BTO for the Pegwell Bay count sector (which includes Sandwich Bay) for the

period: 2000/01 to 2015/16 inclusive⁵. **Figure 5.4.3.2a** shows the extent of the Pegwell Bay count sector. **Table C1** in **Appendix 5-4C** shows the peak count for each species in each season, and **Table C2** the peak and mean counts in each month for the same period (species in bold are those that are qualifying features of the Thanet Coast and Sandwich Bay SPA/Ramsar, or notified features of the constituent SSSIs). Of the six qualifying and/ or notified species, the figures in **Table C1** indicate that numbers of little tern, turnstone, ringed plover and golden plover have declined in Pegwell Bay over the 2000 - 16 period, whereas those for grey plover and sanderling have remained reasonably stable, albeit with between year variation.

- 3.1.4 **Table C2** shows the seasonal occurrence and changes in numbers across the year, with little tern occurring from April - September and numbers peaking during the post-breeding/ return passage period in July and August. Turnstone can occur in Pegwell Bay in any month of the year, though is most numerous from November - April, with the population including both wintering birds (from October/ November - March) and those on autumn passage (August - October) and spring passage (April - May)⁶. Ringed plover also occurs at Pegwell/ Sandwich Bay throughout the year, though is most numerous during autumn passage (in August and September). Numbers of ringed plover then remain reasonably stable from November - March, with another peak in numbers during spring passage in May. Golden plover returning from their breeding grounds, first appear in Pegwell Bay in July, with numbers gradually increasing to a peak from November - February, after which they begin to return north to breed, with the last few birds staying into April. Grey plover and sanderling share a similar pattern of seasonal occurrence in Pegwell Bay, with both species potentially being present in all months of the year. The first returning passage birds occur in July, with peak numbers from October - March, followed by spring passage birds in April and May.
- 3.1.5 Of the other species of waterbirds recorded during the WeBS counts (that are not qualifying or notified features of SPAs/ SSSIs), flocks of gulls are present in the Pegwell and Sandwich Bays throughout the year, with black-headed gull being the most abundant species (primarily July - March), followed by herring gull (throughout the year), common gull (September - March) and great black-backed gull (primarily September - March). A diverse range of other wader and wildfowl species were recorded in the area, including those that occur primarily in winter (brent goose, wigeon, teal, great crested grebe, lapwing and knot), during both the winter and passage periods (oystercatcher, curlew, bar-tailed godwit and dunlin) and those that only occur on passage and rarely winter (whimbrel, common sandpiper and greenshank). **Table 3.2** shows the five-year peak mean count for 2011/12-15/16 (Frost *et al.*, 2017⁷); the national threshold of importance for that species⁸; the percentage of the British population that the five-year peak mean

⁵ The WeBS Core Count survey season runs from July to June of the following year.

⁶ The terms 'winter' and 'passage period' are very loosely defined, as non-breeding birds can occur on migration (on passage) throughout the year; they do however, denote the peak periods when passage birds occur or over-wintering birds are present.

⁷ The 5-year peak mean provided in Frost *et al.* (2017) will often differ from that shown in Table C1, as this mean includes some additional counts undertaken outside the pre-defined WeBS core count survey dates.

⁸ Individual sites that support numbers in excess of 1% of the national (British) or international populations of that species. A wetland in Britain is considered nationally important if it regularly holds 1% or more of the estimated British population of one species, or subspecies of waterbird.

count represents; and the overall and peak periods of occurrence for each of the species that occur frequently in Pegwell and Sandwich Bays.

Table 3.2 Peak Counts of Waterbirds in Pegwell Bay

Species	5yr peak mean	GB threshold	% of GB population	Period of occurrence ⁹	Peak period ¹⁰
Mute swan	10	320	0.03%	All year	No peak
White-fronted goose	16	60	0.27%	Oct - Mar	No peak
Brent goose	1,532	910	1.68%	Sep - Apr	Oct - Mar
Shelduck	166	610	0.27%	All year	No peak
Wigeon	2,090	4,400	0.48%	Sep - Mar	Nov - Feb
Gadwall	52	250	0.21%	Nov - Apr	Dec - Mar
Teal	676	2,100	0.32%	Aug - Mar	Dec - Jan
Mallard	322	6,800	0.05%	All year	Nov - Feb
Pintail	28	290	0.10%	Sep - Feb	Dec - Jan
Shoveler	60	180	0.33%	All year	Nov - Mar
Pochard	24	380	0.06%	Oct - Mar	Jan - Feb
Tufted duck	78	1,100	0.07%	All year	No peak
Common scoter	130	1,000	0.13%	Aug-Mar	No peak
Red-throated diver	175	170	1.03%	Nov - Feb	Dec - Feb
Little grebe	17	160	0.11%	All year	Oct - Feb
Great crested grebe	216	190	1.14%	Nov - Apr	Dec - Mar
Cormorant	70	350	0.20%	All year	Aug - Jan
Little egret	42	45	0.93%	All year	Jul - Oct

⁹ The period when the species is regularly recorded in the area.

¹⁰ The period when the highest numbers of that species generally occur (based on the mean number of individuals recorded in that month during the 2000/01-15/16 period). No peak indicates that the species occurs in highly variable numbers across its period of occurrence.

Species	5yr peak mean	GB threshold	% of GB population	Period of occurrence⁹	Peak period¹⁰
Grey heron	10	610	0.02%	All year	No peak
Moorhen	17	3,200	0.01%	All year	No peak
Coot	53	1,800	0.03%	All year	Dec - Mar
Oystercatcher	883	3,200	0.28%	All year	Aug - Feb
Avocet	27	75	0.36%	All year	No peak
Ringed plover	154	340	0.45%	All year	Aug - Sep
Golden plover	2,537	4,000	0.63%	Jul - Apr	Oct - Mar
Grey plover	312	430	0.73%	Aug - May	Oct - Mar
Lapwing	9,093	6,200	1.47%	All year	Oct - Feb
Knot	304	3,200	0.10%	Jul - May	Nov - Mar
Sanderling	118	160	0.74%	All year	Oct - Mar
Dunlin	1,538	3,500	0.44%	All year	Aug - Apr
Snipe	91	10,000	0.01%	Sep - Apr	Oct - Feb
Black-tailed godwit	30	430	0.07%	All year	Aug - Nov
Bar-tailed godwit	282	380	0.74%	All year	Nov - May
Whimbrel	45	n/a	n/a	Jul - Sep, Apr - Jun	Jul - Aug, Apr - May
Curlew	507	1,400	0.36%	All year	Jul - Apr
Common sandpiper	72	n/a	n/a	All year	Jul - Aug
Green sandpiper	14	n/a	n/a	Jul - Oct, Apr - Jun	Jul - Aug
Greenshank	30	n/a	n/a	Jul - Nov, Apr - May	Jul - Sep
Redshank	159	1,200	0.13%	All year	Jul - Mar
Turnstone	46	480	0.10%	Jul - May	Nov - Apr

Species	5yr peak mean	GB threshold	% of GB population	Period of occurrence ⁹	Peak period ¹⁰
Black-headed gull	6,324	22,000	0.29%	All year	Jul - Feb
Mediterranean gull	30	n/a	n/a	All year	Jul
Common gull	1,361	7,000	0.19%	Jul - Mar	Dec - Feb
Lesser black-backed gull	90	1,200	0.08%	All year	Sep - Oct
Herring gull	2,209	7,300	0.30%	All year	Jul - Mar
Great black-backed gull	353	760	0.46%	All year	Sep - Feb
Little tern	63	n/a	n/a	Apr - Sep	Jul - Aug
Sandwich tern	825	n/a	n/a	Mar - Oct	Jul - Aug
Common tern	2,290	n/a	n/a	Apr - Sep	Jul - Aug

- 3.1.6 The WeBS data in Table 3.2 shows that a diverse range of waterbirds occur in the Pegwell/ Sandwich Bay areas throughout much of the year, though peak numbers of wildfowl and waders are generally present from November to February, with relatively high numbers also present in September, October and March. Outside these periods, high numbers of gulls and passage terns also occur in July and August. The lowest number of waterbirds are recorded in late spring and early summer (April - June), with June being the most 'quiet' period of the year, when the bird community primarily comprises: shelduck, mallard, oystercatcher, lapwing, curlew and a number of gull and tern species.
- 3.1.7 None of the species that form the qualifying interest of the Thanet Coast and Sandwich Bay SPA/ Ramsar site, or the notified interest of their constituent SSSIs (The Sandwich Bay to Hacklinge Marshes SSSI and the Thanet Coast SSSI) have been present in nationally important numbers in Pegwell/ Sandwich Bays in recent years (based on the five-year peak mean counts). However, the numbers of brent geese and lapwing (foraging/ resting on the intertidal habitat), and the numbers of red-throated diver and great crested grebe (foraging offshore) have been nationally important.

WeBS Low Tide Data

- 3.1.8 Data were also obtained from the most recent WeBS Low Tide survey of Pegwell and Sandwich Bays (involving four once-monthly counts undertaken from November 2008 to February 2009 inclusive). **Table C3** in **Appendix 5-4C** shows the peak count for each species in each of the seven count sectors, the locations of which are shown on **Figure 5.4.3.2b**.

3.1.9 Count sectors BG002 (which contains the bulk of the mudflats in Pegwell Bay) and BG007 (which contains the adjacent saltmarsh, mudflats and sandbanks at the mouth of the River Stour) received by far the highest level of use by waders and wildfowl (93% of the birds recorded), with some use of the intertidal habitats (sand and mud) exposed at low tide in BG003 adjacent to, and south of the River Stour (6% of birds). The exception to this were: sanderling, which were primarily recorded in BG003; ringed plover were widely distributed along the Pegwell and Sandwich Bay shorelines; turnstone were largely found in sector BG001, along the north-eastern fringe of Pegwell Bay; and great crested grebe were concentrated offshore in sector BG003.

KMBRC

3.1.10 KMBRC provided a total of 53,000 records of all bird species recorded within a search area of approximately 2 km from the Scoping report Option 1 (north) and Option 2 (south) since 2000, of which 68% of the records were from Pegwell Bay and 20% from Sandwich Bay. Records of Schedule 1 species, potentially breeding within the search area since 2000, included (also see the confidential Appendix F):

- ▶ Hobby (possible breeding in 2010);
- ▶ Quail (14 records, primarily at Sandwich Bay, with some potentially relating to breeding birds, rather than passage migrants);
- ▶ Little ringed plover (bred in Sandwich Bay in 2010);
- ▶ Barn owl (bred at Minster Sewage Treatment Works in 2013, and numerous other records (primarily from Pegwell Bay during the breeding season, indicating local breeding));
- ▶ Black redstart (possible breeding at Richborough Power Station in 2001); and
- ▶ Cetti's warbler (numerous breeding season records from a wide range of locations within the study area);

RSPB

3.1.11 No further records of protected or otherwise notable bird species were provided by RSPB.

Kent Ornithological Society (KOS)

3.1.12 Results from the Kent Breeding Bird Atlas 2008-13¹¹, indicate that six species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) potentially bred within the study area. These species were recorded in tetrads (2 x 2 km grid squares) located wholly or partly with the study area, and included:

- ▶ Hobby: possible breeding in two tetrads, potentially within the study area;

¹¹ The Kent Breeding Bird Atlas 2008-13 was a project undertaken to map the distribution of all bird species breeding in Kent at a tetrad (2 x 2 km National Grid Square) resolution. For each species recorded in each tetrad, the record was assigned as either 'confirmed', 'probable' or 'possible' breeding.

- ▶ Barn owl: confirmed breeding in three tetrads, and possible breeding in one tetrad, potentially within the study area;
- ▶ Cetti's warbler: confirmed breeding in four tetrads, and possible breeding in two tetrads, potentially within the study area; and
- ▶ Also see confidential Appendix F.

Natural England

- 3.1.13 Surveys for golden plover and lapwing were undertaken across a wide area of land from the north coast of Thanet, south to Sandwich Bay, involving twice-monthly counts of the area from November 2016 to March 2017 inclusive, and reported in Henderson & Sutherland (2017). This work was broadly a repeat of the surveys carried out in winter 2002/03 (Griffiths, 2004).
- 3.1.14 Results from the surveys undertaken in winters 2002/03 and 2016/17 showed that golden plover utilise both intertidal habitat and inland areas of farmland. A range of roost sites were identified, including Pegwell Bay, but also inland on arable and grassland/ pasture farmland. The level and type of use by golden plover in the 22 Recording Areas used for the 2016/17 surveys is provided in **Table C4 in Appendix 5-4C**, with the peak count of golden plover recorded in each Recording Area shown on **Figure 5.4.3.3**¹².
- 3.1.15 The only area where golden plover were potentially recorded within the study area was in Pegwell Bay (Recording Area 14), which was used by up to 1,000 roosting birds in winter 2016/17. Elsewhere, the main area for foraging golden plover was the farmland adjacent to the south and south-west of the study area.
- 3.1.16 Lapwing were also recorded during the 2016/17 survey. The peak and mean counts of lapwing in the Recording Areas within or adjacent to the study area are provided in **Table C5 in Appendix 5-4C**¹³. Within Recording Areas 4, 6, 7 and 12-15, lapwing were recorded on all but one of the ten survey visits from November 2016 to March 2017, with a peak total count of 3,819 lapwing noted within this area on 11 December 2016.

Sandwich Bay Bird Observatory

- 3.1.17 The recording area for the SBBO is largely located outside, albeit adjacent to the south of the study area, though regular counts of wildfowl and waders were obtained within the study area from Pegwell Bay. **Table C6 in Appendix 5-4C** shows the peak monthly counts of wildfowl and waders recorded in the SBBO recording area in 2015 (see **Figure 5.4.3.4**), the majority of which were recorded in Pegwell Bay, covered by Recording Compartment 1 (Ellis & Hodgson, 2016).
- 3.1.18 High counts of lapwing were also recorded in other parts of the SBBO recording area (outside Pegwell Bay) in 2015, with 3,000 birds in January in the Worth Recording Compartment No. 8 (located 4.5 - 5.5 km south of the study area); 2,000 in February in the Sandwich Estate Recording Compartment No. 6 (4 km south-east of the study area); and 2,300 - 4,000 birds present intermittently in the

¹² The location of the birds has been placed in the centre of the 1 km grid square; though the count could have occurred anywhere within the square.

¹³ During the survey, lapwing were recorded only to a 'Recording Area' level, with no precise location details provided.

New Downs Recording Compartment No. 4 (approximately 1 - 2 km south-east of the study area) from October to December. Golden plover were similarly recorded away from Pegwell Bay, with 1,060 birds on New Downs in October and 2,200 there in December 2015.

3.1.19 SBBO data also indicates that a number of other waterbird species occasionally occur in nationally important numbers in Pegwell Bay (in addition to those identified by the WeBS data), including:

- ▶ Cormorant: 386 birds were counted offshore of Pegwell Bay on 6 January 2015 (GB threshold = 350 birds);
- ▶ Little egret: 54 birds in Pegwell Bay on 31 August 2015 (GB threshold = 45 birds);
- ▶ Herring gull: 8,400 birds in Pegwell Bay on 4 December 2015 (GB threshold = 7,300); and
- ▶ Mediterranean gull: 60 birds in Pegwell Bay on 4 August 2015 (GB threshold = 18).

3.1.20 In 2014 and 2015, a number of Schedule 1 species were recorded breeding or potentially breeding in the SBBO recording area, including:

- ▶ Garganey: a pair of birds was recorded on Pegwell Bay in June 2015, indicative of possible breeding nearby;
- ▶ Quail: two calling males in July 2015, with five to seven males in 2014, of which four were at Worth;
- ▶ Avocet: five pairs bred at a single site in 2015, with six pairs there in 2014;
- ▶ Little ringed plover: two pairs bred in 2014 and 2015;
- ▶ Barn owl: two pairs in 2015, one pair in 2014;
- ▶ Kingfisher: one pair present in 2015, two breeding pairs in 2014;
- ▶ Cetti's warbler: 18 territorial males in the SBBO area in 2015, compared to 12 in 2014; and
- ▶ Black redstart: an adult and two juveniles were seen in July 2014, suggesting that breeding had occurred nearby.

3.1.21 Ringed plover is also a regular breeding species within the SBBO area (a species that is particularly vulnerable to disturbance), with at least five pairs present in 2014, including four along Princes beach (adjacent to the south-east of the study area) in 2014, and two pairs in the New Downs Area (also, 1 - 2 km south) in 2015.

Richborough Power Station

3.1.22 Breeding and non-breeding bird surveys have been undertaken (from 2010 - 2016) at and adjacent to the former Richborough Power Station (now the Richborough Energy Park) in order to inform EIAs into proposed decommissioning works and new development in the area. These surveys have been carried out within three discrete plots of land, named here as Plots A, B and C, all of which are either

wholly (Plot A) or partly (Plots B and C) within the study area (see **Figure 5.4.3.5** for their location). Plots A and B comprise of seasonally flooded grassland (grazing marsh).

Breeding Bird Survey 2016

3.1.23 Richard Wilson Ecology was commissioned in 2016 by Greengage Environmental LLP (working on behalf of AECOM) to undertake a breeding bird survey of Plots A and B, the results of which are provided in Wilson (2016). A total of five survey visits employing territory mapping methods (Marchant *et al.*, 1983) were completed from 22 April to 28 June 2016. The number of territories of each species recorded in Plots A and B respectively are shown in **Table C7** in **Appendix 5-4C**, with the results for sensitive species provided in the Confidential Annex in **Appendix 5-4F**.

Non-breeding Bird Survey 2010/11 and 2014/15

- 3.1.24 URS undertook a survey of non-breeding birds on Plots B and C in March 2010, and then from October 2010 to February 2011 inclusive, involving once-monthly visits to count the birds using pre-defined transects and vantage points, the results of which are presented in URS (2011). The surveys were undertaken during daylight hours and included a high tide period to determine whether wildfowl and waders were using the area at these times. A further non-breeding bird survey was undertaken at Plot B by AECOM, involving five visits completed from November 2014 to March 2015 inclusive, the results of which are provided in AECOM (2016). The method used involved walked transects undertaken during early morning periods of good weather around ditch boundaries, public footpaths and features across the survey area. **Table C8 in Appendix 5.4C** shows the peak counts of species of waterbirds, birds of prey and other specially protected and SPI recorded utilising the area (birds flying over have been excluded) during the 2010/11 and 2014/15 surveys respectively.
- 3.1.25 The level of use of the area by waterbirds in 2010/11 was much lower in Plot C than in Plot B which contained the disused reservoir in the north of the plot, and was partially flooded in late winter. The only record of golden plover was of a flock of 30 birds flying high over Plot B in January 2011, with no foraging or resting birds recorded within either plot during the surveys. Duck species were largely restricted to the disused reservoir in the north of Plot B, apart from in March 2011, when the adjacent fields were flooded. In 2014/15, a number of waterbirds, including shelduck, lapwing, curlew and redshank were recorded on the wet grassland in Plot B, and the waterbodies held low numbers of gadwall, shoveler, teal and Cetti's warbler in the associated marginal vegetation and scrub.

St Augustine Golf Course

3.1.26 A breeding bird survey using territory mapping methods was undertaken at the St Augustine Golf Course (wholly within the study area), involving three visits undertaken from April - June 2014, the results of which are provided in Bresso (2014). A winter (walkover) bird survey was also undertaken at the golf course, involving once-monthly visits in February 2014 and again in December 2014 and January 2015 (Bresso, 2016). **Figure 5.4.3.6** shows the survey area and

Recording Compartments used for both surveys. **Table C9** in **Appendix 5-4C** shows the number of territories recorded during the breeding bird survey in 2014, and the peak number of birds noted during the winter bird survey in 2014/15.

- 3.1.27 No species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded breeding on the golf course, though kingfisher was noted outside the breeding season (in Compartment H). Relatively low numbers of SPI/BoCC red-listed species were noted, including: cuckoo (one territory), dunnock (seven), song thrush (two), house sparrow (two) and linnet (one). The winter bird community recorded during the 2014/15 non-breeding bird survey, comprised of many resident species, known to breed both on-site and in the wider study area (including PSI: skylark, bullfinch and yellowhammer) but also non-breeding visitors such as lapwing, green sandpiper (in Compartment H), redwing and fieldfare.
- 3.1.28 The arable farmland (in Compartment I) held few birds during the survey, although a flock of lapwing roosted on one survey visit and numbers of starling foraged in the stubbles.

Nemo Link

Winter Bird Survey 2008/09

- 3.1.29 A winter bird survey was undertaken by TEP, entailed two surveyors mapping wader and wildfowl distributions within Pegwell Bay on an hourly basis for a complete tide cycle (from high to low tide, or low to high tide). The survey visits were undertaken once-monthly from November 2008 to March 2009 (inclusive) and in May 2009, with an additional visit being undertaken in February 2009 (six visits in total). The full results from the survey are provided in TEP (2010).
- 3.1.30 The most numerous bird species recorded during the 2008/09 survey were lapwing and golden plover followed by dunlin and oystercatcher, with a number of specific areas within Pegwell Bay identified as being regularly used by specific species, or holding a wide range of species for roosting or foraging. These included the following areas (all within the study area):
- ▶ The mudflats near the north bank of the River Stour;
 - ▶ The large area of saltmarsh immediately to the east of Stonelees;
 - ▶ Shellness;
 - ▶ The saltmarsh and grazing marsh on the south bank of the River Stour; and
 - ▶ The mudflats to the east of the bird hide at the south end of the Pegwell Bay country park.
- 3.1.31 The report concluded that the wildfowl and wader populations in Pegwell Bay would be most sensitive to disturbance from October to February (particularly for lapwing, golden plover, turnstone and grey plover) and also in May (for turnstone, sanderling and grey plover). The report also recommended that construction-related activities on the mudflats of Pegwell Bay avoid these periods where project timescales allow. It also strongly advised that no construction activities be undertaken in February when wintering birds would be especially sensitive to losing valuable feeding time due to disturbance, and that the cable laying routes

avoid the five sensitive areas described previously, regardless of time of year, since these areas are likely to be of importance for birds throughout the year. The survey findings indicate that the proposed cable laying works for the Nemo project would have the least impact on wader and wildfowl if they were restricted to the northern half of the Bay, though the area of shore known as Cliffsend supports a turnstone high tide roost of some importance throughout much of the year.

Breeding Bird Survey 2009

- 3.1.32 A (generic) breeding bird survey was also undertaken by TEP, which entailed two survey visits (on 8 May and 22 June 2009) focussing on Pegwell Bay Country Park and the area to the south known as Stonelees, as well as some peripheral habitats adjacent to the saltmarsh in the northern half of the Bay (see **Figure 5.4.3.7**). This was followed by a breeding redshank survey, entailed two visits on 29 May and 22 June 2009, focussed on all saltmarsh habitat within Pegwell Bay. The full results of both surveys are provided in TEP (2010a).
- 3.1.33 No species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded breeding, though a number of SPI/ BoCC red-listed species were holding territory and are likely to have bred, including: turtle dove (1 territory), dunnock (5-7), mistle thrush (1), song thrush (1-2), bullfinch (1) and reed bunting (1). However, these totals are likely to have under-estimated the true population due to the low number of visits, and lack of survey visits being carried out in the first half of the breeding season, in late March and April.
- 3.1.34 The redshank nesting survey undertaken in 2009 confirmed that eight to ten pairs of redshank bred on saltmarsh habitat within Pegwell Bay to the north of the River Stour, within three localities (named Areas A, B and C respectively, and shown on **Figure 5.4.3.7**):
- ▶ Two pairs: in the saltmarsh around the pool immediately to the north of Pegwell Bay Country Park. The pools also provide an important feeding area for redshank breeding in other parts of the bay, as well as non-breeding birds;
 - ▶ Minimum of three pairs of redshank and one pair of oystercatcher in a mown strip of saltmarsh habitat immediately east of the hide in the Pegwell Bay Country Park; and
 - ▶ Minimum of three pairs of redshank and one pair of oystercatcher in the large area of saltmarsh habitat located to the south of Pegwell Bay Country Park, and to the north of the River Stour.
- 3.1.35 The report recommended that no construction related activities be undertaken in the areas of saltmarsh used by redshank and oystercatcher during the nesting season for these species (from mid-April to mid-July).

3.2 Field Survey

Winter Bird Survey

- 3.2.1 Full details of the results of the non-breeding bird surveys undertaken by APEM in winter 2016/17 are provided in **Appendix 5-4D**.

- 3.2.2 No species that form the qualifying interest of the Thanet Coast and Sandwich Bay SPA / Ramsar site, or notified features of Sandwich Bay to Hacklinge Marshes SSSI were recorded during the Pegwell Bay onshore transect survey, and in general very low numbers of waterbirds were noted.
- 3.2.3 During the vantage point watches (from the two northern observation points overlooking Pegwell Bay), grey plover and sanderling were recorded on all survey visits, with peak counts of 146 grey plover (in November) and 76 sanderling (in February). Golden plover were recorded on all but one of the five visits, with 670 birds in November and 405 in December, after which numbers declined to 10 in January, 65 in February and none in March. Very few turnstone and ringed plover were noted, with peak counts of 8 of each species.

Breeding Bird Survey

- 3.2.4 Six visits of the study area and a 100 m buffer area around its boundary (the CBC Area) were completed from late March to early June 2017, the dates, times and weather conditions of which are provided in **Table E1** in **Appendix 5-4E**. The locations of the territories recorded during the survey are shown on **Figures 5.4.3.8a-e**. The territory locations shown, indicate the approximate central location of where the birds for that territory (singing males, pairs of birds in suitable habitat, etc.) were recorded during the survey visits. The figure does not show the precise location of the nests, unless the nest was inadvertently found during the territory mapping. Searching for nest locations does not form part of the territory-mapping methods used.
- 3.2.5 A total of 68 species were recorded as breeding or are likely to have bred within the CBC Area in 2017, including:
- ▶ Five species listed on Annex I of the Birds Directive: including shelduck and little egret (also see **Confidential Appendix 5-4F**);
 - ▶ Four species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended): including Cetti's warbler (also see **Confidential Appendix 5-4F**);
 - ▶ 14 SPI (as listed on Section 41 of NERC): grey partridge, herring gull, turtle dove, cuckoo, skylark, yellow wagtail, dunnoek, song thrush, starling, house sparrow, bullfinch, linnnet, yellowhammer and reed bunting;
 - ▶ 13 BoCC Red-listed species: grey partridge, herring gull, turtle dove, cuckoo, skylark, yellow wagtail, nightingale, song thrush, mistle thrush, starling, house sparrow, linnnet and yellowhammer; and
 - ▶ Six Kent LBAP Priority Species: grey partridge, cuckoo, yellow wagtail, house sparrow, yellowhammer and reed bunting.
- 3.2.6 The number of territories of each species recorded within the CBC Survey Area are provided in **Table G1** in **Appendix 5-4G**. Further details on the distribution and utilisation of the different habitats within the study area by these and other species is presented, as follows.

Schedule 1 Species

3.2.7 A total of 46 territories of Cetti's warbler were identified and associated with wet scrub habitats, with numbers concentrated in broad two areas: (i) along the banks of the River Stour and the adjacent ditches to the south and west, and the adjacent wet scrub to the west of the Richborough Energy Park, and (ii) the southern end of Pegwell Bay Country Park/ Stonelees (see **Figure 5.4.3.8a**). Details for the other Schedule 1 breeding species recorded are provided in the **Confidential Appendix 5-4F**.

Other SPI / BoCC Red-listed Species

- 3.2.8 A total of three pairs of grey partridge were located on the St Augustine's and Stonelees golf course and in the adjacent fields of oilseed rape, with a fourth pair on the grazing marshes in the far south of the study area. Other species associated with the open arable and grazing marsh farmland included: yellowhammer, yellow wagtail and skylark. Four territories of yellowhammer were identified in the farmland to the north of Westerlees Hill, and there were two yellow wagtail territories, one to the north of Westerlees, and another in wheat fields to the south of the River Stour. Skylark were concentrated in two areas, in the wheat fields north of Westerlees and the grazing marsh in the south of the study area, with two territories also on the saltmarshes east of Stonelees.
- 3.2.9 The extensive areas of scrub between Westerlees Hill and the Richborough Energy Park held a diverse range of bird species including turtle dove (five territories) and nightingale (nine territories). Nightingale and turtle dove (two territories each) were also found at Stonelees, with single nightingale also located in scrub at the northern end of Pegwell Bay Country Park and along the River Stour by Richborough Port. Linnet were found across the study area, with concentrations in the scrub at Pegwell Bay Country Park and the adjacent golf courses, and around Westerlees and the River Stour in the west. Likewise, dunnock and song thrush were widely distributed, found in scrub, woodland and gardens throughout the area.
- 3.2.10 Herring gull, house sparrow and starling were restricted to, or concentrated around the human dwellings in Cliffsend village, and there were scattered pairs of bullfinch in the hedgerows and scrub, and mistle thrush favoured the short grassland on the golf course, which provided an important foraging habitat for the species. Reed bunting were associated with three main habitat types, being found in the open, ditch-dissected farmland south of the River Stour; in the oilseed rape adjacent to the north of the golf courses; and in the saltmarsh around Pegwell Bay. Calling male cuckoos were heard across the Study area, being concentrated in the areas of scrub around Westerlees, Pegwell Bay Country Park and the golf courses, though the 17 territories recorded is likely to be an over-estimate due to the mobile nature of this species, and its far-reaching call. The locations of the territories of these species is shown on the following figures:
- ▶ **Figure 5.4.3.8b** – herring gull, grey partridge, turtle dove and cuckoo;
 - ▶ **Figure 5.4.3.8c** – skylark, yellow wagtail, song thrush and mistle thrush;
 - ▶ **Figure 5.4.3.8d** – dunnock, nightingale, starling and house sparrow; and
 - ▶ **Figure 5.4.3.8e** – bullfinch, linnet, reed bunting and yellowhammer.

Other Species

- 3.2.11 The areas of scrub adjacent to the west of Richborough Energy Park held a heronry, with a minimum of three pairs of grey heron and two of little egret nesting there in 2017. A diverse range of species were associated with the dry scrub habitats, including: garden warbler, lesser whitethroat and whitethroat, plus a range of typical resident species such as wren, dunnock and blackbird. The numerous ditches around the farmland and scrub, particularly in the south and west held high densities of reed warbler and sedge warbler. Three other bird of prey species were recorded as breeding or are likely to have bred: buzzard, kestrel and sparrowhawk. A number of species associated with wetland habitats were noted, along the River Stour, the adjacent disused reservoir and golf course ponds and ditches, including mute swan, mallard, moorhen and coot. Two pairs of tufted duck were present on the golf course ponds, and may have bred, though the survey period did not cover the month of July, when broods of this late-breeding species are most likely to be seen. A water rail was heard calling from waterside vegetation in the disused reservoir, and given that suitable habitat was present, may have attempted to breed.
- 3.2.12 The intertidal saltmarshes that fringe the mudflats of Pegwell Bay, within the study area held seven pairs of redshank and three pairs of oystercatcher, and a total of four pairs of shelduck were present within the study area (primarily near the disused reservoir) and may have bred (see **Figure 5.4.3.8f**).

Other Non-breeding Species, and Congregations of Non-breeding Birds Recorded

- 3.2.13 A further 25 species were recorded during the breeding bird survey in 2017 for which no evidence of breeding was obtained. Of these, the mudflats of Pegwell Bay held a number of wildfowl and wetland species that do not breed in the area, but use the intertidal habitats for foraging and roosting outside the breeding season, both in winter and the passage periods. Peak counts, (all in April), included: oystercatcher (44 birds), curlew (41); shelduck (60) and whimbrel (8); a flock of 16 grey plover and 3 common sandpiper were noted on 9 May and low numbers of mallard (24 birds), teal (2) and shoveler (4) were occasionally recorded. Very few non-breeding species were seen on the intertidal areas during the second half of May and in June, although no systematic counts of non-breeding birds were undertaken within Pegwell Bay, and these records are ad-hoc observation of birds in the area. Also of note was a flock of 185 starlings foraging in the saltmarsh adjacent to the Pegwell Bay Country Park on 6 June.
- 3.2.14 Of the species that are known to breed, or could potentially breed within or close to the study area (based on information obtained from Clements *et al.*, 2015), occasional greylag goose, lesser black-backed gull, house martin and jackdaw were noted; a little grebe was seen on the disused reservoir on 26 March, and shoveler (seen on Pegwell Bay) has been recorded breeding in the study area. Hobby was seen hunting over the study area on three dates: 9 May, and 8 and 9 June, and although this species has been recorded as possibly breeding in the study area during the 2008-13 Atlas period, there was no evidence to suggest that breeding had taken place nearby in 2017 due to the lack of records. A red kite (a potential, future breeding species in the area) was seen flying over Richborough Port on 12 April, and an avocet was seen on the Stonelees saltmarshes on 22 March; this species having recently bred close by to the south of the study area.

The only record of golden plover was of a single flying over the Stonelees Golf Course on 27 March. The remaining species listed in Table C10 are likely to be lingering winter visitors (great black-backed gull and redwing), non-breeding visitors (cormorant, common tern, spoonbill and grey wagtail) or passage migrants (wheatear, siskin and crossbill) to the area.



4. Key Species Summary

4.1 Schedule 1 Breeding Species

Cetti's Warbler

- 4.1.1 Cetti's warbler is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and as a consequence, is afforded special protection from disturbance at the nest site during the breeding season (see Appendix B). The UK population was estimated to be 2,000 territorial males in 2006-10 (Musgrove *et al.*, 2013), and 500 - 1,000 pairs in Kent during 2008-13 (Clements *et al.*, 2015), though both of these are likely to under-estimate the current population of this species. Cetti's warbler first bred in Kent in 1968, and increased to 108 pairs in 1978, after which a series of cold winters caused near extinction in the county by 1988. Cetti's warblers re-colonised Kent in the 1990s and had increased to an estimated 400 - 500 pairs by 2007. However, further cold winters in 2009/10 and 2010/11 caused declines across much of the country, including in Kent, after which the UK population is likely to have declined to approximately 1,500 pairs (Holling, 2015) though it has increased again since. During the Kent Atlas period of 2008-13, the population in Kent was largely restricted to the north Kent marshes, the Stodmarsh area, Sandwich/ Pegwell Bays and the Romney Marshes in the south.
- 4.1.2 Therefore the 46 pairs recorded in the study area in 2017 represent 4.6 - 9.2% of the Kent population, and 2.3% of the estimated UK population of 2,000 pairs.

Other Possible Breeding Species

Barn Owl

- 4.1.3 Barn owl is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). The Kent bird atlas 2008-13 indicates that barn owl potentially breeds with the study area, and that the county population is 100 - 200 pairs, up from 50 - 100 pairs during the 1988-94 atlas (Clements *et al.*, 2015). Barn owl was not recorded in the study area during the breeding bird survey in 2017, and is not mentioned as occurring in Wilson (2016). However, the species is known to breed in the area (including within the adjacent SBBO recording area) and KMBRC data includes numerous records of the species during the breeding period (March-September). In addition, the methods used for the breeding bird surveys undertaken within the study area (including those in 2017) are not designed to detect largely nocturnal or crepuscular species such as barn owl.
- 4.1.4 There is likely to be suitable nest sites for barn owl within the study area and therefore breeding in the area cannot be entirely discounted.

Black Redstart

- 4.1.5 Black redstart is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and possibly bred at the Richborough Power Station in 2001, and within the SBBO recording area in 2014. Confirmed breeding was also recorded in the tetrad in which part of the study area is located during the 1988-94 Kent Breeding

Bird Atlas (Clements *et al.*, 2015). The buildings and industrial areas in the south of the study area provide suitable breeding habitat for black redstart (pers. Comm. Martin Sutherland¹⁴). In view of this, the occurrence of breeding black redstart within the study area cannot be entirely discounted.

4.2 Qualifying Species of SPAs/ Ramsar Sites

Golden Plover

- 4.2.1 Golden plover is listed on Annex I of the Birds Directive. The Thanet Coast and Sandwich Bay SPA was originally designated in part for the internationally important non-breeding population of golden plover that it supports and nationally important numbers of non-breeding golden plover are notified features of the Sandwich Bay to Hacklinge Marshes SSSI and the Thanet Coast SSSI. However, as part of the third JNCC SPA review (Stroud *et al.*, 2016), golden plover was removed as a designated species from the SPA (likely due to declining numbers), although this change is to date unratified. The UK population was estimated to be 420,000 birds in winter (Musgrove *et al.*, 2013).
- 4.2.2 Results from the desk study, and in particular from Henderson & Sutherland (2017) indicate that golden plover roost in Pegwell Bay, and forage (and roost) on farmland across a much wider area from Sandwich Bay to the north Thanet coast; all which form part of the SPA population of this species. The desk study provided no evidence to indicate that golden plover utilise farmland within the study area to any extent, with only occasional birds recorded. The numbers of golden plover occurring in the Thanet area has varied greatly between years, and is currently at a low ebb (Henderson & Sutherland, 2017). The same study found that three main habitats were used by roosting golden plover: cereals (39% of birds), intertidal (34%) and wetlands (21%), whereas for foraging birds it was cereals (54%), pasture (31%) and ploughed/bare land (15%).
- 4.2.3 Golden plover do not usually remain faithful to a single location/ area throughout the winter but tend to use a number of sites dependant on food availability and weather conditions (Percival, 2007). The birds are very much dependent upon the presence of suitable foraging areas during autumn and winter. Mason & MacDonald (1999), in their study of wintering populations of golden plover and lapwing in north-east Essex, found that the former species showed a strong association for winter cereals, with much of the foraging activity in fields of cereal less than 100 mm in height. Kirby (1997) identified many other factors that might influence the changing use of a site by golden plover (and lapwing). One of the main food sources for both species are earthworms, which occur in much higher densities in the early stages of an arable crop rotation, with very few present in fields that have been under continuous arable cultivation for three or more years (Kirby, 1997). Large open fields are most favoured (Kirby 1997, Mason & MacDonald 1999) and during prolonged periods of hard weather, when the ground has been frozen for at least three days, lapwing and golden plover move from arable fields to grassland, where invertebrate prey remains more accessible. Where grassland is not present, the birds often leave the area for warmer climes

¹⁴ Martin Sutherland has lived in the Sandwich / Pegwell area for many years, and undertaken an extensive range of bird surveys in the area for Natural England and the SBBO.

such as in France and on the Iberian Peninsula (Kirby, 1997). However, it should be noted that these studies and the winter bird surveys described in the desk study in this report, focus on the use of habitats during the day, and that golden plover are known to use different habitats to forage in, during the night (Gillings *et al.*, 2005).

- 4.2.4 Golden plover can be present in the Pegwell Bay area from late July to early April, though peak numbers generally occur from November to February. The five-year peak mean WeBS core count for Pegwell Bay/ Sandwich Bay (for 2011/12-2015/16) of 2,537 golden plover, does not exceed the national threshold of importance for this species (4,000 birds). However, a peak count of 4,270 birds was recorded in the SBBO area in 2015, indicating that nationally important numbers of golden plover still occasionally occur in the area. Elsewhere in Kent, peak counts of golden plover in 2014 included: Medway Estuary (5,000 birds), Swale Estuary (7,240), and the Walland Marsh (3,000), Privett [ed] 2016.
- 4.2.5 The overwinter bird surveys (**Appendix 5-4D**) recorded no golden plover in the onshore transect surveys within 500 m of the RLB. The intertidal surveys recorded a peak count 670 non-feeding birds roosting on the edge of the saltmarsh in the central section of Pegwell Bay during the November 2016 survey with a peak count of 250 feeding birds on the mud and sand flats of the central section of Pegwell Bay recorded during the December survey. An overview of the distribution of golden plover concentrations throughout the entire survey period is provided in Figure 3 of **Appendix 5-4D**.
- 4.2.6 Golden plover activity was concentrated in areas within the intertidal corridor RLB; on the saltmarsh and intertidal land in the central section of Pegwell Bay (which consistently held the highest numbers), on the intertidal land north of Shell Ness and on the intertidal land east of Shell Ness.
- 4.2.7 The numbers of golden plover currently roosting in Pegwell Bay are rarely of national importance, although they are clearly of importance in terms of the county and SPA/ SSSI population. The numbers occurring in the study area will be dependent upon suitable foraging habitat being present, but also on weather conditions both locally and further afield in Continental Europe. There is no evidence to indicate that the farmland within the study area is used by important numbers of golden plover on a regular basis, either for foraging or roosting with the only key concentration record within the IAol.

Turnstone

- 4.2.8 The Thanet Coast and Sandwich Bay SPA and Ramsar site are designated for their internationally important numbers of non-breeding turnstone. The SPA qualifying population of turnstone (of 940 individuals, 5-year peak mean counts from 1991/92-1995/96) represent 1.4% of the Western Palearctic population. The UK population was estimated to be 51,000 birds in winter (Musgrove *et al.*, 2013). Turnstone almost exclusively occur in coastal habitats, foraging and resting on rocky shorelines and beaches, but will also forage along the tidelines on sandy beaches and on mudflats.
- 4.2.9 Results from the Thanet Coast Turnstone Monitoring Report (Hodgson, 2016), involving six surveys undertaken from 2001-2010, indicated that the SPA population of turnstone varied from 1,087 to 1,335 birds, with a mean of 1,227.

This was followed by another coordinated count in 2013 which suggested that a marked decline has occurred, with just 620 turnstone counted. Further coordinated counts in winter 2013/14 (two counts) and latterly in 2016 (single count) confirmed this decline, with 583, 664 and 537 birds recorded respectively. It was suggested in Hodgson (2016) that prior to high tide, turnstones from the Thanet Coast and Sandwich Bay SPA flew to join a roost, 2.5 km west of Whitstable Harbour on the north Kent coast, within the Swale SPA and some 18 km north-west of the study area. This suggestion was based on results from coastal survey plots. It would therefore appear that the birds, as would be expected for this species, are following the coastline around Thanet and not undertaking any overland movements. Tabulated survey results from the report indicate that turnstone concentrations within the Thanet Coast and Sandwich Bay SPA occur mainly across the northern extremities of the SPA, heading west toward Whitstable, with Pegwell Bay supporting only a small proportion of the total SPA population. This is supported by data from WeBS core and low tide counts, results from the winter bird surveys in 2016-17 and from SBBO data, all of which indicate that Pegwell Bay supports relatively low numbers, and a small proportion of the SPA population of turnstone. Elsewhere in Kent, peak counts of turnstone in 2014 included: the Medway Estuary (245 birds), Swale Estuary (556) and Herne Bay (186), all along the north Kent coast (Privett [ed] 2015).

- 4.2.10 The numbers of turnstone using Pegwell Bay for roosting and foraging do not exceed the threshold of national importance, though are clearly important in terms of the county population and turnstone are qualifying features for the Thanet Coast and Sandwich Bay SPA and Ramsar

Little Tern

- 4.2.11 Little tern is listed on Annex I of the Birds Directive and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). The UK population of breeding little tern was estimated to be 1,900 pairs during the Seabird 2000 census (Musgrove *et al.*, 2013). A breeding population of six pairs of little tern is a qualification feature of the Thanet Coast and Sandwich Bay SPA, and a notified feature of the Thanet Coast SSSI. However, as part of the third JNCC SPA review (Stroud *et al.*, 2016), little tern was removed as a designated species of the SPA, due to recent extirpation from the SPA, although this change is to date, unratified.
- 4.2.12 Historically, little terns have bred at two sites within the SPA: in Pegwell Bay and Minnis Bay (approximately 8 km north west of the study area). During the Kent Bird Atlas 1988-94, breeding was confirmed in two tetrads (2 x 2 km National Grid squares) in each of Minnis Bay and Pegwell Bay (Clements *et al.*, 2015). Breeding appears to have ceased in Pegwell Bay soon afterwards, with none reported in 1996 (Kent bird report). At the time of the national Seabird Census undertaken from 1998-2002 (Seabird 2000), four pairs of little tern were still breeding at Plumbpudding Island in Minnis Bay, with breeding also noted further afield in Kent (outside the SPA) on the Medway Islands (14 pairs) and at Shellness on the Isle of Sheppey (20). Breeding was not noted in Minnis Bay in 2004 or 2006 (Kent bird reports) and little tern was not recorded as breeding anywhere in Kent in 2014, though the species were still noted as a passage migrant in Sandwich Bay (Privett [ed] 2015, 2016).

- 4.2.13 The main cause for the disappearance of this species as a breeding bird from Pegwell Bay is likely to be disturbance from humans and their activities, including dog walkers, bait-diggers and people in boats. The Pegwell Bay little tern colony was located in the south of Pegwell Bay, at the mouth of the River Stour, where suitable nesting sites are still available. However, given the continued and unresolved problem of human disturbance, it is unlikely that little tern will successfully re-colonise the area in the future.

4.3 Notified Species of SSSIs

Ringed Plover

- 4.3.1 Non-breeding ringed plover are a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI, due to nationally important numbers occurring there during the passage periods. The UK population of ringed plover is estimated to be 36,000 birds in winter (Musgrove *et al.*, 2013). WeBS core count data indicates that the numbers of ringed plover using Pegwell/ Sandwich Bays in winter and passage has declined since 2000-05. Ringed plover are recorded in Pegwell Bay in all months of the year, though peak numbers generally occur during autumn passage in August - September, with reasonably consistent (albeit lower) numbers occurring from October through to March, with another spike in numbers during spring passage in May. Results from the most recent WeBS Low Tide Survey in winter 2008/09 and results from the winter bird surveys undertaken in 2016-17 indicate that ringed plover are widely distributed across the Pegwell and Sandwich Bays in winter.
- 4.3.2 Ringed plover almost exclusively utilise coastal and intertidal habitats outside the breeding season, foraging on open mudflats, shorelines and beaches individually or in loose scattered groups, and roosting in larger flocks on nearby saltmarshes and other intertidal habitats above the high water mark. The species is very rarely recorded inland during winter, though in the breeding season, birds will nest on inland water bodies as well as coastal beaches (Brown & Grice, 2005).
- 4.3.3 The five-year peak WeBS core count of ringed plover in Pegwell Bay and Sandwich Bay for 2011/12-2015/16 is 154 birds, though the peak count in the SBBO Recording Area (which covers a similar extent of intertidal habitat was 350 birds in 2015. This latter count exceeds the threshold for national (Great Britain) importance of 340 birds (www.bto.org). Elsewhere in Kent, other key sites for the species in winter/ passage occur along the north coast, and include (peak counts for 2014 in parenthesis, Privett [ed] 2016): Isle of Sheppey/ Swale Estuary (762 birds), Thames Estuary (371) and Minnis Bay (191).
- 4.3.4 The numbers of ringed plover occurring in Pegwell Bay are occasionally of national importance during autumn passage (August-September), and are important in terms of the county population during winter and spring passage (October-May).

Grey Plover

- 4.3.5 Non-breeding grey plover are a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI, due to nationally important numbers occurring there during winter. The UK population of grey plover is estimated to be 43,000 birds in winter

(Musgrove *et al.*, 2013). Grey plovers are generally recorded in Pegwell Bay from August to May, with peak numbers occurring from October - March, though birds are also present during spring passage in April-May. WeBS Core Count data for the Pegwell/ Sandwich Bays show that numbers of grey plover have changed little over the past 15 years, and the WeBS Low Tide counts and results from the winter bird surveys undertaken in 2016-17 show that the species is primarily found in Pegwell Bay, and the mudflats adjacent to the south of the River Stour (i.e. within the study area).

- 4.3.6 Grey plover is almost exclusively found on intertidal habitat, foraging in loose flocks across the mudflats, and roosting at high tide on the adjacent saltmarsh and sand banks. Elsewhere in Kent, other key sites for the species in winter occur along the north coast, and include (peak counts for 2014 in parenthesis, Privett [ed] 2016): Swale Estuary (1,214 birds), Medway Estuary (610) and Thames Estuary (305).
- 4.3.7 The numbers of grey plover occurring in Pegwell Bay occasionally exceed the threshold of national (GB) importance in winter, and are clearly of importance in terms of the county population.

Sanderling

- 4.3.8 Non-breeding sanderling are a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI, due to nationally important numbers occurring there during winter. The UK population of sanderling is estimated to be 17,000 birds in winter (Musgrove *et al.*, 2013).
- 4.3.9 Sanderling are recorded in Pegwell Bay in all months of the year, though peak numbers occur during winter from November - March, with birds also present during the spring and autumn passage periods (April - May and August - September respectively). The species is almost exclusively found in coastal areas, most often foraging along sandy shorelines and roosting at high tide on adjacent saltmarshes, beaches and sand banks. WeBS Core Count data for the Pegwell/ Sandwich Bays show that numbers of sanderling have changed little over the past 15 years, and the WeBS low tide counts show that the species is widely distributed in the area. Elsewhere in Kent, other key sites for the species in winter occur along the north coast, and include (peak counts for 2014 in parenthesis, Privett [ed] 2016): the coastline around Thanet (410 birds), Minnis Bay (306) and the Swale Estuary (169). However, the highest count was noted on the coastline around Dungeness where a peak count of 520 birds.
- 4.3.10 The numbers of sanderling occurring in Pegwell Bay rarely exceed the threshold of national (GB) importance in winter, though are clearly of importance at a county level.

4.4 SPI/ BoCC Red-listed Breeding Species

Turtle Dove

- 4.4.1 Turtle dove is a SPI to conservation (as listed on Section 41 of NERC) and is BoCC red-listed due to a severe long-term decline in the UK breeding population. Numbers of turtle dove have declined in the UK by 93% since 1995, and by 80% in

the South East England Region, which includes Kent (Harris *et al.*, 2016). The county population was estimated at 2,000 - 3,000 pairs during 2008-13 (Clements *et al.*, 2015) though given the continued decline, the true figure is now likely to be less than 2,000 pairs.

- 4.4.2 A total of eight territories were located within the study area in 2017, representing a minimum of 0.4% of this county total. Of these, five territories were in the extensive area of scrub between the Richborough Energy Park and Wetherlees Hill.

Nightingale

- 4.4.3 Nightingale has recently been BoCC Red-listed in Eaton *et al.* (2015) due to a decline in the national breeding population. The numbers of nightingale in Kent have changed little between the last two national census' for the species, from an estimated 1,450-1,575 in 1999 to 1,450-1,550 in 2012 (representing approximately 25% of the UK population), though the 1999 census is considered to be an underestimate (Henderson & Orton 2015, Wilson *et al.* 2002). Nationally, the population in 2012 was estimated to be 5,799 - 5,919 territories (Henderson & Orton, 2015). The distribution of breeding records in Kent have also changed little between 1999 and 2012, with nightingale being concentrated across the south-west, north-west and around Canterbury, but sparsely distributed in the Sandwich and Pegwell Bay coastal area, including around the study area. There has been a continued shift away from the use of woodland for breeding in Kent, with greater use of scrub. In 1999, 43% of breeding nightingale were located in woodland in Kent and 39% in scrub, compared to 30% and 51% respectively in 2012 (Henderson & Orton, 2015).
- 4.4.4 The total of 13 nightingale territories located in the study area in 2017 were primarily located in the area of dense scrub between the Richborough Energy Park and Wetherless Hill, and represent 0.8 - 0.9% of the county population.

Other PSI / BoCC Red Listed Breeding Species

- 4.4.5 A further 13 SPI and/ or BoCC Red-listed species were recorded breeding in the study area in 2017. The importance of these species' populations in terms of their respective county populations (from Clements *et al.*, 2015) is provided in **Table 4.1** together with the main habitats the species are utilising for breeding.

Table 4.1 Importance of the Study Area to SPI/BoCC Red-listed Species

BTO species code	Species name	No territories	County population (from – to)		% of county population (from – to)		Habitats
P.	Grey partridge	4	600	1,200	0.3%	0.7%	Arable fields & the golf courses
HG	Herring gull	5	4,000	8,000	0.1%	0.1%	Residential areas of Cliffsend village

BTO species code	Species name	No territories	County population (from – to)		% of county population (from – to)		Habitats
S.	Skylark	14	20,000	28,000	0.1%	0.1%	Farmland and saltmarsh
YW	Yellow wagtail	2	1,000	2,000	0.1%	0.2%	Open farmland
D.	Dunnock	125	40,000	65,000	0.2%	0.3%	Gardens, hedges, woodland and scrub
ST	Song thrush	43	22,000	27,000	0.2%	0.2%	Gardens, hedges, woodland and scrub
M.	Mistle thrush	5	3,000	5,000	0.1%	0.2%	Woodland and golf courses
SG	Starling	24	20,000	70,000	0.0%	0.1%	Residential areas of Cliffsend village
HS	House sparrow	87	120,000	145,000	0.1%	0.1%	Residential areas of Cliffsend village
BF	Bullfinch	14	4,000	6,000	0.2%	0.4%	Hedges, woodland and scrub
LI	Linnet	53	10,000	15,000	0.4%	0.5%	Hedgerows and scrub
RB	Reed bunting	40	7,000	13,000	0.3%	0.6%	Ditches, oilseed rape and saltmarsh
Y.	Yellowhammer	4	15,000	20,000	0.0%	0.0%	Hedgerows in open farmland

None of the populations of SPI and/ or BoCC Red-listed (listed in Table 4.1) within the study area are likely to be important in terms of their respective county (Kent) populations.

4.5 Other Species Associated with Intertidal Habitats in Pegwell Bay

Non-Breeding

4.5.1 The intertidal habitats of Pegwell Bay (principally mudflats and saltmarsh), provide suitable habitat for a wide range of non-breeding waterbirds (that do not form the qualifying/ notified interest of local SPAs/ SSSIs) throughout much of the year. The importance of the numbers of these waterbird species in Pegwell Bay, and their seasonal occurrence is discussed further in this section.

4.5.2 An analysis of WeBS data (see **Table C2** in **Appendix 5-4C**) and information provided by the SBBO show that Pegwell Bay is used by the highest numbers of foraging and roosting waders and wildfowl from October - March, though some species also occur in potentially important numbers during autumn passage (August - September) and spring passage (April - May). Numbers of tern species (primarily Sandwich and common tern, but also lower numbers of little tern) peak in July and August, and numbers of black-headed gull and herring gull are also at high levels during these months. Four species have been identified as occurring in nationally important numbers in Pegwell Bay in recent years, as follows:

- ▶ Brent goose: foraging on the mudflats in Pegwell Bay, and loafing on the inshore waters at high tide, primarily from October to March;
- ▶ Red-throated diver: flocks of birds foraging offshore in Pegwell Bay, primarily from December to February;
- ▶ Great crested grebe: flocks of birds foraging offshore, primarily from December to March; and
- ▶ Lapwing: flocks of roosting birds on the mudflats and adjacent saltmarsh, primarily from October to February. The arable farmland and grazing marshes in the west of the study area (part of the eastern part of the Ash Levels) were also used by relatively low numbers of lapwing during winter.

4.5.3 A review of the SBBO data and results from the 2016\ 2017 surveys (**Appendix 5-4**) have identified a further six species that have occurred in national (or near national) important numbers in Pegwell Bay over the past five years, but on a more infrequent basis: cormorant, little egret, bar-tailed godwit, Mediterranean gull, great black-backed gull and herring gull. In addition, Pegwell Bay provides an important stop-over location for migrant waders, in particular, for whimbrel, greenshank and common sandpiper during autumn passage, from July to September. For the remaining species of wildfowl, waders and gulls that occur regularly in the area, Pegwell Bay clearly supports county important numbers of these species outside the breeding season (based on the peak counts at key sites in Kent, provided in Privett [ed] 2015, 2016), including:

- ▶ Wildfowl: shelduck, wigeon, teal, shoveler, mallard and common scoter;
- ▶ Waders: oystercatcher, grey plover, knot, dunlin, curlew and redshank;
- ▶ Terns: Sandwich tern, common tern and little tern; and
- ▶ Gulls: Black-headed gull and common gull.

Breeding Season

Shelduck

4.5.4 Four pairs of shelduck were present in the study area during the breeding bird survey in 2017, of which three were near the disused reservoir south of Wetherlees Hill, and another on the saltmarsh east of Stonelees. No broods of young were seen during the survey undertaken from late March to early June, though this species is a relatively late-breeder, with young often not present until late June and July.

- 4.5.5 The four pairs of shelduck recorded in the study area represent 0.9 - 1.3% of the estimated county population of 300-450 pairs (Clement *et al.*, 2015).

Oystercatcher

- 4.5.6 Three pairs of oystercatcher were present in the study area during the breeding bird survey in 2017, all located on the saltmarsh of Pegwell Bay, from Stonelees, north to Cliffsend Point. No broods of young were seen during the surveys during late March to early June, though territorial behaviour observed from these pairs of birds indicate that breeding was attempted.
- 4.5.7 The three pairs of oystercatcher within the study area represent just 0.3% of the estimated county population of 600-800 pairs (Clement *et al.*, 2015).

Redshank

- 4.5.8 Seven pairs of redshank were present in the study area during the breeding bird survey in 2017, with 8-10 pairs located in a similar area in 2009 (TEP 2010a). The redshank that were recorded breeding in 2017 were located in two areas of saltmarsh around Pegwell Bay, with five pairs in the larger block of this habitat east of Stonelees and south of Pegwell Bay Country Park, with a further two pairs in saltmarsh adjacent to the northern end of the country park.
- 4.5.9 The seven pairs of redshank within the study area represent 0.5 - 0.8% of the estimated county population of 900 - 1,400 pairs (Clement *et al.*, 2015).

5. References

- AECOM (2016). *Richborough Communications Mast: Environmental Statement Chapter 6: Ecology*. Report produced by AECOM.
- Bresso, K. (2014). *St. Augustine Golf Club, Breeding Bird Assessment Report*. Report produced by K B Ecology Limited in July 2014 for the Lee Evans Partnership LLP.
- Bresso, K. (2016). *The winter bird community of St. Augustine Golf Club, Cliffsend, Kent*. Report produced by K B Ecology Limited in July 2016 for the Lee Evans Partnership LLP.
- Brown, A. & Grice, P. (2005). *Birds in England*. T & A.D. Poyser, London.
- Bureau Veritas (2008). Former Richborough Power Station: Interim Ecology Report. Report produced by Bureau Veritas HS&E Limited for Montagu Evans LLP in June 2008.
- Clements, R., Orchard, M., McCanch, N. & Wood, S. (2015). *Kent Breeding Bird Atlas 2008-13*. Kent Ornithological Society.
- Eaton, M.A., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud D., and Gregory, R. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108:708-746.
- Frost, T.M., Austin, G.E., Calbrade, Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. and Balmer, D.E. (2017). *Waterbirds in the UK 2015/16: The Wetland Bird Survey*. BTO/RSPB/JNCC. Thetford.
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998). *Bird monitoring methods: a manual of techniques for key UK species*. RSPB, Sandy.
- Gillings, S., Fuller, R.J. & Sutherland, W.J. (2005). Diurnal studies do not predict nocturnal habitat choice and site selection of European golden plovers (*Pluvialis apricaria*) and Northern Lapwings (*Vanellus vanellus*). *The Auk* 122(4): pp1249-2005.
- Griffiths, M. (2004). *Numbers and distribution of the wintering golden plover population in and around the Thanet Coast and Sandwich Bay SPA in 2002/2003*. English Nature Research Report Number 569. English Nature: Peterborough.
- Harris, S.J., Massimino, D., Newson, S.E., Eaton, M.A., Marchant, J.H., Balmer, D.E., Noble, D.G., Gillings, S., Procter, D. & Pearce-Higgins, J.W. (2016). *The Breeding Bird Survey 2015*. BTO Research Report 687. British Trust for Ornithology, Thetford.
- Henderson, A. & Orton, G. (2015). *Nightingales in Kent in 2012: an update with revised data*. In the Kent Bird Report 2013. Kent Ornithological Society.
- Henderson, A. & Sutherland, M. (2017). *Numbers and distribution of Golden Plovers in the Thanet Coast and Sandwich Bay SPA during the winter of 2016/2017*. A report for Natural England in March 2017.
- Hodgson, I. (2016). *Thanet Coast Turnstone (Arenaria interpres) monitoring, January – February 2016*. Report to Natural England. Sandwich Bay Bird Observatory Trust: Sandwich.
- Kirby, J.S. (1997). Influence of environmental factors on the numbers and activity of wintering Lapwings and Golden Plovers. *Bird Study* (1997) 44, p97-110.

- Marchant, J.H. (1983). *Common Birds Census instructions*. BTO, Tring.
- Mason, C.F. & MacDonald, S.M. (1999). Habitat use by Lapwings and Golden Plovers in a largely arable landscape. *Bird Study*: 1999 46: p89-99.
- Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. and Stroud, D. (2013). Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 106: 64-100.
- NE (2010). *Assessing the effects of onshore wind farms on birds*. Technical Information Note 069. Natural England.
- Percival, S. M. (2007). *Predicting the Effects of Wind Farms on Birds in the UK: The Development of an Objective Assessment Method*. In *Birds and Wind Farms: Risk Assessment and Mitigation*. de Lucas, M, Janss, G. and Ferrer, M. (eds). Lynx Edicions, Barcelona.
- Privett, K. [ed] (2016). *2014 Kent Bird Report*. Kent Ornithological Society.
- Privett, K. [ed] (2015). *2013 Kent Bird Report*. Kent Ornithological Society.
- Ruddock, M. & Whitfield, D.P. (2007). *A Review of Disturbance Distances in Selected Bird Species*. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage.
- Stroud, D.A., Bainbridge, I.P., Maddock, A., Anthony, S., Baker, H., Buxton, N., Chambers, D., Enlander, I., Hearn, R.D., Jennings, K.R, Mavor, R., Whitehead, S. & Wilson, J.D. - on behalf of the UK SPA & Ramsar Scientific Working Group (eds.) (2016). *The status of UK SPAs in the 2000s: The Third Network Review*. [c.1, 108] pp. JNCC, Peterborough. <http://jncc.defra.gov.uk/page-7309>.
- TEP (2010). *UK – Belgium Interconnector, Project NEMO. Winter bird survey 2008/09*. Report prepared by TEP in February 2010 for National Grid International Limited (Doc Ref: TEP 1430.01.024 r1).
- TEP (2010a). *UK – Belgium Interconnector, Project NEMO. Breeding bird survey and redshank nesting survey 2010*. Report prepared by TEP in July 2010 for National Grid International Limited (Doc Ref: TEP 1430.01.025 r1).
- URS (2010). *Richborough Power Station, Revised Peregrine Falcon Strategy*. Memorandum to Natural England from URS Corporation Limited, date 26 February 2010.
- URS (2011). *Richborough Power Station, Winter Bird Survey of Sites B and C*. Reported produced by URS Scott Wilson Ltd for BFL Management Limited.
- Wilson, A.M., Henderson, A.C.B. & Fuller, R.J. (2002). Status of the Nightingale *Luscinia megarhynchos* in Britain at the end of the 20th Century with particular reference to climate change. *Bird Study* 49: pp193–204.
- Wilson, R. (2016). *Breeding Bird Survey, Richborough Power station & South Richborough Pastures LWS*, Report produced by Richard Wilson Ecology for Greengage Environmental LLP.



Appendix A

Scientific Names of Species Referred to in this Report



Table A1 Scientific Names of Species Referred to in this Report

Common/ English name	Scientific name
Arctic tern	<i>Sterna paradisaea</i>
Avocet	<i>Recurvirostra avosetta</i>
Barn owl	<i>Tyto alba</i>
Barnacle goose	<i>Branta leucopsis</i>
Bar-tailed godwit	<i>Limosa lapponica</i>
Bearded tit	<i>Panurus biarmicus</i>
Bittern	<i>Botaurus stellaris</i>
Black redstart	<i>Phoenicurus ochruros</i>
Black tern	<i>Chlidonias niger</i>
Blackbird	<i>Turdus merula</i>
Blackcap	<i>Sylvia atricapilla</i>
Black-headed gull	<i>Chroicocephalus ridibundus</i>
Black-tailed godwit	<i>Limosa limosa</i>
Blue tit	<i>Cyanistes caeruleus</i>
Brent goose	<i>Branta bernicla</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Buzzard	<i>Buteo buteo</i>
Canada goose	<i>Branta canadensis</i>
Carrion crow	<i>Corvus corone</i>
Caspian Gull	<i>Larus cachinans</i>
Cetti's warbler	<i>Cettia cetti</i>
Chaffinch	<i>Fringilla coelebs</i>
Chiffchaff	<i>Phylloscopus collybita</i>
Collared dove	<i>Streptopelia decaocto</i>
Common crossbill	<i>Loxia curvirostra</i>

Common/ English name	Scientific name
Common gull	<i>Larus canus</i>
Common sandpiper	<i>Actitis hypoleucos</i>
Common scoter	<i>Melanitta nigra</i>
Common tern	<i>Sterna hirundo</i>
Coot	<i>Fulica atra</i>
Cormorant	<i>Phalacrocorax carbo</i>
Corn bunting	<i>Miliaria calandra</i>
Cuckoo	<i>Cuculus canorus</i>
Curlew	<i>Numenius arquata</i>
Curlew sandpiper	<i>Calidris ferruginea</i>
Dunlin	<i>Calidris alpina</i>
Dunnock	<i>Prunella modularis</i>
Eider	<i>Somateria mollissima</i>
Feral pigeon	<i>Columba livia</i>
Fieldfare	<i>Turdus pilaris</i>
Fulmar	<i>Fulmarus glacialis</i>
Gadwall	<i>Anas strepera</i>
Garden warbler	<i>Sylvia borin</i>
Garganey	<i>Anas querquedula</i>
Goldcrest	<i>Regulus regulus</i>
Golden plover	<i>Pluvialis apricaria</i>
Goldeneye	<i>Bucephala clangula</i>
Goldfinch	<i>Carduelis carduelis</i>
Goosander	<i>Mergus merganser</i>
Grasshopper warbler	<i>Locustella naevia</i>
Great black-backed gull	<i>Larus marinus</i>

Common/ English name	Scientific name
Great crested grebe	<i>Podiceps cristatus</i>
Great spotted woodpecker	<i>Dendrocopos major</i>
Great tit	<i>Parus major</i>
Green sandpiper	<i>Tringa ochropus</i>
Green woodpecker	<i>Picus viridis</i>
Greenfinch	<i>Chloris chloris</i>
Greenshank	<i>Tringa nebularia</i>
Grey heron	<i>Ardea cinerea</i>
Grey partridge	<i>Perdix perdix</i>
Grey plover	<i>Pluvialis squatarola</i>
Grey wagtail	<i>Motacilla cinerea</i>
Greylag goose	<i>Anser anser</i>
Hawfinch	<i>Coccothraustes coccothraustes</i>
Hen harrier	<i>Circus cyaneus</i>
Herring gull	<i>Larus argentatus</i>
Hobby	<i>Falco subbuteo</i>
House martin	<i>Delichon urbicum</i>
House sparrow	<i>Passer domesticus</i>
Jack snipe	<i>Lymnocyptes minimus</i>
Jackdaw	<i>Corvus monedula</i>
Jay	<i>Garrulus glandarius</i>
Kestrel	<i>Falco tinnunculus</i>
Kingfisher	<i>Alcedo atthis</i>
Kittiwake	<i>Rissa tridactyla</i>
Knot	<i>Calidris canutus</i>
Lapwing	<i>Vanellus vanellus</i>

Common/ English name	Scientific name
Lesser black-backed gull	<i>Larus fuscus</i>
Lesser spotted woodpecker	<i>Dendrocopos minor</i>
Lesser whitethroat	<i>Sylvia curruca</i>
Linnet	<i>Carduelis cannabina</i>
Little egret	<i>Egretta garzetta</i>
Little grebe	<i>Tachybaptus ruficollis</i>
Little gull	<i>Hydrocoloeus minutus</i>
Little owl	<i>Athene noctua</i>
Little ringed plover	<i>Charadrius dubius</i>
Little stint	<i>Calidris minuta</i>
Little tern	<i>Sternula albifrons</i>
Long-eared owl	<i>Asio otus</i>
Long-tailed tit	<i>Aegithalos caudatus</i>
Magpie	<i>Pica pica</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh harrier	<i>Circus aeruginosus</i>
Meadow pipit	<i>Anthus pratensis</i>
Mediterranean gull	<i>Larus melanocephalus</i>
Mistle thrush	<i>Turdus viscivorus</i>
Moorhen	<i>Gallinula chloropus</i>
Mute swan	<i>Cygnus olor</i>
Nightingale	<i>Luscinia megarhynchos</i>
Nightjar	<i>Caprimulgus europaeus</i>
Oystercatcher	<i>Haematopus ostralegus</i>
Peregrine	<i>Falco peregrinus</i>
Pheasant	<i>Phasianus colchicus</i>

Common/ English name	Scientific name
Pied wagtail	<i>Motacilla alba</i>
Pink-footed goose	<i>Anser brachyrhynchus</i>
Pintail	<i>Anas acuta</i>
Pochard	<i>Aythya ferina</i>
Quail	<i>Coturnix coturnix</i>
Red kite	<i>Milvus milvus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-legged partridge	<i>Alectoris rufa</i>
Redshank	<i>Tringa totanus</i>
Red-throated diver	<i>Gavia stellata</i>
Redwing	<i>Turdus iliacus</i>
Reed bunting	<i>Emberiza schoeniclus</i>
Reed warbler	<i>Acrocephalus scirpaceus</i>
Ringed plover	<i>Charadrius hiaticula</i>
Ring-necked parakeet	<i>Psittacula krameri</i>
Robin	<i>Erithacus rubecula</i>
Rook	<i>Corvus frugilegus</i>
Ruff	<i>Philomachus pugnax</i>
Sand martin	<i>Riparia riparia</i>
Sanderling	<i>Calidris alba</i>
Sandwich tern	<i>Sterna sandvicensis</i>
Scaup	<i>Aythya marila</i>
Sedge warbler	<i>Acrocephalus schoenobaenus</i>
Shelduck	<i>Tadorna tadorna</i>
Shoveler	<i>Anas clypeata</i>
Siskin	<i>Carduelis spinus</i>

Common/ English name	Scientific name
Skylark	<i>Alauda arvensis</i>
Snipe	<i>Gallinago gallinago</i>
Song thrush	<i>Turdus philomelos</i>
Sparrowhawk	<i>Accipiter nisus</i>
Spoonbill	<i>Platalea leucorodia</i>
Spotted redshank	<i>Tringa erythropus</i>
Starling	<i>Sturnus vulgaris</i>
Stock dove	<i>Columba oenas</i>
Stonechat	<i>Saxicola torquatus</i>
Swallow	<i>Hirundo rustica</i>
Swift	<i>Apus apus</i>
Teal	<i>Anas crecca</i>
Tree pipit	<i>Anthus trivialis</i>
Tufted duck	<i>Aythya fuligula</i>
Turnstone	<i>Arenaria interpres</i>
Turtle dove	<i>Streptopelia turtur</i>
Water rail	<i>Rallus aquaticus</i>
Wheatear	<i>Oenanthe oenanthe</i>
Whimbrel	<i>Numenius phaeopus</i>
White-fronted goose	<i>Anser albifrons</i>
Whitethroat	<i>Sylvia communis</i>
Wigeon	<i>Anas penelope</i>
Willow tit	<i>Poecile montana</i>
Wood sandpiper	<i>Tringa glareola</i>
Woodcock	<i>Scolopax rusticola</i>
Woodpigeon	<i>Columba palumbus</i>



Common/ English name	Scientific name
Wren	<i>Troglodytes troglodytes</i>
Yellow wagtail	<i>Motacilla flava</i>
Yellowhammer	<i>Emberiza citrinella</i>
Yellow-legged gull	<i>Larus michahellis</i>





Appendix B

Legislation and Species Designations



Wildlife and Countryside Act 1981

With certain exceptions¹⁵, all wild birds, their nests and eggs are protected by section 1 of the *Wildlife and Countryside Act 1981* (as amended). Therefore, it is an offence, *inter alia*, to:

- ▶ Intentionally kill, injure or take any wild bird;
- ▶ Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; or
- ▶ Intentionally take or destroy the egg of any wild bird.

These offences do not apply to hunting of birds listed in Schedule 2 of the Act subject to various controls.

Bird species listed on Schedule 1 of the Act receive further protection, thus for these species it is also an offence to:

- ▶ Intentionally or recklessly disturb any bird while it is nest building, or is at a nest containing eggs or young; or
- ▶ Intentionally or recklessly disturb the dependent young of any such bird.

For golden eagle, white-tailed eagle and osprey, it is also an offence to:

- ▶ Take, damage or destroy the nest of these species (this applies at any time, not only when the nest is in use or being built).

Directive 2009/147/EC (The Wild Birds Directive), 2009

Certain bird species receive protection at a European level due to appearing on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version).

Certain endangered, rare, or vulnerable bird species, which warrant special protection, are included on Annex I of the Directive 2009/147/EC of The European Parliament and of The Council of 30 November 2009 on the conservation of wild birds (codified version); also referred to as the *Wild Birds Directive*.

The *Wild Birds Directive* recognises that habitat loss and degradation are the most serious threats to the conservation of wild birds. It therefore places great emphasis on the protection of habitats for endangered as well as migratory species (listed in Annex I), especially through the establishment of a coherent network of Special Protection Areas (SPAs) comprising all the most suitable territories for these species. Together with Special Areas of Conservation (SACs) designated under *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive')*, SPAs form a network of pan-European protected areas known as Natura 2000.

Ramsar Sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention. Sites proposed for selection are advised by the UK statutory nature

¹⁵ Some species, such as game birds, are exempt in certain circumstances.

conservation agencies, or the relevant administration in the case of Overseas Territories and Crown Dependencies, co-ordinated through JNCC. In selecting sites, the relevant authorities are guided by the Criteria set out in the Convention. The Criteria pertaining specifically to birds are as follows:

- ▶ Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds; and
- ▶ Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

In the UK, the first Ramsar sites were designated in 1976 since which, many more have been designated. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also Special Protection Areas (SPAs) classified under the Birds Directive. However, greater attention is now being directed towards non-bird features which are increasingly being taken into account, both in the selection of new sites and when reviewing existing sites.

Natural Environment and Rural Communities Act 2006

Section 40 of the *Natural Environment and Rural Communities (NERC) Act 2006* places duties on public bodies to have regard to the conservation of biodiversity in the exercise of their normal functions. In particular, Section 41 of the NERC Act requires the Secretary of State to publish a list of species which are of Principal Importance for conservation in the UK. This list is largely derived from the 'Priority Species' listed under the former UK Biodiversity Action Plan (BAP), which continue to be regarded as Priority Species under the subsequent country-level biodiversity strategies. The Section 41 list replaces the list published by Defra in 2002 under Section 74 of the *Countryside and Rights of Way (CRoW) Act 2000*.

Birds of Conservation Concern: Red List birds

Red and Amber list bird are those listed as being of high or medium conservation concern (respectively) in Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man (Eaton *et al.*, 2015). Red list species are those that are Globally Threatened according to IUCN criteria; and/or those whose population or range has declined rapidly in recent years; and/or those that have declined historically and not shown a substantial recent recovery.



Appendix C

Desk Study Results



Table C1 Peak Counts of Waterbirds in Pegwell Bay (WeBS Core Count Data: 2000/01 to 2014/15)

Species name	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Mute Swan	1	7	0	0	39	18	37	9	12	5	12	13	7	6	5	16
Pink-footed Goose	0	0	0	0	0	0	2	0	0	0	0	0	20	0	1	0
White-fronted Goose	0	0	41	0	0	0	0	118	0	21	0	0	0	0	0	0
Greylag Goose	0	0	0	0	46	200	69	150	102	88	80	70	95	39	113	53
Canada Goose	0	0	0	12	7	7	34	7	25	33	31	29	6	0	3	0
Barnacle Goose	0	0	0	0	0	0	0	46	0	0	13	0	7	0	0	0
Brent Goose	34	163	110	69	103	121	220	300	47	799	125	260	250	100	209	33
Shelduck	148	125	122	81	219	150	82	154	142	166	86	131	273	102	116	208
Wigeon	214	841	1,720	1,100	710	411	550	700	410	1,250	1,450	2,080	740	750	630	670
Gadwall	14	17	2	18	24	2	9	25	7	22	29	21	81	18	35	32
Teal	37	129	308	140	323	352	660	150	761	826	470	1,140	1,600	305	171	162
Mallard	290	265	327	208	337	276	258	208	334	553	262	370	380	374	222	213
Pintail	15	8	12	2	3	1	4	2	26	20	20	21	19	3	12	2
Shoveler	20	9	34	19	21	7	10	12	39	37	11	66	19	92	43	42
Pochard	0	0	0	0	13	0	40	46	9	1	28	59	21	3	1	4
Tufted Duck	5	0	0	1	103	27	131	104	103	52	66	158	75	85	32	33
Eider	14	3	25	18	2	0	1	0	2	0	2	1	0	0	0	0
Common Scoter	23	3	80	0	40	0	101	0	30	14	2	9	0	10	5	0
Goldeneye	2	0	0	0	1	1	1	2	1	1	1	0	0	0	0	1
Red-breasted Merganser	1	3	1	0	3	0	3	0	5	2	0	0	0	0	1	0
Red-throated Diver	4	54	215	0	10	5	12	11	517	6	18	0	85	92	12	1
Little Grebe	0	1	2	0	18	45	31	31	25	29	9	32	5	12	4	11
Great Crested Grebe	370	146	604	20	233	38	48	110	300	12	212	103	88	480	101	64
Cormorant	23	62	11	27	44	83	36	31	32	74	91	40	16	88	19	19
Little Egret	17	20	23	26	48	56	71	33	79	62	40	47	41	29	52	21

Species name	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Grey Heron	5	6	4	2	7	13	6	11	14	10	11	9	11	12	10	6
Spoonbill	0	1	0	0	1	1	1	1	1	0	10	0	0	2	0	0
Water Rail	2	2	0	1	2	2	2	2	0	3	0	1	0	2	2	2
Moorhen	16	0	0	0	21	50	21	36	53	69	25	22	26	15	13	4
Coot	0	0	0	0	18	18	63	72	14	14	44	50	49	27	55	67
Oystercatcher	990	1,020	1,550	1,180	925	1,220	1,980	1,200	780	686	750	820	560	1,250	948	525
Avocet	1	13	4	1	31	3	8	4	7	11	1	17	1	1	21	53
Little Ringed Plover	1	1	0	0	3	1	1	0	1	2	1	2	2	3	3	0
Ringed Plover	595	440	560	355	640	190	50	114	157	100	27	19	52	44	79	87
Golden Plover	4,000	7,000	5,800	8,000	5,330	7,000	4,170	5,500	3,500	1,200	3,400	3,500	4,330	1,093	2,456	260
Grey Plover	493	395	543	485	376	284	360	170	269	200	387	370	175	481	230	221
Lapwing	5,900	6,000	9,630	10,000	5,420	8,100	17,000	12,000	8,200	5,720	5,000	6,420	23,880	6,460	1,890	2,665
Knot	500	465	420	450	410	100	320	460	270	350	270	420	300	310	220	220
Sanderling	375	185	122	115	180	41	120	110	93	67	93	120	101	120	106	79
Little Stint	15	7	10	3	4	3	0	2	0	1	2	3	0	2	1	1
Curlew Sandpiper	4	22	4	25	5	32	0	2	2	6	1	4	0	2	6	0
Dunlin	1,540	2,100	1,960	1,390	1,430	600	1,510	1,070	1,150	1,500	820	1,960	830	1,500	1,271	1,330
Ruff	9	7	10	2	3	11	7	0	2	1	1	3	2	1	0	1
Jack Snipe	0	1	0	0	0	0	5	5	3	0	0	0	1	0	0	2
Snipe	11	250	15	80	33	40	62	71	39	18	20	20	100	81	30	28
Woodcock	0	0	0	0	0	0	0	1	0	1	3	47	2	0	0	1
Black-tailed Godwit	0	2	10	127	23	5	10	3	11	20	2	41	10	2	3	7
Bar-tailed Godwit	492	327	285	439	240	110	550	240	270	143	224	320	217	240	240	270
Whimbrel	56	52	20	7	26	27	76	19	51	53	35	15	24	25	6	28
Curlew	405	366	390	463	390	396	560	350	475	527	370	540	300	490	501	365
Common Sandpiper	82	7	0	6	4	39	93	106	122	84	163	71	127	42	77	14

Species name	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Green Sandpiper	44	1	0	7	4	12	15	26	17	13	6	19	17	3	4	7
Spotted Redshank	2	3	2	1	2	3	3	3	1	1	1	1	1	1	2	0
Greenshank	53	77	12	26	6	36	30	40	33	50	22	28	30	37	16	3
Wood Sandpiper	4	1	0	0	0	1	0	0	1	0	2	3	1	2	1	1
Redshank	402	426	301	380	294	249	280	245	329	247	76	150	210	226	103	105
Turnstone	190	220	202	235	100	7	110	21	130	48	40	17	65	7	16	21
Kittiwake	1	50	3	1	1	0	0	0	0	0	1	0	0	105	0	0
Black-headed Gull	10,290	4,700	3,200	5,600	2,500	2,700	4,800	16,000	5,200	4,850	3,000	12,000	1,050	3,791	3,328	2,500
Little Gull	0	3	0	0	0	0	0	1	8	0	0	19	0	16	0	1
Mediterranean Gull	1	1	0	0	1	0	3	4	11	5	1	65	2	0	1	0
Common Gull	1,200	2,000	1,090	1,125	678	194	1,800	2,500	2,200	800	1,000	1,500	1,000	1,345	43	1,600
Lesser Black-backed Gull	180	170	76	60	113	160	376	310	80	41	120	50	26	54	66	5
Herring Gull	3,890	3,000	1,500	1,470	5,450	440	3,200	4,500	2,600	1,030	1,300	1,000	2,207	2,116	1,620	500
Yellow-legged Gull	0	2	1	2	0	0	3	2	3	0	2	2	1	1	0	2
Caspian Gull	0	1	0	2	1	0	2	1	1	0	1	0	1	2	0	1
Great Black-backed Gull	1,050	1,000	470	305	610	1,190	700	850	670	312	212	475	220	401	70	200
Little Tern	9	9	29	9	0	1	2	3	12	0	2	1	1	0	0	NC
Black Tern	0	1	0	0	0	0	0	0	1	0	1	16	1	0	0	NC
Sandwich Tern	320	660	360	930	680	824	423	520	1,060	340	170	1,410	210	325	100	NC
Common Tern	40	55	180	36	50	26	5	173	474	20	130	7,400	20	6	120	NC
Arctic Tern	1	3	20	4	0	0	0	2	8	0	1	6	2	0	0	NC
Kingfisher	1	0	0	0	0	1	3	3	6	2	0	3	2	2	1	3

NC = no data available for this species during this period

Table C2 Monthly Peak and Mean Counts of Waterbirds in Pegwell Bay (WeBS Core Count Data: 2000/01-15/16)

Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Mute Swan	Peak	9	8	8	10	5	37	39	21	6	11	16	7
	Mean	2	1	2	3	2	7	5	5	2	3	3	1
Greylag Goose	Peak	95	88	105	71	68	113	52	200	113	47	102	52
	Mean	19	11	14	6	5	14	11	33	31	20	34	11
Canada Goose	Peak	30	26	31	29	34	33	24	15	7	4	2	0
	Mean	2	4	4	4	4	3	3	3	1	1	0	0
Brent Goose	Peak	18	1	35	799	163	56	190	260	250	47	6	2
	Mean	1	0	10	97	30	16	46	73	41	8	1	0
Shelduck	Peak	50	44	91	89	125	166	273	154	116	142	136	147
	Mean	23	17	32	32	49	71	98	77	43	44	62	52
Wigeon	Peak	1	7	519	500	570	1,450	1,720	2,080	502	16	0	0
	Mean	0	1	92	133	299	602	640	396	127	2	0	0
Gadwall	Peak	1	0	3	6	18	42	57	63	81	29	5	7
	Mean	0	0	1	1	3	7	15	10	8	4	1	1
Teal	Peak	6	112	135	162	323	1,600	1,140	300	246	31	2	6
	Mean	2	17	53	78	89	248	292	89	41	6	0	1
Mallard	Peak	110	135	164	210	258	553	337	370	140	67	109	113
	Mean	43	53	88	98	147	232	175	146	44	24	35	37
Pintail	Peak	1	0	4	13	4	20	26	15	1	0	0	0
	Mean	0	0	0	2	1	4	6	3	0	0	0	0
Shoveler	Peak	2	13	18	14	22	37	66	92	43	19	3	2
	Mean	1	2	2	4	7	8	12	18	10	4	0	0
Pochard	Peak	1	0	0	4	7	28	46	59	13	1	2	0

Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Mean	0	0	0	0	1	2	7	5	2	0	0	0
Tufted Duck	Peak	50	9	9	41	131	85	120	158	103	52	51	27
	Mean	11	2	2	9	23	12	20	28	25	19	16	9
Eider	Peak	7	3	18	16	4	14	25	25	16	19	8	9
	Mean	1	0	1	1	0	1	2	2	1	2	1	1
Common Scoter	Peak	0	9	101	1	14	4	80	20	40	0	0	0
	Mean	0	1	7	0	2	0	6	2	5	0	0	0
Red-throated Diver	Peak	0	0	0	0	6	104	517	215	0	1	1	0
	Mean	0	0	0	0	1	22	35	15	0	0	0	0
Little Grebe	Peak	8	12	20	26	31	45	29	39	19	8	6	7
	Mean	2	3	5	7	7	9	9	13	5	3	1	1
Great Crested Grebe	Peak	0	1	1	3	7	217	480	604	300	13	2	1
	Mean	0	0	0	0	2	37	98	119	44	1	0	0
Cormorant	Peak	26	62	83	39	74	25	91	26	31	23	44	21
	Mean	9	14	22	15	17	11	20	8	7	7	10	8
Little Egret	Peak	62	79	71	40	24	17	11	10	9	12	21	21
	Mean	23	29	35	16	10	4	3	3	2	4	4	7
Grey Heron	Peak	10	11	13	13	11	12	9	14	10	6	5	6
	Mean	4	4	5	6	5	4	3	5	2	2	2	2
Moorhen	Peak	31	28	23	38	21	53	69	50	38	18	21	16
	Mean	9	11	9	10	6	13	12	13	9	6	5	5
Coot	Peak	26	21	10	27	33	57	72	56	48	63	18	26
	Mean	8	5	2	5	5	11	17	22	10	8	4	5
Oystercatcher	Peak	638	670	1,980	1,180	1,200	1,550	1,000	1,210	990	290	213	306

Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Mean	192	359	887	566	590	689	571	515	265	156	128	100
Avocet	Peak	21	4	13	11	4	31	17	2	10	15	18	53
	Mean	2	1	2	1	1	2	1	0	2	2	1	4
Ringed Plover	Peak	17	640	595	340	180	132	232	355	225	41	200	21
	Mean	4	123	152	44	48	31	46	57	30	8	50	7
Golden Plover	Peak	21	300	196	2,070	6,240	7,000	8,000	4,710	3,750	71	0	0
	Mean	2	48	41	788	2,396	2,780	3,209	2,092	472	7	0	0
Grey Plover	Peak	5	30	226	250	400	481	493	370	543	190	112	2
	Mean	1	8	37	95	144	191	233	196	128	25	22	0
Lapwing	Peak	292	763	890	2,500	4,700	11,000	23,880	17,000	2,220	30	68	241
	Mean	90	167	191	1,025	2,706	4,367	6,517	4,676	265	8	11	30
Knot	Peak	5	28	40	70	170	460	500	420	465	304	189	4
	Mean	1	4	14	19	77	188	285	186	122	28	21	0
Sanderling	Peak	27	120	115	185	180	115	375	122	170	81	95	7
	Mean	6	20	29	46	67	44	65	56	59	19	28	1
Little Stint	Peak	3	10	15	3	7	1	2	1	0	1	1	1
	Mean	0	1	2	0	1	0	0	0	0	0	0	0
Curlew Sandpiper	Peak	32	22	25	8	1	0	0	0	0	0	1	0
	Mean	3	3	4	1	0	0	0	0	0	0	0	0
Dunlin	Peak	83	960	600	640	1,530	1,940	2,100	1,960	1,650	551	176	45
	Mean	34	150	217	306	693	818	1,091	808	396	118	54	7
Ruff	Peak	0	6	9	4	2	3	10	11	7	0	0	1
	Mean	0	1	2	0	0	0	1	1	1	0	0	0
Snipe	Peak	1	4	9	60	140	250	81	62	9	4	1	0

Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Mean	0	1	3	13	34	27	28	17	3	1	0	0
Black-tailed Godwit	Peak	4	23	28	22	127	7	10	2	2	2	20	41
	Mean	1	5	4	3	11	1	2	0	0	0	2	3
Bar-tailed Godwit	Peak	17	15	72	122	224	270	335	439	250	492	550	3
	Mean	3	4	18	23	79	133	203	164	77	93	86	1
Whimbrel	Peak	35	50	15	1	1	1	0	0	0	76	56	12
	Mean	12	12	3	0	0	0	0	0	0	16	21	2
Curlew	Peak	453	490	540	486	527	375	501	560	396	258	131	360
	Mean	230	246	326	256	214	225	242	266	196	106	35	86
Common Sandpiper	Peak	121	163	45	12	6	2	4	4	6	10	21	6
	Mean	52	55	13	2	1	0	1	1	1	3	6	0
Green Sandpiper	Peak	44	17	10	7	1	0	1	0	1	5	1	5
	Mean	10	8	4	2	0	0	0	0	0	1	0	1
Spotted Redshank	Peak	1	1	2	3	3	2	3	1	2	2	1	1
	Mean	0	0	1	1	1	1	1	0	0	0	0	0
Greenshank	Peak	40	77	53	14	2	1	0	0	1	33	21	1
	Mean	14	24	19	6	1	0	0	0	0	3	6	0
Redshank	Peak	329	426	340	420	380	235	402	330	326	150	60	49
	Mean	107	128	179	185	153	108	129	112	99	45	23	11
Turnstone	Peak	22	10	35	54	194	225	235	220	254	104	30	1
	Mean	3	2	5	8	36	48	51	64	29	15	7	0
Kittiwake	Peak	1	0	0	0	50	105	1	0	0	1	3	1
	Mean	0	0	0	0	4	8	0	0	0	0	0	0
Black-headed Gull	Peak	12,000	4,850	5,800	3,791	3,500	5,200	10,235	16,000	4,700	74	750	159

Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	Mean	1,295	1,152	1,646	1,006	967	1,490	1,380	3,050	863	10	64	53
Little Gull	Peak	0	0	8	3	0	1	19	0	1	0	0	0
	Mean	0	0	1	0	0	0	2	0	0	0	0	0
Mediterranean Gull	Peak	65	5	4	2	2	1	4	3	0	3	1	3
	Mean	6	1	1	0	0	0	0	0	0	1	0	0
Common Gull	Peak	105	183	845	1,345	1,200	2,200	2,000	2,500	1,050	12	12	4
	Mean	18	38	188	225	193	676	665	609	118	1	2	1
Lesser Black-backed Gull	Peak	48	113	376	180	43	122	151	120	160	62	76	120
	Mean	17	28	78	57	17	27	34	34	31	11	19	13
Herring Gull	Peak	1,000	1,470	2,200	2,116	1,000	2,600	5,450	4,500	2,600	400	1,300	328
	Mean	204	372	680	518	485	525	1,329	1,027	361	114	187	88
Great Black-backed Gull	Peak	100	170	480	1,190	670	890	1,050	700	517	360	105	67
	Mean	27	53	139	326	269	328	258	165	89	49	24	22
Little Tern	Peak	12	29	2	0	0	0	0	0	0	8	2	2
	Mean	3	4	0	0	0	0	0	0	0	1	0	0
Sandwich Tern	Peak	1,410	500	423	19	1	1	1	1	36	200	72	380
	Mean	539	219	74	3	0	0	1	0	3	39	23	48
Common Tern	Peak	474	7,400	269	4	0	0	0	0	0	70	10	30
	Mean	70	610	39	0	0	0	0	0	0	5	1	3
Arctic Tern	Peak	6	20	6	0	0	0	0	0	0	8	1	1
	Mean	1	2	0	0	0	0	0	0	0	1	0	0
Kingfisher	Peak	0	1	6	3	3	3	3	3	0	0	0	0
	Mean	0	0	1	1	0	1	0	0	0	0	0	0
Total number of birds		3,107	4,026	5,389	6,050	9,905	14,052	17,884	15,204	4,071	1,053	1,000	623



Species name	Count	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Total excluding gulls & terns		927	1,544	2,540	3,914	7,968	10,996	14,214	10,317	2,605	821	680	395

Table C3 Peak Counts of Waterbirds in Pegwell and Sandwich Bays (WeBS Low Tide Data, 2008-09)

Species	BG001	BG002	BG003	BG004	BG005	BG006	BG007
Mute Swan							12
Greylag Goose			3				51
Canada Goose							11
Brent Goose		18					27
Shelduck		47	35	5			40
Wigeon		320	200	30	31		170
Gadwall							4
Teal		290	60				411
Mallard		175	24				230
Pintail		8					18
Shoveler		8	1				38
Pochard							9
Tufted Duck							14
Scaup					1		
Eider	1		2		4		
Common Scoter			2		14		
Goldeneye							1
Goosander			2				
Red-throated Diver		3	1				
Little Grebe							25
Great Crested Grebe			69				1
Cormorant		17	22	2	5		7

Species	BG001	BG002	BG003	BG004	BG005	BG006	BG007
Little Egret		10					18
Grey Heron		2					14
Moorhen							53
Coot							14
Oystercatcher		480	210	26	4	1	4
Avocet		1			1		
Ringed Plover		70	70	20	10	77	
Golden Plover		3,140					3,500
Grey Plover		173	100	20			7
Lapwing		8,000		20	8		8,200
Knot		200	80	40			
Sanderling		16	75		3		
Dunlin		1,000	400				3
Jack Snipe		2					1
Snipe		11	17				39
Bar-tailed Godwit		200	182	40	3		6
Curlew	1	300	82	10	6		220
Common Sandpiper							6
Spotted Redshank		1					1
Redshank	2	81	30	1			79
Turnstone	128		6		3	5	4
Black-headed Gull	600	3,000	900	600	298	30	390
Mediterranean Gull		1					
Common Gull	200	1,000	100	100	20	24	800

Species	BG001	BG002	BG003	BG004	BG005	BG006	BG007
Lesser Black-backed Gull	1	22	10			3	50
Herring Gull	300	1,100	500	300	27	76	400
Yellow-legged Gull		1					
Caspian Gull			1				
Great Black-backed Gull	3	600	150	10		7	150
Sandwich Tern		1					1
Kingfisher							6

NB: species in bold are those that are qualifying / notified species of the Thanet Coast and Sandwich Bay SPA/Ramsar, and its constituent SSSIs.

Table C4 Golden Plover: Level and Type of Use in Each Recording Area (Henderson & Sutherland, 2017)

Area No.	Area (distance and direction from study area)	% of birds ¹⁶	Peak count	Description of use of the Recording Area
1	Worth Marshes east (4.0 km south)	6	242	Regular; with a peak count of 242 birds in January, usually foraging in sheep grazed pastures
2	Worth Marshes west (4.4 km south)		87	Recorded on three occasions and always in flight, with a maximum of 87 birds in February. However, thought likely sometimes to feed in this area.
3	St George's (2.5 km south)		11	One record of 11 birds roosting in pasture in November
4	Sandwich Marshes (partly within study area)	18	610	Up to 610 roosting at the flood-relief pools adjoining the R Stour in November-December, but subsequently few present, and none noted on the farmland. Interchange with the low-tide roost in Pegwell Bay occurs.

¹⁶ The percentage of the total number of golden plover recorded during the Henderson & Sutherland (2017) survey, is provided for the main Areas used by the species.

Area No.	Area (distance and direction from study area)	% of birds ¹⁶	Peak count	Description of use of the Recording Area
5	Monks' Wall (1.4 km south)		0	None recorded
6	Richborough Marshes (partly within study area)		6	One record of six birds roosting on wet, ploughed land in December
7	Ash Levels east (partly within study area)	28	1,030	The most strongly favoured area, holding 28% of all birds counted throughout the winter, and a maximum of 1,030 present in late January. While small numbers were noted feeding, most records were of roosting birds. A few were seen in sheep pasture but most occurred on winter cereal fields.
8	Goshall Valley (900 m south-west)	11	810	Recorded on three visits (all foraging and roosting in winter cereal), with a peak count of 810 in early January. Interchange with Areas 4 and 7 was evident, and probably also Area 14, as 80 birds were seen flying north east towards Pegwell Bay on a falling tide on 11 February.
9	Nash-Westmarsh (2.7 km south-west)		0	None recorded. A substantial part of the area near Nash favoured in previous years now has been planted with fruit trees, making it unsuitable for Golden Plovers.
10	Ash Levels (west) (2.5 km west)		0	None recorded, despite the area being broadly similar in land use/habitat to Area 7
11	Monkton Marshes (2.7 km west)		0	None recorded
12	Minster Marshes (partly within study area)		4	One record, involving four birds in late December
13	Ebbsfleet - Sevenscore (partly within study area)		0	None recorded during survey visits. Outside the survey visits, a flock of 120 was seen landing in oil seed rape in the area at TR335652 on 3rd January 2017.

Area No.	Area (distance and direction from study area)	% of birds ¹⁶	Peak count	Description of use of the Recording Area
14	Pegwell Bay (within study area)	15	690	The mudflats form a roost site, used intermittently at low tide. During survey visits, a peak count of 690 birds was recorded (in late November) though none were present on several survey dates. Regular visits to the area outside the survey (in winter 2016/17) produced peak counts of 880 in November, 150 in December, 800 in January, 1000 in February but none in March. Disturbance caused by bait-diggers and other sources continues to be a problem in this area.
15	Upland Thanet (east) (adjacent to the north of the study area)		402	Some areas, especially to the east, were unsuitable because of the tall Brassica crops. Areas of ploughed/fallow land closer to Pegwell Bay were used for feeding and roosting in the first half of the winter, as follows. A flock of 402 birds was roosting and foraging in a field on 13 November; followed by 53 roosting in a different field on 27 November; and 43 roosting in the same field as the early November record on 31 December. None were recorded in Area 15 in January and February (a March survey was not undertaken in this Area). These birds also used Pegwell Bay.
16	Upland Thanet west (1.8 km north-west)		1	None recorded in survey visits. Outside the survey visits, one golden plover was seen with 43 Lapwings, feeding in oil seed rape at TR330685 on 1st December 2016.
17	Sarre Marshes (5.2 km west)		0	None recorded.

Area No.	Area (distance and direction from study area)	% of birds ¹⁶	Peak count	Description of use of the Recording Area
18	Wantsum Marshes (6.7 km west)		1	One record of a bird feeding in winter cereal on 13 November. Outside the survey visits, a flock of 90 was feeding in winter wheat just north of Chislet (in the south east of Area 18) on 21 January.
19	Minnis Bay Marshes (6.0 km north-west)		28	Up to 28 birds were recorded roosting in the fields
20	Reculver (8.9 km north-west)		4	Up to four birds were recorded overflying the area on three visits. Outside the survey visits, a flock of 20 was roosting in oilseed rape stubble at TR245690 on 6th March 2017.
21	Swalecliffe (17.5 km north-west)		0	None recorded. Much of this area has been rendered unsuitable since previous survey by the establishment of static caravan parks and a football ground.
22	Long Rock (18.5 km north-west)	12	392	Up to 392 were recorded roosting in the intertidal zone in December-January. Golden plover were noted in this area only in the early morning, after which disturbance by visitors caused the birds to depart.

Table C5 Peak and Mean Counts of Lapwing in 2016/17 (from Henderson & Sutherland 2017)

Recording Area (description)	Peak	Mean
4 (Sandwich Marshes)	1,300	306
6 (Richborough Marshes)	600	122
7 (Ash Levels East)	1,129	345
12 (Minster Marshes)	645	144
13 (Ebbsfleet to Sevenscore)	300	44
14 (Pegwell Bay)	1,260	441
15 (Upland Thanet East)	550	160

Table C6 Peak Monthly Counts of Waterbirds in the SBBO Recording Area in 2015

Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mute swan	24	22	29	24	22	16	9	9	5	19	15	21
Brent goose	370	320	220	305	5	1			134	165	1,234	35
Shelduck	193	111	109	115	111	154	58	59	129	78	287	109
Wigeon	938	952	308	20	1			24	180	131	700	622
Gadwall	75	101	49	12	13	6	2	4	2	12	40	52
Teal	1,210	645	284	29	8	1	18	196	437	590	505	568
Mallard	254	194	68	46	48	69	51	198	138	61	177	270
Pintail	23	24	43	6				2	15	2	9	3
Shoveler	84	105	92	37	3	2	5	3	50	80	42	155
Eider			1						8	1	12	3
Common scoter	31	6	2	8	11	40	7	22	55		95	5
Red-throated diver	74	152	11						1	1	6	61
Great crested grebe	196	233	300	46	4	2	1		2		28	117
Cormorant	386	306	6	19	22	5	27	29	17	19	17	25
Little egret	15	6	12	16	29	26	26	56	38	25	19	15
Oystercatcher	880	941	632	289	156	149	542	827	830	823	660	732



Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avocet	1	8	10	18	22	25	18	5	18	4	5	1
Ringed plover	60	32	2	55	350	31	13	250	45		30	85
Golden plover	4,270	2,730	220	3			5	77	71	700	1,060	2,222
Grey plover	218	230	159	27	9		1	20	34	41	160	200
Lapwing	6,250	9,350	325	26	30	55	72	334	540	2,671	3,011	5,680
Knot	320	280	220	7	7	2	7	210	27	2	143	200
Sanderling	97	77	68	84	270	7	60	43	45		135	92
Little stint						1	1	19	10			
Curlew sandpiper					3		1	22	2			
Dunlin	1,630	1,420	320	531	162	18	170	504	260	80	1,160	1,580
Ruff	1						1	18	3			
Jack snipe	7	1	1	4						2		6
Snipe	101	71	19	25	3	1	2	10	16	22	87	42
Woodcock	4	2	3									
Black-tailed godwit	3	4	1	5	10	1	7	9	42	12	6	7
Bar-tailed godwit	281	288	220	60	48	1	18	17	15	23	181	226
Whimbrel				88	60		20	39	6			1



Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Curlew	498	450	413	175	9	46	360	415	290	245	390	382
Common sandpiper				7	10		30	23	5	1		
Green sandpiper				3		2	7	16	8	7	1	1
Spotted redshank	1	2	1	3			5	29	6		6	1
Greenshank				4	12	4	7	48	5	11		
Wood sandpiper				1			3	2				
Redshank	170	70	55	92	4	4	80	220	186	100	142	91
Turnstone	5	3	5	42	46	24	40	18	9	16	64	23
Kittiwake	3	14	1		1			1		8	32	28
Black-headed gull	2,201	2,080	400	202	7	51	1,506	10,000	2,003	2,960	1,518	5,090
Mediterranean gull	NC	NC	NC	NC	NC	NC	40	60	NC	NC	NC	NC
Common gull	722	670	112	15	9		8	290	20	54	983	2,440
Lesser black-backed gull	27	41	61	63	87	12	22	52	30	7	86	20
Herring gull	2,570	1,700	230	384	1,026	145	2,029	860	507	561	609	8,561
Yellow-legged gull	3	2	1	1			2	2			5	10
Great black-backed gull	314	180	61	58	40	68	128	130	264	11	420	569
Sandwich tern			1	374	306	14	740	400	191	1	1	



Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common tern				6	50	1	710	200	23			

NC: no count data provided.

Table C7 Number of Territories in Plots A and B (Wilson, 2016)

Species name	Plot A	Plot B
Mallard		1
Woodpigeon	P	P
Turtle dove		1
Cuckoo	1	3
Wren	12	8
Dunnock		2
Robin		2
Nightingale	1	
Blackbird	1	1
Song thrush		1
Cetti's warbler	6	3
Reed warbler	4	4
Blackcap	2	2
Lesser whitethroat		1
Whitethroat	4	6
Chiffchaff	6	3
Chaffinch	2	
Linnet		3
Bullfinch		1
Reed bunting		2

Table C8 Peak Counts of Birds in Plots A and B in 2010/11 and 2014/15

Species name	2010/11	2010/11	2014/15
	Plot C	Plot B	Plot B
Mute swan		2	3
Greylag goose			22
Shelduck		2	2
Wigeon		20	
Gadwall		14	2
Teal	10	254	176
Mallard	3	53	80
Shoveler			7
Goldeneye	1		1
Cormorant		1	1
Little grebe		1	
Little egret			3
Grey heron		2	2
Marsh harrier		1	2
Hen harrier		1	
Sparrowhawk		1	1
Buzzard	1	1	
Kestrel	1	1	1
Peregrine		1	2
Moorhen	3	4	2
Coot	2	1	2

	2010/11	2010/11	2014/15
Lapwing	2	110	219
Ruff		1	
Snipe	13	1	
Woodcock	1		
Black-tailed godwit		1	
Curlew	13	31	174
Redshank	1	3	6
Black-headed gull	2	260	53
Common gull	18	1	
Lesser black-backed gull		9	
Herring gull	1	6	3
Woodpigeon		230	450
Kingfisher		1	1
Skylark	2		
Meadow pipit	2	8	
Stonechat		2	
Fieldfare	70		13
Song thrush	1	2	4
Redwing	15	10	10
Mistle thrush	2	1	
Cetti's warbler	1	2	2
Starling	400	600	200
Bullfinch		1	2

	2010/11	2010/11	2014/15
Reed bunting	1		

Table C9 Results from the St Augustine's Golf Course Bird Surveys

Species name	No. territories (2014)	No. individuals (winter 2014/15)
Mute swan		2
Teal		7
Mallard	1	15
Grey heron		1
Buzzard		1
Kestrel	2	2
Moorhen	13	37
Coot	3	7
Oystercatcher		2
Lapwing		130
Curlew		17
Green sandpiper		1
Redshank		1
Black-headed gull		121
Common gull		2
Herring gull		12
Rock dove / feral pigeon	1	
Stock dove	1	2
Woodpigeon	12	216



Species name	No. territories (2014)	No. individuals (winter 2014/15)
Collared dove	4	2
Ring-necked parakeet	3	14
Cuckoo	1	
Little owl	1	1
Kingfisher		1
Green woodpecker	2	2
Great spotted woodpecker	1	1
Skylark		2
Meadow pipit		2
Pied wagtail		1
Wren	11	14
Dunnock	7	4
Robin	8	11
Blackbird	9	45
Fieldfare		1
Song thrush	2	13
Redwing		11
Mistle thrush		4
Reed warbler	13	
Blackcap	4	
Lesser whitethroat	1	
Whitethroat	6	
Chiffchaff	2	



Species name	No. territories (2014)	No. individuals (winter 2014/15)
Long-tailed tit	1	12
Blue tit	9	18
Great tit	4	14
Jay	1	2
Magpie	2	14
Jackdaw		1
Rook	12	50
Carrion crow	1	9
Starling		490
House sparrow	2	10
Chaffinch	5	23
Greenfinch	2	
Goldfinch	3	15
Linnet	1	2
Bullfinch		2
Yellowhammer		1

Table C10 Breeding Bird Survey 2017: Number of Territories in Survey Area

BTO code	Species name	No. territories	Annex I	WCA (Sch 1)	SPI	BoCC Red-listed	Local BAP
MS	Mute swan	4					
SU	Shelduck	4	Yes				
MA	Mallard	20					
TU	Tufted duck	2					
RL	Red-legged partridge	1					
P.	Grey partridge	4			Yes	Yes	Yes
PH	Pheasant	18					
ET	Little egret	2	Yes				
H.	Grey heron	3					
SH	Sparrowhawk	1					
BZ	Buzzard	3					
K.	Kestrel	5					
WA	Water rail	1					
MH	Moorhen	24					
CO	Coot	2					
OC	Oystercatcher	3					
RK	Redshank	7					
HG	Herring gull	5			Yes	Yes	
FP	Feral Pigeon	35					
SD	Stock dove	19					
WP	Woodpigeon	89					
CD	Collared dove	70					

BTO code	Species name	No. territories	Annex I	WCA (Sch 1)	SPI	BoCC Red-listed	Local BAP
TD	Turtle dove	8			Yes	Yes	
RI	Ring-necked parakeet	12					
CK	Cuckoo	17			Yes	Yes	Yes
SI	Swift	1					
G.	Green woodpecker	7					
GS	Great spotted woodpecker	6					
S.	Skylark	14			Yes	Yes	
SL	Swallow	10					
MP	Meadow pipit	8					
YW	Yellow wagtail	2			Yes	Yes	Yes
PW	Pied wagtail	5					
WR	Wren	200					
D.	Dunnock	125			Yes		
R.	Robin	98					
N.	Nightingale	13				Yes	
B.	Blackbird	146					
ST	Song thrush	43			Yes	Yes	
M.	Mistle thrush	5				Yes	
CW	Cetti's warbler	46		Yes			
SW	Sedge warbler	42					
RW	Reed warbler	155					
BC	Blackcap	94					

BTO code	Species name	No. territories	Annex I	WCA (Sch 1)	SPI	BoCC Red-listed	Local BAP
GW	Garden warbler	4					
LW	Lesser whitethroat	26					
WH	Whitethroat	168					
CC	Chiffchaff	70					
GC	Goldcrest	1					
LT	Long-tailed tit	23					
BT	Blue tit	65					
GT	Great tit	62					
J.	Jay	4					
MG	Magpie	40					
RO	Rook	29					
C.	Carrion crow	13					
SG	Starling	24			Yes	Yes	
HS	House sparrow	87			Yes	Yes	Yes
CH	Chaffinch	94					
BF	Bullfinch	14			Yes		
GR	Greenfinch	48					
GO	Goldfinch	87					
LI	Linnet	53			Yes	Yes	
Y.	Yellowhammer	4			Yes	Yes	Yes
RB	Reed bunting	40			Yes		Yes
Other species recorded during the survey for which no evidence of breeding was obtained							

BTO code	Species name	No. territories	Annex I	WCA (Sch 1)	SPI	BoCC Red-listed	Local BAP
GJ	Greylag goose						
T.	Teal						
SV	Shoveler						
LG	Little grebe						
CA	Cormorant						
NB	Spoonbill		Yes	Yes			
KT	Red kite		Yes	Yes			
HY	Hobby			Yes			
AV	Avocet		Yes	Yes			
GP	Golden plover		Yes				
GV	Grey plover						
WM	Whimbrel			Yes		Yes	
CU	Curlew				Yes	Yes	Yes
CS	Common sandpiper						
BH	Black-headed gull						
MU	Mediterranean gull		Yes	Yes			
LB	Lesser black-backed gull						
GB	Great black-backed gull						
CN	Common tern		Yes				
GL	Grey wagtail					Yes	
W.	Wheatear						



BTO code	Species name	No. territories	Annex I	WCA (Sch 1)	SPI	BoCC Red-listed	Local BAP
RE	Redwing			Yes		Yes	
JD	Jackdaw						
CR	Crossbill			Yes			
SK	Siskin						





Appendix D

Winter Bird Survey Report 2016/17





Final Report

Thanet Extension Offshore Wind Farm

**Export Cable Route Intertidal and Terrestrial Wintering Bird
Surveys**

Vattenfall Wind Power Ltd

APEM Ref P00001329

August 2017

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Document citation

APEM (2017). Thanet Extension Offshore Wind Farm: Export Cable Route Intertidal and Terrestrial Wintering Bird Surveys. APEM Scientific Report P00001329 to Vattenfall Wind Power Ltd, August 2017, v3.0

Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	23/03/17	All	All	Creation of report outline	RB
1.1	25/04/17	3		Incorporation of field data analysis	RB
1.2	26/05/17	All	All	Final draft for issue to client	RB
2.0	14/06/17	All	All	Copy received back after client review with feedback marked with tracks and comments	Client
2.1	19/06/17	All	All	Final report prepared addressing client comments	RB
3.0	02/08/17	All	All	Final report including onshore EIA consultant comments	RB

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1. Introduction

1.1 Project background

The proposed Thanet Extension Offshore Wind Farm (Thanet Extension) comprises an array of offshore wind turbines sited around the existing Thanet Offshore Wind Farm (TOWF), a potential offshore converter station, inter-array cables, interconnector cables and offshore and onshore export cables taking power to an onshore converter station. The Thanet Extension site covers an area of approximately 70 km² and is situated 8 km from its nearest points on the UK coast (Annex 1). The offshore export cables are proposed to run to the coast of Kent, making landfall in the Pegwell/Sandwich Bay area. At the time that the surveys described in this report were commissioned a decision had not been made on which of the two options (Pegwell Bay or Sandwich Bay) would be selected for the landfall of the export cable.

1.2 Aim of this report

The aim of this report is to provide baseline information (species, numbers and distribution) on the wintering birds using the intertidal and terrestrial land that lies along and around the export cable route options. The focus on wintering birds is because the survey area includes a number of protected nature conservation sites that have populations of wintering birds as their interest features. The results of the surveys will inform the Environmental Impact Assessment (EIA) and reported in the Environmental Statement (ES) that will be submitted as part of the application for consent for Thanet Extension.

1.3 Selection of survey methodology

The survey aim required information to be collected on bird species, numbers and distribution in two distinct types of habitat along the export cable route:

1. On the terrestrial land (above the mean high water mark) including freshwater habitats such as reedbeds, ponds and ditches.
2. On the intertidal land (from the mean low water mark to the mean high water mark and above in the case of roosting birds) recognising that the species, numbers and distribution would change with the tidal cycle in addition to changing across the seasons.

A survey method was selected for each habitat that best suited the birds that were expected to be encountered, accounted for the known variation created by the tidal cycle and provided accurate spatial information to inform the assessment of the proposed export cable route.

On the terrestrial land a line transect method (Hill *et al.*, 2005) was applied recording the numbers, distribution and activity of birds along a corridor that encompassed each of the proposed export cable route options.

On the intertidal land the through-the-tidal-cycle-count (TTTCC) method was applied. This method records the numbers, distribution and activity of birds through an individual tidal cycle of 6 hours. For this reason it incorporates both the standard high tide (Core Count) and the low tide count techniques of the long running Wetland Bird Survey (<https://www.bto.org/volunteer-surveys/webs/about>) that is the standard method of monitoring long-term changes in bird numbers in the UK, including those on estuaries. The TTTCC builds on these methods by mapping the distribution of birds at hourly intervals through an individual tidal cycle.

2. Methodology

2.1 Transect Surveys

A transect consists of the recording of bird numbers, distribution and activity (e.g. feeding, roosting, etc.) along a fixed route, in this case following the line of the proposed onshore cable route options where this coincided with, or was close to, a road, track or path. Each transect was walked steadily recording all birds (both seen and heard) on a set of large scale maps and species totals for each transect was tabulated on a recording form. All bird species using and flying over the land above Medium High Water Springs (MHWS) were recorded (birds whose use is of habitat below MHWS were recorded on the TTTCC carried out on a separate day). The generic method is described in Bibby *et al.* (2000) and Hill *et al.* (2005).

Three transects were used to provide sufficient coverage of the land above MHWS crossed by the two proposed cable route options. Two transects were used to cover the southern option across the Sandwich Bay Estate and the Sandwich Bay National Nature Reserve (NNR) and one transect to cover the northern option across Pegwell Bay and the country park (illustrated on Figure 1). The combined coverage provided by these transects is illustrated on Figure 2. The three transects were counted by three observers simultaneously, with these observers keeping in touch by mobile phone to ensure that duplicate recording was avoided.

Set out below are the key elements of how the transect survey was delivered and bird information recorded along each of the three transect routes:

- Surveys were conducted once a month from November 2016 to March 2017 inclusive.
- Timing of surveys in relation to the tidal state (rising or falling, spring or neap) was varied in order to sample the different conditions across the winter (birds might use terrestrial land in different ways across the tidal cycle).
- Surveys did not take place in heavy rain, poor visibility or strong wind.
- The period of observation on site was around 2-3 hours.
- The transect was conducted using public rights of way and minor roads.
- The survey was of land through which the two potential cables route options would run and all land adjacent to these routes which was above MHWS and was visible from the transect route. Habitats covered along the three transect routes included sand dune systems, agricultural land, fresh waterbodies, managed golf course, salt marsh and saline pools/channels, woodland, and industrial and residential estates.
- All waterbird species and non-waterbird species associated with coastal habitats were recorded, including such species as short-eared owl, kingfisher, meadow pipit, pied wagtail, Cetti's warbler and reed bunting.
- The transect was walked at a steady pace to ensure that birds can be recorded effectively. Regular stop and scan points were selected to minimise the possibility that birds might be present in parts of the survey area that were out of sight because of local topography, vegetation or buildings obscuring the view.
- The limit of extent of the recording of bird locations and numbers by mapping is the area defined by the transect viewshed shown in Figure 2 and the shoreline below the MHWS.
- Bird behaviour activity was also recorded, categorised as 'feeding activity' or 'not feeding activity'; the latter includes a whole range of behaviours including roosting, resting, preening, bathing and vigilance/alert. 'Feeding activity' was recorded on the recording map with a note or by placing the species name and number in a box.
- Birds that flew in and landed during the count period were recorded and included in the totals. Birds that had already been counted on site and then flew off were recorded and included in the totals.

Key elements of information recording:

- At the beginning of the transect, details of observer, date, start time and weather were noted on the recording cover sheet (noting any subsequent significant changes during the transect).
- Throughout the transect, the surveys area was methodically scanned for birds, all of which were counted and their location recorded on the map. All birds were recorded in one of three categories dependent on their behaviour:
 1. Feeding
 2. any another activity that is not feeding;
 3. or flying over without landing.
- Birds were recorded on the map using the British Trust for Ornithology (BTO) two letter code and behaviour notation and, in addition:
 1. Feeding birds were identified on the map by placing their name and the count within a box or by using a supplementary note.
 2. Birds that flew over were identified by running an arrow showing the flight line through the BTO code.
 3. Birds that moved from one part of the site to another were identified by an arrow linking the two points.
- The number of birds was bound to change due to movements in and out of the site during the transect, potentially as a result of flushing by human activity. As a result, a tally was kept for each species (seeking to avoid double counting) and the total count for each species recorded in the relevant 'total number' column of the summary form.
- If during the count period there was any activity (e.g. human disturbance) or change in conditions (e.g. sunlight glinting on the water) that might have affected the count then that was recorded on the cover sheet in the space provided.
- At the end of the transect the finish time was recorded on the cover sheet and the observations summarised on the summary sheet.

Reporting of the counts from the three transects:

All bird counts obtained from the Sandwich Bay NNR and Sandwich Bay Estate transects have been combined to present information for the complete proposed southern cable route option. The counts from the Pegwell Bay and associated area are presented separately, representing the northern cable route option. Regular communication between observers during each transect and consultation at the end of the survey, ensured that any duplication of records was minimised and avoided where possible.

2.2 Through-the-tidal-cycle-counts

A TTTCC consists of the recording of bird numbers, distribution and activity (e.g. feeding, roosting, etc.) through an individual tidal cycle of 6 hours, from low to high tide or vice versa. The 6 hour survey was divided in to 6 x 1 hour periods during which all birds (both seen and heard) were recorded on large scale maps and the totals for each hour tabulated on recording forms. All bird species using and flying over the intertidal land were recorded (birds whose use is of habitat above mean high water springs (MHWS) were recorded on the transect count carried out on a separate day).

Three observation points were used to provide sufficient coverage of the intertidal land crossed by the proposed potential cable route options. Two observation points were used that viewed the northern landfall option and one observation point that viewed the southern landfall option (illustrated on Figure 1). The combined coverage provided by these observation points is illustrated on Figure 2. Due to the topography of the coastline, it was not possible to achieve full visual coverage from one fixed survey position at any of the three observation points, the

observers therefore moved between a maximum of three positions within each one hourly count to ensure that full coverage was achieved. The three observation points were counted by three observers simultaneously, with these observers keeping in touch by mobile phone to ensure that duplicate recording was avoided.

Set out below are the key elements of how the TTTCC survey was delivered and bird information recorded across the three observation points:

- Surveys were conducted once a month from November 2016 to March 2017 inclusive.
- Timing of surveys in relation to the tidal state (rising or falling, spring or neap) was varied in order to sample both from low tide to high tide (rising) and high tide to low tide (falling) for different tidal heights (in the continuum of spring to neap) across the winter.
- Surveys did not take place in heavy rain, poor visibility or strong wind.
- The count was undertaken throughout the low to high tide period or the high to low tide period, specifically within the period 6 hours after low or high tide.
- The total count period was of 6 hours duration but each hour was recorded separately.
- The survey was of intertidal land that would be crossed by, and is adjacent to, the two potential cable route options.
- The limits of extent of the count within each specific coastal area are depicted in Figure 2 and provided full coverage of the survey area and from the upper shore (limit of beach above high tide) out to sea to the limit of reasonable visibility and bird identification.
- All birds were counted that were using the shore or the sea. Birds flying over were ticked as present in the relevant column of the recording form but they were not counted. An exception was made for diver species which were counted even if only in flight. This was because red-throated diver is the interest feature of the Outer Thames Estuary Special Protection Area (SPA) that is sited to the north and east of the areas surveyed.
- All birds using the shore, sand/mudflats or the sea, the number of individuals and their behaviour were recorded on a large scale map using the BTO two letter code and behaviour notation and, in addition:
 1. Feeding birds were identified on the map by placing their BTO code and the count within a box or by using a supplementary note.
 2. Birds that flew over were identified by running an arrow showing the flight line through the BTO code.
 3. Birds that moved from one part of the site to another were identified by an arrow linking the two points.
- Behaviour activity was also recorded, categorised as 'feeding activity' or 'not feeding activity'; the latter includes a whole range of behaviours including roosting, resting, preening, bathing and vigilance/alert.
- Birds that fly in and land during the count period were recorded. Birds that have already been counted on the shore or water that fly off will already have been recorded. Birds that simply flew over were not counted (their presence is noted as described above) other than divers.
- Any notable assemblages of species of identified conservation priority that were observed above MHWS (particularly within inland arable and wetland habitats which form part of the transect survey route) during the 6 hours count period were also noted.
- To achieve full visual coverage of each observation point, observers moved between a maximum of three pre-determined positions during each one hour period to ensure that the full extent of their survey area had been viewed and all species counted.
- The observer was not tied to the optimal observation point. As described above, the curvature and topography of the coastline requires them to walk for part of their survey

and define 'sub'-observation points in order to see, identify and count birds across the full extent of the survey area.

Key elements of information recording:

- At the beginning of the TTTCC details of observer, survey number, date, start time, low tide time and weather were noted on the recording cover sheet (noting any subsequent significant changes during the 6 hour count period).
- The 6 hour count was divided into six 1 hour recording periods.
- At the beginning of each 1 hour recording period details of observer, date, which 1 hour period it was and start time were recorded on a recording sheet and map.
- At the beginning of each 1 hour count period, the position of the tideline was drawn on the recording map for that period, usually with a dotted or dashed line, and a brief description of the extent of exposed mud (optimal feeding habitat for wading birds) along the shoreline was written in the relevant box.
- The number of birds was bound to change due to movements in and out of the survey area during each 1 hour recording period. As a result, individual scan counts were noted/tallied during each hour and if there was time for repeated scans then the approach was to note each 'repeat count' and then at the end of the 1 hour period, the final maximum count for each species was calculated and entered in to the relevant 'max count' column of the recording form.
- If during the count period there was any activity (e.g. human disturbance) or change in conditions (e.g. sunlight glinting on the water) that might have affected the count then that was recorded on the cover sheet in the space provided.
- If marine mammals were incidentally recorded (this was not the primary function of these surveys), the maximum number was recorded on the cover sheet.
- At the end of the 6 hour period the finish time was recorded on the cover sheet.

Reporting of the counts from the three observation points:

The two northern observation points at Pegwell Bay and Shell Ness provided full coverage for the proposed northern cable route option through the intertidal area of Pegwell Bay, and the southern observation point at Sandwich Bay provided full coverage of the proposed southern route option landfall. Therefore all bird counts obtained from the Pegwell Bay and Shell Ness observation points throughout the TTTCC surveys have been combined, and treated separately from the Sandwich Bay data. Regular communication between observers during each 1 hour period of each 6 hour survey and consultation at the end of each survey ensured that duplication of records was minimised and avoided where possible.

2.3 Limitations to the surveys

Surveys are by their nature a sample of the birds occurring at a site and additional species and/or greater numbers might occur on days that were not surveyed. The number and distribution of birds will change with the state of the tide (the reason why TTTCCs were conducted) but also across the spring-neap cycle. The date of each survey within the month was chosen to provide a spread across the winter of counts on spring, intermediate or neap tides. The date of each transect survey within the month was chosen to provide a spread across the winter of counts around the high tide, around the low tide or at an intermediate stage. A survey at monthly intervals is the general practice for many surveys of wetland habitats and of birds outside the breeding season (e.g. the Wetland Bird Survey). The programme of monthly surveys, with a spread across tidal states through the winter, is considered appropriate for the aims of this study – understanding the bird populations using the site for the purposes of informing an EIA.

The programme of surveys was commissioned in November 2016 and as a result it does not include surveys in October, a month that is normally included within the 'winter' for surveys of birds in coastal habitats. This might have resulted in some passage migrant species being missed, or the peak of some species being missed if they occur in larger numbers in passage than during the winter. This omission is not considered significant in relation to the aims of this study – understanding the bird populations using the site for the purposes of informing an EIA – and the survey information can be supplemented by desk study, particularly that of the Wetland Bird Survey results from previous years.

2.4 Surveyor experience and competencies

The minimum experience held by all surveyors was 10 years in the identification of British waterbirds by sight and competent in the conduct of the survey methods applied as shown by a minimum of five years experience of bird survey in the UK following standard methods such as fixed point counts, line transects and intertidal counts. The lead surveyor in each team had, in addition, experience in the application of the survey techniques in professional ecological surveys designed to inform impact assessment.

3. Survey Results

This section provides the results of the full five month survey period from November 2016 to March 2017 inclusive. The surveys are referred to in the tables by visit number i.e. Visit 1 to Visit 5 with Visit 1 being November 2016 and Visit 5 March 2017.

For each survey, information is provided in a standard format on when the individual monthly surveys took place; the weather and tidal conditions under which the survey took place; the observers conducting the survey; the count of the bird species¹ observed on each survey; and where relevant a commentary on the counts and any limitations to the delivery of the survey. Limitations that are common to all or a specific category of survey have already been described in the methodology section above.

3.1 Transect Surveys: Pegwell Bay, Sandwich Bay NNR and Sandwich Bay Estate

3.1.1 Survey visits

Error! Reference source not found. lists the survey dates and the weather conditions for the visits.

Table 1 Pegwell Bay, Sandwich Bay NNR and Sandwich Bay Estate: Transect survey dates and weather conditions

Visit	Date	Weather
1	25/11/2016	Wind NE 4; cloud 0/8; sunny, temp ~10 C.
2	20/12/2016	Wind ESE 2-3; cloud 7/8; overcast, temp ~5 C.
3	06/01/2017	Wind NW 2; cloud 7/8; temp ~3 C.
4	03/02/2017	Wind S 4; cloud 4/8; temp ~8 C.
5	10/03/2017	Wind SW 3; cloud 4/8; temp ~10 C.

Table 2 relates the date and duration of the survey to the tidal state.

Table 2 Pegwell Bay, Sandwich Bay NNR and Sandwich Bay Estate: Transect surveys in relation to tidal state

Visit	Date	Start time (GMT)	Finish time (GMT)	Tidal state
1	25/11/2016	09.30	11.45	Neap tide Falling from a high tide at 08.40 to a low tide at 13.45
2	20/12/2016	08.40	11.00	Between spring and neap tide Around low tide at 10.30
3	06/01/2017	10.00	12.15	Between spring and neap tide Around low tide at 11.00

¹ The scientific names of birds are given in Appendix 1.

Visit	Date	Start time (GMT)	Finish time (GMT)	Tidal state
4	03/02/2017	08.45	10.55	Spring tide Around low tide at 10.00
5	10/03/2017	09.00	11.20	Neap tide Around high tide at 10.05

Table 3 lists the observers and the survey duration for each of the Pegwell Bay visits.

Table 3 Pegwell Bay: Observers and transect survey duration.

	Observer	Date	Start time (GMT)	Finish time (GMT)
1	S Reid	25/11/2016	09.30	11.45
2	A Chick	20/12/2016	08.40	11.00
3	R Buisson	06/01/2017	10.00	12.15
4	A Chick	03/02/2017	08.45	10.55
5	A Chick	10/03/2017	09.00	11.20

Table 4 lists the observers and the survey duration for each of the combined Sandwich Bay NNR and Sandwich Bay Estate visits.

Table 4 Sandwich Bay NNR and Sandwich Bay Estate: Observers and transect survey duration

	Observer [S = southern part; N = northern part]	Date	Start time (GMT)	Finish time (GMT)
1	R Buisson (S) & S Holloway (N)	25/11/2016	09.55	12.15
2	S Reid (S) & S Holloway (N)	20/12/2016	08.20	10.40
3	S Reid (S) & S Holloway (N)	06/01/2017	08.35	11.30
4	S Reid (S) & S Holloway (N)	03/02/2017	08.00	10.30
5	S Reid (S) & S Holloway (N)	10/03/2017	08.40	11.15

3.1.2 Observations - Pegwell Bay

Table 5 lists the count of each species for each of the visits. As this was a transect survey in which different areas were observed sequentially, the count is the total number of each species observed along the transect (accounting for any known duplicate observations).

The counts shown in Table 5 are of birds utilising land visible from the transect route and above MHWS or any areas below MHWS that were not visible, and therefore not counted, during the Pegwell Bay and Shell Ness TTTCC surveys, particularly the areas of saltmarsh and tidal channels to the south of Pegwell Bay Country Park. Any counts made of the lagoon, adjacent to Sandwich Road and north of the Pegwell Bay Country Park, during the transect have not been included in the count totals in Table 4 as the lagoon was routinely and comprehensively counted during the TTTCC surveys. These additional counts are included on the relevant results maps in Appendix 2.

Table 5 Pegwell Bay Transect: Total count of bird species on each visit

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
Dark-bellied brent goose	0	0	9	0	0
Mallard	0	2	0	0	4
Little egret	0	0	0	0	1
Grey heron	0	1	0	0	0
Moorhen	1	0	1	0	0
Oystercatcher	2	0	0	0	0
Snipe	2	0	0	0	0
Curlew	4	0	1	0	3
Redshank	10	1	0	4	7
Black-headed gull	5	14	16	30	1
Common gull	0	0	2	1	0
Herring gull	5	0	4	11	7
Kingfisher	1	0	0	0	0
Skylark	0	0	0	0	2
Cetti's warbler	0	0	0	1	0
Pied wagtail	4	2	0	0	0
Grey wagtail	0	0	0	1	1
Meadow pipit	12	0	7	1	0
Reed bunting	8	7	2	0	4

Species accounts

Waders

A total of seven species of wader (including all rail and heron sp.) were recorded during the survey period. The most numerous wader species recorded was redshank with a peak count across the winter surveys of 10, predominantly feeding in the tidal channels to the south of Pegwell Bay, during the November survey. All of the waders recorded were utilising similar intertidal habitat, except for oystercatcher, two of which were observed feeding on St. Augustine's Golf Course to the west of Sandwich Road.

No species were observed on these transects that were over-wintering interest features of the Thanet Coast and Sandwich Bay SPA (golden plover and turnstone) or non-breeding interest features of the Sandwich Bay to Hacklinge Marshes SSSI (ringed plover, golden plover, grey plover and sanderling).

Wildfowl

Two species of wildfowl were recorded during the survey period (not including those recorded on the lagoon). Dark-bellied brent goose was recorded during the January survey, with a total of nine birds feeding to the north of Pegwell Bay. Mallard was recorded during both December and March surveys, feeding in intertidal channels to the south of the Country Park.

Gulls

Three species of gull were recorded during the survey period. The most numerous gull species recorded was black-headed gull, with a peak count across the winter surveys of 30, predominantly feeding on St. Augustine's Golf Course, recorded during the February survey. The remaining gull counts are relatively well distributed between habitats along the transect route, including the birds using house roof tops.

Passerines

The passerines recorded are species predominantly associated with coastal or wetland habitats along the transect route. A total of 7 species (including kingfisher) were recorded during the survey period. The most numerous species recorded was meadow pipit with a peak count across the winter surveys of 12, predominantly feeding within the saltmarsh to the south of the Pegwell Bay Country Park, during the November survey.

3.1.3 Observations – Sandwich Bay NNR and Estate

Table 6 lists the count of each species for each of the visits. As this was a transect survey in which different areas were observed sequentially, the count is the total number of each species observed along the transect (accounting for any known duplicate observations). Golden plover counts have been highlighted orange in the table as it is an overwintering interest feature of the Thanet Coast and Sandwich Bay SPA. Ringed plover counts have been highlighted green in the table as it is a non-breeding interest feature of the Sandwich Bay to Hacklinge Marshes SSSI.

The counts shown in Table 6 are of birds utilising land visible from the transect route and above MHWS, particularly the areas of saltmarsh, tidal channels and waterbodies towards the north, and arable land, sand dune and fresh water pools towards the south, of the transect route. Maps showing the distribution of these records are provided in Appendix 2, Figure 9-13. Bird species that were recorded inland during the Sandwich Bay Estate TTTCC survey (consistently undertaken on the previous day) have not been included in the transect count totals in Table 5 to avoid duplicating records as it is considered that those birds observed inland during the TTTCC will have been counted during the transect survey. However these TTTCC records are still presented on the survey results maps provided in Appendix 2, Figure 98-127.

Table 6 Sandwich Bay NNR and Estate Transect: Total count of bird species on each visit

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
Mute swan	2	3	0	3	5
Pink-footed goose	0	0	0	0	4
European white-fronted goose	0	0	0	12	0
Greylag goose	6	90	0	69	83
Barnacle goose	0	0	1	0	1
Dark-bellied brent goose	0	0	0	0	1
Shelduck	22	21	59	20	28
Wigeon	0	1	27	4	6
Gadwall	0	8	18	15	11
Teal	800	196	207	967	87

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
Mallard	38	9	27	49	54
Shoveler	2	11	4	22	12
Pochard	10	0	0	0	0
Tufted duck	1	0	1	0	9
Goldeneye	0	1	0	0	0
Little grebe	2	0	0	1	3
Cormorant	0	7	0	1	0
Little egret	2	2	3	1	3
Grey heron	0	2	3	1	0
Marsh harrier	0	1	2	0	0
Peregrine	0	0	1	2	0
Moorhen	5	2	27	8	6
Coot	16	40	42	35	31
Oystercatcher	0	0	0	0	10
Avocet	0	0	0	3	14
Snipe	1	6	9	16	1
Ringed plover	0	0	0	0	6
Golden plover	60	120	0	0	0
Lapwing	505	1,197	821	2,627	10
Curlew	34	9	23	60	15
Redshank	6	5	5	4	7
Dunlin	10	0	0	0	0
Black-headed gull	46	5	27	94	59
Common gull	29	10	24	72	49
Lesser black-backed gull	1	0	0	0	2
Herring gull	110	3	14	51	138
Great black-backed gull	55	0	0	0	8
Kingfisher	0	2	0	0	0
Cetti's warbler	2	1	2	1	4
Stonechat	2	2	2	0	0
Pied wagtail	1	0	1	0	2
Grey wagtail	1	0	0	0	0
Meadow pipit	0	6	20	8	4
Rock pipit	0	0	0	0	1
Reed bunting	2	3	4	7	7
Corn bunting	0	0	0	0	11

Species accounts

Golden Plover

A qualifying feature of the Thanet Coast and Sandwich Bay SPA and the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in orange in the table above), golden plover were recorded as utilising the habitat along the transect route on two of the five visits. The peak count across the winter surveys of golden plover was 120, recorded during the December

survey. Golden plover were also observed on the TTTCC surveys within the transect survey area during the November (peak count 375) and January (peak count 33) TTTCC surveys. Their location is shown on the relevant results maps in Appendix 2, Figures 98-127. An overview of the distribution of golden plover concentrations throughout the entire survey period is provided in Appendix 2, Figure 3. The three concentrations that were along the transect route (numbered 4-6 on Figure 3) were on the intertidal land on the right bank of the River Stour at Long Reach (area 4), on pasture fields to the east of the Royal St George's Golf Course Club House (area 5) and on pasture fields to the south of the Restharrow Scrape (area 6).

With respect to the Thanet Coast and Sandwich Bay SPA population, the Natura 2000 Standard Data Form (JNCC, 2015) states that the population for the site is 411 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. The peak count recorded on the transect surveys was 120 individuals, representing 29% of the SPA population. With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Ringed Plover

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), ringed plover were recorded as utilising the habitat along the transect route on one of the five visits. The peak count across the winter transect surveys of ringed plover was 6, recorded during the March survey on marshland to the east of Long Reach.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the passage migrant population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >300. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Waders

A total of 13 species of wader (including all rail and heron sp. and those shorebirds species already identified individually above) were recorded during the survey period. The most numerous wader species recorded was lapwing with a peak count across the winter surveys of 2,627, involving roosting birds predominantly distributed between two locations, towards the southern and northern extents of the transect, each with totals of 1,450 and 1,150 respectively. Other wader species were recorded feeding and roosting in varying concentrations, and were well distributed throughout arable, wetland, intertidal and grassland habitats throughout the survey area. Those waders that are the other overwintering/non-breeding interest features of the Thanet Coast and Sandwich Bay SPA (turnstone) and Sandwich Bay to Hacklinge Marshes SSSI (grey plover and sanderling) were not observed on the transect surveys.

Wildfowl

A total of 17 species of wildfowl (including cormorant) were recorded during the survey period. The most numerous wildfowl species recorded was teal with a peak count across the winter surveys of 967, predominantly congregating on Restharrow Scrape at the south end of the transect, during the November survey. A large number of teal, as well as a variety of other wildfowl species, were consistently recorded there throughout the winter survey period.

Gulls

Five species of gull were recorded during the survey period. The most numerous gull species recorded was herring gull, predominantly feeding in arable land toward the south or loafing on waterbodies toward the north of the transect route, with a peak count across the winter surveys of 138 recorded during the March survey. The remaining gull counts are relatively well distributed between arable and wetland habitats along the transect route.

Raptors

Two species of raptor were recorded during the survey period. Peregrine was recorded during the January and February surveys, with a peak count across the winter surveys of two hunting toward the north of the transect route during the February survey. Marsh harrier was recorded during the December and January surveys, with a peak count across the winter surveys of two hunting toward the north of the transect route during the January survey.

Passerines

The passerines recorded are species predominantly associated with coastal or wetland habitats along the transect route. A total of nine species (including kingfisher) were recorded during the survey period. The most numerous passerine species recorded was meadow pipit with a peak with peak count of 20, predominantly feeding within intertidal and wetland habitat toward the north of the transect route, during the January survey.

3.1.4 *Limitations*

As described in the methodology section, this survey uses public highways (roads and paths) from which to view the habitats above MHWS, or below MHWS which could not be viewed during TTTCC surveys, along the line of, and adjacent to, the two proposed potential cable route options. As a result, coverage of those habitats is totally dependent on the location of such public highways in relation to the proposed cable route. A transect route was selected that best followed the proposed cable routes and provided the best viewing of the surrounding habitat. As a result of local topography and/or screening vegetation/buildings some areas of coastal habitat above MHWS were not visible. It is considered that any large and significant concentrations of wildfowl utilising this habitat would not have been missed but that the more 'cryptic' species such as snipe, if present in viewable but not closely accessible areas, may not have been recorded.

There were no other limitations to the conduct of the surveys.

3.2 TTTCC Surveys: Pegwell Bay and Sandwich Bay

3.2.1 Survey visits

Table 7 lists the survey dates, tide times and the weather conditions for the visits.

Table 7 Pegwell Bay and Sandwich Bay TTTCCs: Survey dates, tides and weather conditions

Visit	Date	Tide times	Weather and tide state
1	24/11/2016	HT 07.25 LT 14.20	Wind NE 6; cloud 2/8; visibility excellent; temp ~10 C. Neap tide. Count on the falling tide.
2	19/12/2016	LT 09.45 HT 15.15	Wind ENE 2; cloud 8/8; visibility moderate; temp ~6 C. Between spring and neap tide. Count on the rising tide.
3	05/01/2017	LT 10.20 HT 16.00	Wind N 2-3; cloud 1/8; visibility excellent; temp ~3-8 C. Between spring and neap tide. Count on the rising tide.
4	02/02/2017	LT 09.15 HT 14.45	Wind SSE 5; cloud 4/8; visibility excellent; temp ~10 C. Spring tide. Count on the rising tide.
5	09/03/2017	HT 09.05 LT 16.00	Wind SW 3-5; cloud 4/8; visibility excellent; temp ~14 C. Neap tide. Count on the falling tide.

Table 8 lists the observers and the survey duration for each of the visits.

Table 8 Pegwell Bay and Sandwich Bay TTTCCs: Observers and survey duration

Visit	Observers	Date	Start time (GMT)	Finish time (GMT)
1	R Buisson, S Holloway, S Reid	24/11/2016	08.00	16.00
2	A Chick, S Holloway, S Reid	19/12/2016	09.00	15.00
3	R Buisson, A Chick, S Reid	05/01/2017	10.00	16.00
4	A Chick, S Holloway, S Reid	02/02/2017	08.30	14.30
5	A Chick, S Holloway, S Reid	09/03/2017	09.30	15.30

3.2.2 Observations – Pegwell Bay/Shell Ness

Table 9 lists the peak count from the six one-hour counts of each species for each of the visits. Turnstone and golden plover counts have been highlighted orange in the table as both are overwintering interest features of the Thanet Coast and Sandwich Bay SPA. Ringed plover, grey plover and sanderling have been highlighted in green in the table as they are non-breeding interest features of the Sandwich Bay to Hacklinge Marshes SSSI (along with golden plover).

This survey consists of two simultaneous TTTCC surveys from two observation points, each of which was observed for six hours. As a result a specific approach was required as to the definition of the peak count. At each observation point the individual peak count was identified as the highest number of each species observed in any one hour. The identification of the whole survey peak count was determined based on the results of consultation between the

two observers, who noted the movements of groups of birds between parts of Pegwell Bay, to ensure that any particular whole survey peak count did not represent a duplication of counts.

Maps showing the distribution of records for each one hourly count of each of the five visits, separated in to Gull, Waders, and Wildfowl and Auks, are provided in Appendix 2, Figures 14-97.

Table 9 Pegwell Bay – the coastal area covered from the two northern observation TTTCC points combined: Peak count of bird species on each visit

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
Dark-bellied brent goose	62	5	51	27	96
Shelduck	11	25	143	76	68
Wigeon	1,085	583	494	414	102
Teal	40	83	51	65	22
Mallard	54	77	114	75	16
Shoveler	30	21	23	15	8
Goldeneye	0	1	0	0	0
Great crested grebe	0	1	0	0	0
Cormorant	3	19	352	360	729
Little egret	1	3	0	0	0
Grey heron	0	4	1	1	2
Water rail	0	0	1	1	0
Oystercatcher	825	616	771	510	345
Ringed plover	5	0	8	0	2
Golden plover	670	405	10	76	0
Grey plover	146	98	107	85	2
Lapwing	691	1,376	430	640	0
Knot	289	214	69	36	25
Sanderling	47	37	28	76	36
Dunlin	1,480	520	780	672	70
Snipe	0	6	0	1	0
Black-tailed godwit	7	5	2	1	9
Bar-tailed godwit	300	252	401	290	51
Curlew	174	126	311	106	147
Redshank	30	30	57	23	8
Turnstone	8	4	0	0	0
Black-headed gull	240	566	416	440	558
Common gull	38	408	300	339	290
Lesser black-backed gull	110	4	23	6	2
Herring gull	416	692	882	140	898
Yellow-legged gull	1	0	0	0	0
Great black-backed gull	605	752	129	157	61
Medium gull sp. (low visibility)	0	0	0	0	65
Carrion crow	2	0	6	0	0
Cetti's warbler	0	0	1	0	0

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
Stonechat	0	0	0	1	0
Pied wagtail	0	1	0	1	0
Meadow pipit	0	1	1	4	8
Rock pipit	0	1	0	2	1
Starling	0	0	32	0	0
Goldfinch	0	0	20	0	0
Reed bunting	0	21	2	8	2

Species accounts

Golden Plover

A qualifying feature of the Thanet Coast and Sandwich Bay SPA (highlighted in orange in the table above), golden plover was recorded in four of the five visits during the winter survey period. The peak count was of 670 non-feeding birds roosting on the edge of the saltmarsh in the central section of Pegwell Bay during the November survey. The peak count of feeding birds was 250 on the mud and sand flats of the central section of Pegwell Bay recorded during the December survey. An overview of the distribution of golden plover concentrations throughout the entire survey period is provided in Appendix 2, Figure 3. The three concentrations that were within the survey area for the TTTCC (numbered 1-3 on Figure 3) were on the saltmarsh and intertidal land in the central section of Pegwell Bay (area 1), on the intertidal land north of Shell Ness (area 2) and on the intertidal land east of Shell Ness (area 3). The numbers recorded in areas 2 and 3 were significantly less (i.e. always <100) than those recorded at area 1.

With respect to the Thanet Coast and Sandwich Bay SPA population, the Natura 2000 Standard Data Form (JNCC, 2015) states that the population for the site is 411 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. The peak count recorded on the TTTCC surveys was 670 individuals, representing 163% of the SPA population. With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Turnstone

A qualifying feature of the Thanet Coast and Sandwich Bay SPA (highlighted in orange in the table above), turnstone was recorded on three occasions during the winter survey period (on two of the one hour counts in November and on one of the one hour counts in December). The peak count was of eight non-feeding birds that were roosting on the upper shore between Shell Ness and the Sandwich Flats during the November survey. The peak count of feeding birds was four recorded on the edge of the derelict Hoverport in Pegwell Bay during the December survey.

With respect to the Thanet Coast and Sandwich Bay SPA population, the Natura 2000 Standard Data Form (JNCC, 2015) states that the population for the site is 940 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. The peak count recorded on the TTTCC surveys was eight individuals, representing 0.8% of the SPA population.

Ringed Plover

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), ringed plover was recorded in three of the five visits during the winter survey period. The peak count was of 8 feeding birds on the mud and sand flats in the central section of Pegwell Bay during the January survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the passage migrant population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >300. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Grey Plover

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), grey plover was recorded in each of the five visits during the winter survey period. The peak count was of 146 feeding birds approximately evenly divided between the mud and sandflats adjacent to Shell Ness point (76 birds) and across the mud and sand flats in the northern section of Pegwell Bay (70 birds) in the November survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the wintering population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >210. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Sanderling

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), sanderling was recorded in each of the five visits during the winter survey period. The peak count was of 76 feeding birds divided between the mud and sandflats adjacent to Shell Ness point (46 birds) and the mud and sand flats close to the tide edge in the southern section of Pegwell Bay (30 birds) in the February survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the wintering population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >140. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Waders

A total of 17 species of wader (including all rail and heron sp. and those shorebirds species already identified individually above) were recorded during the survey period. The most numerous wader species recorded were dunlin and lapwing. The peak count of Dunlin was 1,480 feeding birds divided between the mud and sand flats in the northern section of Pegwell Bay (1,070 birds) and the mud and sandflats adjacent to Shell Ness point (410 birds) in the November survey. The peak count of lapwing was 1,376 roosting birds primarily along the edge of the saltmarsh in the central section of Pegwell Bay in the December survey. Notable numbers of bar-tailed godwit were recorded, with a peak count of 401 recorded feeding across the mud and sand flats in the central section of Pegwell Bay during the January survey.

Gulls

A total of six species of gull were recorded as using the survey area during the survey period. The most numerous gull species recorded was herring gull, with a peak count of 898 recorded during the March survey. Large numbers of gulls were recorded feeding on the intertidal mud within Pegwell Bay and coming in to roost during periods of high tide, and particularly at dusk.

Wildfowl

A total of nine species of wildfowl (including cormorant) were recorded as using the survey area during the survey period. The most numerous wildfowl species recorded was wigeon, with a peak count of 1,085 non-feeding birds divided between the lagoon in the central section of Pegwell Bay (250 birds), the saltmarsh of the southern section of Pegwell Bay (350 birds) and the edge of the River Stour at Shell Ness (485 birds) in the November survey. Cormorants displayed a gradual increase in numbers throughout the survey period, with a peak count of 729 recorded during the March survey, utilising an intertidal sandbank to rest during periods of low tide.

Passerines

The passerines recorded are species associated with coastal habitats or were observed feeding on the upper shore or intertidal zone. A total of nine passerine species were recorded as using the survey area during the survey period. The most numerous passerine species recorded were starling and reed bunting, with peak counts of 32 and 21 respectively.

3.2.3 Observations – Sandwich Bay

Table 10 lists the peak count from the six one-hour counts of each species for each of the visits. Turnstone counts have been highlighted orange in the table as it is an overwintering interest feature of the Thanet Coast and Sandwich Bay SPA. Ringed plover, grey plover and sanderling counts have been highlighted green in the table as they are non-breeding interest features of the Sandwich Bay to Hacklinge Marshes SSSI.

To achieve full visual coverage of the survey area (the southern cable option landfall and a buffer extending north and south of this point) along this part of the coast, three locations were selected from which coastal areas to the northern extent, centre, and southern extent could be viewed and birds comprehensively counted. Each of these three locations was visited for 15 minutes within each one hour count period, with the remaining time spent walking between locations. Any birds observed between the three locations that were considered to not have already been counted were recorded. This approach was necessitated by the curvature of the shingle ridge that formed the coast at this point.

Maps showing the distribution of records for each one hourly count of each of the five visits are provided in Appendix 2, Figures 98-127.

Table 10 **Sandwich Bay – the coastal area covered from the single southern TTTCC observation point: Peak count of bird species on each visit.**

Bird Species	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17
European white-fronted goose	0	0	2	0	0
Wigeon	0	18	7	0	0
Mallard	0	26	0	0	0
Scaup	0	1	0	0	0
Common scoter	24	59	32	21	0
Velvet scoter	0	10	0	0	0
Red-throated diver	1	14	0	2	2
Black-throated diver	0	0	0	1	0
Great crested grebe	0	24	29	70	363
Cormorant	0	58	0	320	350
Merlin	1	0	0	0	0
Kestrel	1	0	0	0	0
Oystercatcher	6	202	28	140	4
Ringed plover	0	58	0	12	0
Grey plover	0	0	10	1	0
Sanderling	0	6	5	4	0
Curlew	0	0	0	26	0
Turnstone	8	21	17	8	13
Black-headed gull	175	15	62	48	46
Common gull	85	31	100	32	79
Lesser black-backed gull	20	0	0	4	0
Herring gull	140	40	220	54	113
Great black-backed gull	35	38	25	10	6
Kittiwake	0	0	0	0	1
Guillemot	0	0	1	1	0
Short-eared owl	0	0	2	0	0
Skylark	1	0	0	0	0
Meadow pipit	2	4	7	0	1
Rock pipit	0	0	0	0	1
Linnet	2	0	0	0	0

Species accounts

Golden Plover

Golden plover was not recorded within the survey area during the survey period. However, they were recorded utilising the farmland above MHS that was within the transect survey area during the November (peak count 375) and January (peak count 33) TTTCC surveys (see Appendix 2, Figures 98-127). These birds were observed on a pasture field to the south of Restharrow Scrape (area 6 on Figure 3). An overview of the distribution of golden plover concentrations throughout the entire survey period is provided in Appendix 2, Figure 3. None of those concentrations were within the intertidal area recorded by the Sandwich Bay TTTCC.

With respect to the Thanet Coast and Sandwich Bay SPA population, the Natura 2000 Standard Data Form (JNCC, 2015) states that the population for the site is 411 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. The peak count recorded during a TTTCC survey, but of birds using an area that was within the transect survey recording area as it was above MHWs, was 375 individuals, representing 91% of the SPA population. With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Turnstone

A qualifying feature of the Thanet Coast and Sandwich Bay SPA (highlighted in orange in the table above), turnstone was recorded on all surveys during the survey period. The peak count was of 21 non-feeding birds along the shore opposite the northern end of the residential development of the Estate during the December survey. The peak count of feeding birds was 17, the majority (14) being recorded along the shore beyond the southern end of the residential development of the Estate during the January survey.

With respect to the Thanet Coast and Sandwich Bay SPA population, the Natura 2000 Standard Data Form (JNCC, 2015) states that the population for the site is 940 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. The peak count recorded on the TTTCC surveys was 21 individuals, representing 2.2% of the SPA population.

Ringed Plover

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), ringed plover was recorded in two of the five visits during the winter survey period. The peak count was of 58 non-feeding birds roosting along the shore opposite the northern end of the residential development of the Estate during the December survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the passage migrant population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >300. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Grey Plover

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), grey plover was recorded in two of the five visits during the winter survey period. The peak count was of 10 feeding birds on the intertidal flats to the north of the residential development of the Estate during the January survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the wintering population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >210. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Sanderling

A qualifying feature of the Sandwich Bay to Hacklinge Marshes SSSI (highlighted in green in the table above), sanderling was recorded in three of the five visits during the winter survey period. The peak count was of 6 feeding birds on the intertidal flats to the north of the residential development of the Estate during the December survey.

With respect to the Sandwich Bay to Hacklinge Marshes SSSI population, the SSSI citation states that the wintering population is of nationally important numbers and refers to Salmon *et al.* (1989) that gives the qualifying population at that time as >140. The SSSI citation does not state the population for which the notification was made and as a result a comparison with that population cannot be made.

Waders

A total of six species of wader (including those already identified above) were recorded as utilising the survey area during the survey period. The most numerous wader species recorded was oystercatcher, with a peak count of 202 feeding birds on the intertidal flats to the north of the residential development of the Estate, recorded during the December survey.

Gulls

A total of six species of gull were recorded as using the survey area during the survey period. The most numerous gull species recorded was herring gull, with a peak count of 220 recorded during the January survey. Large numbers of gulls were recorded feeding and roosting along coastline, utilising the shingle beach, intertidal sand/mud and the sea.

Wildfowl

A total of ten species of wildfowl (including cormorant) were recorded as using the survey area during the survey period. The most numerous wildfowl species recorded was great crested grebe, with a peak count of 363 feeding birds recorded up to a kilometre offshore in a wide band across the survey area during the March survey.

Seabirds

Guillemot was the only truly pelagic seabird species recorded as utilising the survey area, with one non-feeding bird recorded on the sea during the January survey, and one feeding bird recorded on the sea during the February survey. Both gannet and fulmar were observed flying across the survey area, but not landing on the sea or foraging, during the survey period.

Raptors

A total of three species of raptor were recorded as using the survey area during the survey period. The most numerous recorded species recorded was short-eared owl with a peak count of two birds hunting during the January survey. Although the movements of these two birds, and any attempts to catch prey, mostly occurred above MHWS within the Restharrow Dunes area, both birds were observed making occasional flights over the coastal path and shingle beach to the south of the Sandwich Bay estate. Although the birds did not land below MHWS, their in-flight hunting behaviour is to be considered as utilisation of the survey area.

Passerines

The passerines recorded are species associated with coastal habitats or were observed feeding on the upper shore or intertidal zone. A total of four passerine species were recorded as using the survey area during the survey period. The most numerous passerine species recorded was meadow pipit, with a peak count of seven birds within the survey area.

3.2.4 *Limitations*

As described above, full visual coverage could not be achieved from a single, static location as the local topography limited the visibility of certain areas of the coast. The full extent of the coastal zone was observed by moving within each hour of observation between a maximum of three predetermined locations. This approach of moving between points will have resulted in the full population of coastal birds being recorded but in the process of moving some passage migrant seabirds passing offshore may have been missed as a telescope will not have been used during those times.

There were no other limitations to the conduct of the surveys.

References

Bibby, C.J., Burgess, N.D., Hill, D.A., and Mustoe, S.H. (2000). *Bird Census Techniques*. [2nd edition]. Academic Press, London.

Hill, D., Fasham, M., Tucker, G., Shewry, M. and Shaw, P. (eds) (2005). *Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring*. CUP, Cambridge.

JNCC (2015) *Thanet Coast and Sandwich Bay SPA Natura 2000 Standard Data Form* (update version 2015-12). JNCC, Peterborough.

Salmon, D.G., Prys-Jones, R.P. and Kirby, J.S. (1989). *Wildfowl and Wader Counts 1988-89*. Wildfowl & Wetlands Trust, Slimbridge.

Appendix 1: Scientific names of birds

English vernacular name	Scientific name	Species code used on maps
Mute swan	<i>Cygnus olor</i>	MS
White-fronted goose (European)	<i>Anser albifrons</i>	WG
Greylag goose	<i>Anser anser</i>	GJ
Canada goose	<i>Branta canadensis</i>	CG
Barnacle goose	<i>Branta leucopsis</i>	BY
Brent goose (dark-bellied)	<i>Branta bernicla</i>	BG
Shelduck	<i>Tadorna tadorna</i>	SU
Wigeon	<i>Anas penelope</i>	WN
Gadwall	<i>Anas strepera</i>	GA
Teal	<i>Anas crecca</i>	T.
Mallard	<i>Anas platyrhynchos</i>	MA
Pintail	<i>Anas acuta</i>	PT
Shoveler	<i>Anas clypeata</i>	SV
Pochard	<i>Aythya ferina</i>	PO
Tufted duck	<i>Aythya fuligula</i>	TU
Goldeneye	<i>Bucephala clangula</i>	GN
Red-throated diver	<i>Gavia stellata</i>	RH
Black-throated diver	<i>Gavia arctica</i>	BV
Little grebe	<i>Tachybaptus ruficollis</i>	LG
Great crested grebe	<i>Podiceps cristatus</i>	GG
Cormorant	<i>Phalacrocorax carbo</i>	CA
Little egret	<i>Egretta garzetta</i>	ET
Grey heron	<i>Ardea cinerea</i>	H.
Marsh harrier	<i>Circus aeruginosus</i>	MR
Peregrine	<i>Falco peregrinus</i>	PE
Merlin	<i>Falco columbarius</i>	ML
Kestrel	<i>Falco tinnunculus</i>	K.
Water rail	<i>Rallus aquaticus</i>	WA
Moorhen	<i>Gallinula chloropus</i>	MH
Coot	<i>Fulica atra</i>	CO
Oystercatcher	<i>Haematopus ostralegus</i>	OC
Avocet	<i>Recurvirostra avosetta</i>	AV
Snipe	<i>Gallinago gallinago</i>	SN
Ringed plover	<i>Charadrius hiaticula</i>	RP
Golden plover	<i>Pluvialis apricaria</i>	GP
Grey plover	<i>Pluvialis squatarola</i>	GV
Lapwing	<i>Vanellus vanellus</i>	L.
Curlew	<i>Numenius arquata</i>	CU
Redshank	<i>Tringa totanus</i>	RK
Knot	<i>Calidris canutus</i>	KN
Dunlin	<i>Calidris alpina</i>	DN
Sanderling	<i>Calidris albe</i>	SS
Black-tailed godwit	<i>Limosa limosa</i>	BW
Bar-tailed godwit	<i>Limosa lapponica</i>	BA
Turnstone	<i>Arenaria interpres</i>	TT
Black-headed gull	<i>Chroicocephalus ridibundus</i>	BH
Common gull	<i>Larus canus</i>	CM

English vernacular name	Scientific name	Species code used on maps
Lesser black-backed gull	<i>Larus fuscus</i>	LB
Herring gull	<i>Larus argentatus</i>	HG
Yellow-legged gull	<i>Larus michahellis</i>	YG
Great black-backed gull	<i>Larus marinus</i>	GB
Kittiwake	<i>Rissa tridactyla</i>	KI
Guillemot	<i>Uria aalge</i>	GU
Short-eared owl	<i>Asio flammeus</i>	SE
Kingfisher	<i>Alcedo atthis</i>	KF
Skylark	<i>Alauda arvensis</i>	S.
Carrion crow	<i>Corvus corone</i>	C.
Cetti's warbler	<i>Cettia cetti</i>	CW
Wren	<i>Troglodytes troglodytes</i>	WR
Stonechat	<i>Saxicola torquatus</i>	SC
Pied wagtail	<i>Motacilla alba</i>	PW
Grey wagtail	<i>Motacilla cinerea</i>	GL
Meadow pipit	<i>Anthus pratensis</i>	MP
Rock pipit	<i>Anthus petrosus</i>	RC
Starling	<i>Sturnus vulgaris</i>	SG
Goldfinch	<i>Carduelis carduelis</i>	GO
Linnet	<i>Linaria cannabina</i>	LI
Reed bunting	<i>Emberiza schoeniclus</i>	RB
Corn bunting	<i>Emberiza calandra</i>	CB
House sparrow	<i>Passer domesticus</i>	HS

Appendix 2: Figures

Supplied as a separate document



Appendix of Figures to the Final Report

Thanet Extension Offshore Wind Farm

**Export Cable Route Intertidal and Terrestrial Wintering Bird
Surveys**

Vattenfall Wind Power Ltd

APEM Ref P00001329

August 2017

Roger Buisson, Sean Sweeney and Scott Reid

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Date of issue: August 2017

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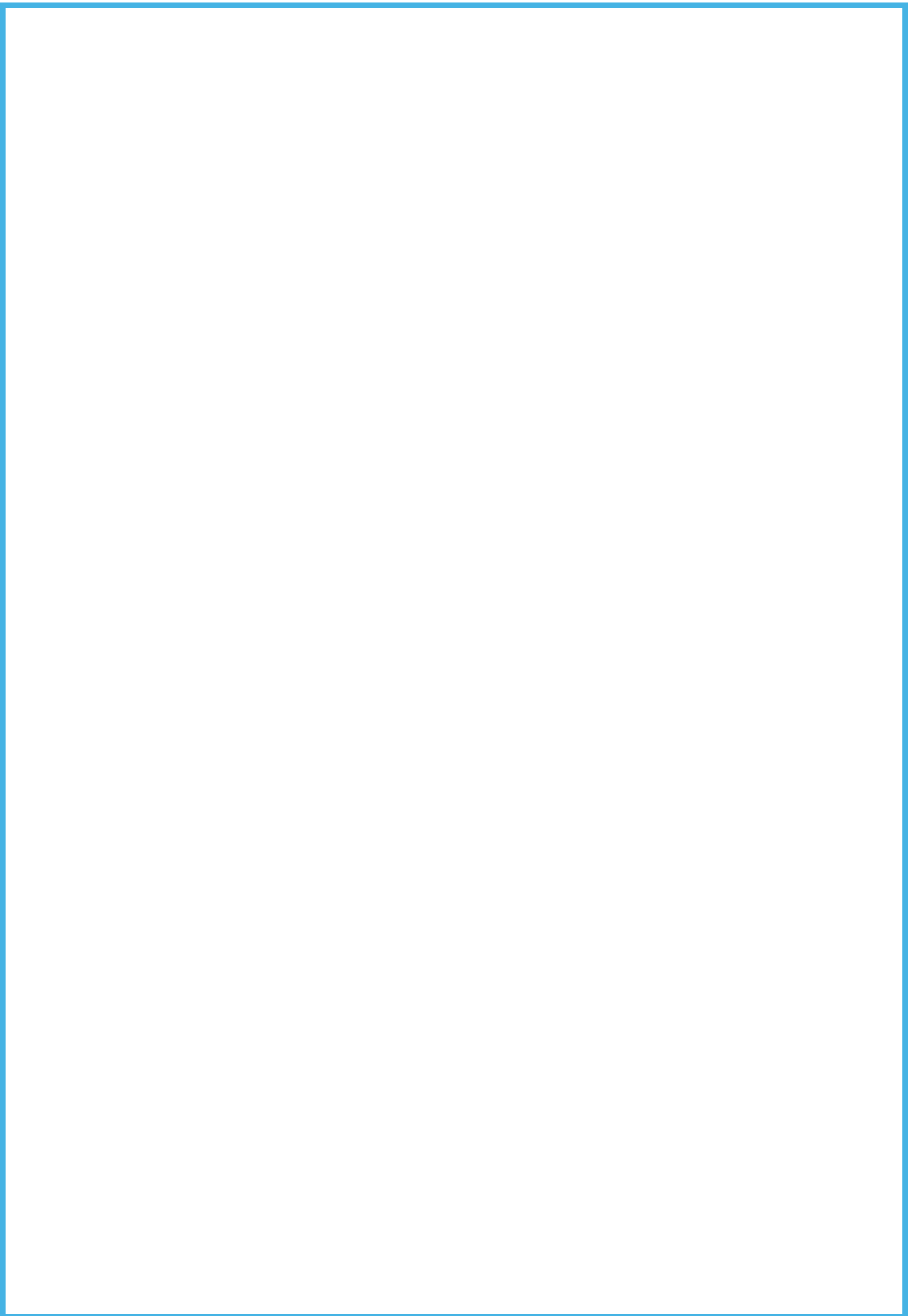
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Registered in England No. 02530851

Document citation

APEM (2017). Thanet Extension Offshore Wind Farm: Export Cable Route Intertidal and Terrestrial Wintering Bird Surveys – Appendix of Figures to the Final Report. APEM Scientific Report P00001329 to Vattenfall Wind Power Ltd, August 2017, v3.0



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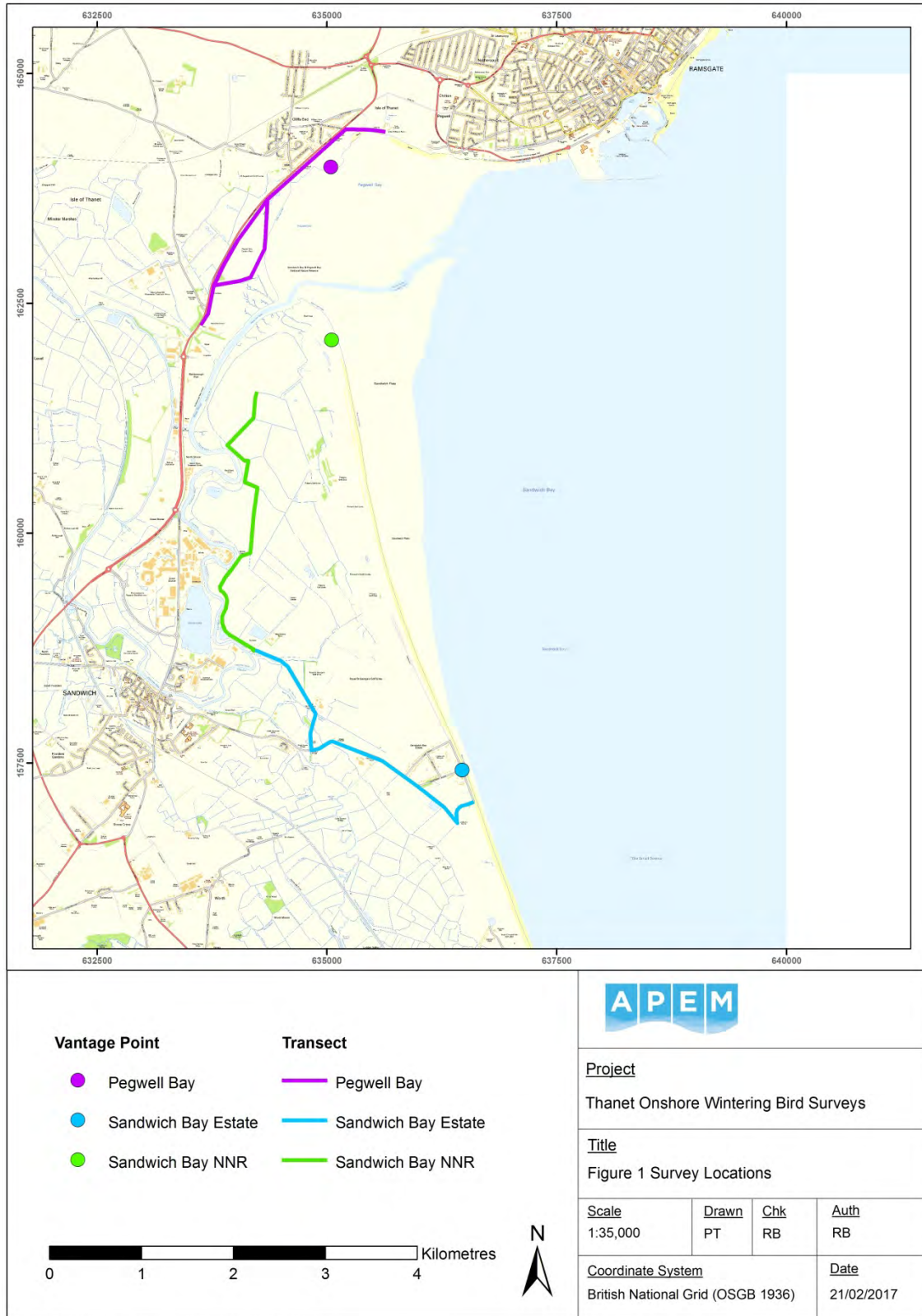
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Appendix 2: Figures

Survey method information



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Figure 1 Survey Locations: TTTCC vantage points and transect routes

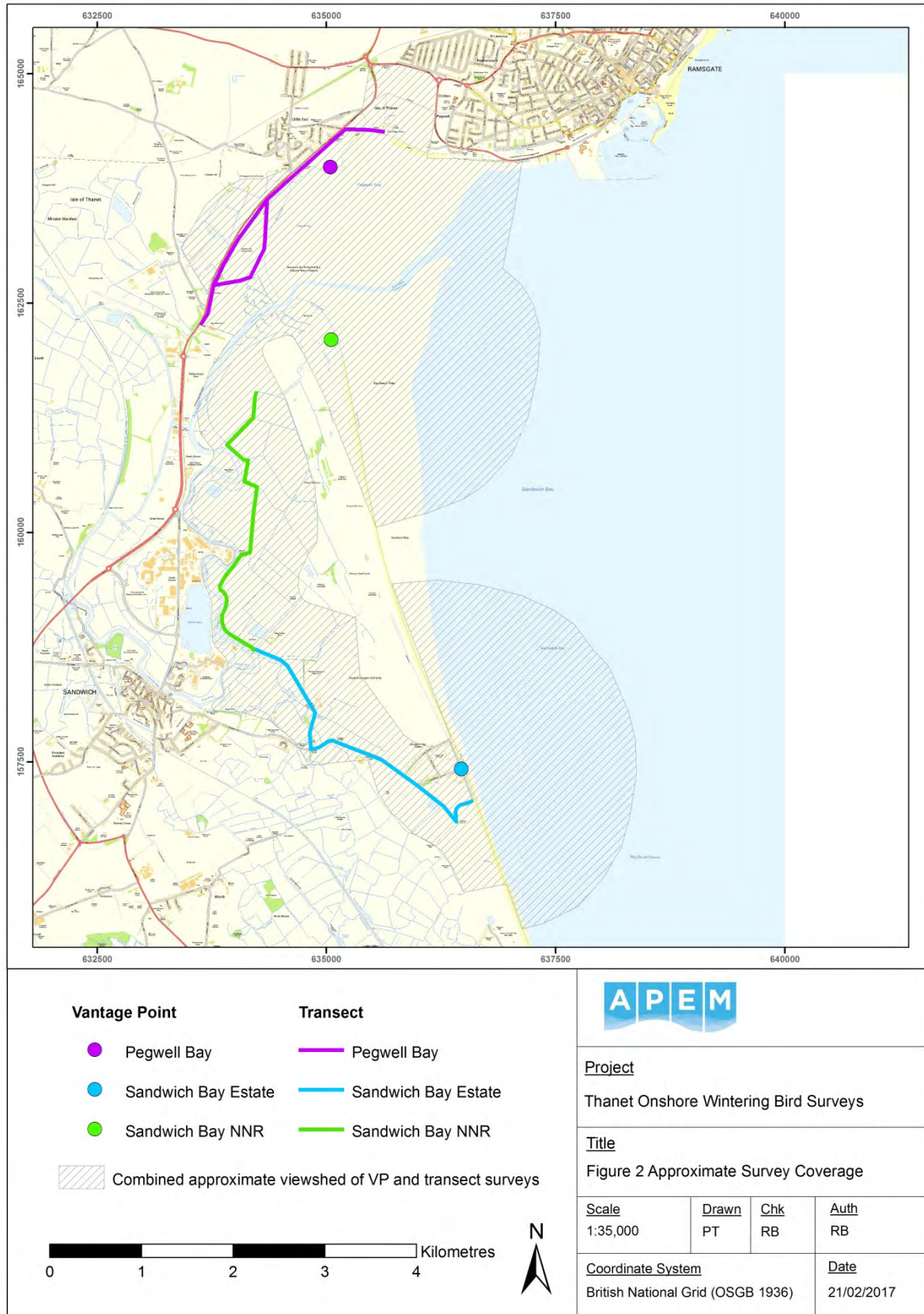
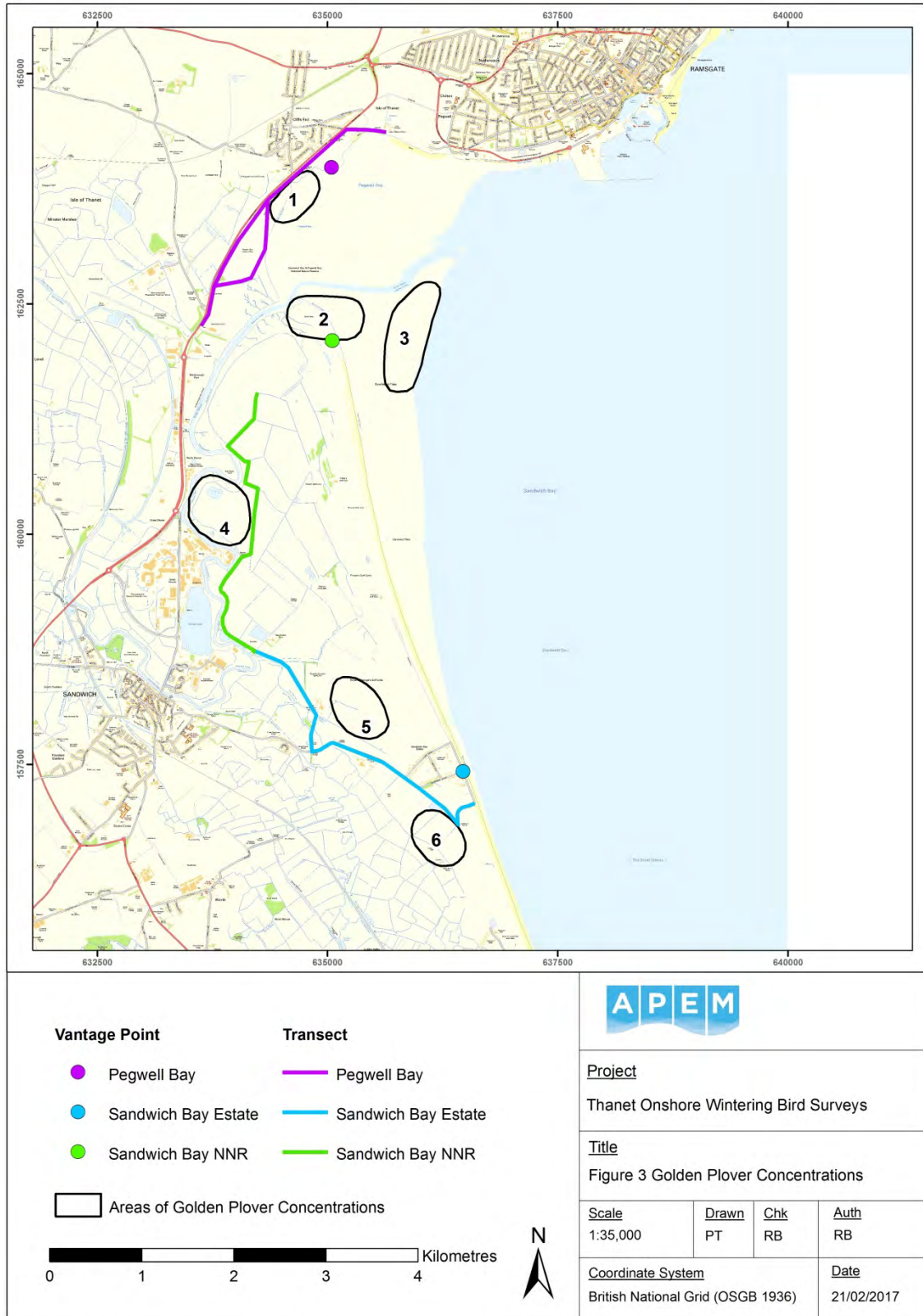


Figure 2 Combined survey coverage: Viewsheds from vantage points and transect routes

Golden plover summary information



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Figure 3 Golden plover concentrations

Pegwell Bay transect observations

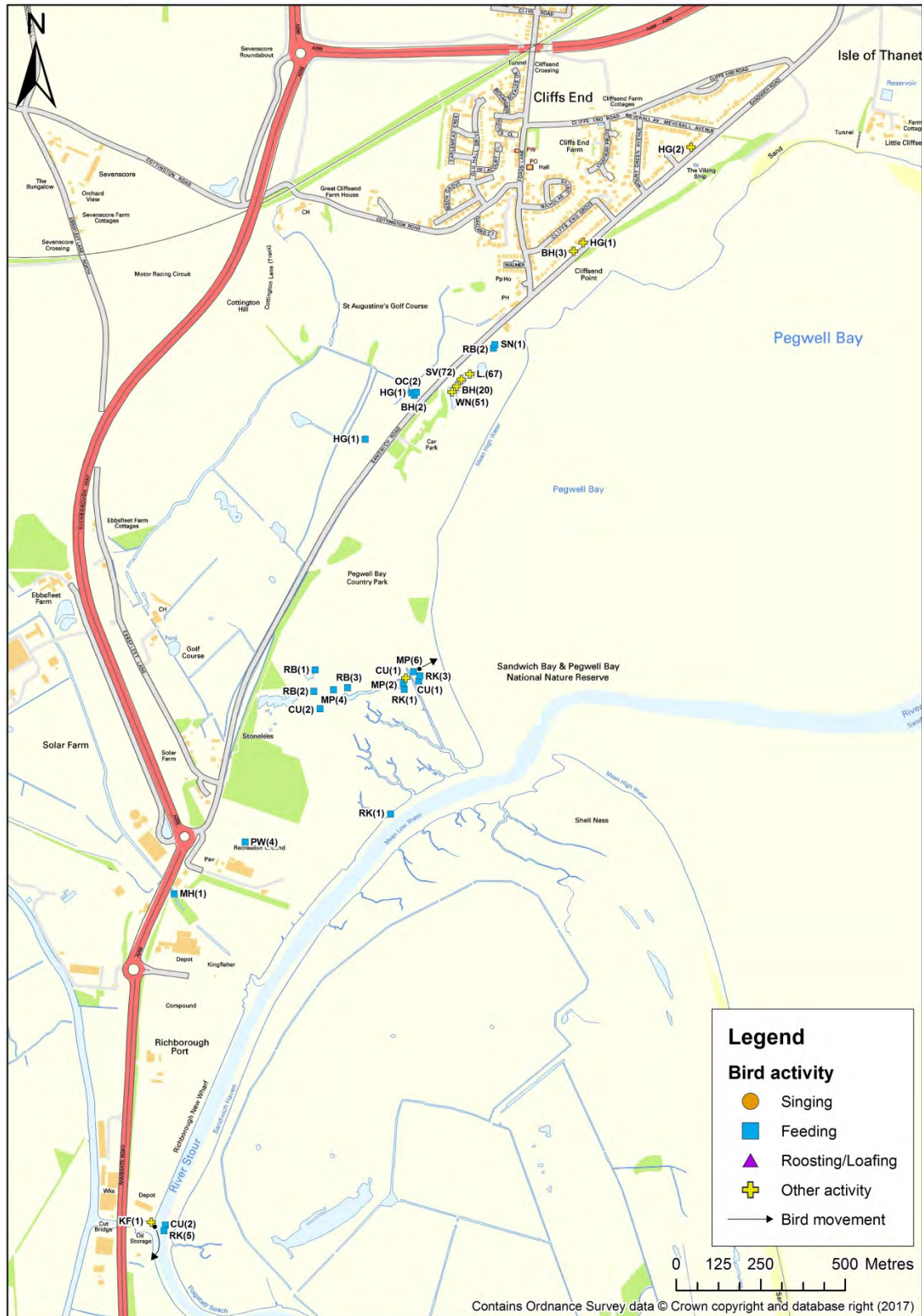


Figure 4 Pegwell Bay transect observations November 2016

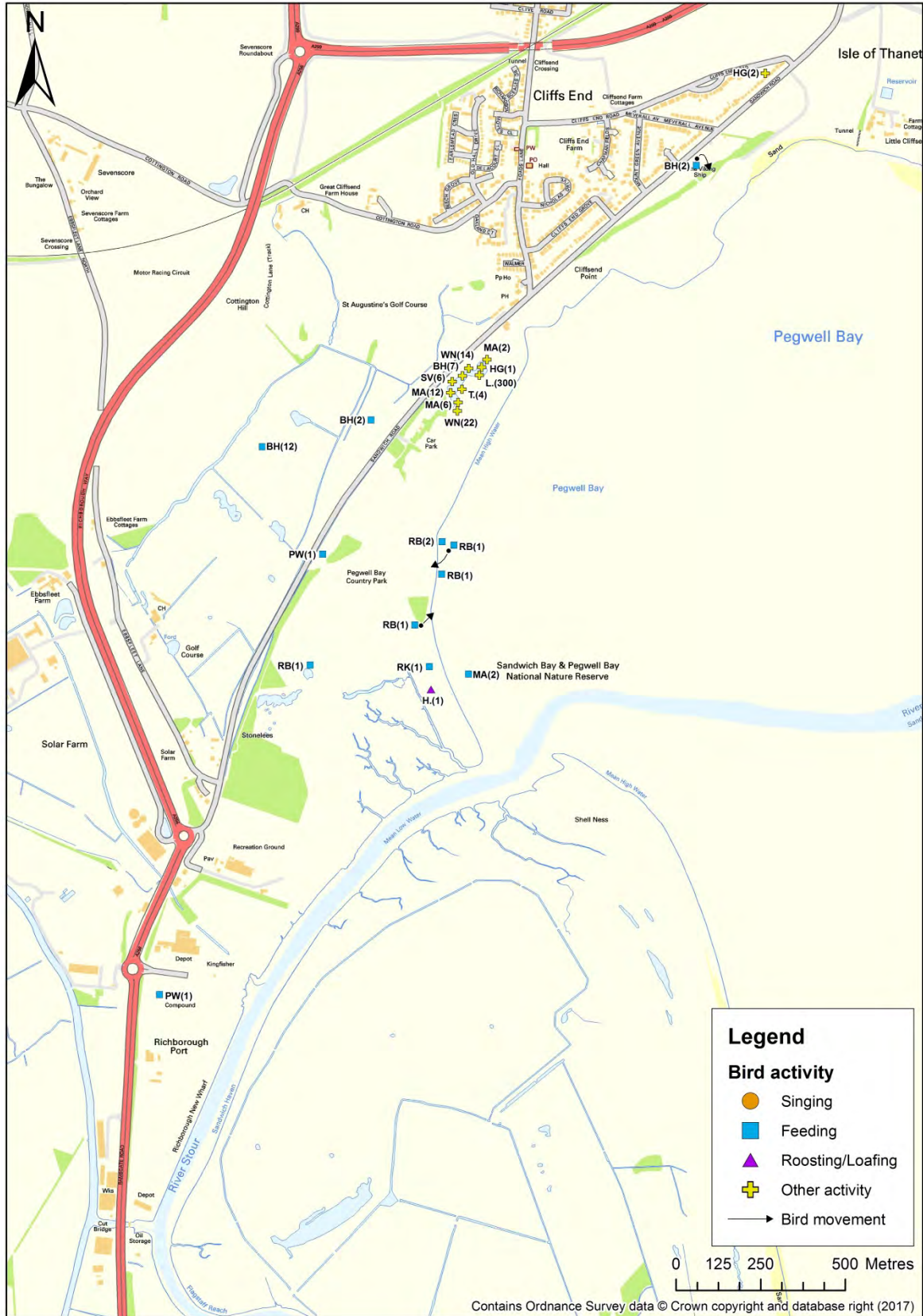


Figure 5 Pegwell Bay transect observations December 2016

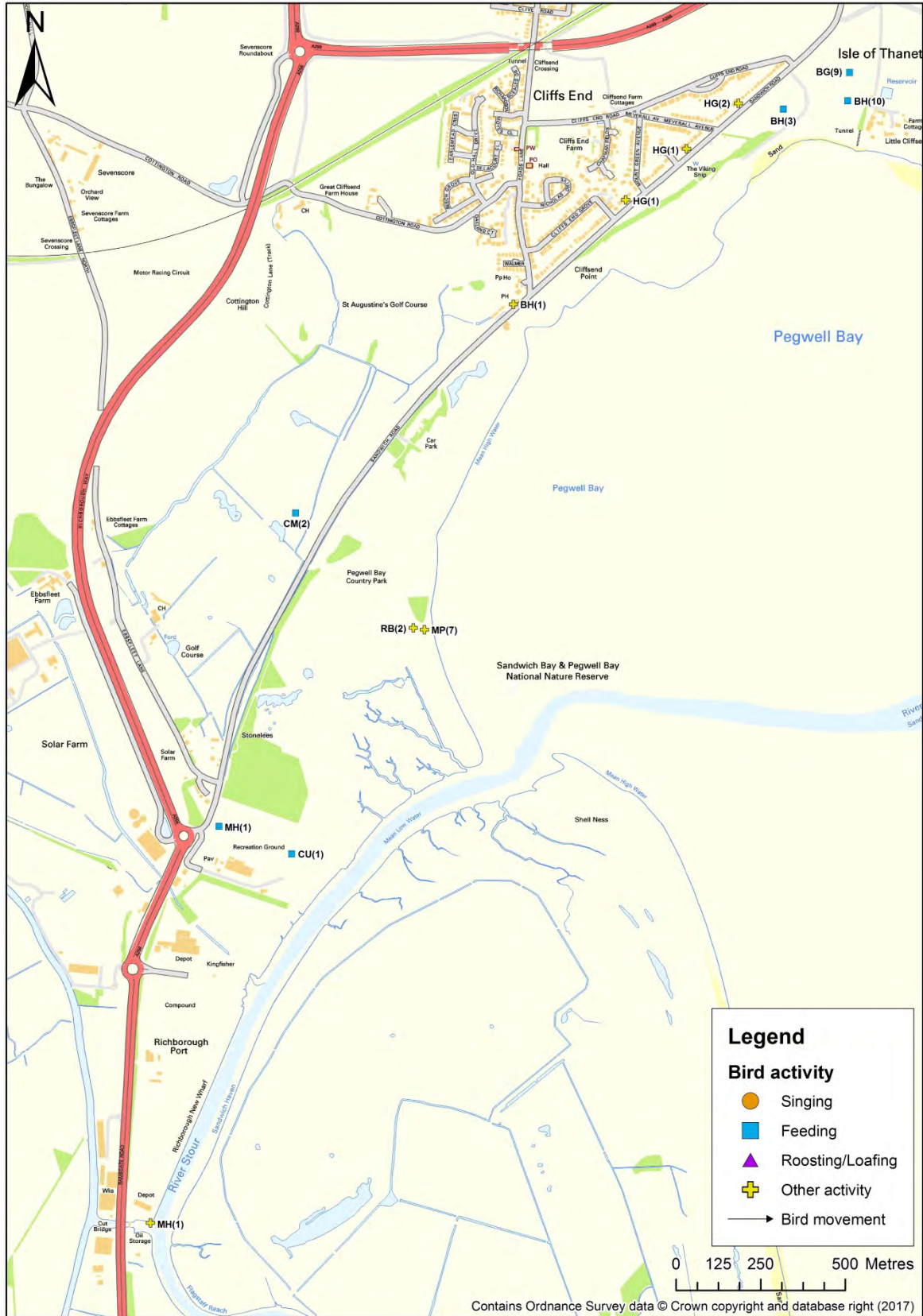


Figure 6 Pegwell Bay transect observations January 2017

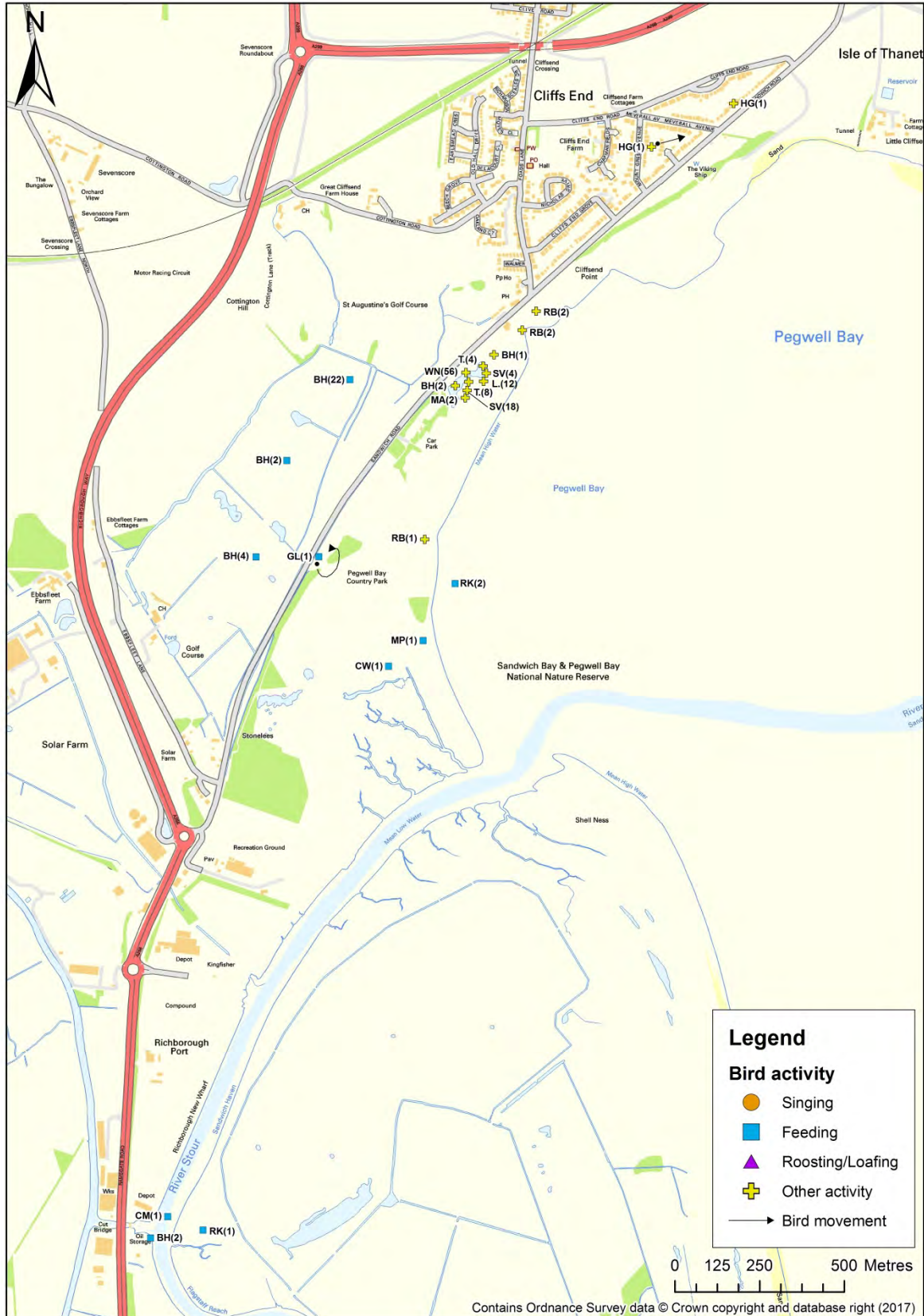


Figure 7 Pegwell Bay transect observations February 2017

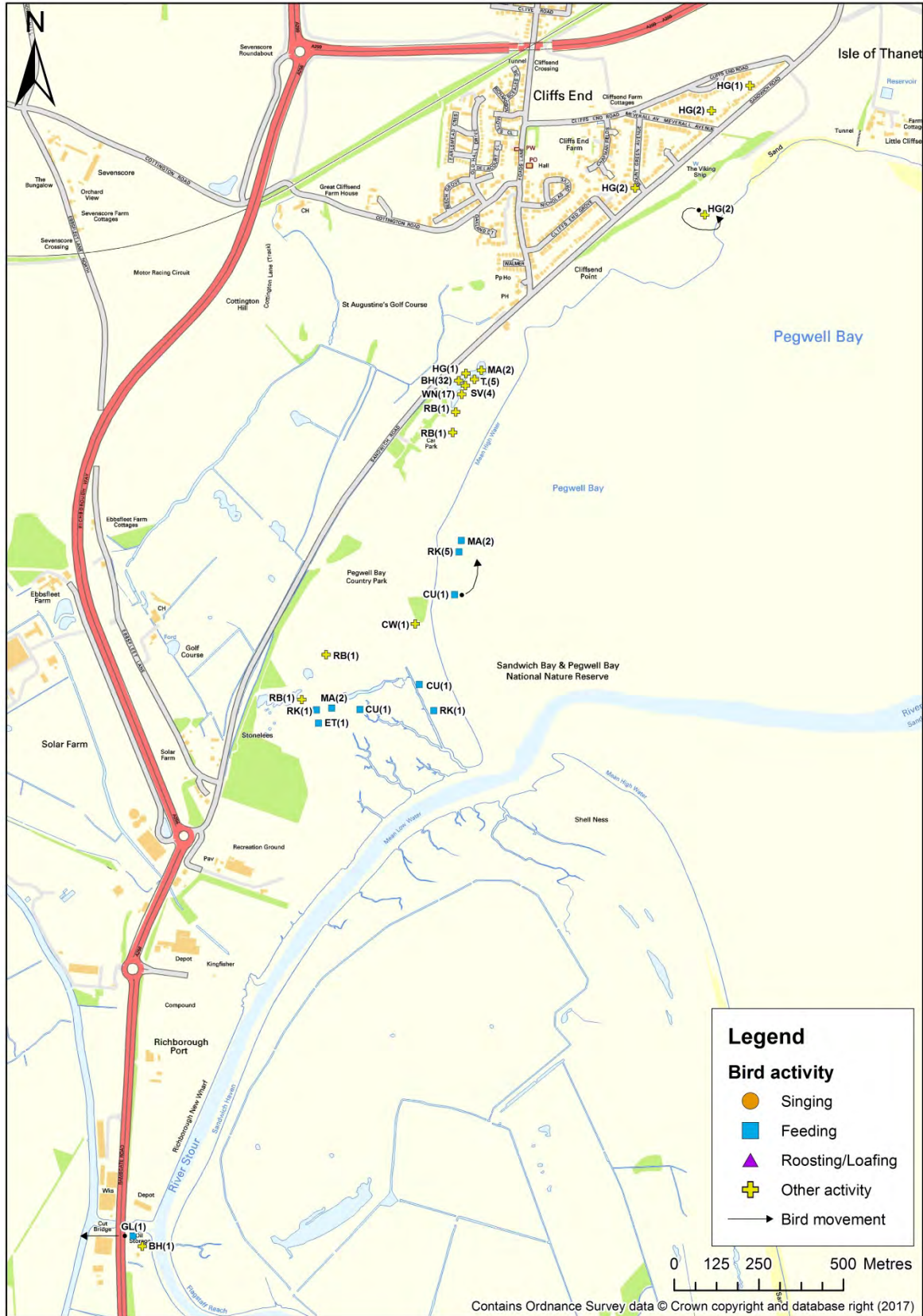


Figure 8 Pegwell Bay transect observations March 2017

Sandwich Bay NNR & Estate transect observations



Figure 9 Sandwich Bay NNR & Estate transect observations November 2016



Figure 10 Sandwich Bay NNR & Estate transect observations December 2016



Figure 11 Sandwich Bay NNR & Estate transect observations January 2017

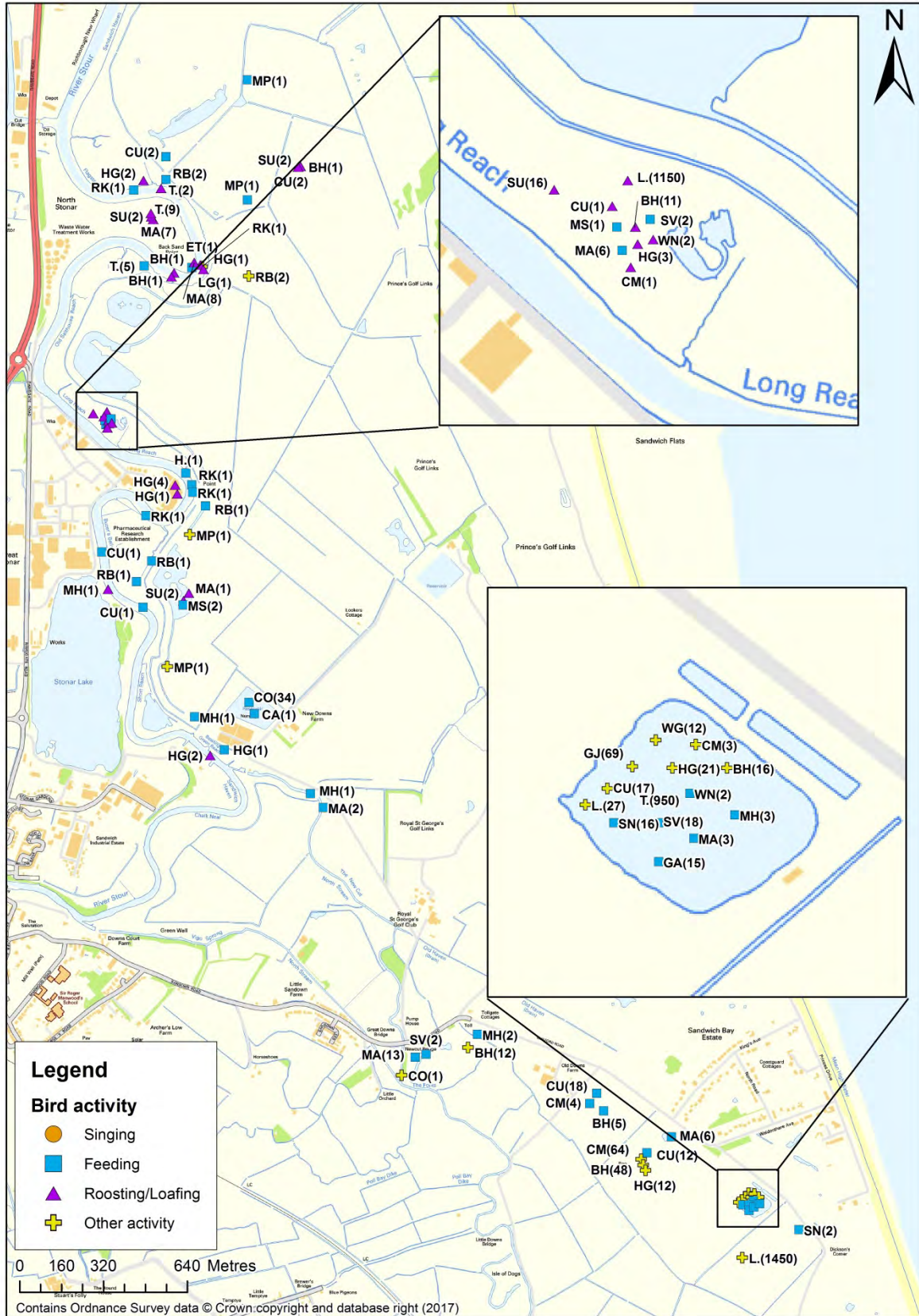


Figure 12 Sandwich Bay NNR & Estate transect observations February 2017



Figure 13 Sandwich Bay NNR & Estate transect observations March 2017

Pegwell Bay & Shell Ness TTTCC hourly observations



Figure 14 Pegwell Bay & Shell Ness TTTCC observations December 2016: Gulls Hour 1

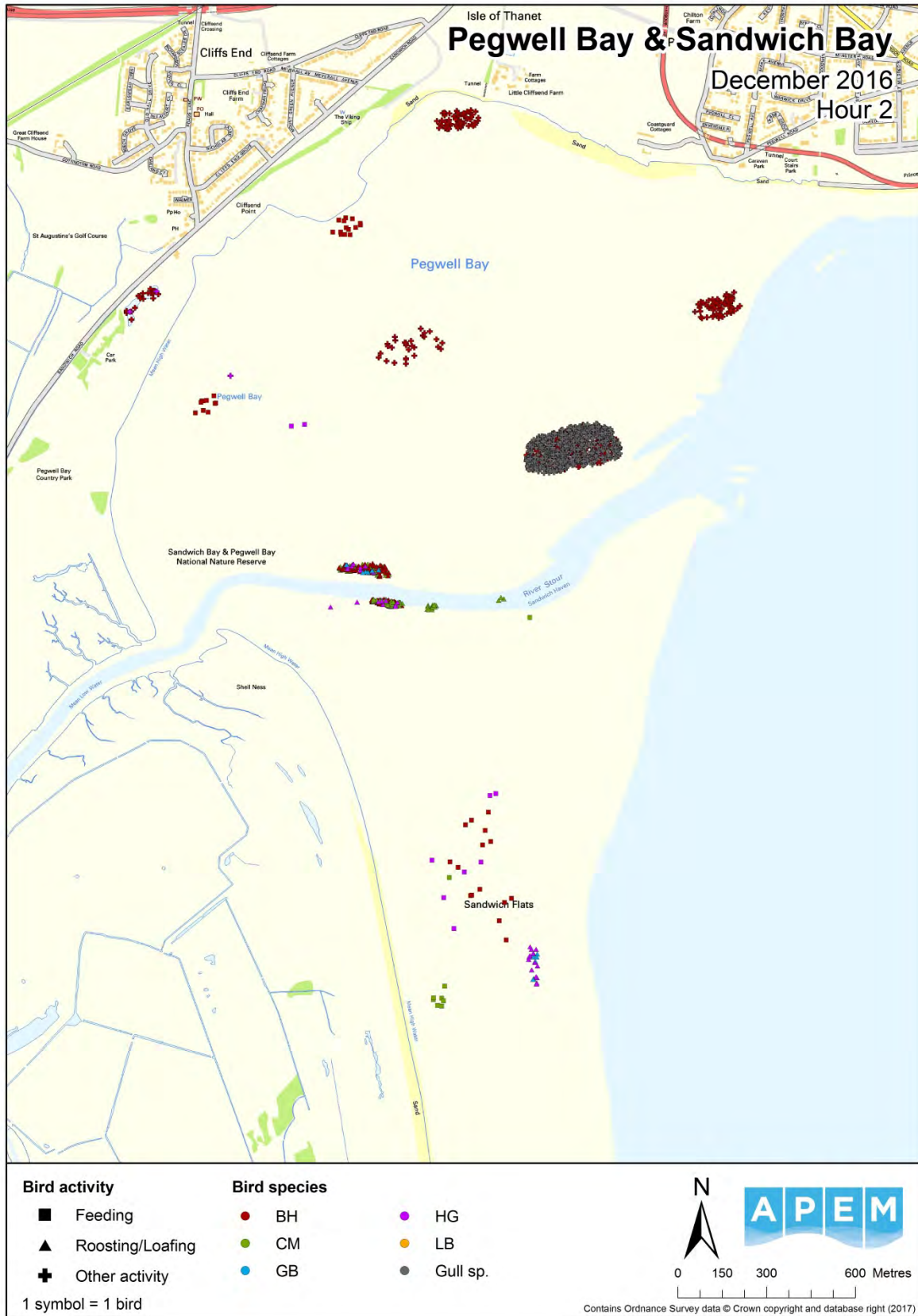


Figure 15 Pegwell Bay & Shell Ness TTTCC observations December 2016: Gulls Hour 2

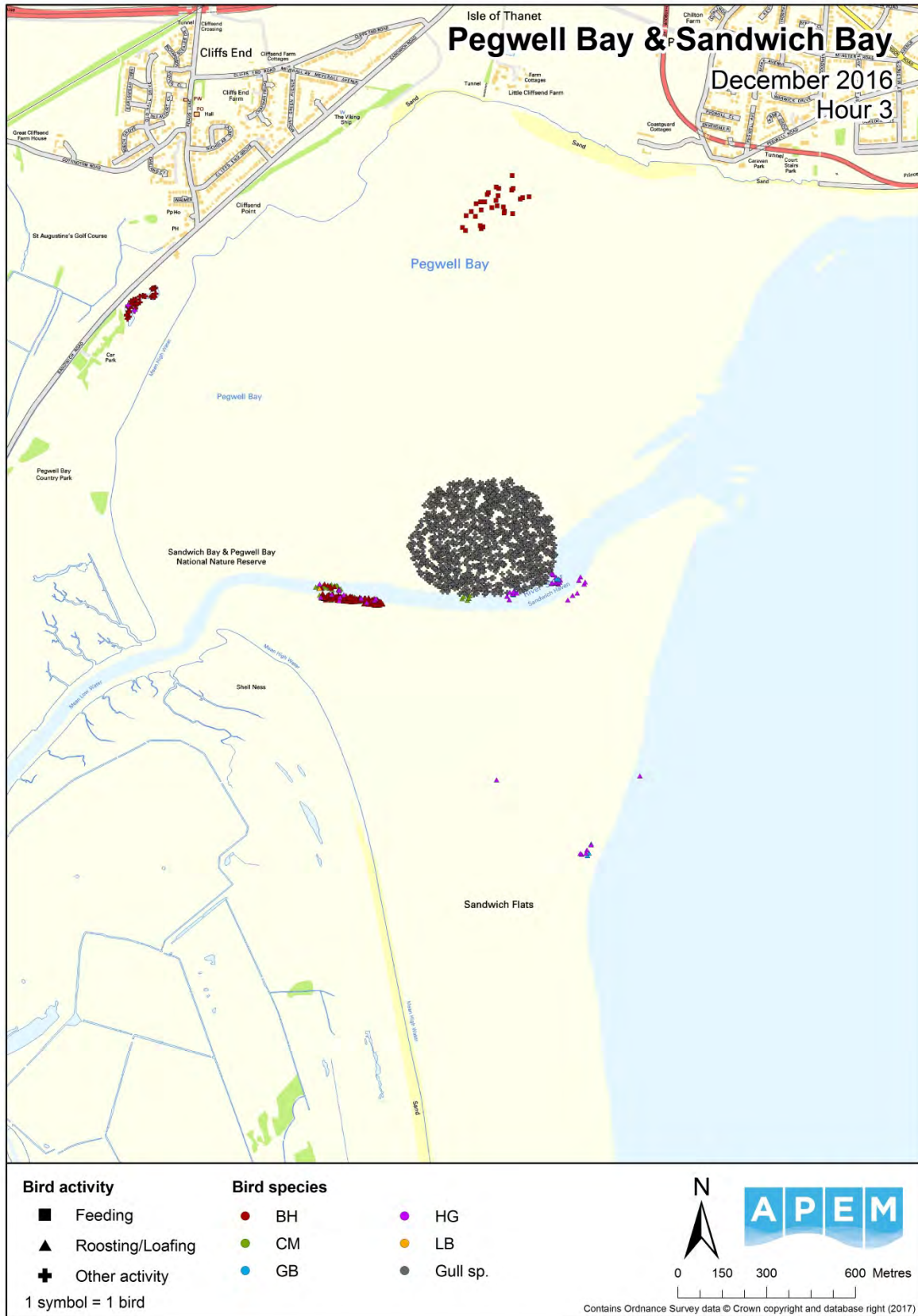


Figure 16 Pegwell Bay & Shell Ness TTTCC observations December 2016: Gulls Hour 3

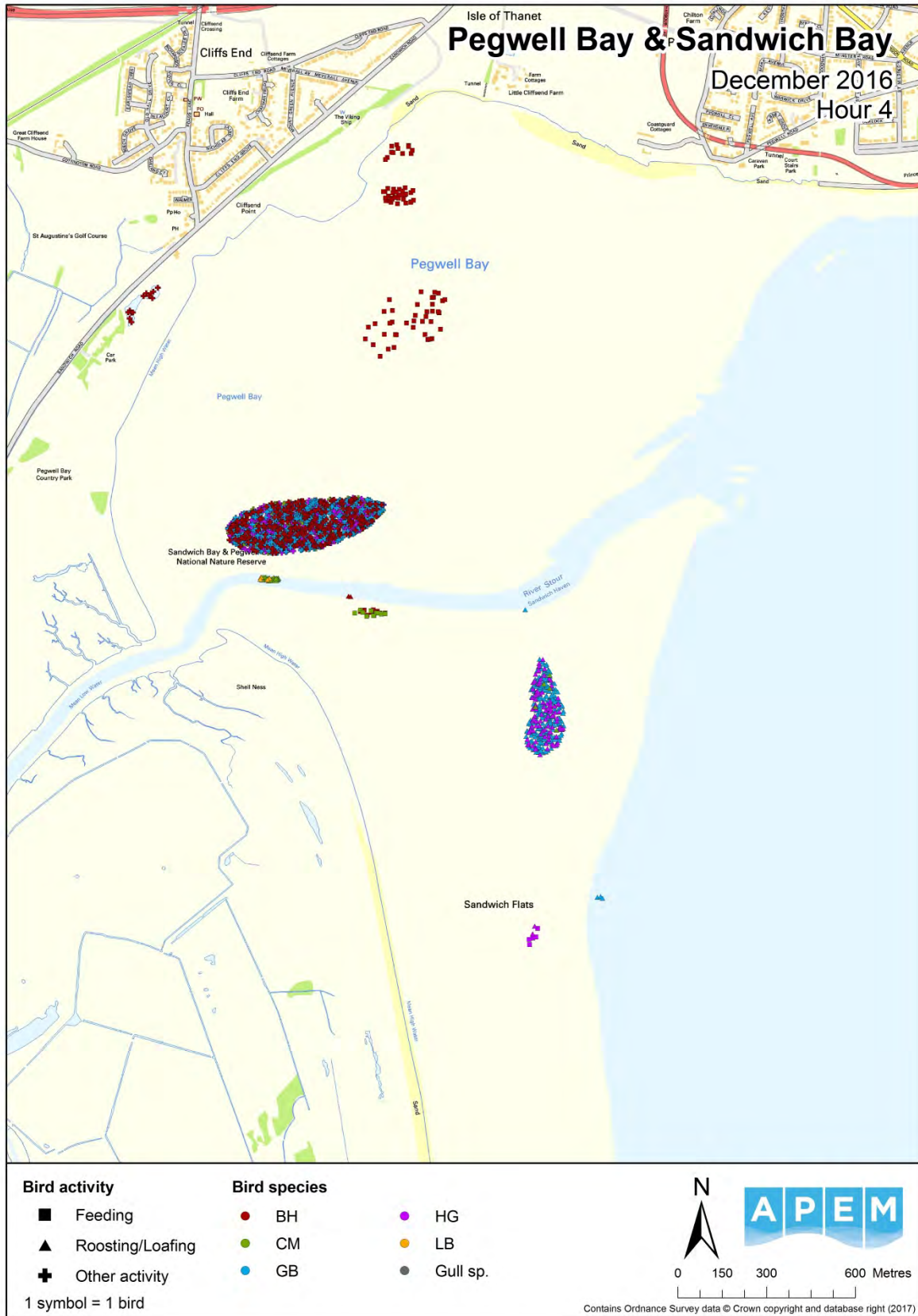


Figure 17 Pegwell Bay & Shell Ness TTTCC observations December 2016: Gulls Hour 4

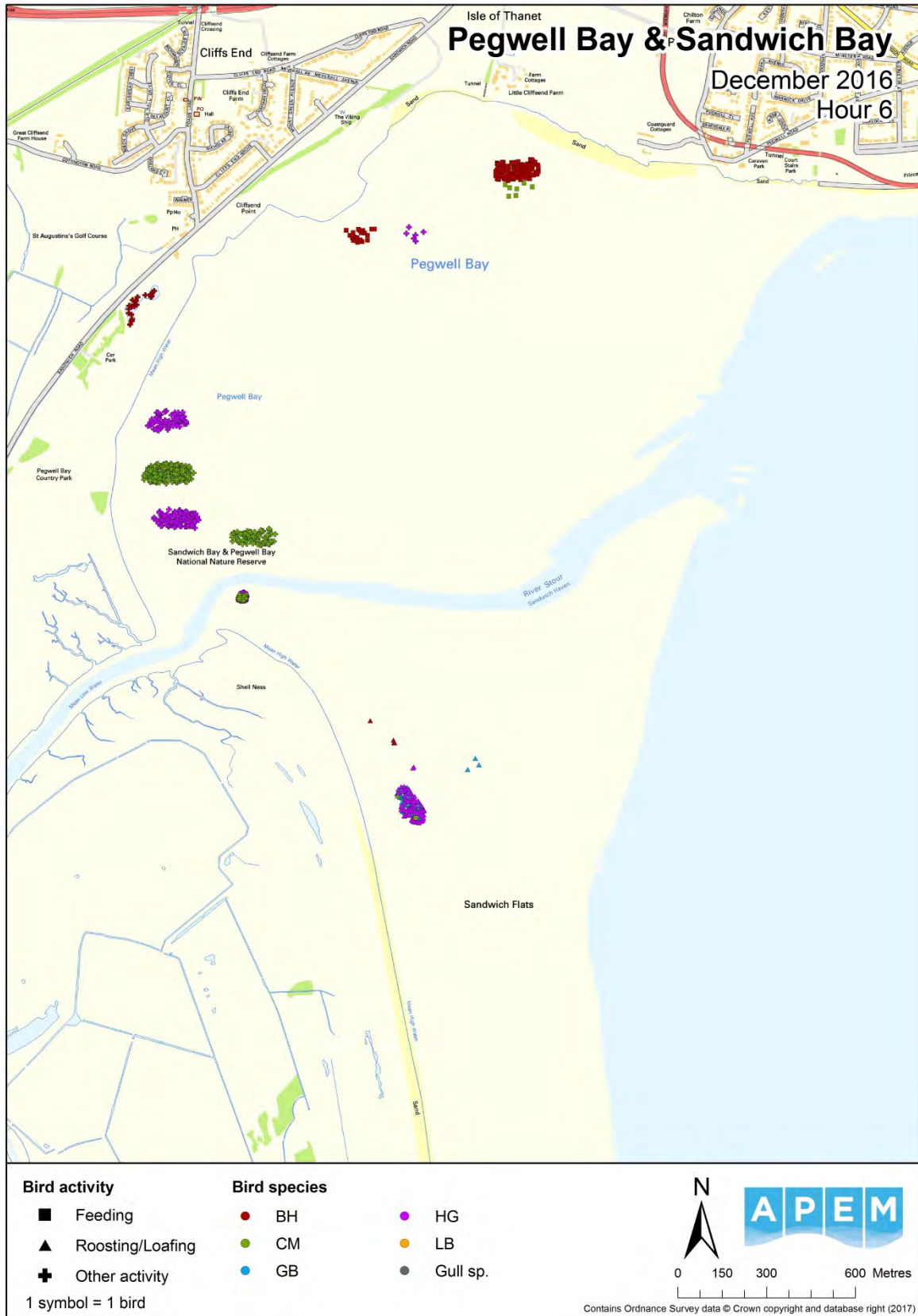


Figure 19 Pegwell Bay & Shell Ness TTTCC observations December 2016: Gulls Hour 6

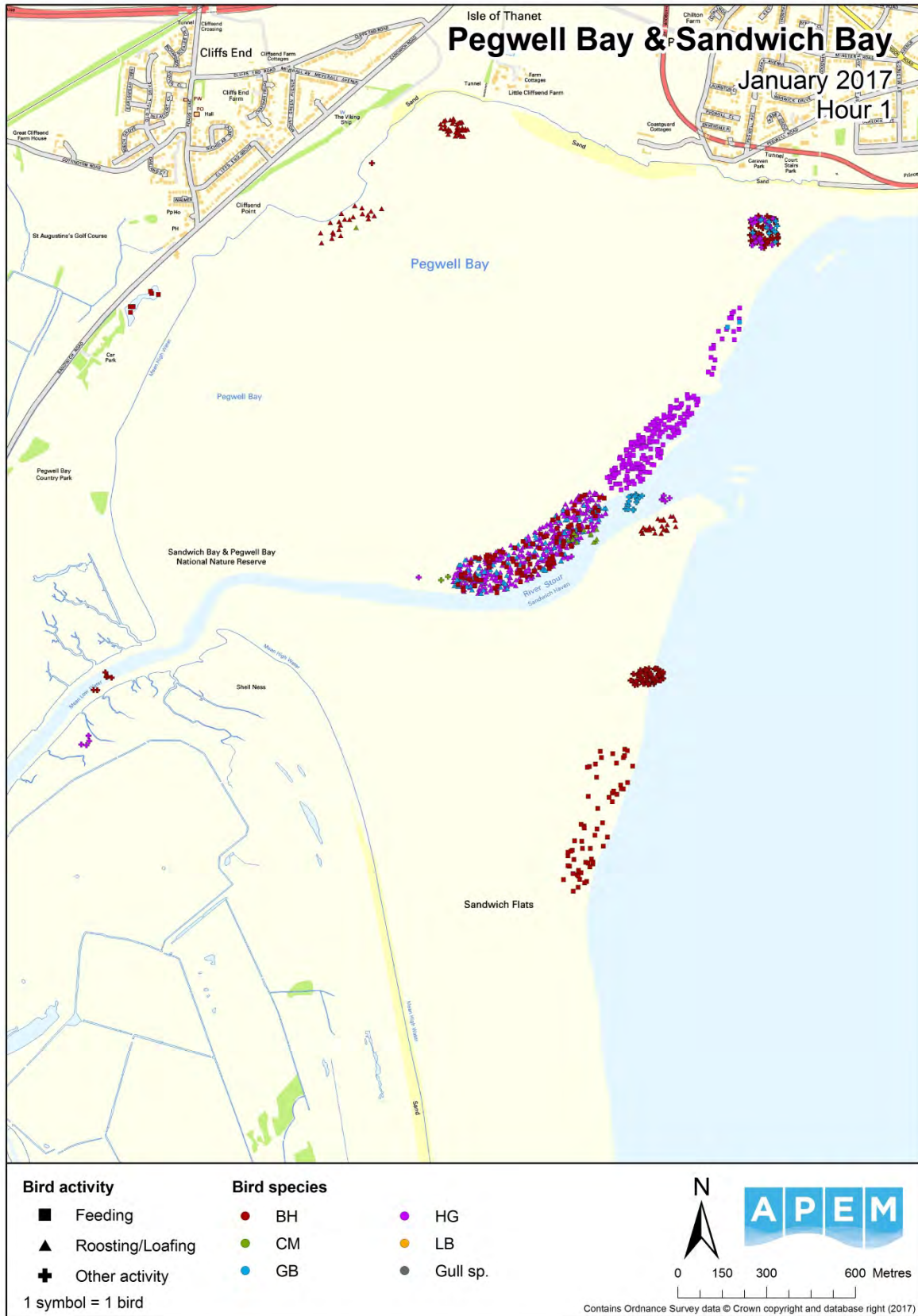


Figure 20 Pegwell Bay & Shell Ness TTTCC observations January 2017: Gulls Hour 1

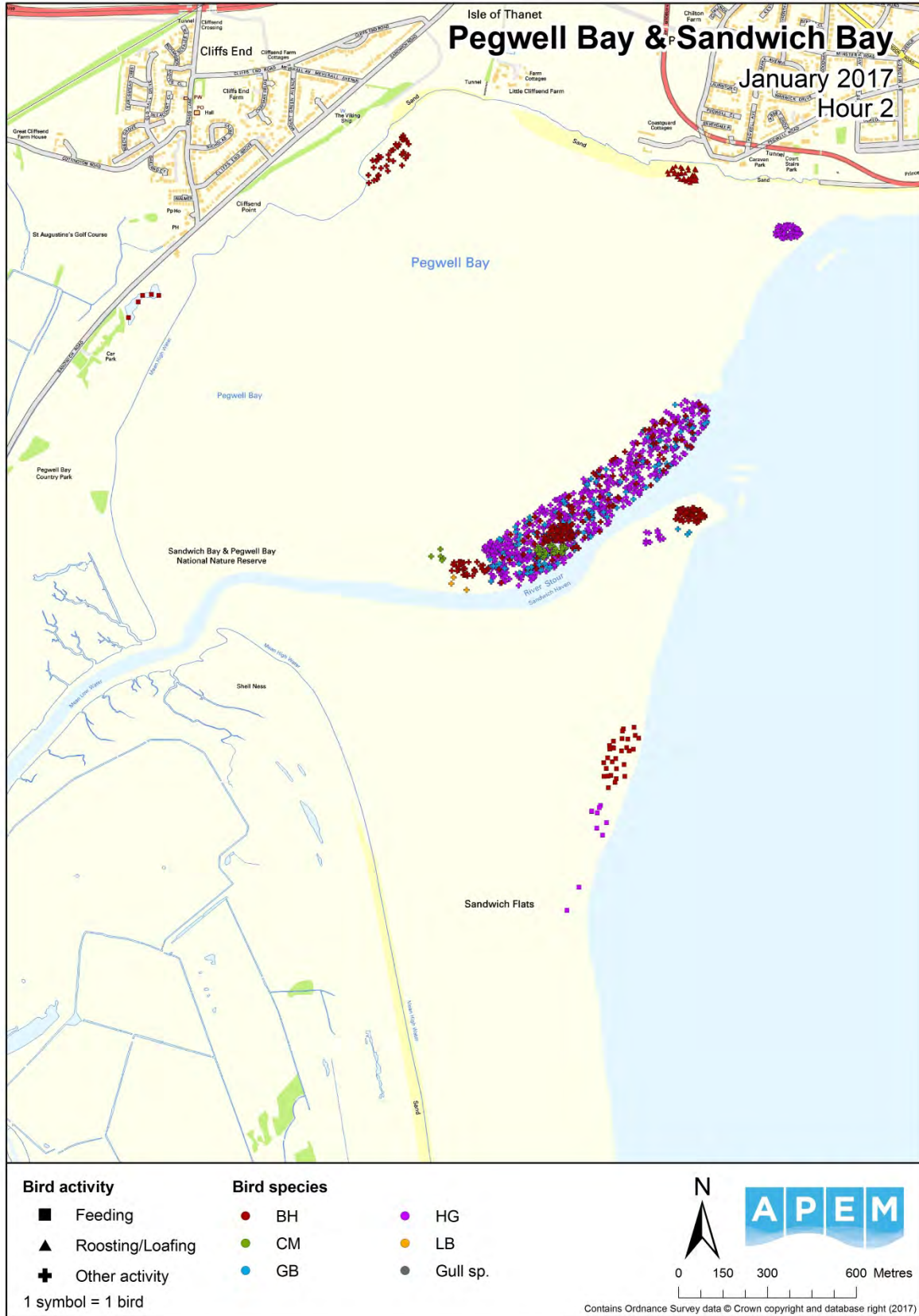


Figure 21 Pegwell Bay & Shell Ness TTTCC observations January 2017: Gulls Hour 2

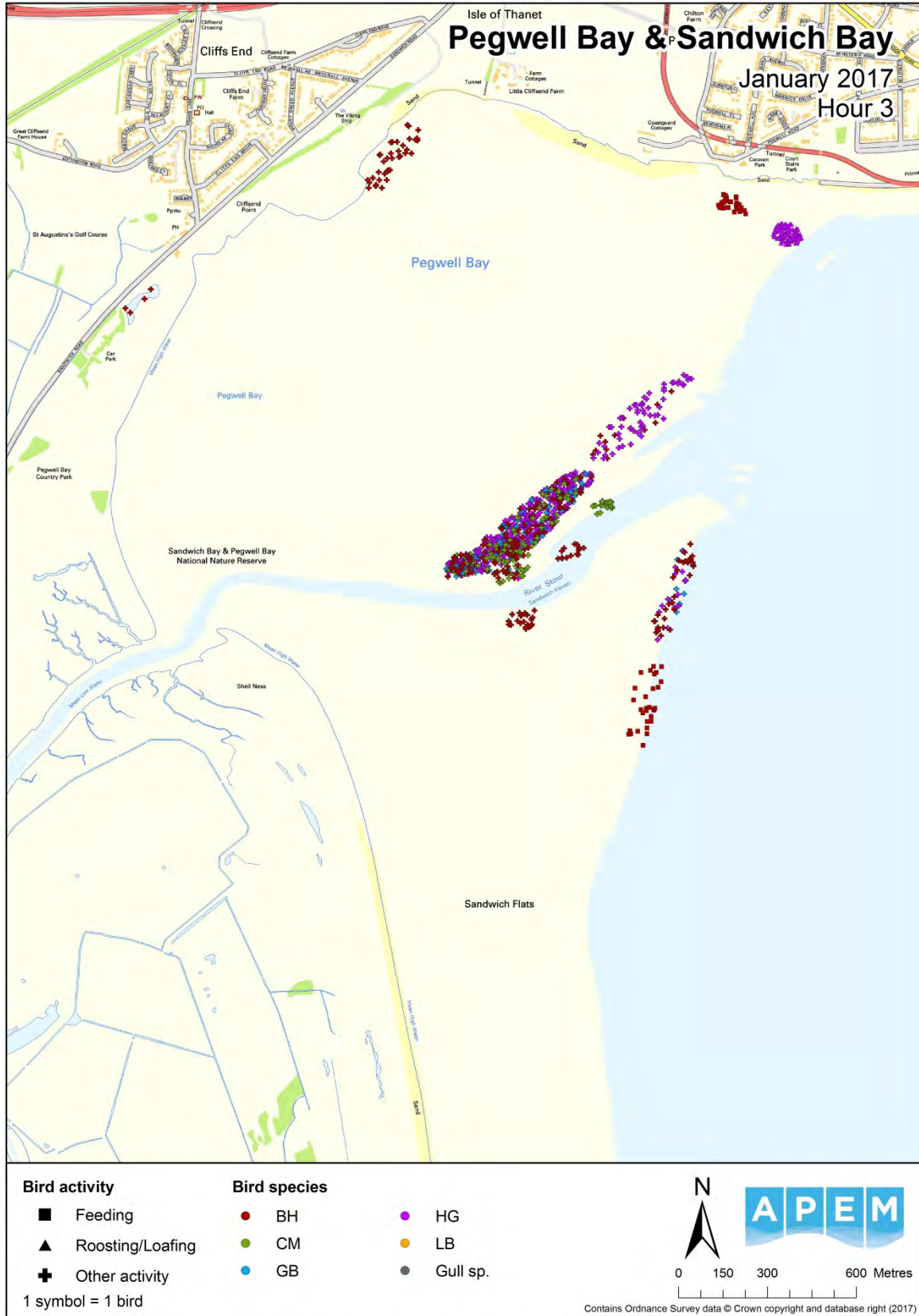


Figure 22 Pegwell Bay & Shell Ness TTTCC observations January 2017: Gulls Hour 3



Figure 24 Pegwell Bay & Shell Ness TTTCC observations January 2017: Gulls Hour 5



Figure 25 Pegwell Bay & Shell Ness TTTCC observations January 2017: Gulls Hour 6



Figure 27 Pegwell Bay & Shell Ness TTTCC observations February 2017: Gulls Hour 2

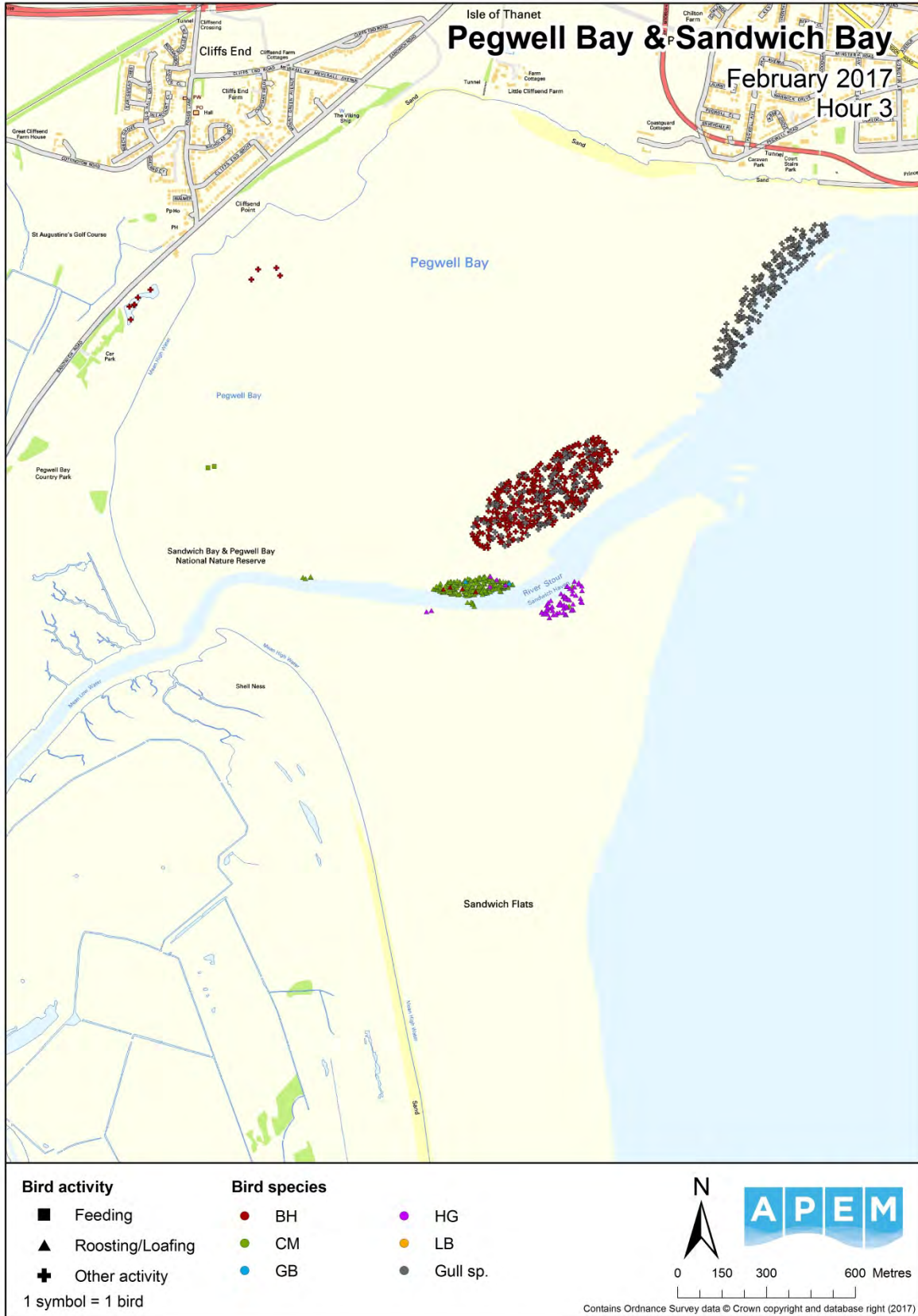


Figure 28 Pegwell Bay & Shell Ness TTCC observations February 2017: Gulls Hour 3



Figure 29 Pegwell Bay & Shell Ness TTTCC observations February 2017: Gulls Hour 4

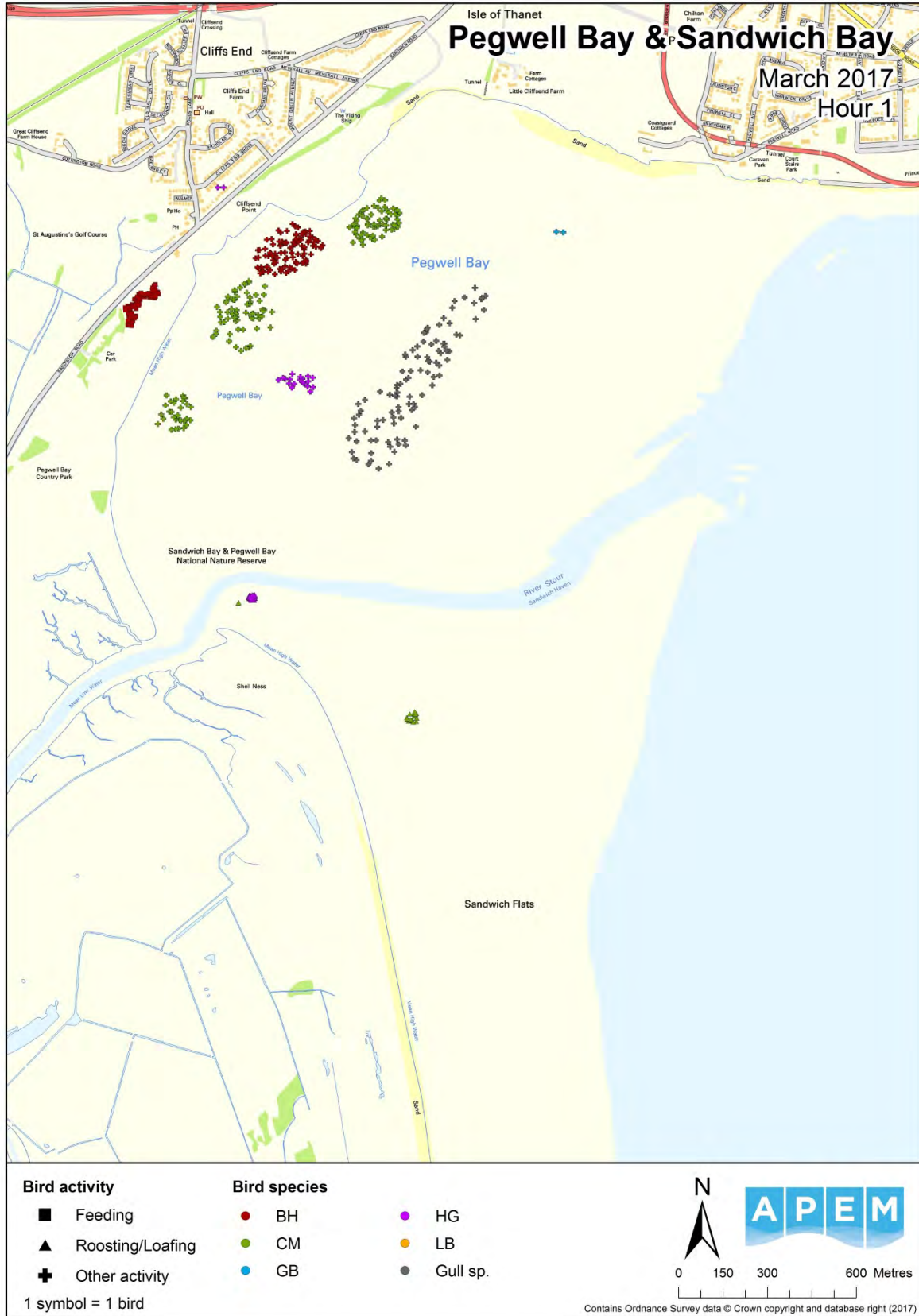


Figure 32 Pegwell Bay & Shell Ness TTTCC observations March 2017: Gulls Hour 1



Figure 33 Pegwell Bay & Shell Ness TTCC observations March 2017: Gulls Hour 2



Figure 34 Pegwell Bay & Shell Ness TTTCC observations March 2017: Gulls Hour 3



Figure 36 Pegwell Bay & Shell Ness TTTCC observations March 2017: Gulls Hour 5

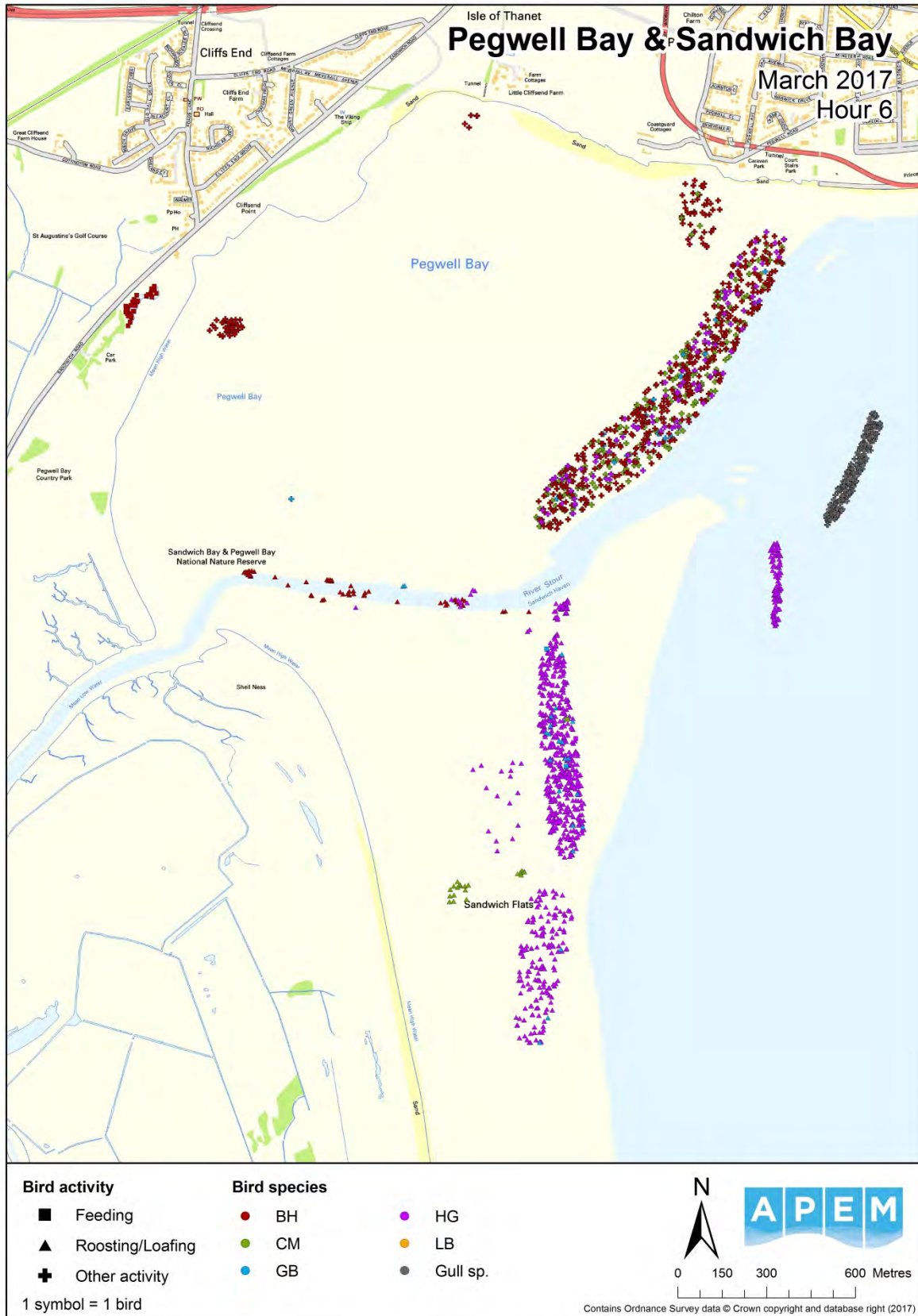


Figure 37 Pegwell Bay & Shell Ness TTTCC observations March 2017: Gulls Hour 6



Figure 38 Pegwell Bay & Shell Ness TTTCC observations November 2016: Waders Hour 1

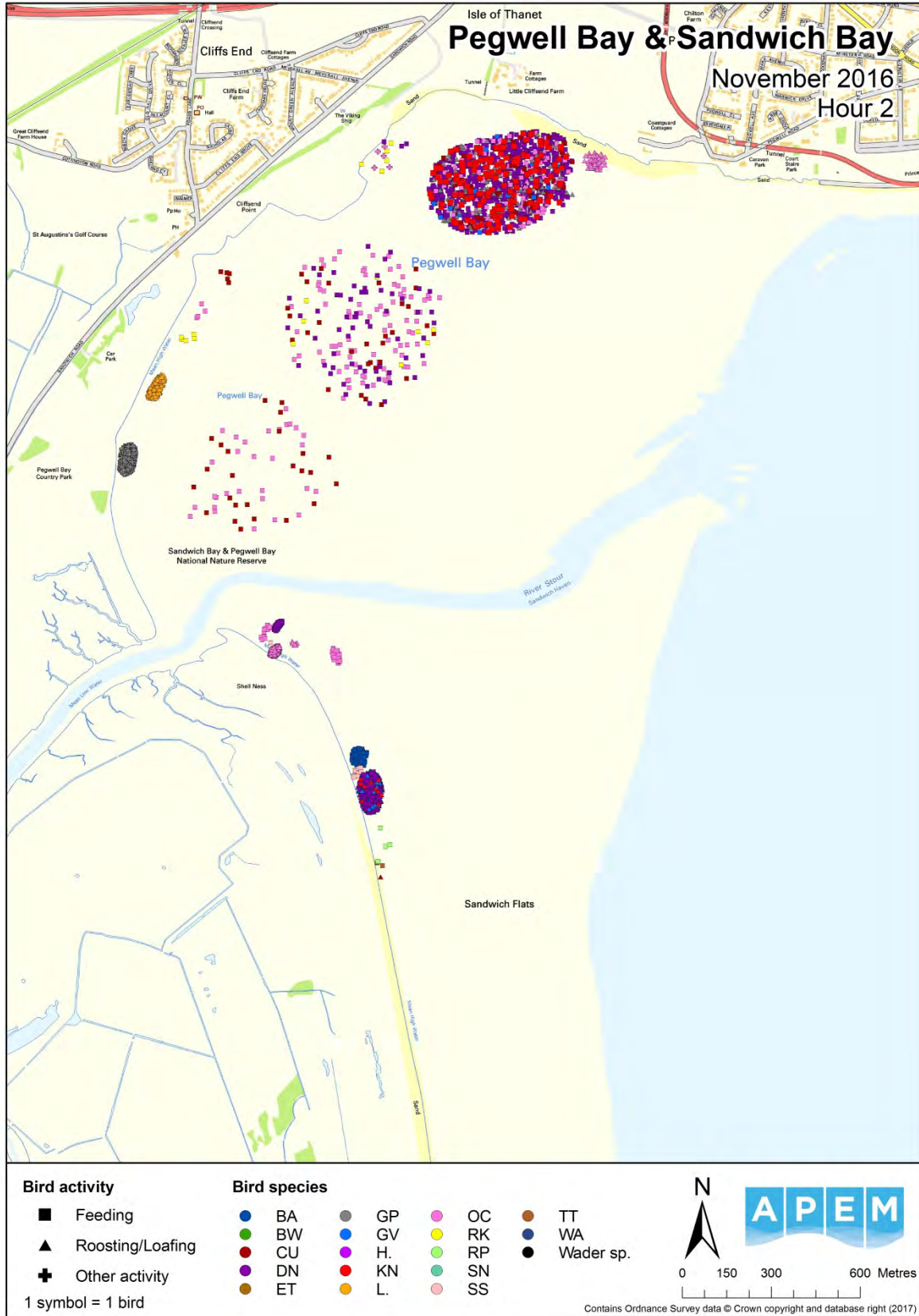


Figure 39 Pegwell Bay & Shell Ness TTTCC observations November 2016: Waders Hour 2



Figure 40 Pegwell Bay & Shell Ness TTTCC observations November 2016: Waders Hour 3

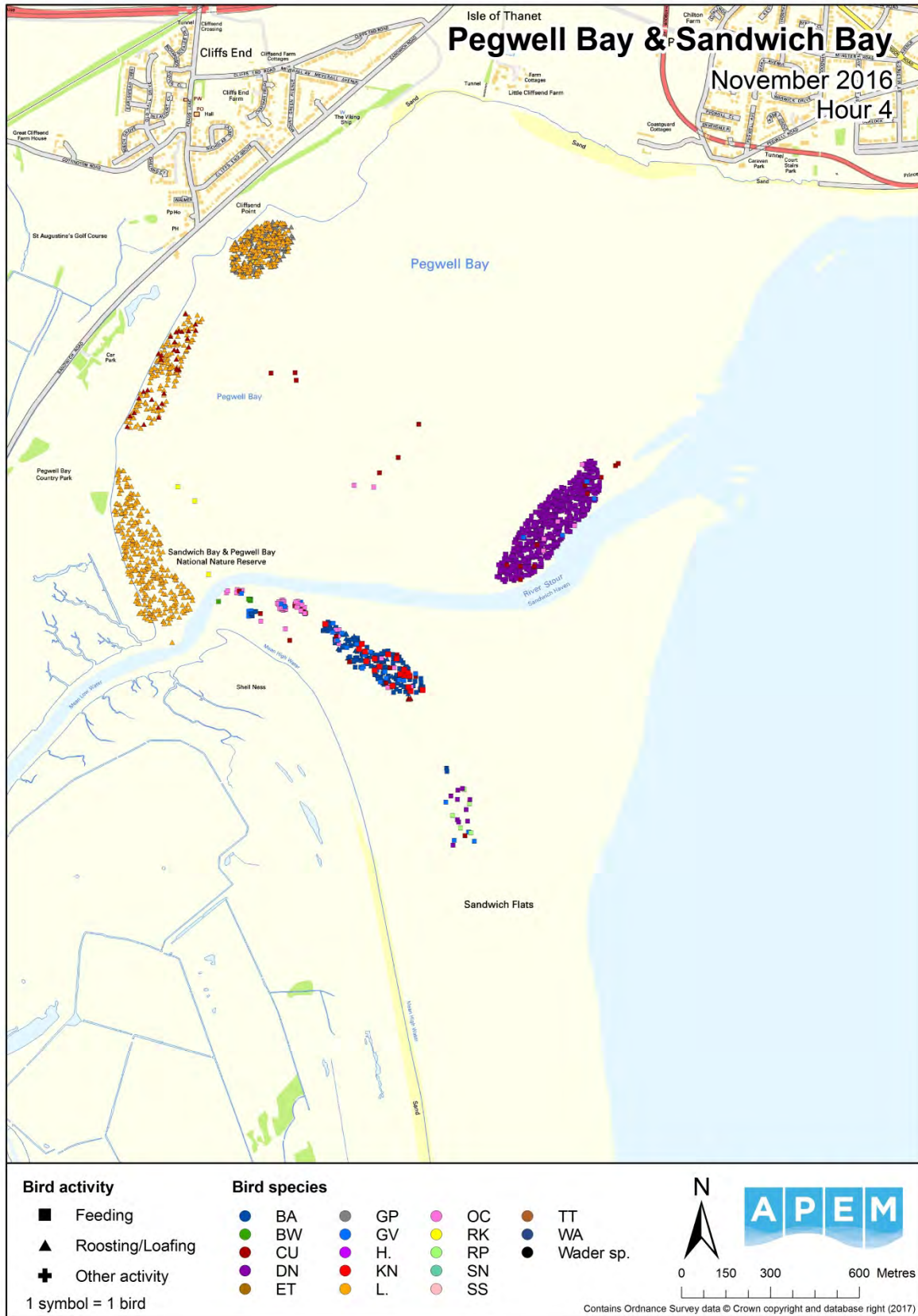


Figure 41 Pegwell Bay & Shell Ness TTTCC observations November 2016: Waders Hour 4

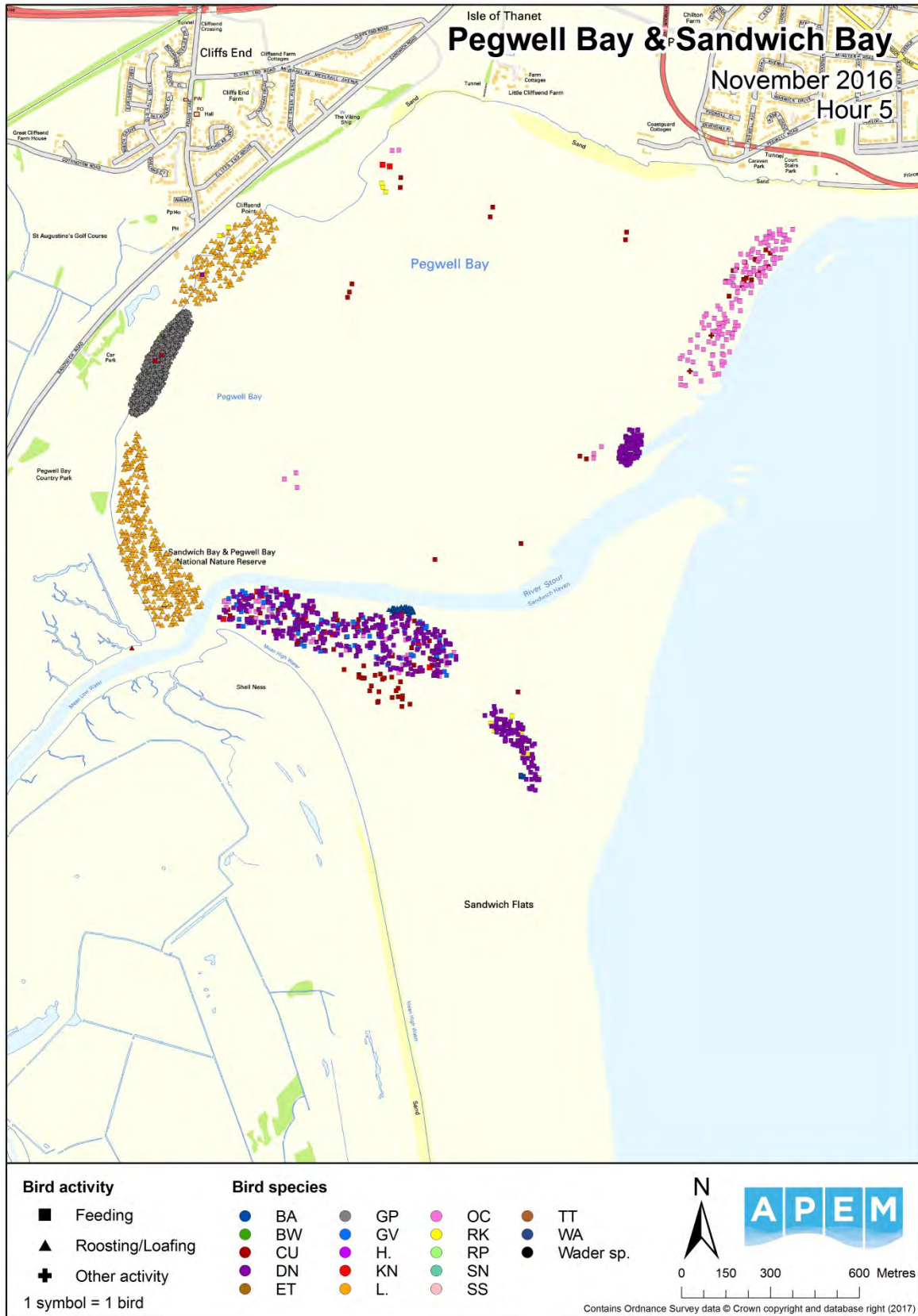


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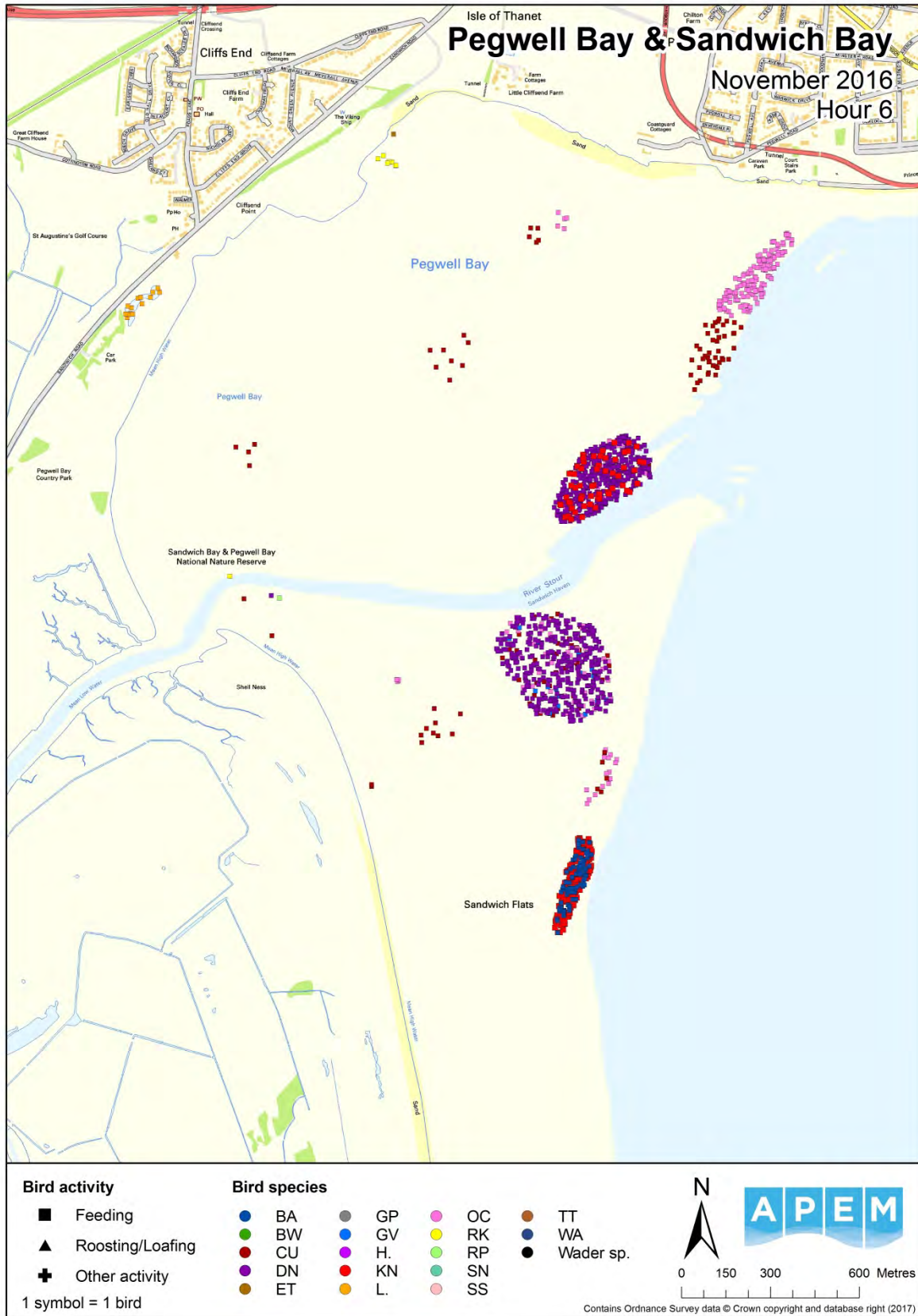


Figure 43 Pegwell Bay & Shell Ness TTTCC observations November 2016: Waders Hour 6

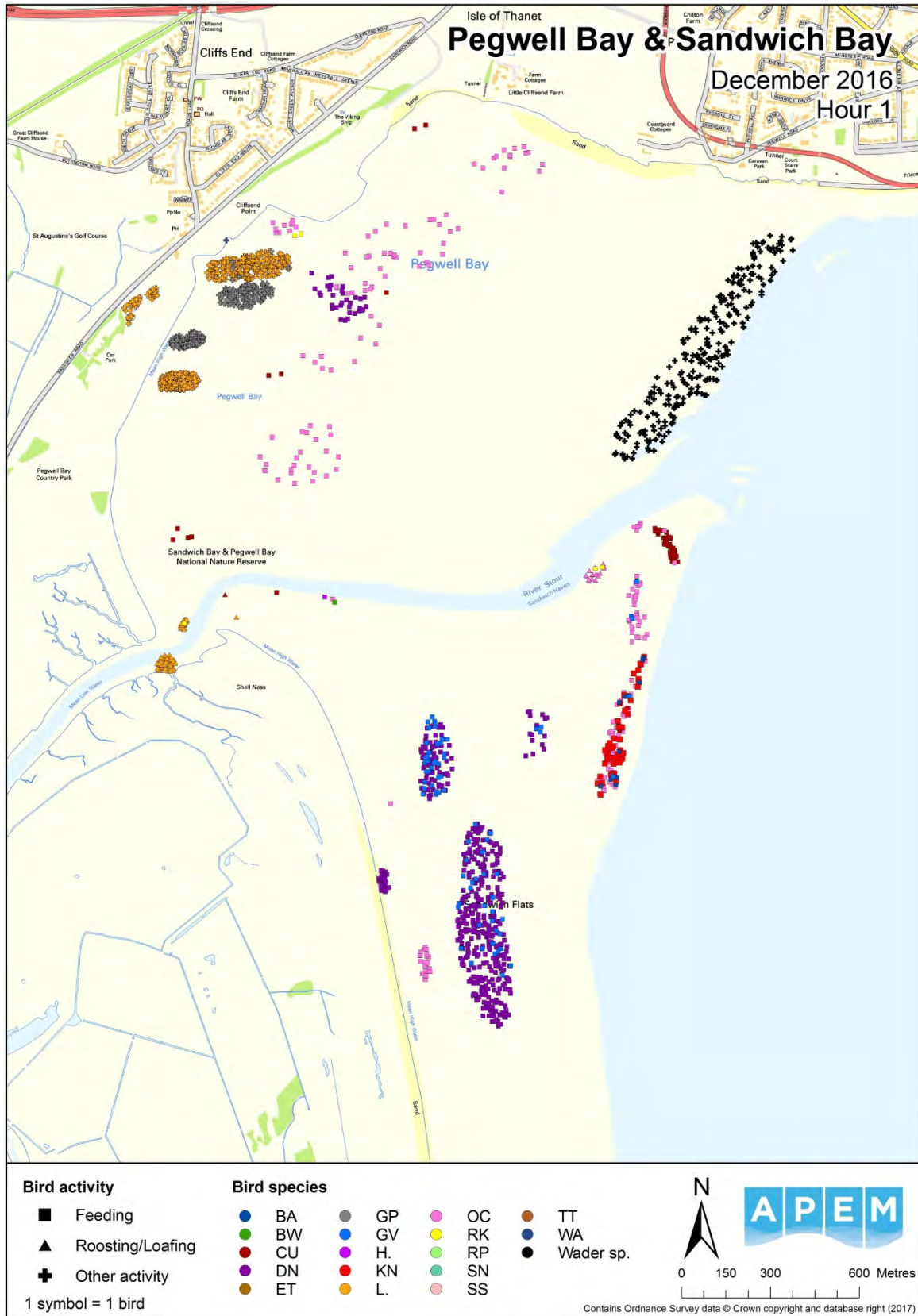


Figure 44 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 1

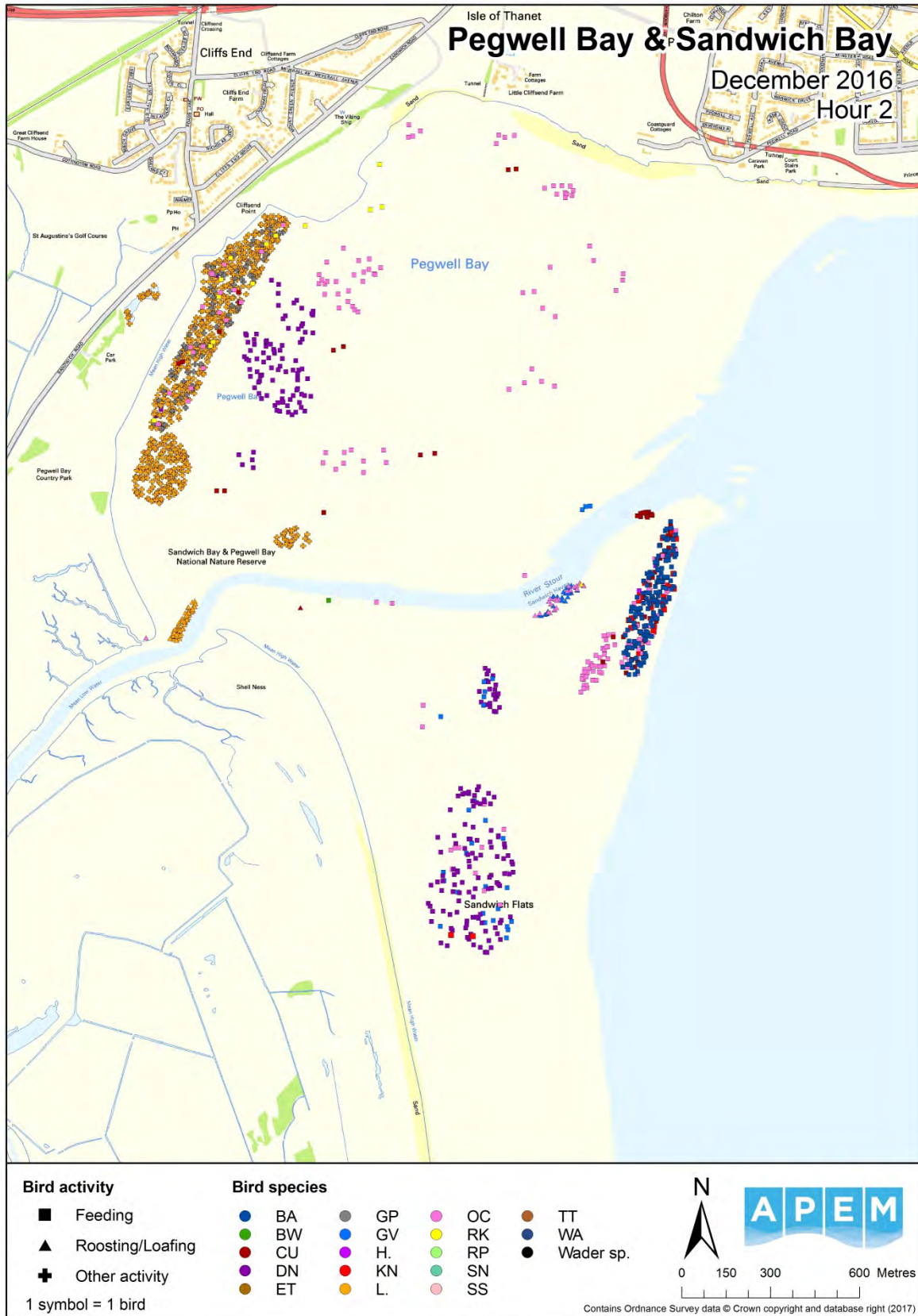


Figure 45 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 2

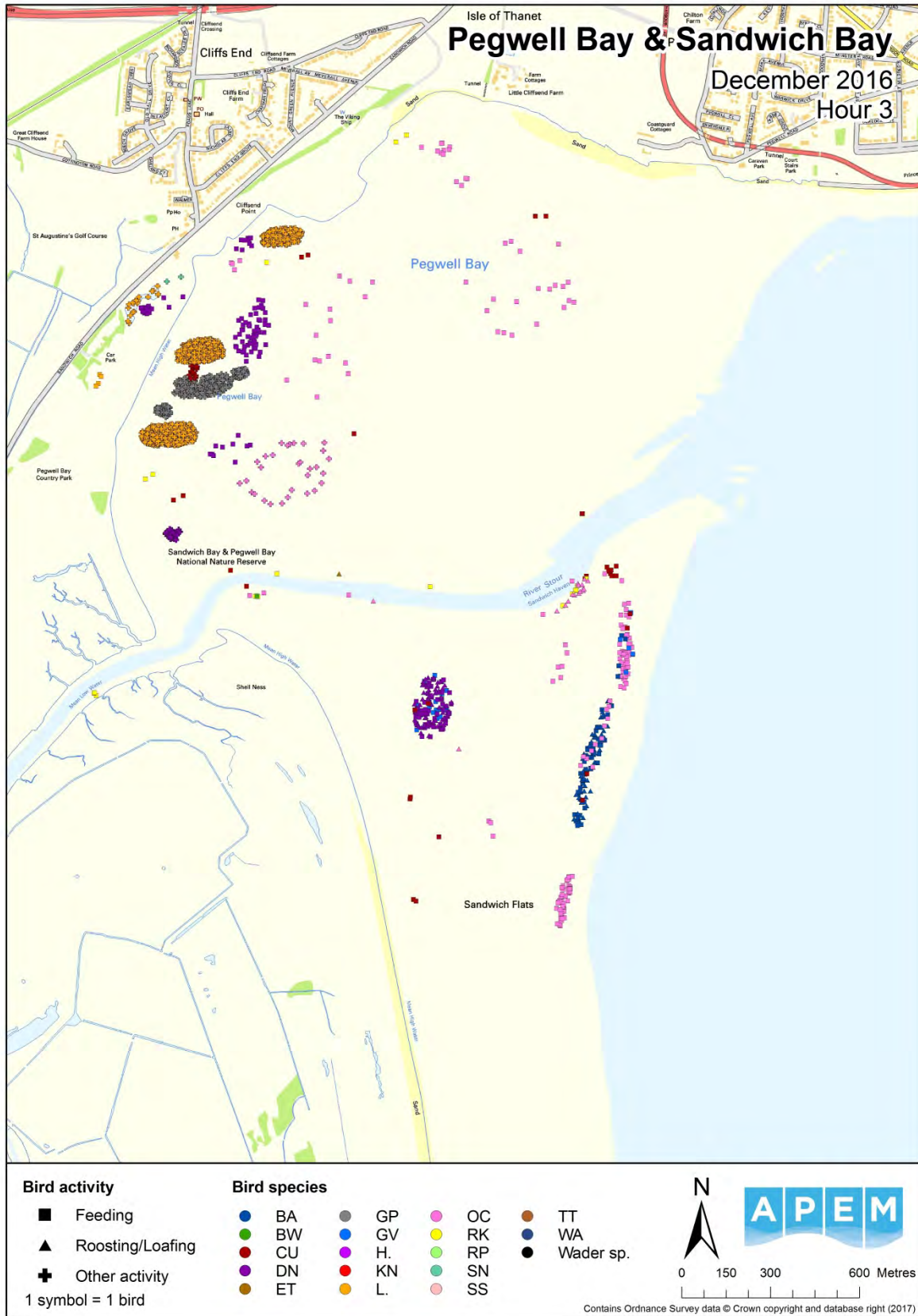


Figure 46 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 3

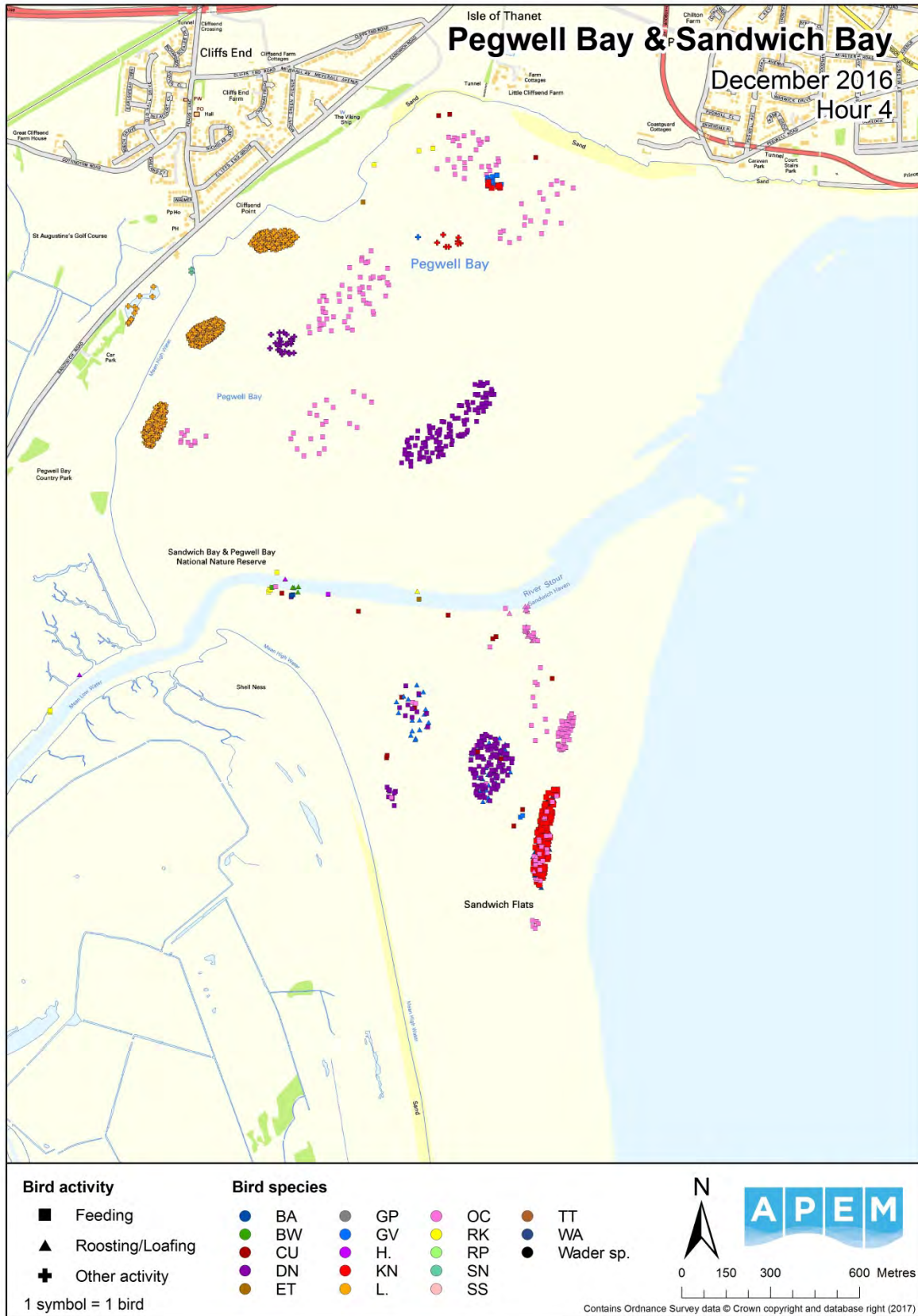


Figure 47 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 4

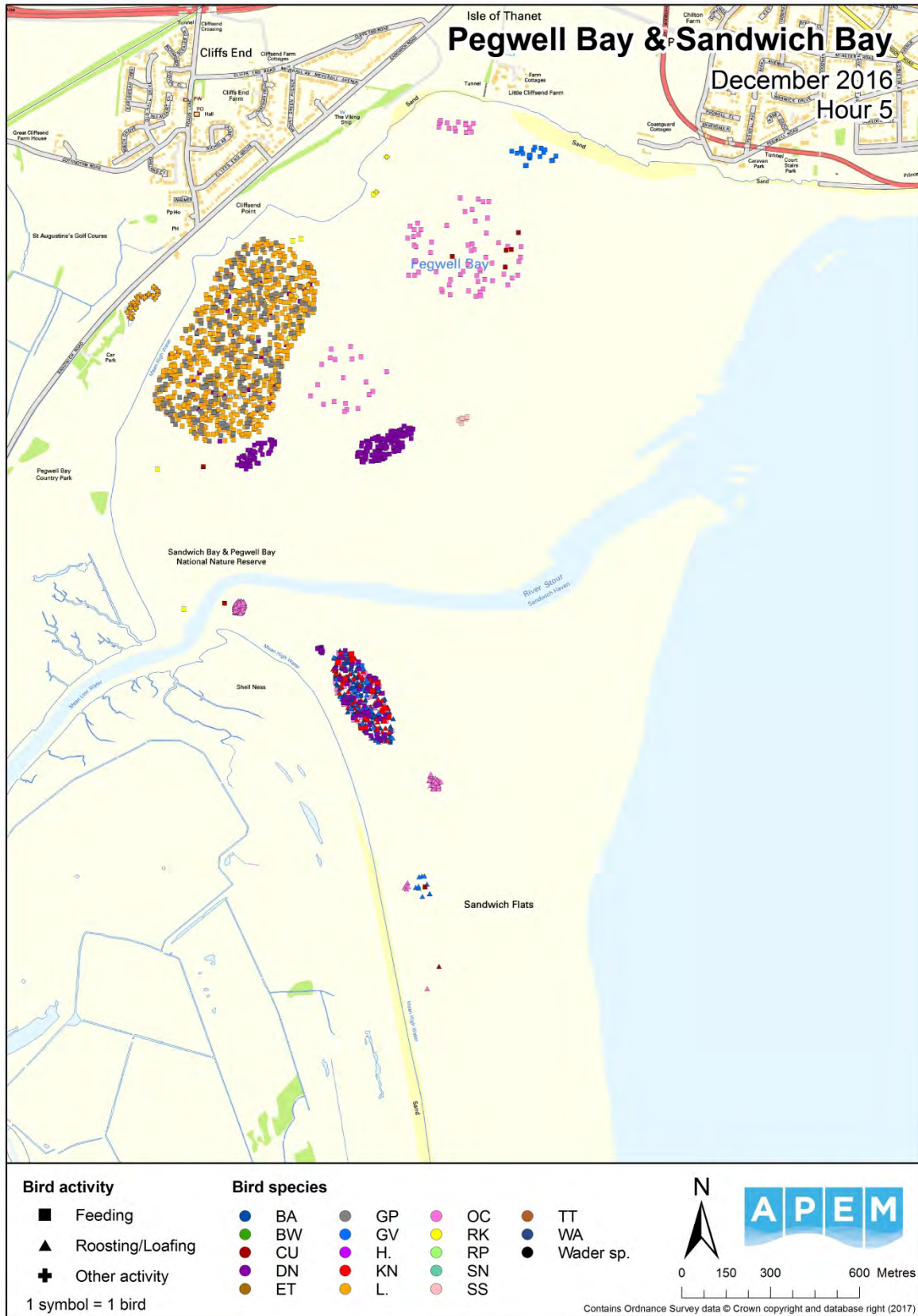


Figure 48 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 5

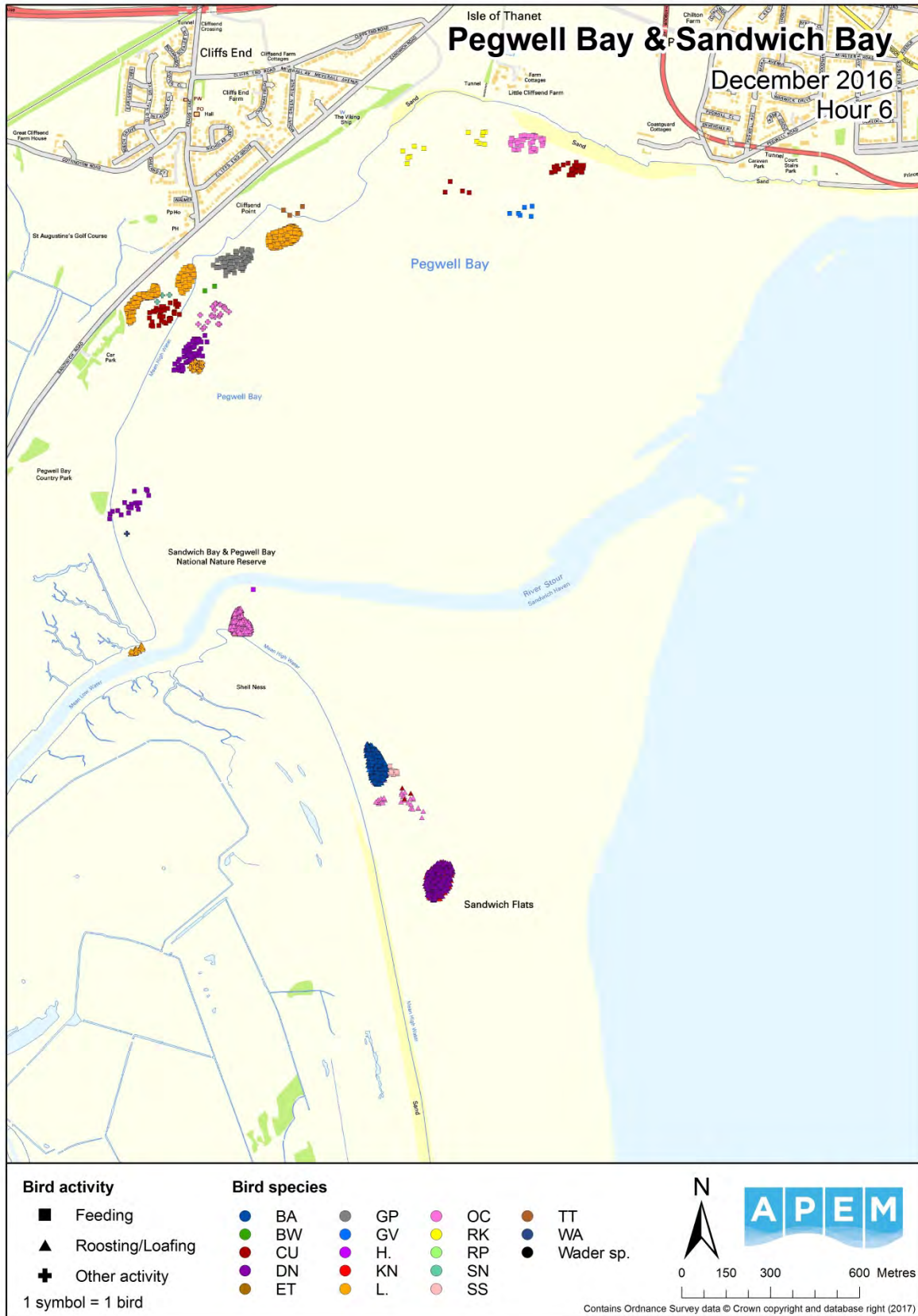


Figure 49 Pegwell Bay & Shell Ness TTTCC observations December 2016: Waders Hour 6

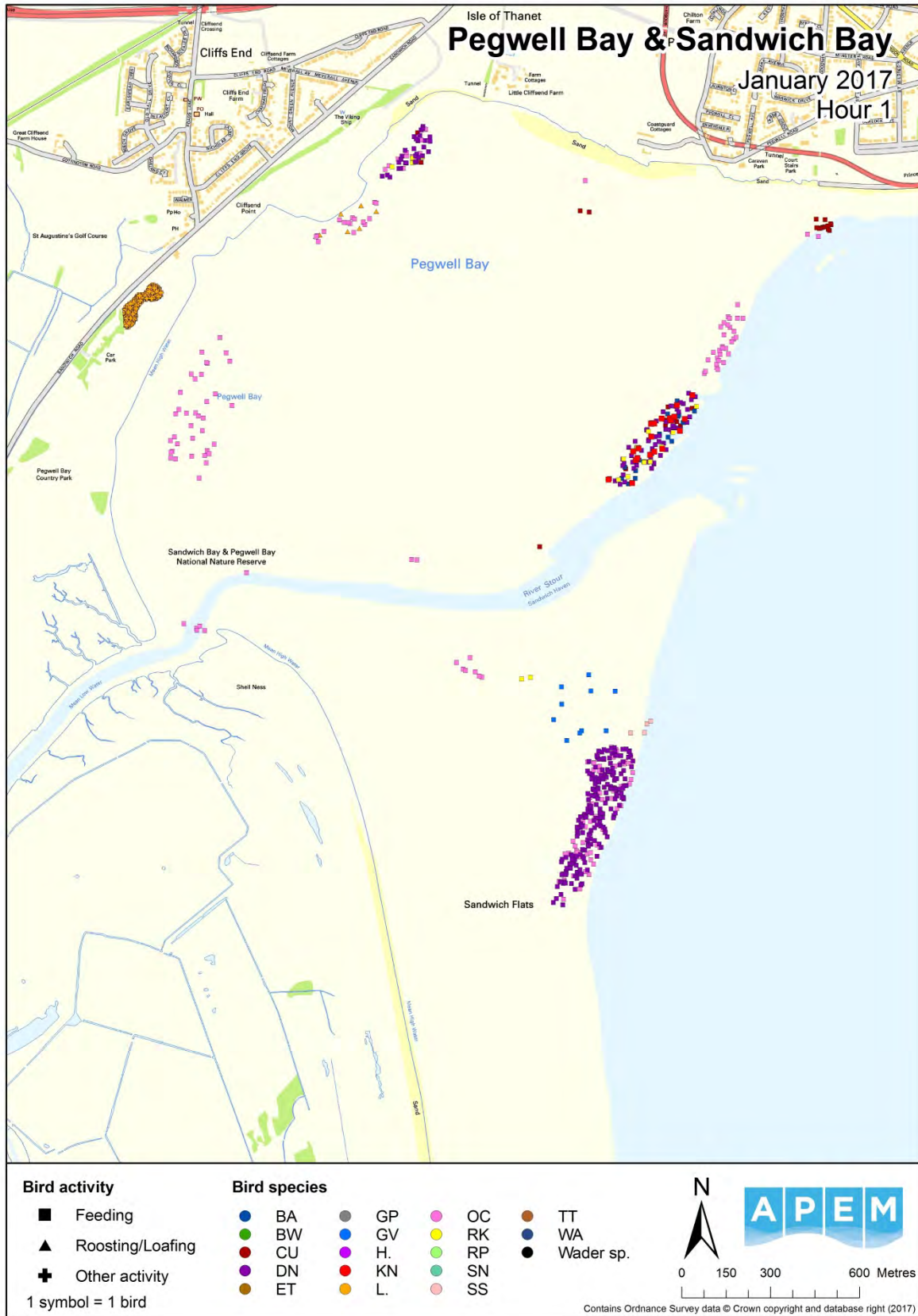


Figure 50 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 1

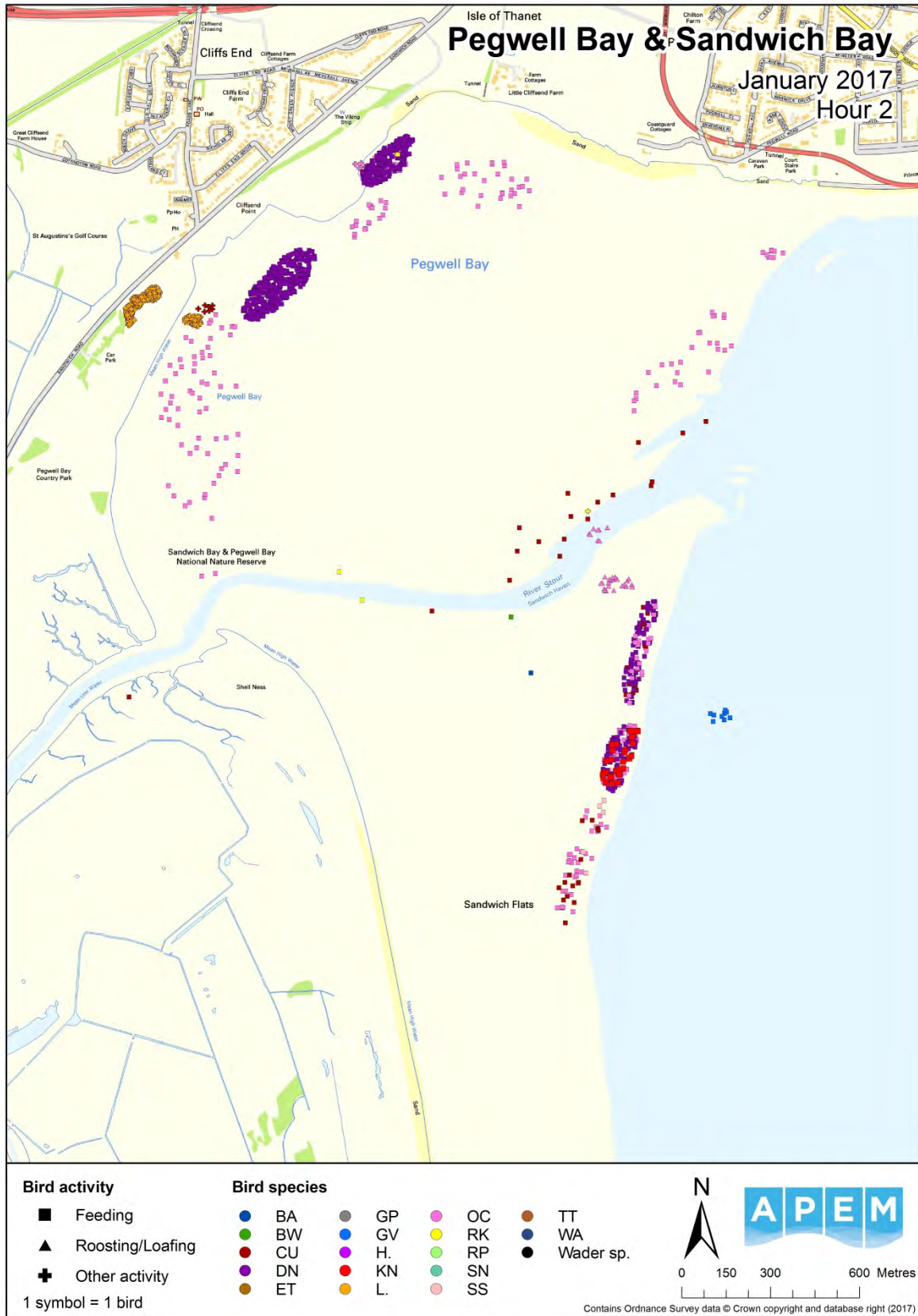


Figure 51 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 2

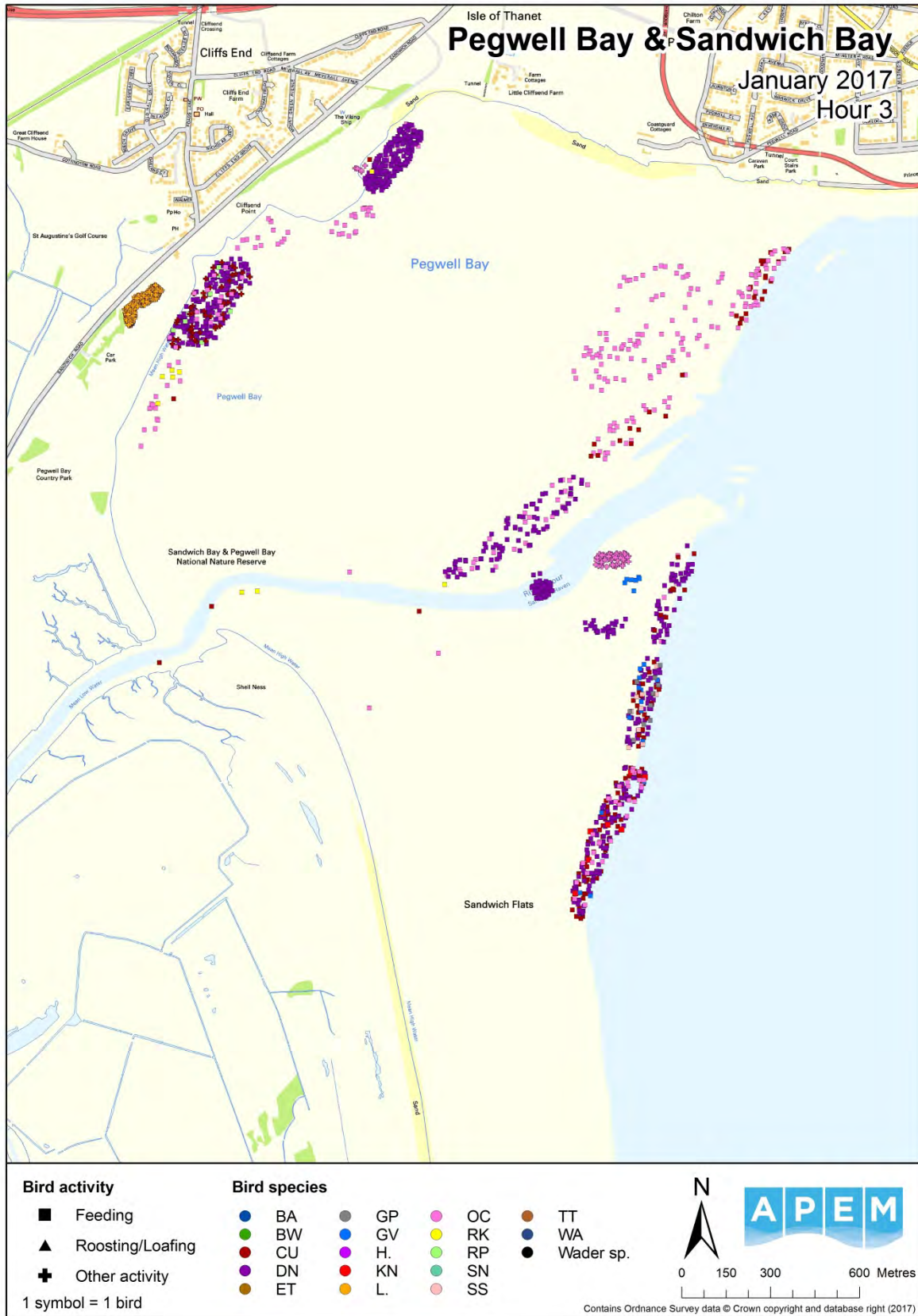


Figure 52 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 3

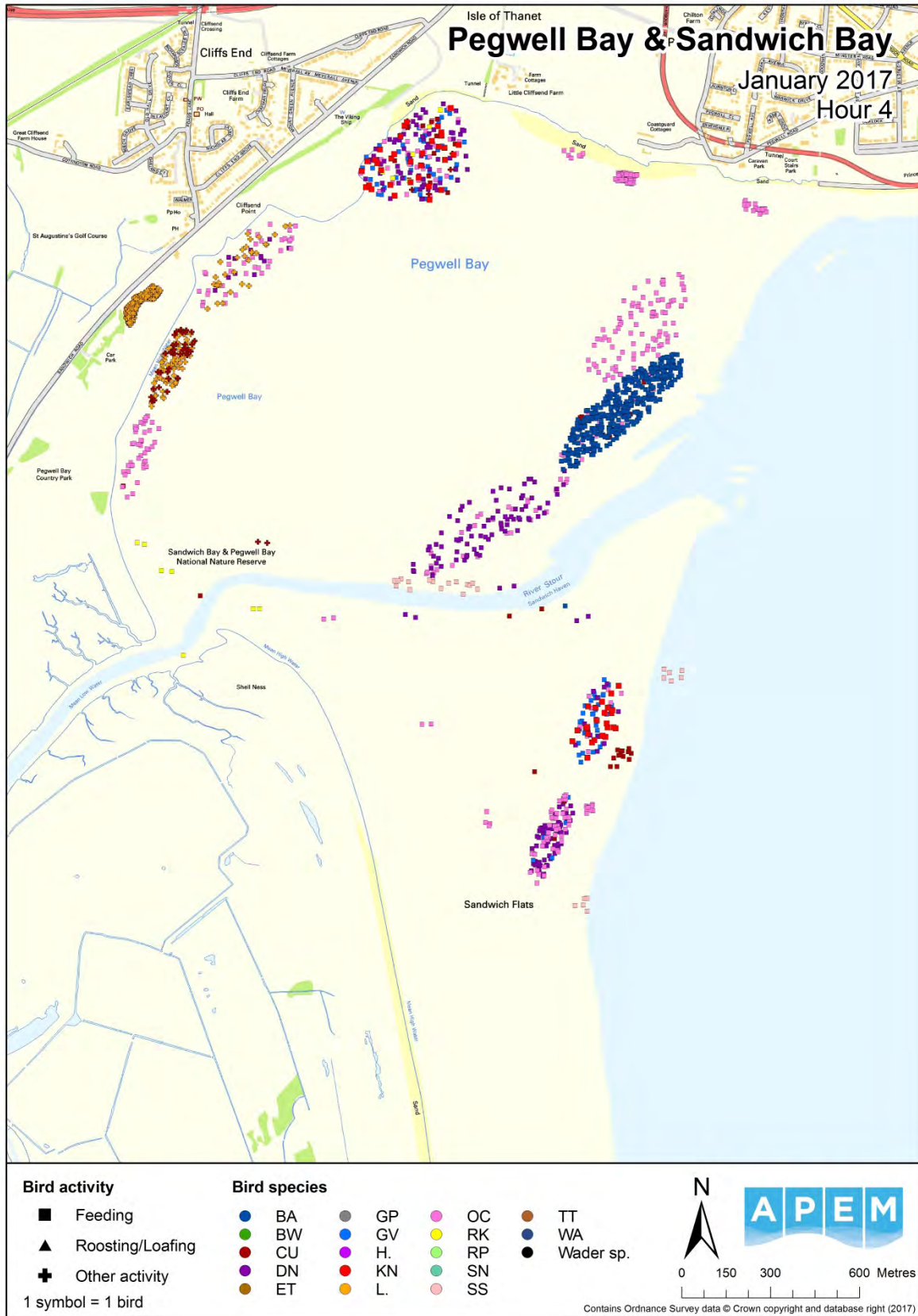


Figure 53 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 4

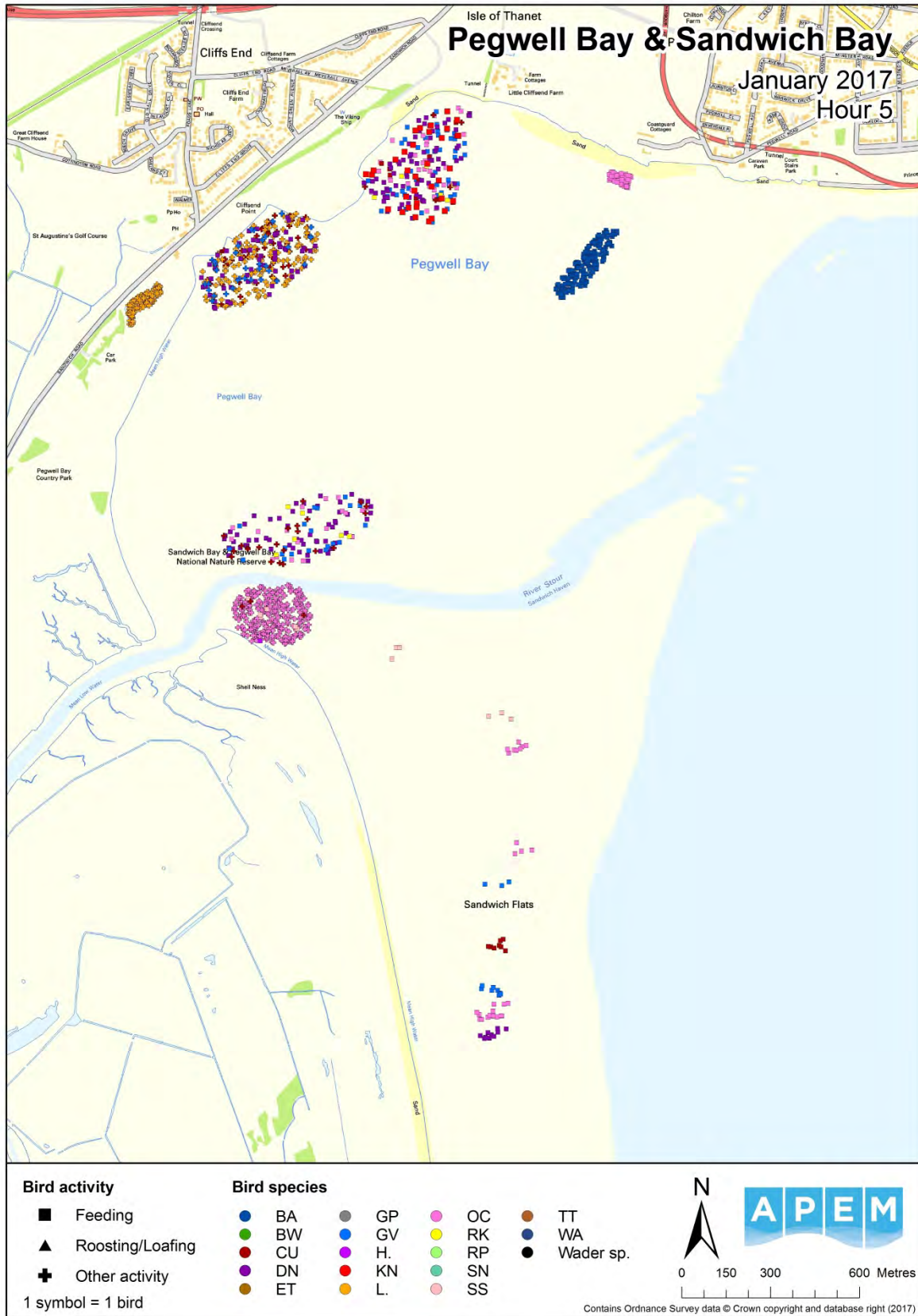


Figure 54 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 5

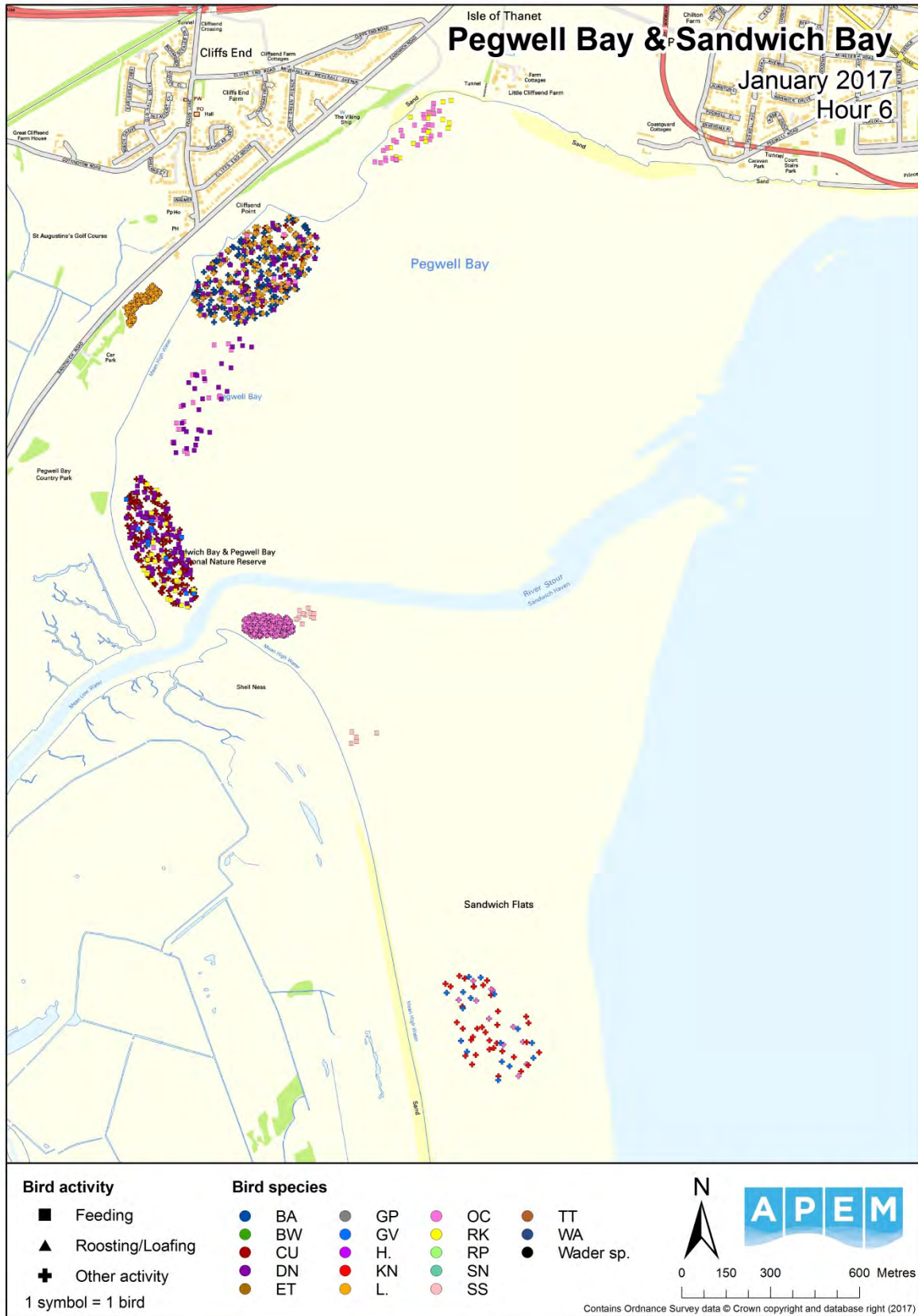


Figure 55 Pegwell Bay & Shell Ness TTTCC observations January 2017: Waders Hour 6

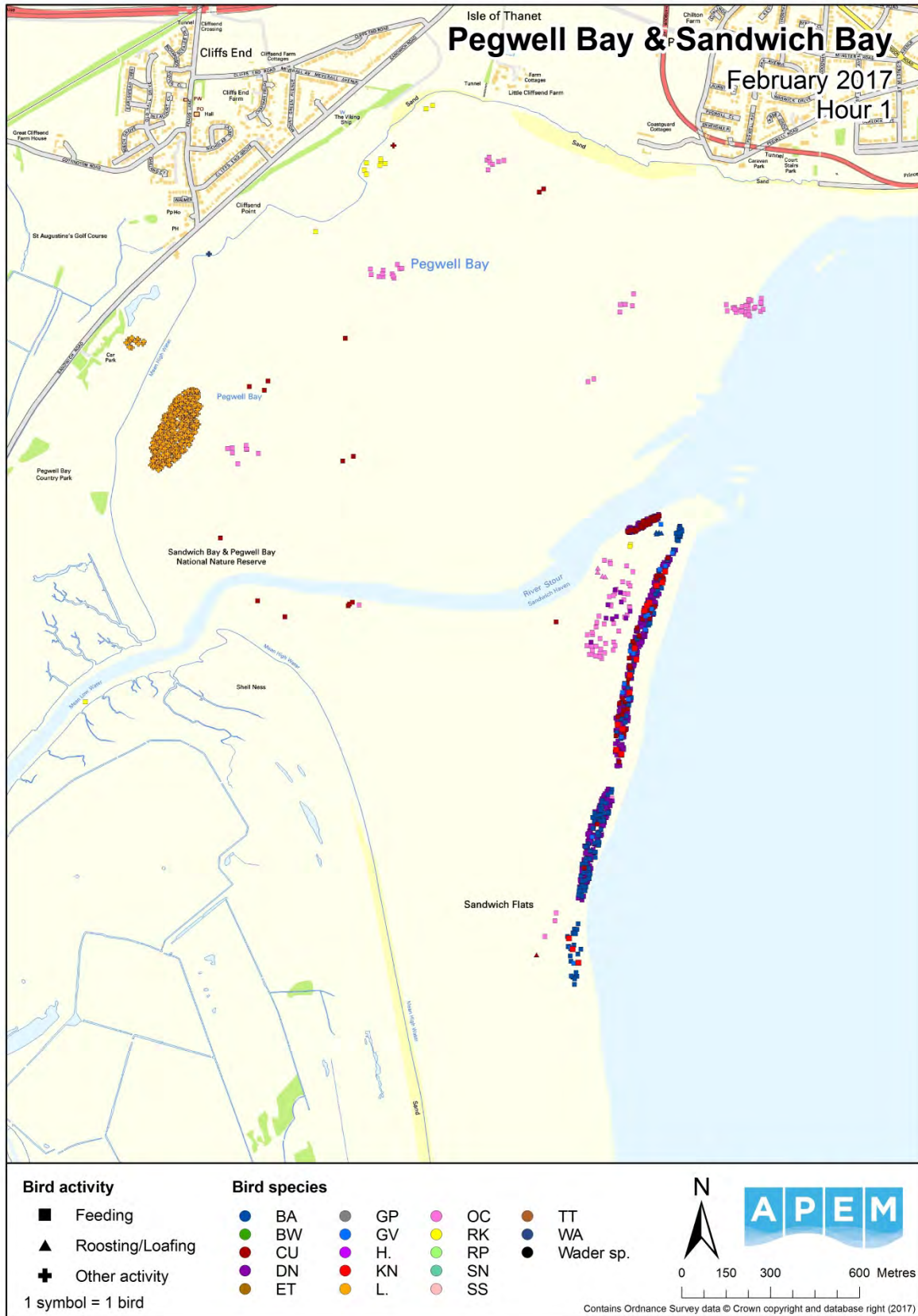


Figure 56 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 1

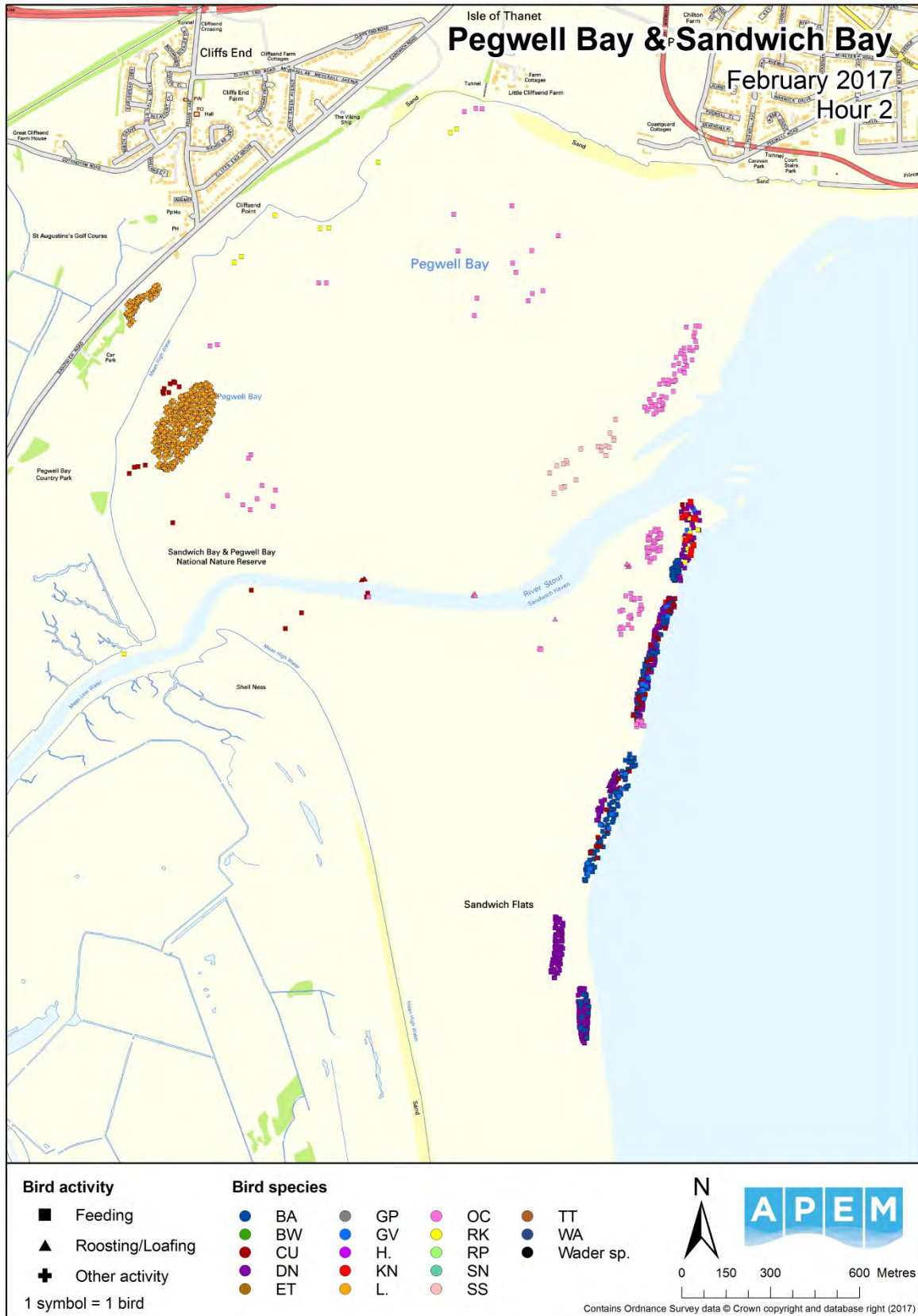


Figure 57 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 2

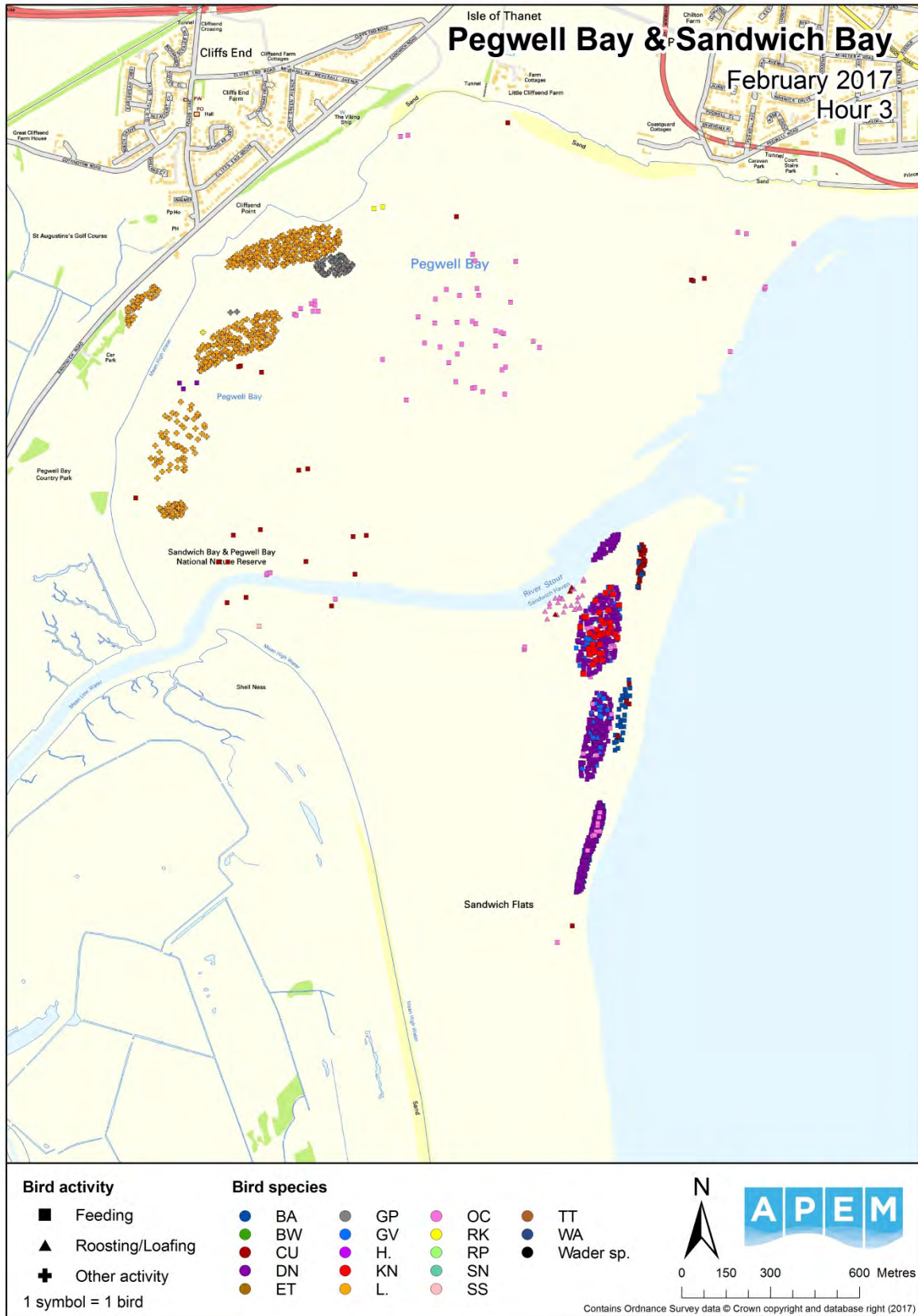


Figure 58 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 3

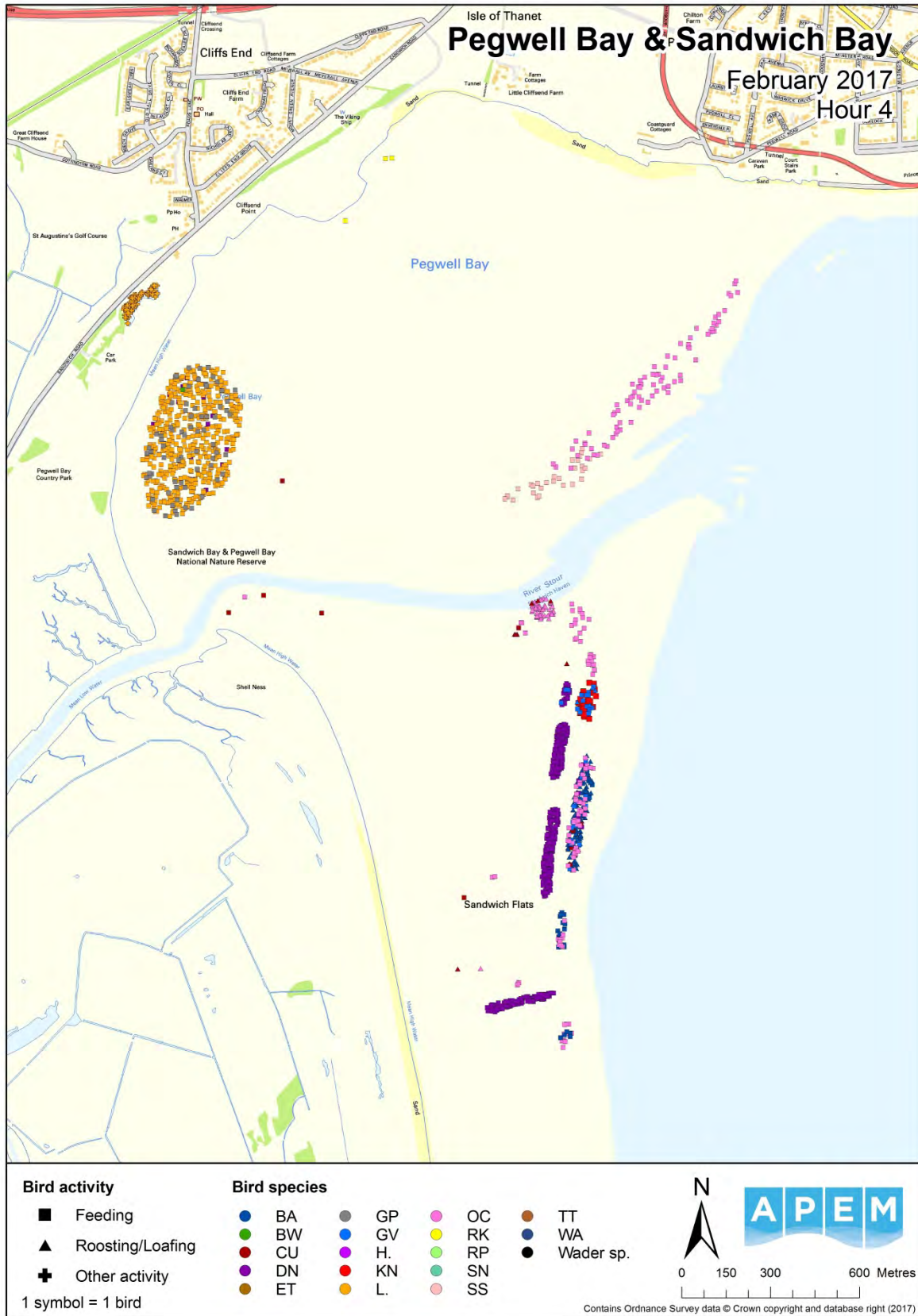


Figure 59 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 4

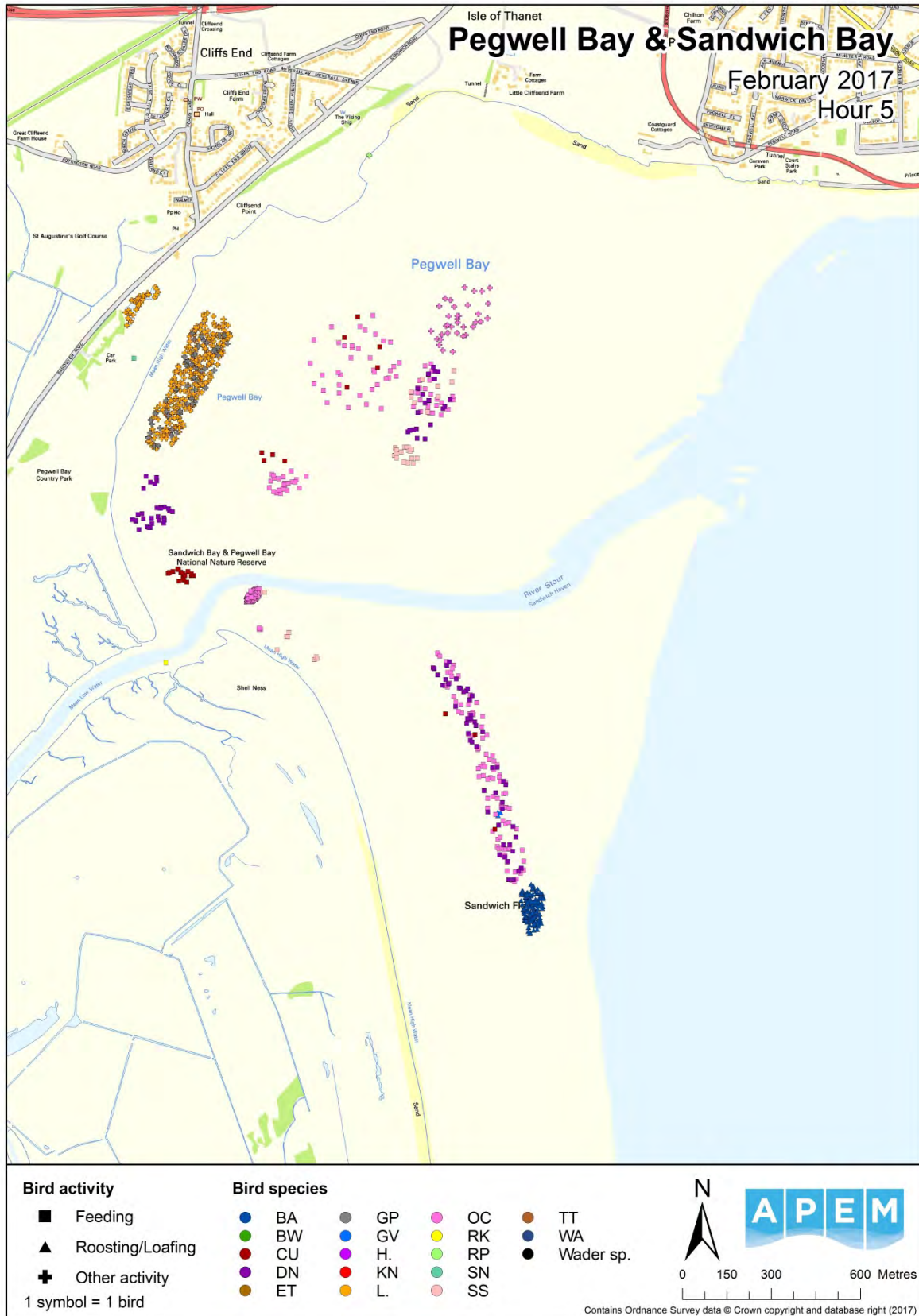


Figure 60 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 5



Figure 61 Pegwell Bay & Shell Ness TTTCC observations February 2017: Waders Hour 6



Figure 62 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 1



Figure 63 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 2

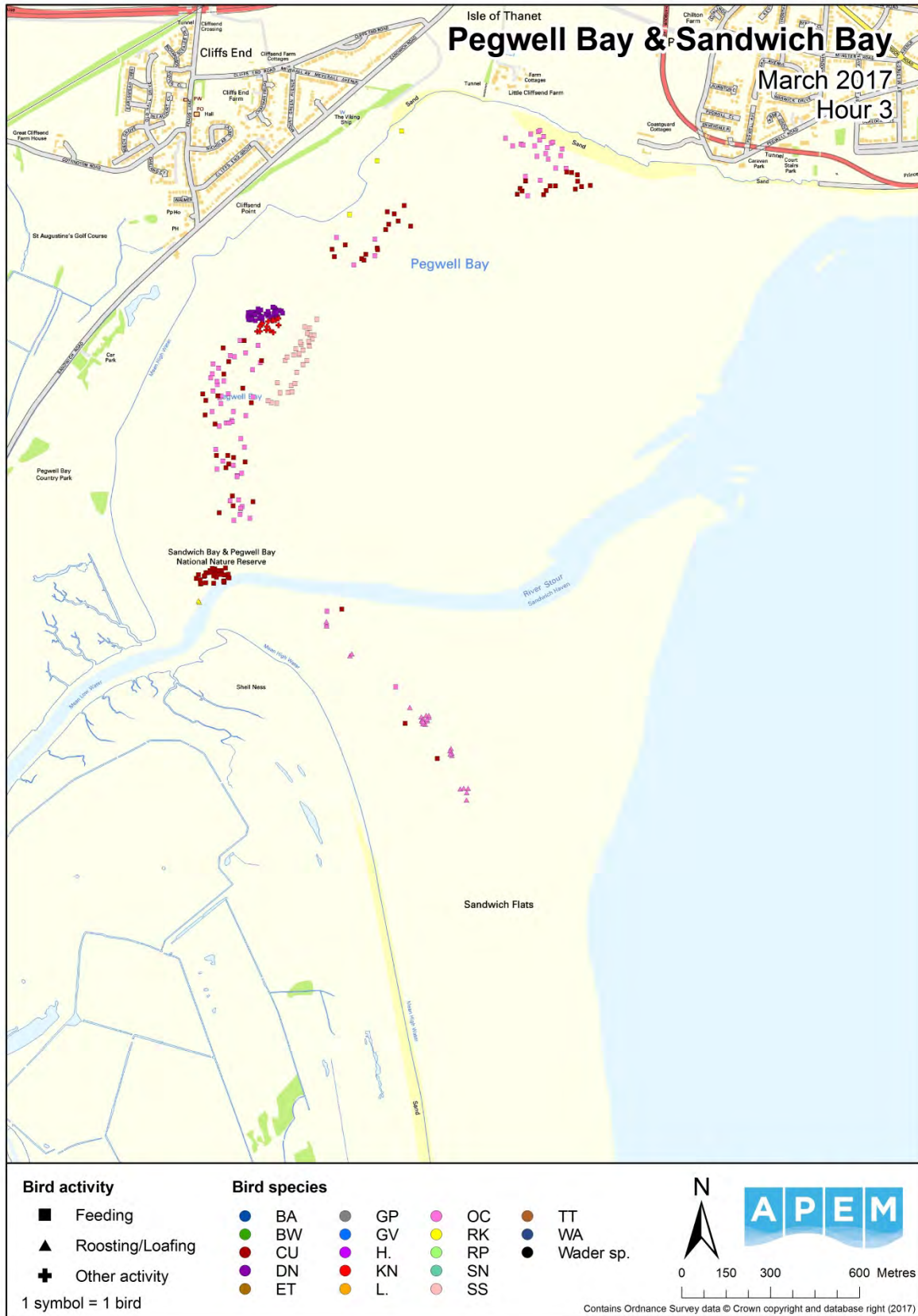


Figure 64 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 3

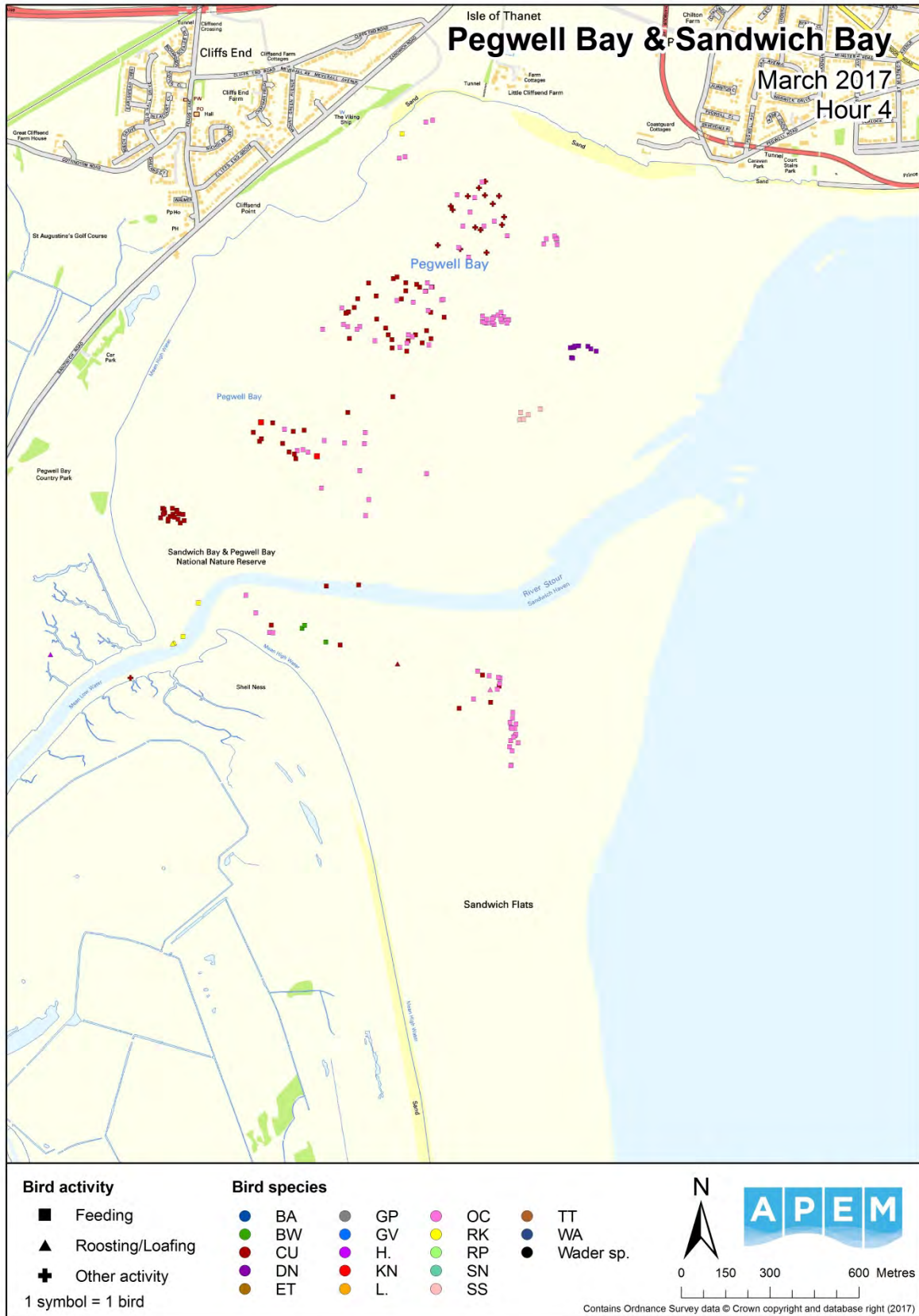


Figure 65 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 4

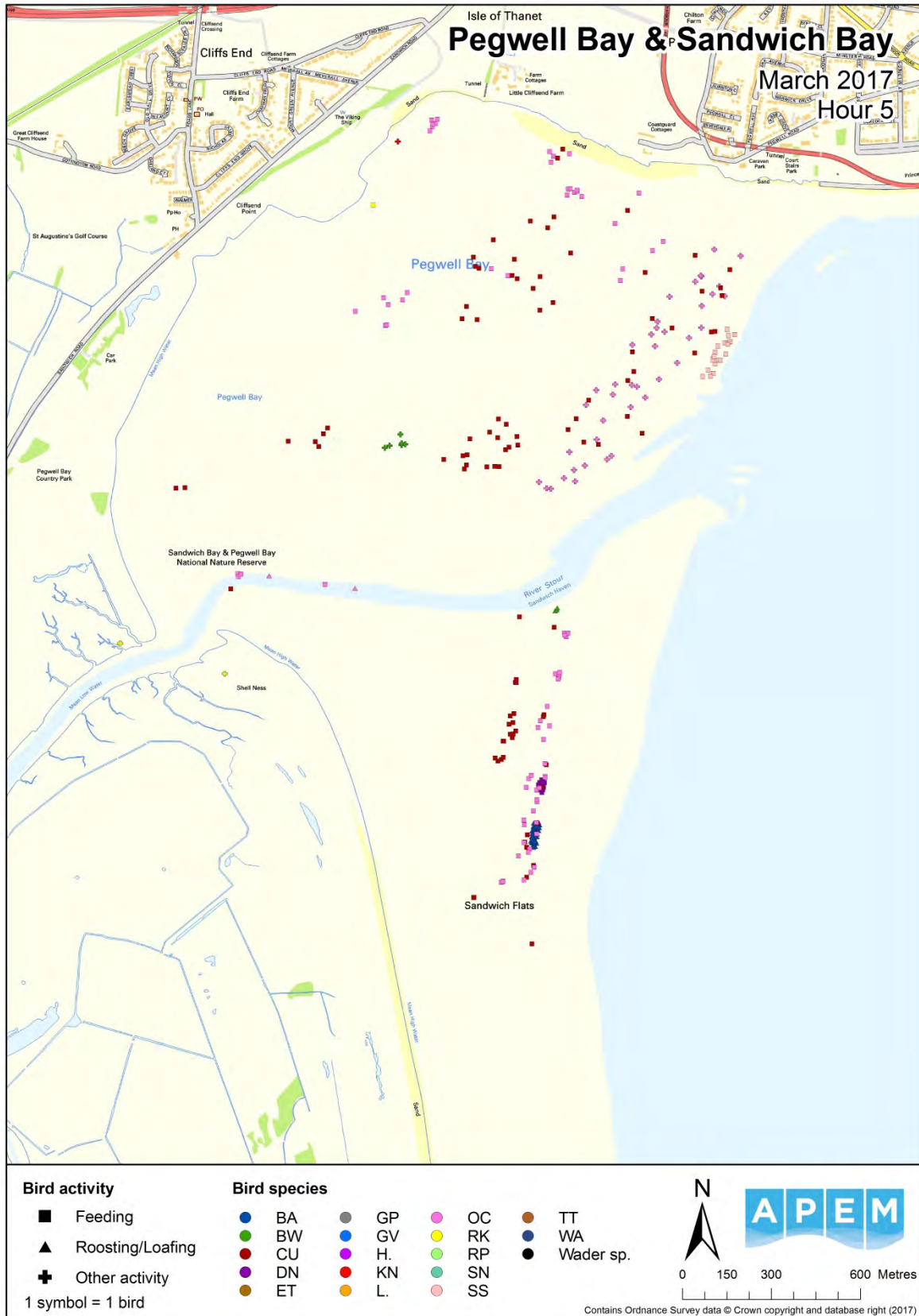


Figure 66 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 5

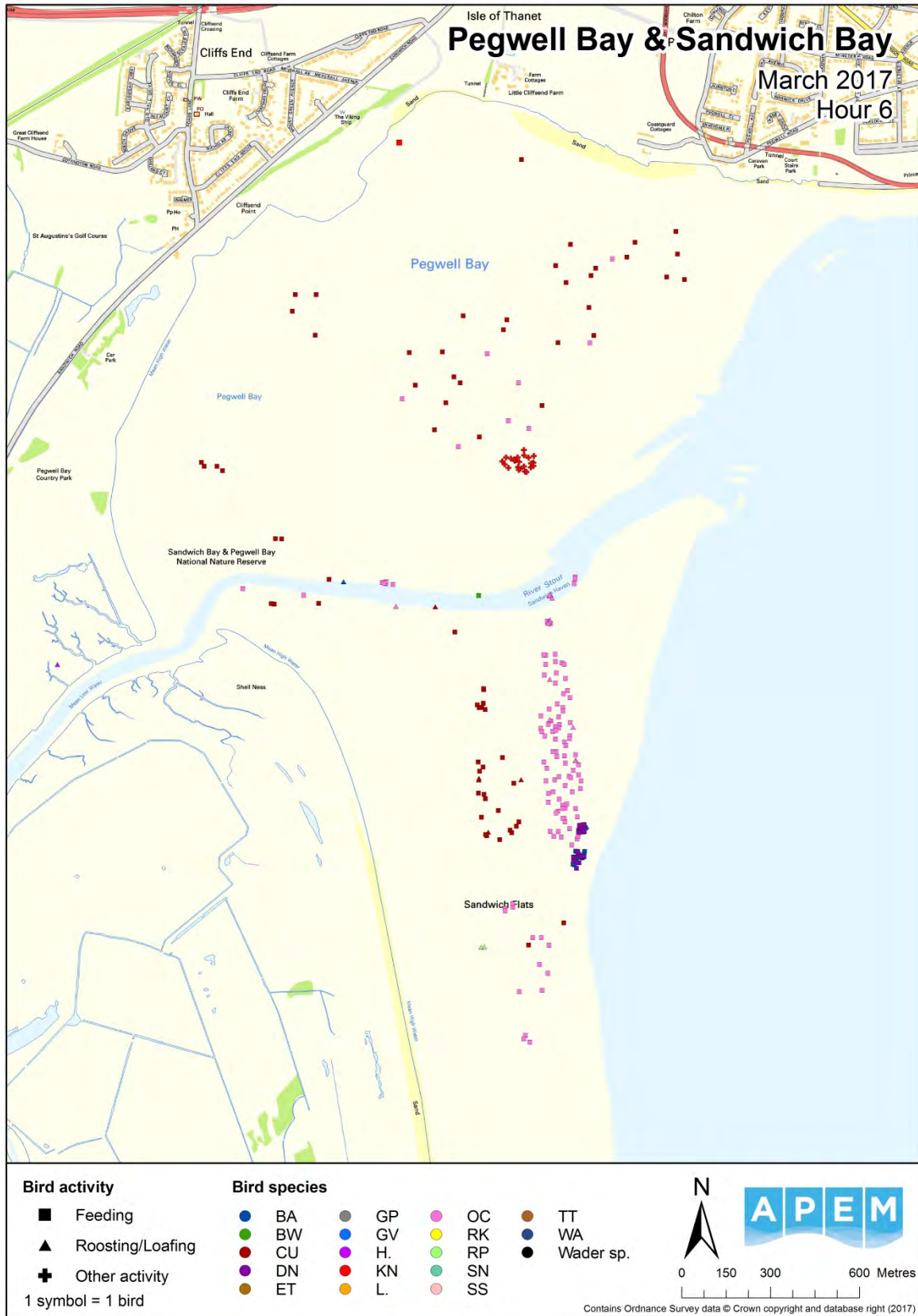


Figure 67 Pegwell Bay & Shell Ness TTTCC observations March 2017: Waders Hour 6



Figure 68 Pegwell Bay & Shell Ness TTTCC observations November 2016: Wildfowl & seabirds Hour 1

Sandwich Bay Estate TTTCC hourly observations

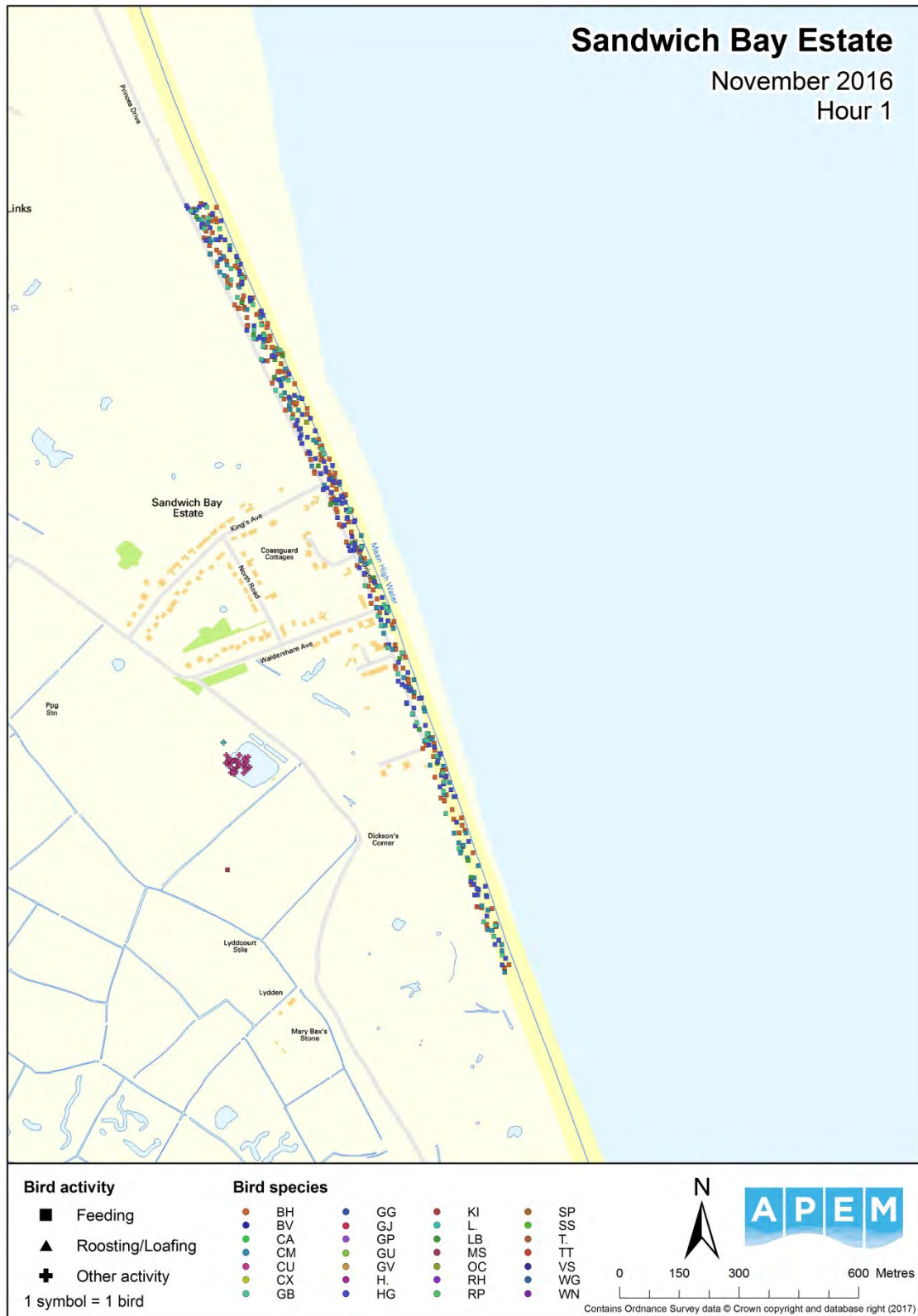


Figure 98 Sandwich Bay Estate TTTCC observations November 2016: Hour 1



Figure 99 Sandwich Bay Estate TTTCC observations November 2016: Hour 2

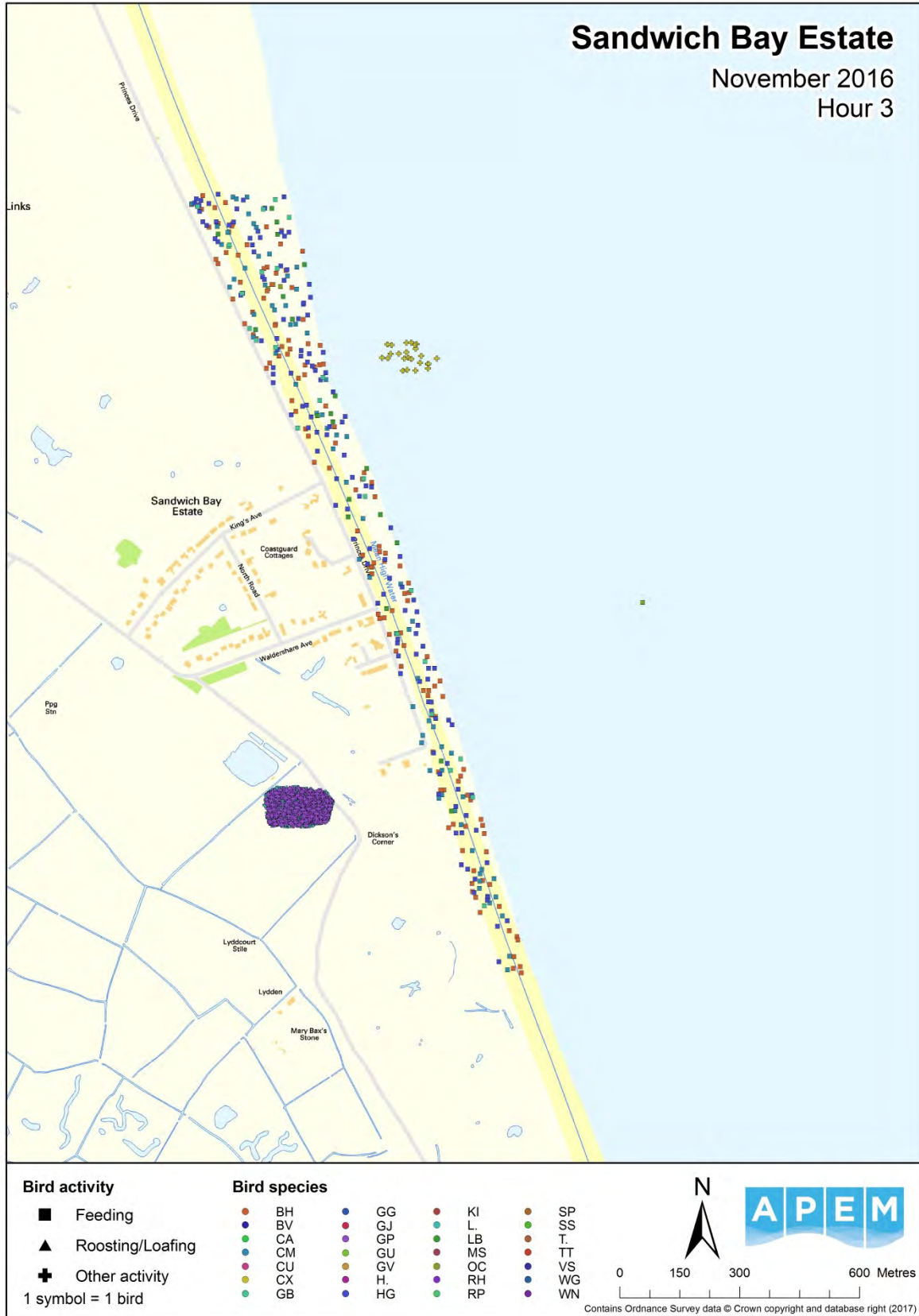


Figure 100 Sandwich Bay Estate TTTCC observations November 2016: Hour 3

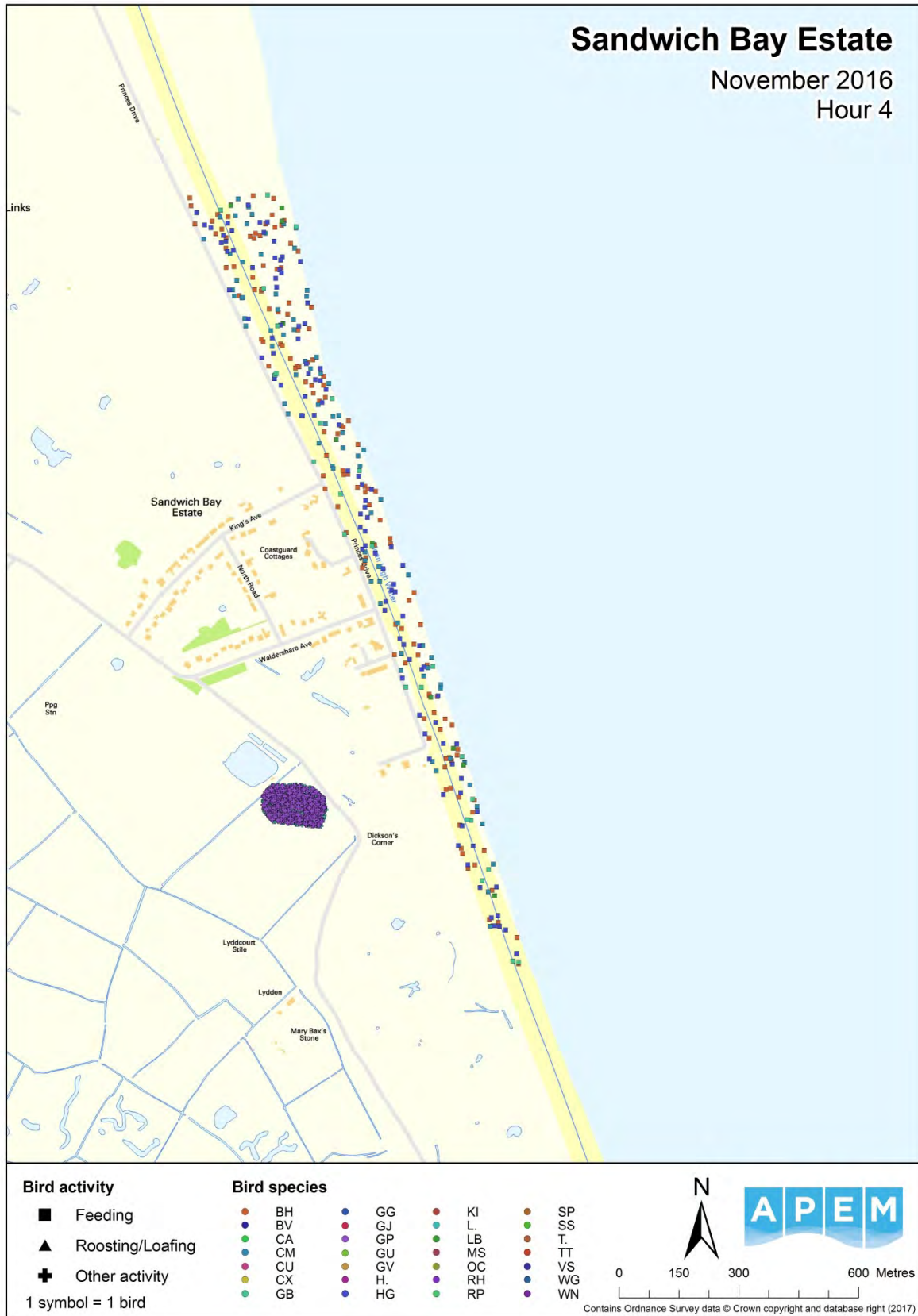


Figure 101 Sandwich Bay Estate TTTCC observations November 2016: Hour 4



Figure 102 Sandwich Bay Estate TTTCC observations November 2016: Hour 5

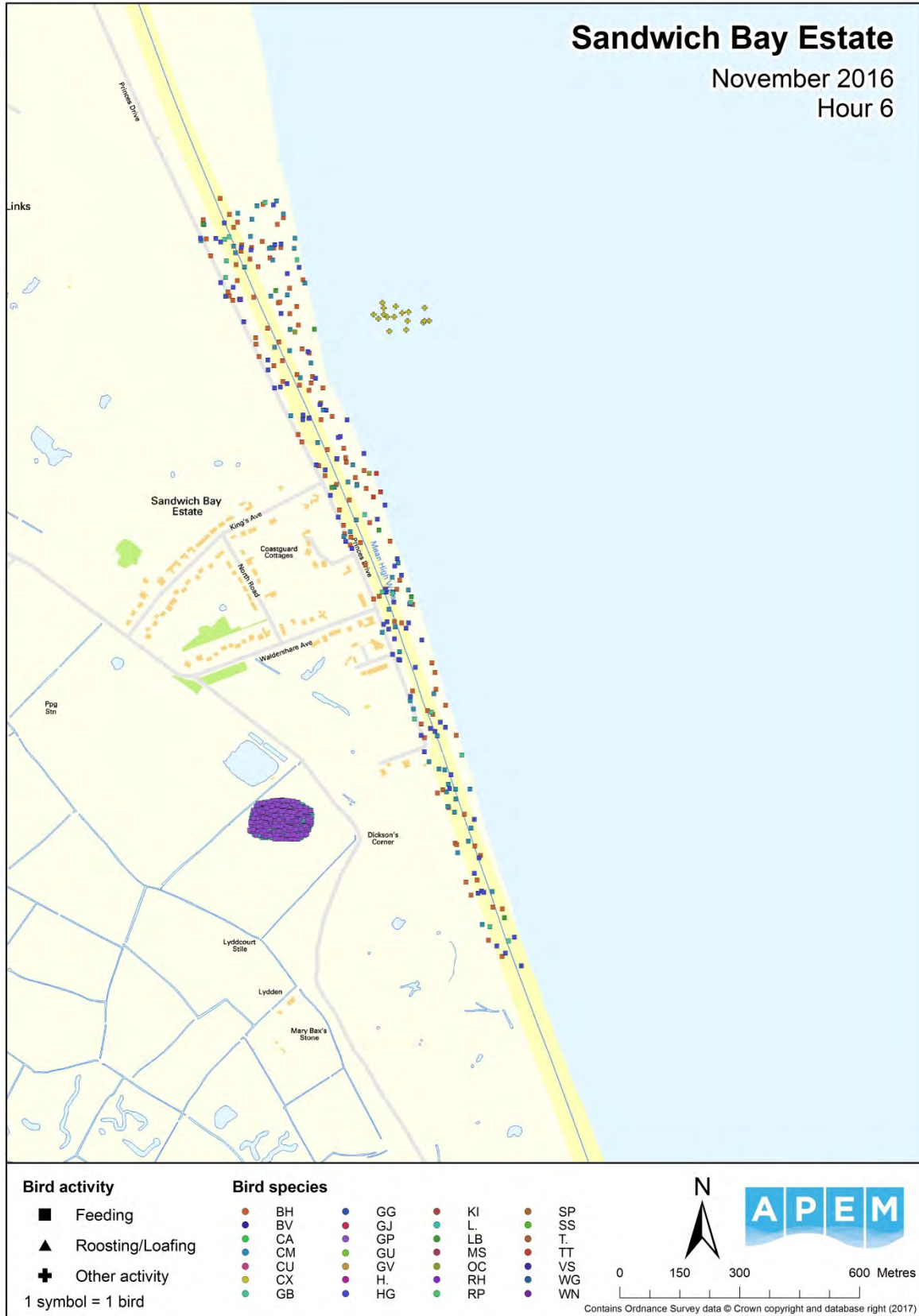


Figure 103 Sandwich Bay Estate TTTCC observations November 2016: Hour 6

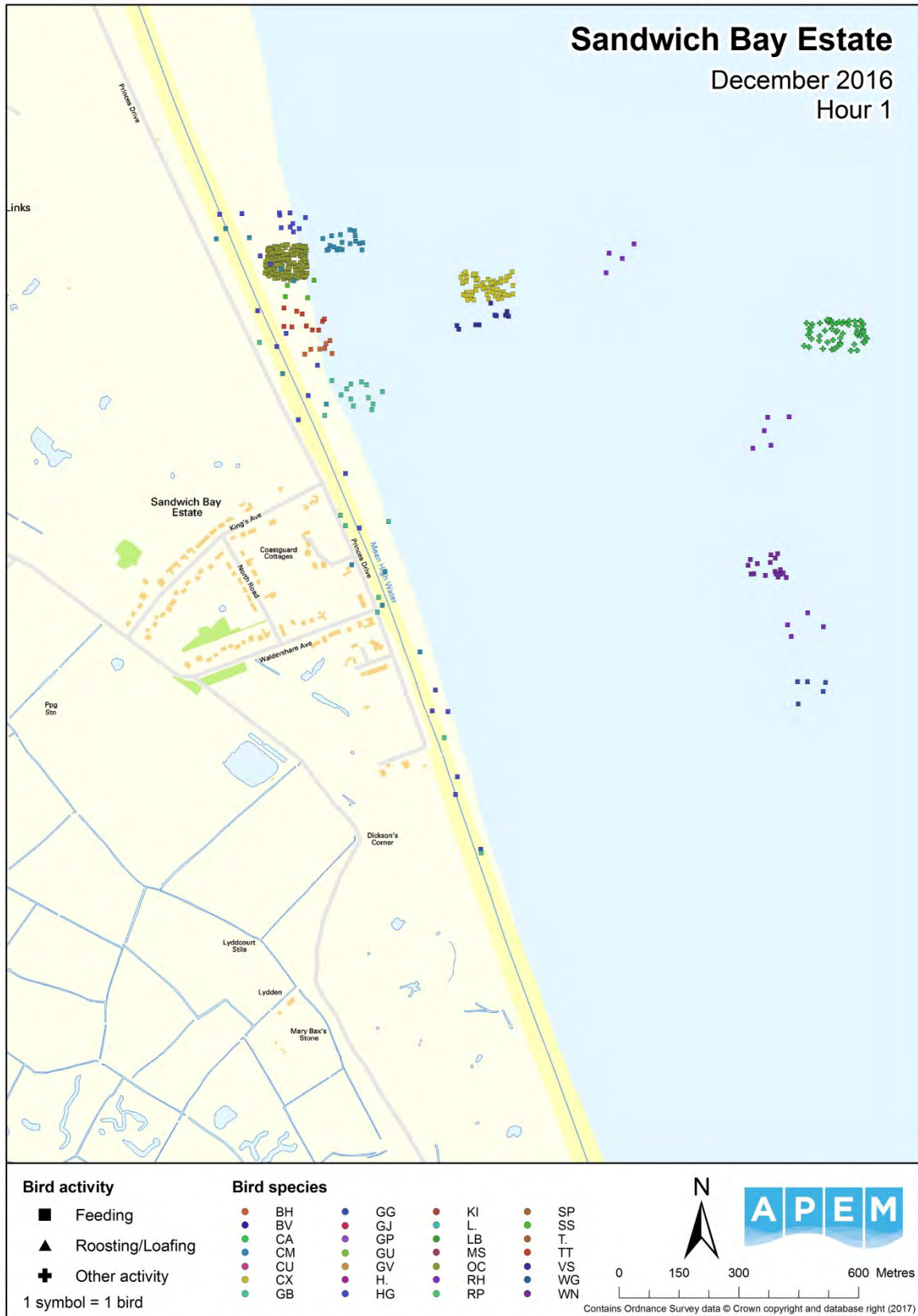


Figure 104 Sandwich Bay Estate TTTCC observations December 2016: Hour 1



Figure 105 Sandwich Bay Estate TTTCC observations December 2016: Hour 2

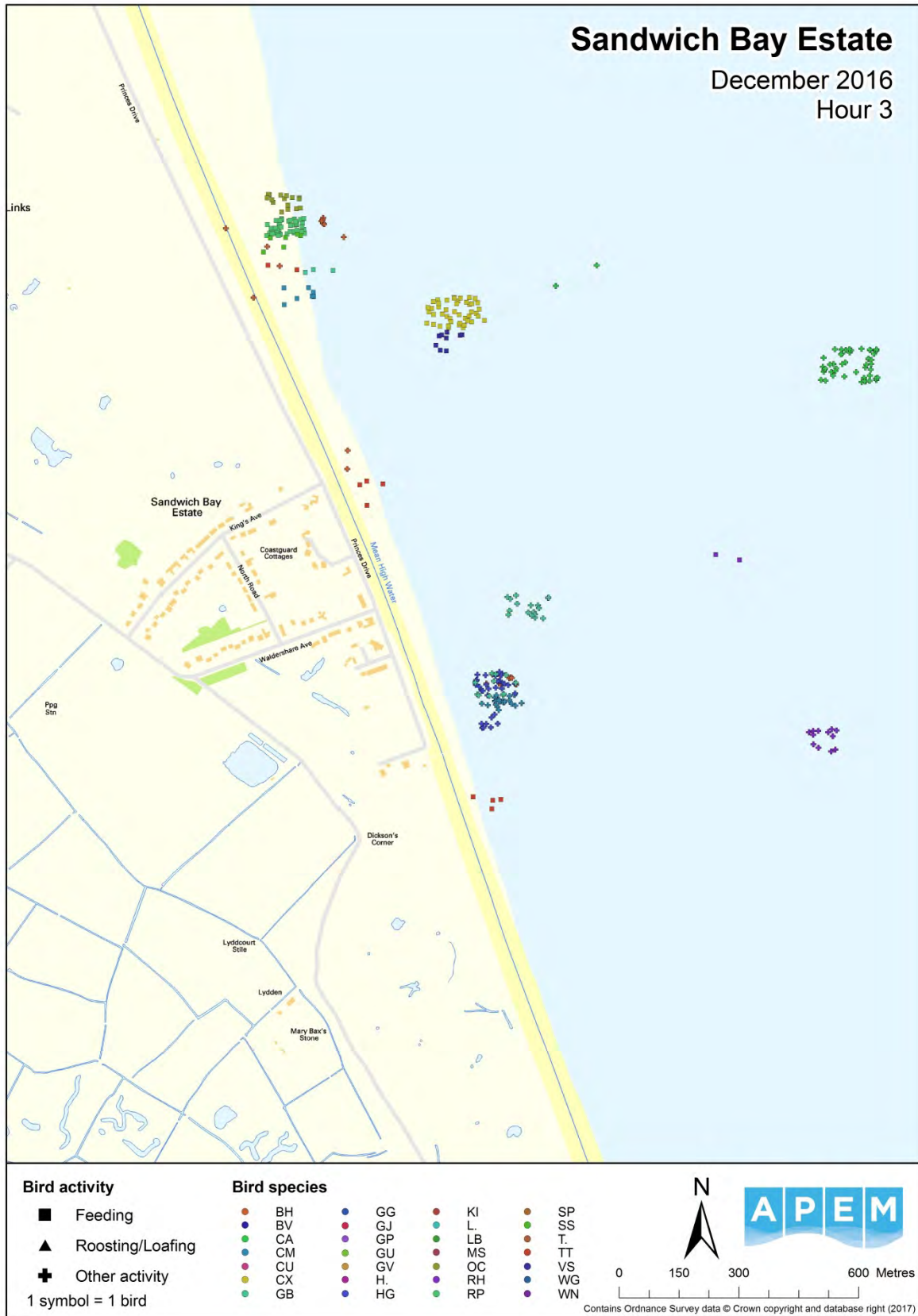


Figure 106 Sandwich Bay Estate TTTCC observations December 2016: Hour 3

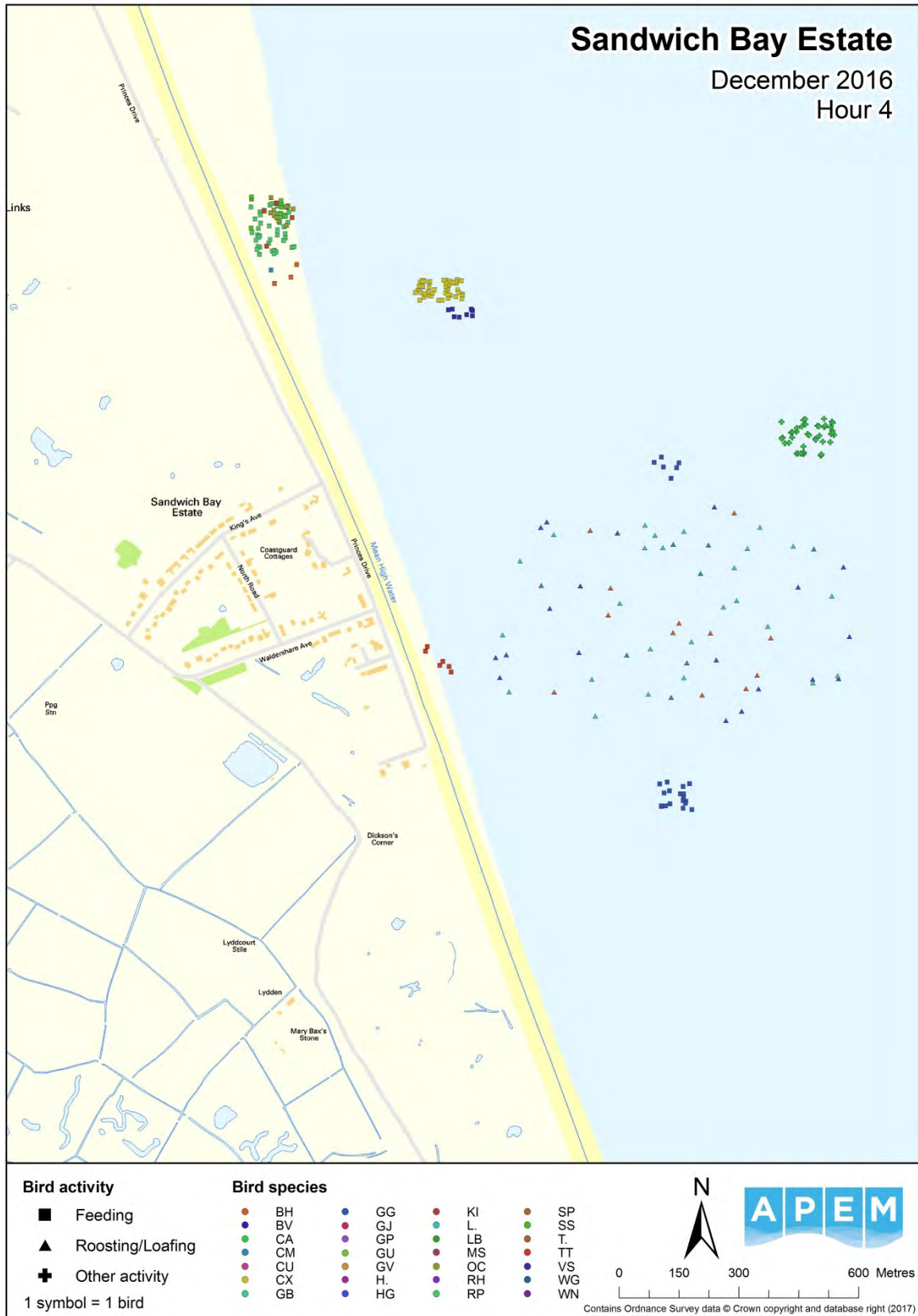


Figure 107 Sandwich Bay Estate TTTCC observations December 2016: Hour 4



Figure 108 Sandwich Bay Estate TTTCC observations December 2016: Hour 5

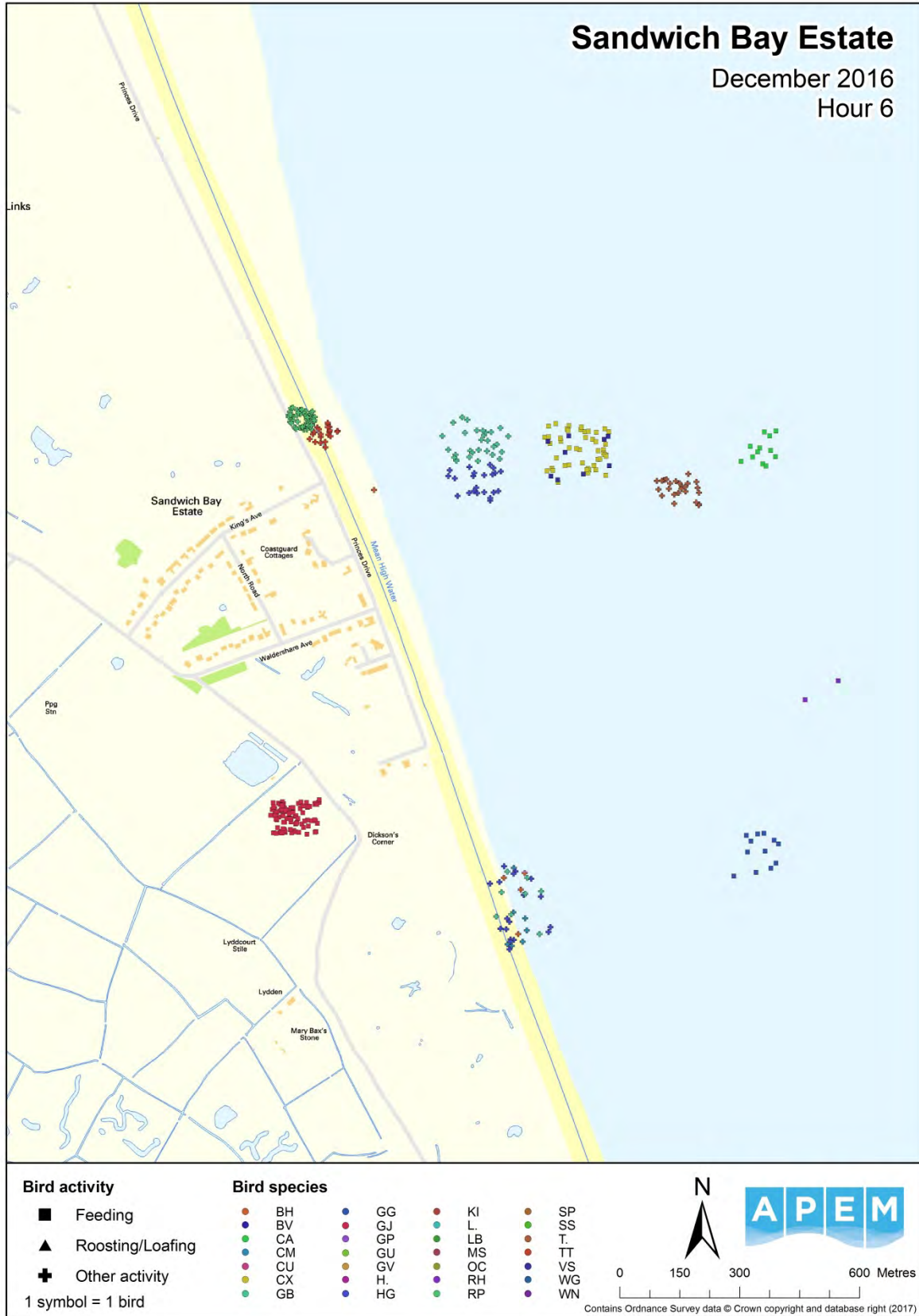


Figure 109 Sandwich Bay Estate TTTCC observations December 2016: Hour 6



Figure 110 Sandwich Bay Estate TTTCC observations January 2017: Hour 1



Figure 111 Sandwich Bay Estate TTTCC observations January 2017: Hour 2



Figure 112 Sandwich Bay Estate TTTCC observations January 2017: Hour 3



Figure 113 Sandwich Bay Estate TTTCC observations January 2017: Hour 4

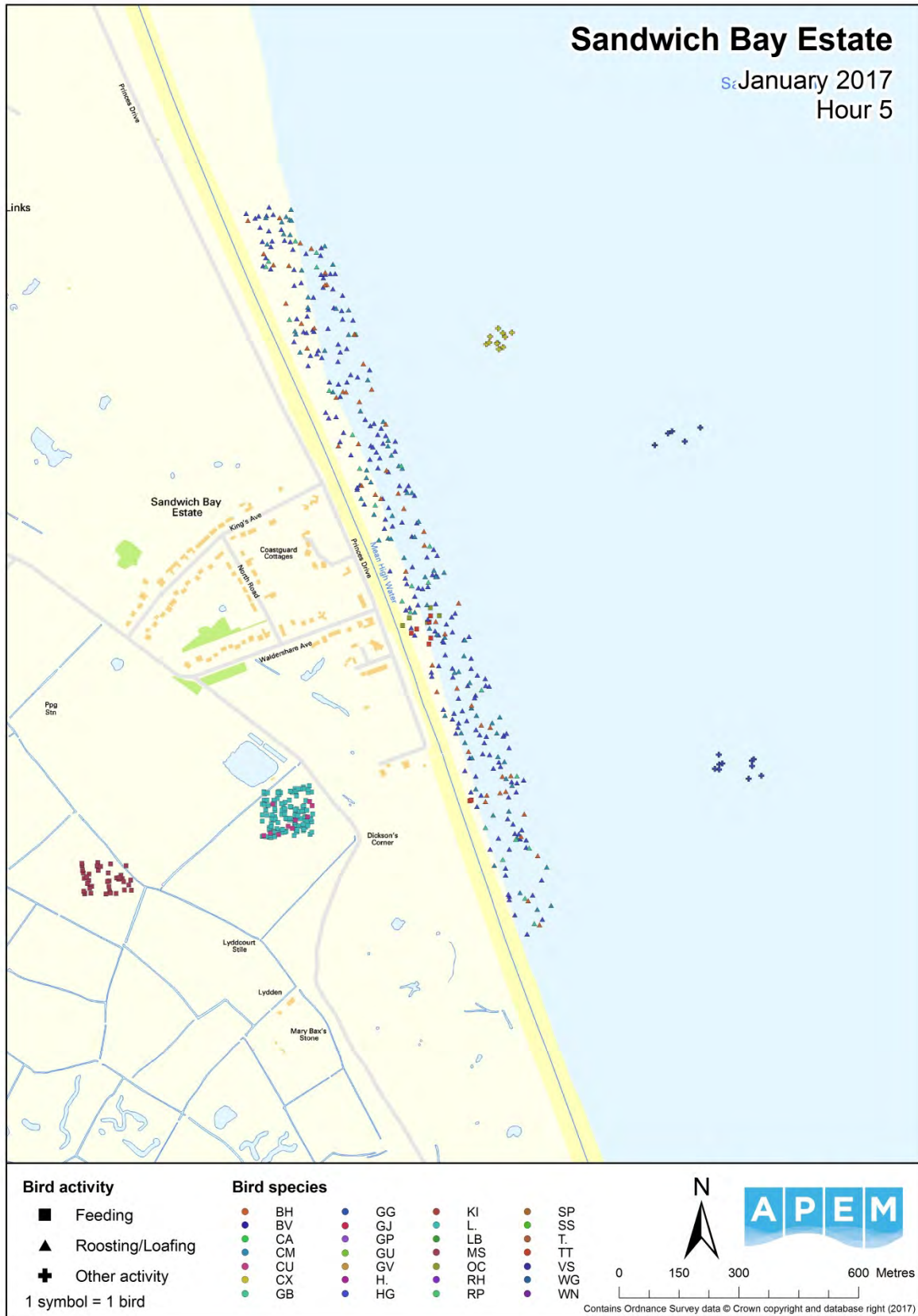


Figure 114 Sandwich Bay Estate TTTCC observations January 2017: Hour 5

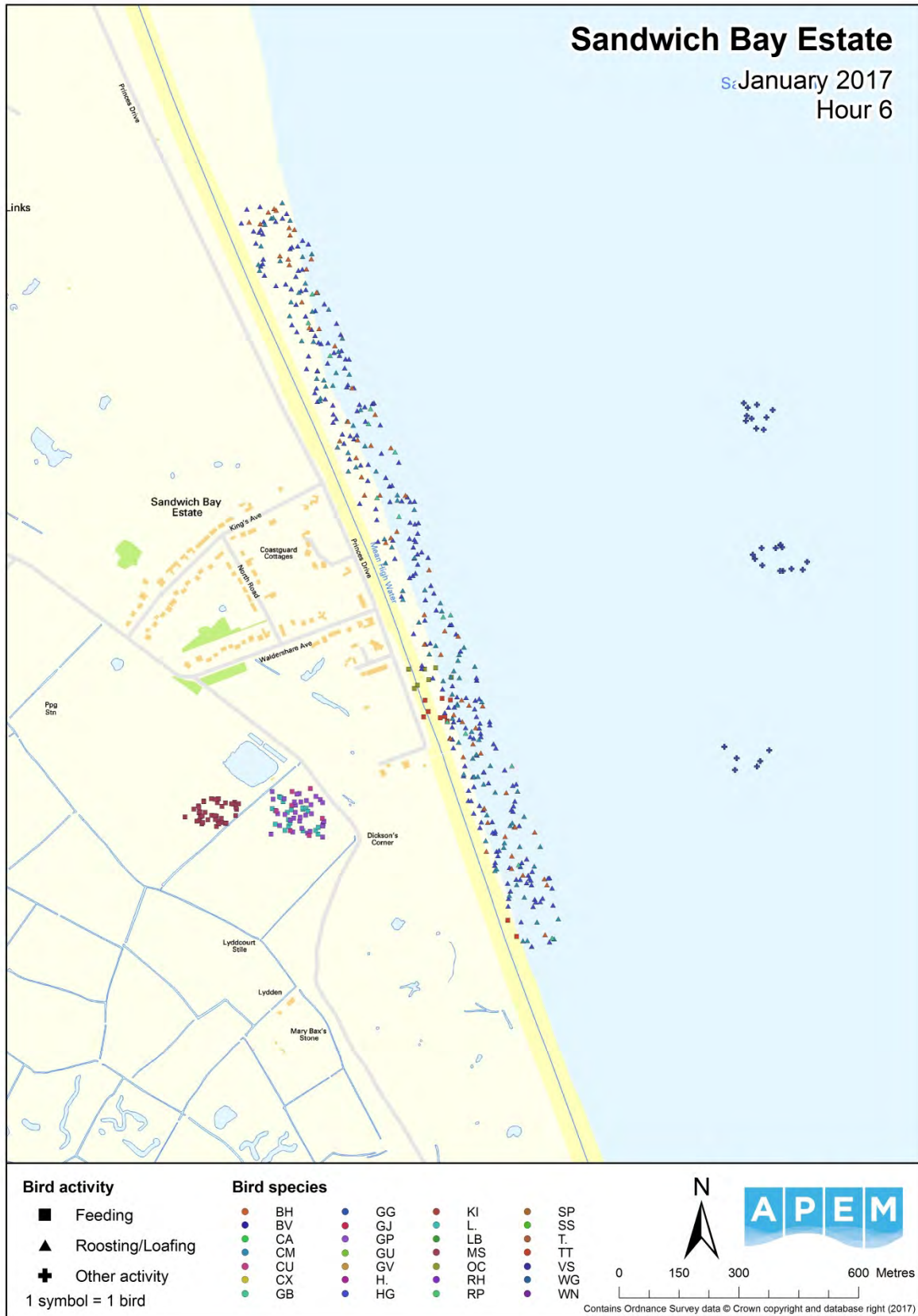


Figure 115 Sandwich Bay Estate TTTCC observations January 2017: Hour 6

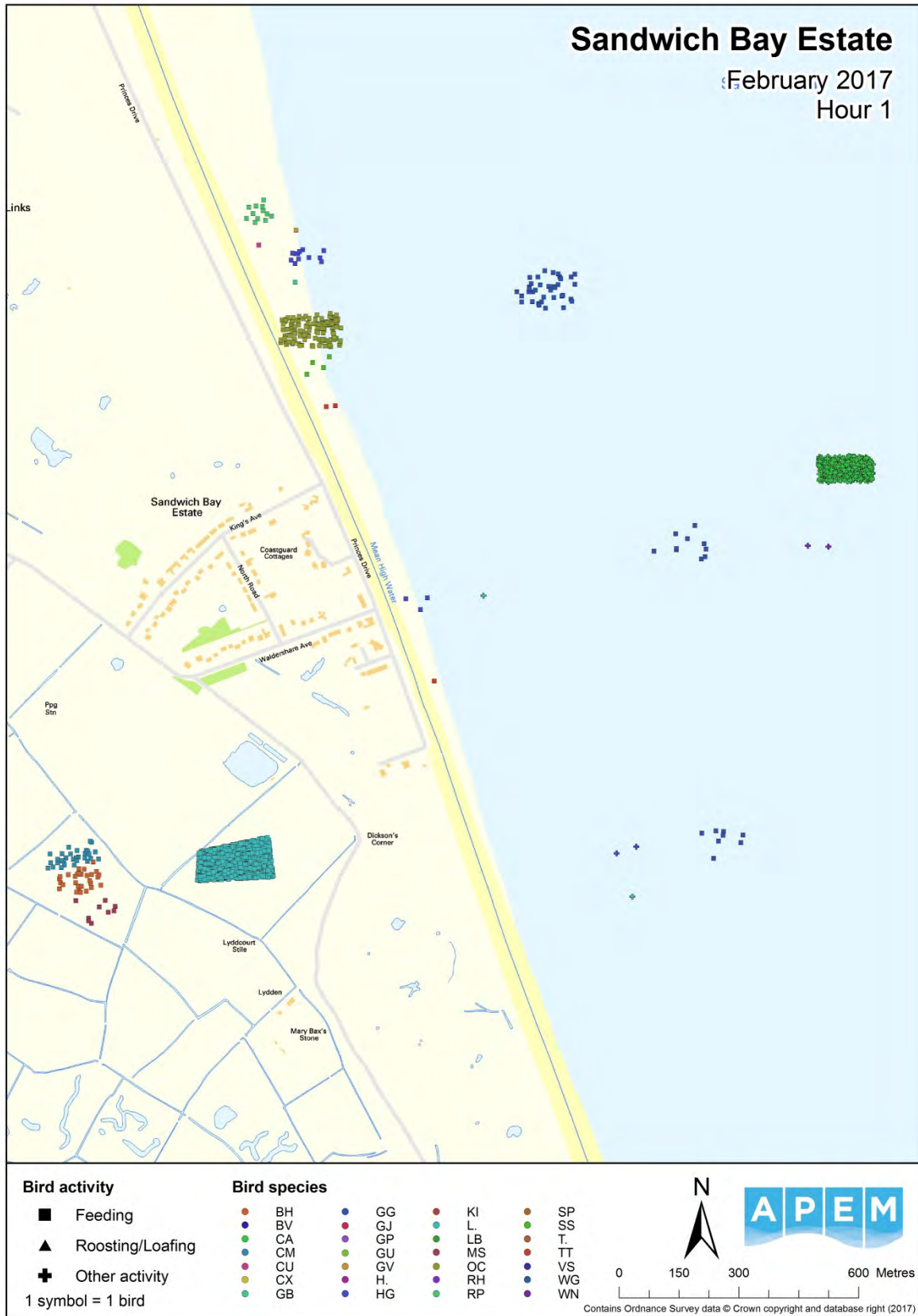


Figure 116 Sandwich Bay Estate TTTCC observations February 2017: Hour 1

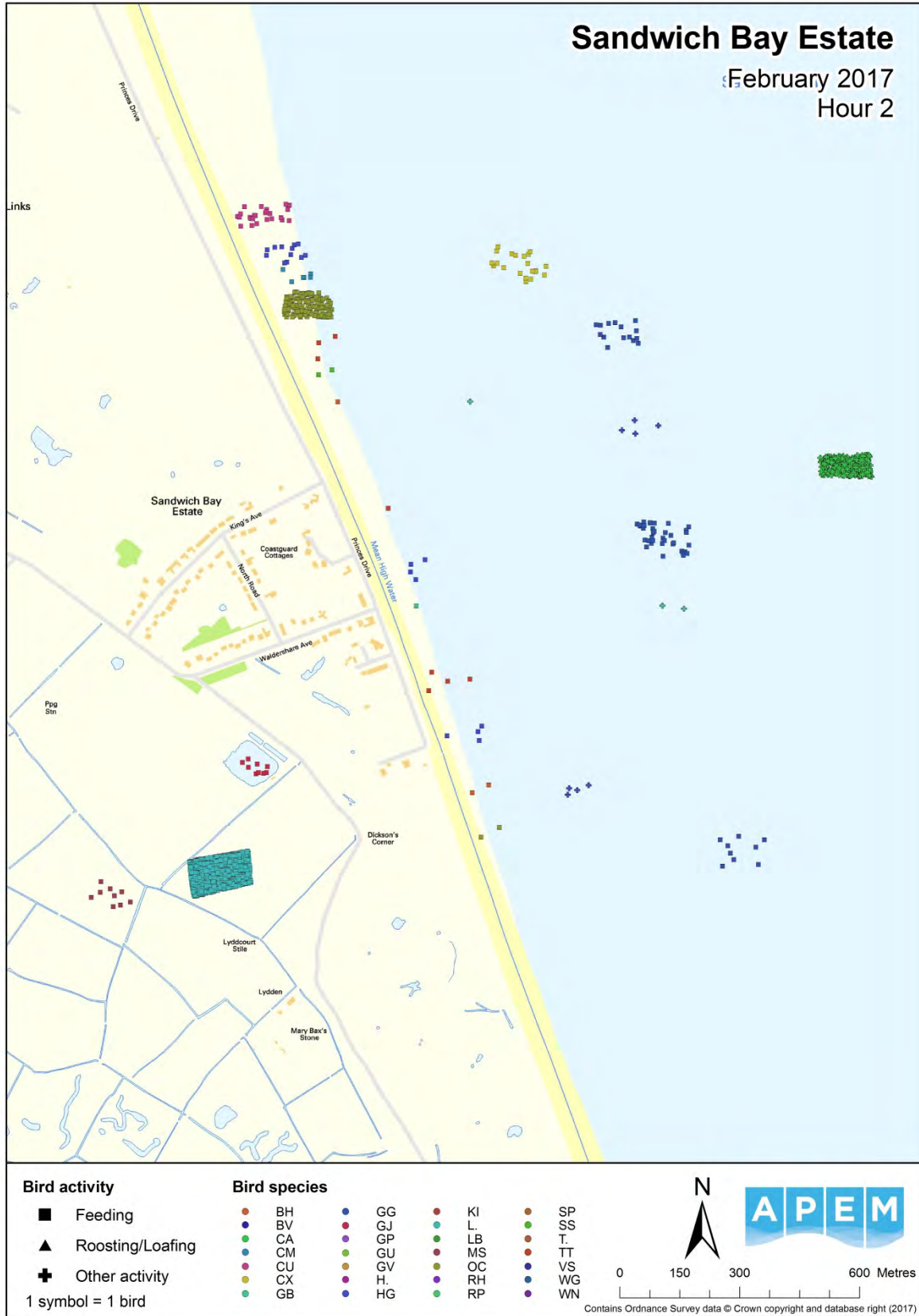


Figure 117 Sandwich Bay Estate TTTCC observations February 2017: Hour 2



Figure 118 Sandwich Bay Estate TTTCC observations February 2017: Hour 3



Figure 119 Sandwich Bay Estate TTTCC observations February 2017: Hour 4



Figure 120 Sandwich Bay Estate TTTCC observations February 2017: Hour 5



Figure 121 Sandwich Bay Estate TTTCC observations February 2017: Hour 6

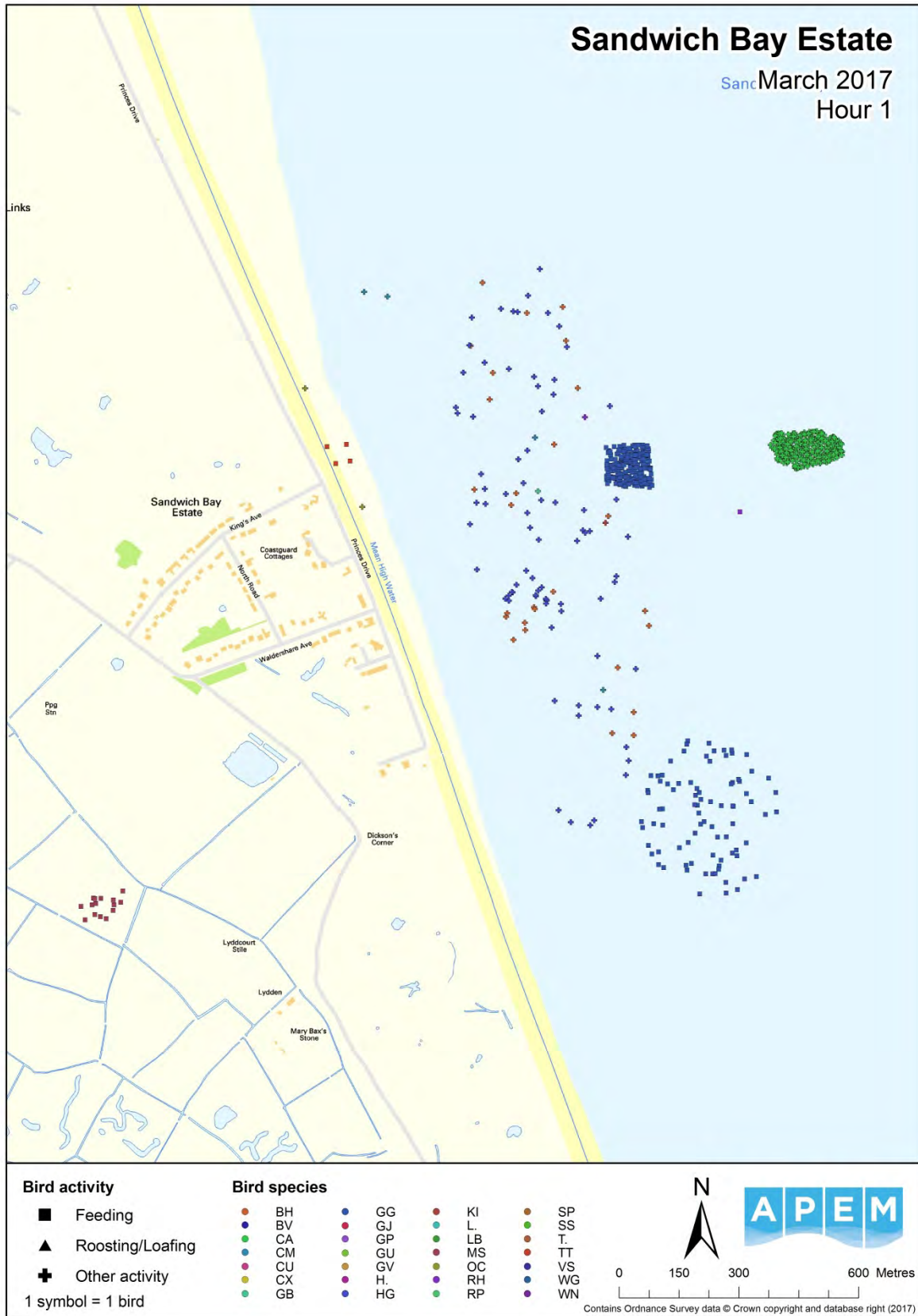


Figure 122 Sandwich Bay Estate TTTCC observations March 2017: Hour 1



Figure 123 Sandwich Bay Estate TTTCC observations March 2017: Hour 2

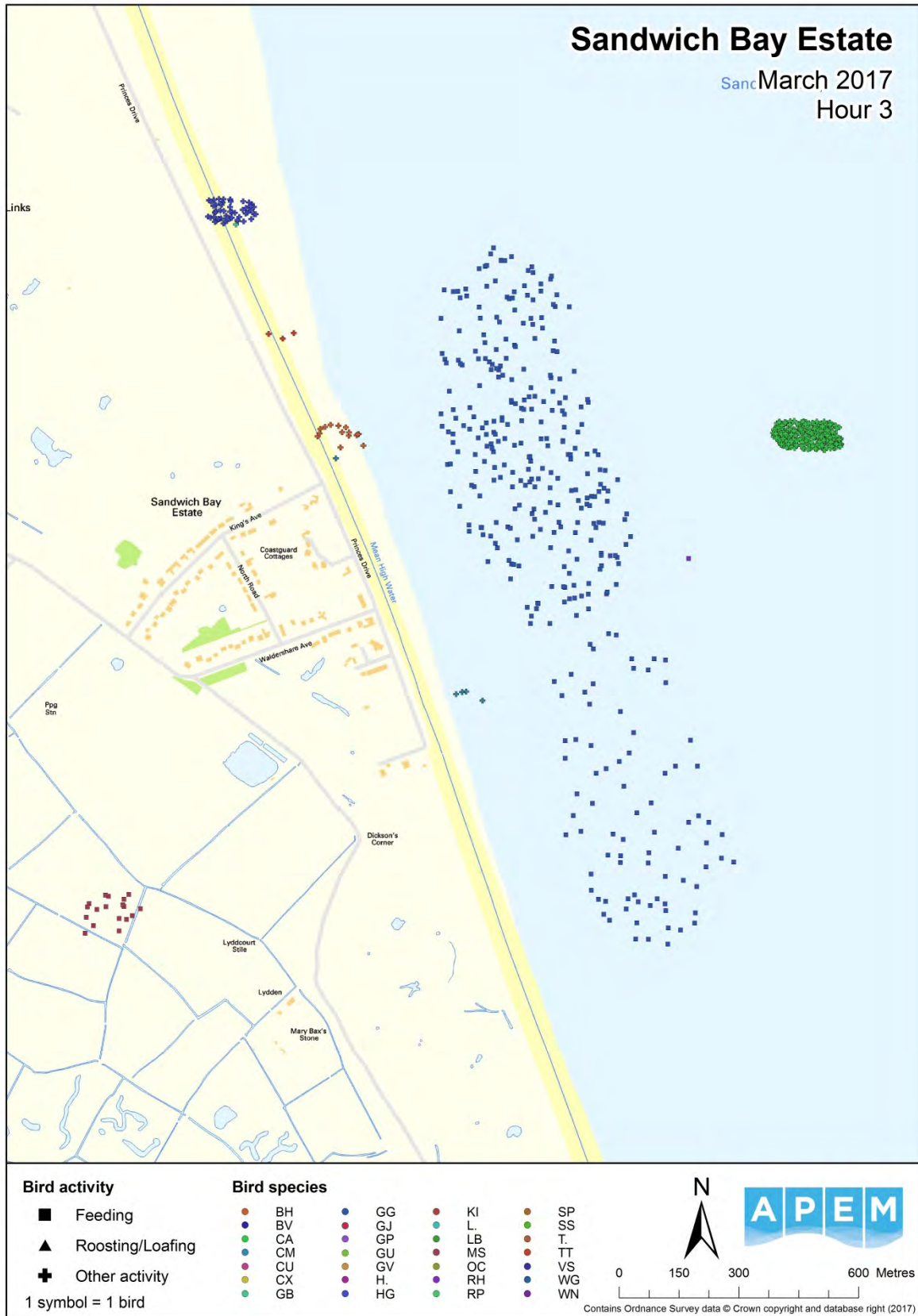


Figure 124 Sandwich Bay Estate TTTCC observations March 2017: Hour 3



Figure 125 Sandwich Bay Estate TTTCC observations March 2017: Hour 4



Figure 126 Sandwich Bay Estate TTTCC observations March 2017: Hour 5



Figure 127 Sandwich Bay Estate TTTCC observations March 2017: Hour 6



Figure 70 Pegwell Bay & Shell Ness TTTCC observations November 2016: Wildfowl & seabirds Hour 3



Figure 71 Pegwell Bay & Shell Ness TTTCC observations November 2016: Wildfowl & seabirds Hour 4



Figure 72 Pegwell Bay & Shell Ness TTTCC observations November 2016: Wildfowl & seabirds Hour 5



Figure 73 Pegwell Bay & Shell Ness TTTCC observations November 2016: Wildfowl & seabirds Hour 6



Figure 74 Pegwell Bay & Shell Ness TTTCC observations December 2016: Wildfowl & seabirds Hour 1



Figure 75 Pegwell Bay & Shell Ness TTTCC observations December 2016: Wildfowl & seabirds Hour 2



Figure 76 Pegwell Bay & Shell Ness TTTCC observations December 2016: Wildfowl & seabirds Hour 3



Figure 77 Pegwell Bay & Shell Ness TTTCC observations December 2016: Wildfowl & seabirds Hour 4



Figure 79 Pegwell Bay & Shell Ness TTTCC observations December 2016: Wildfowl & seabirds Hour 6

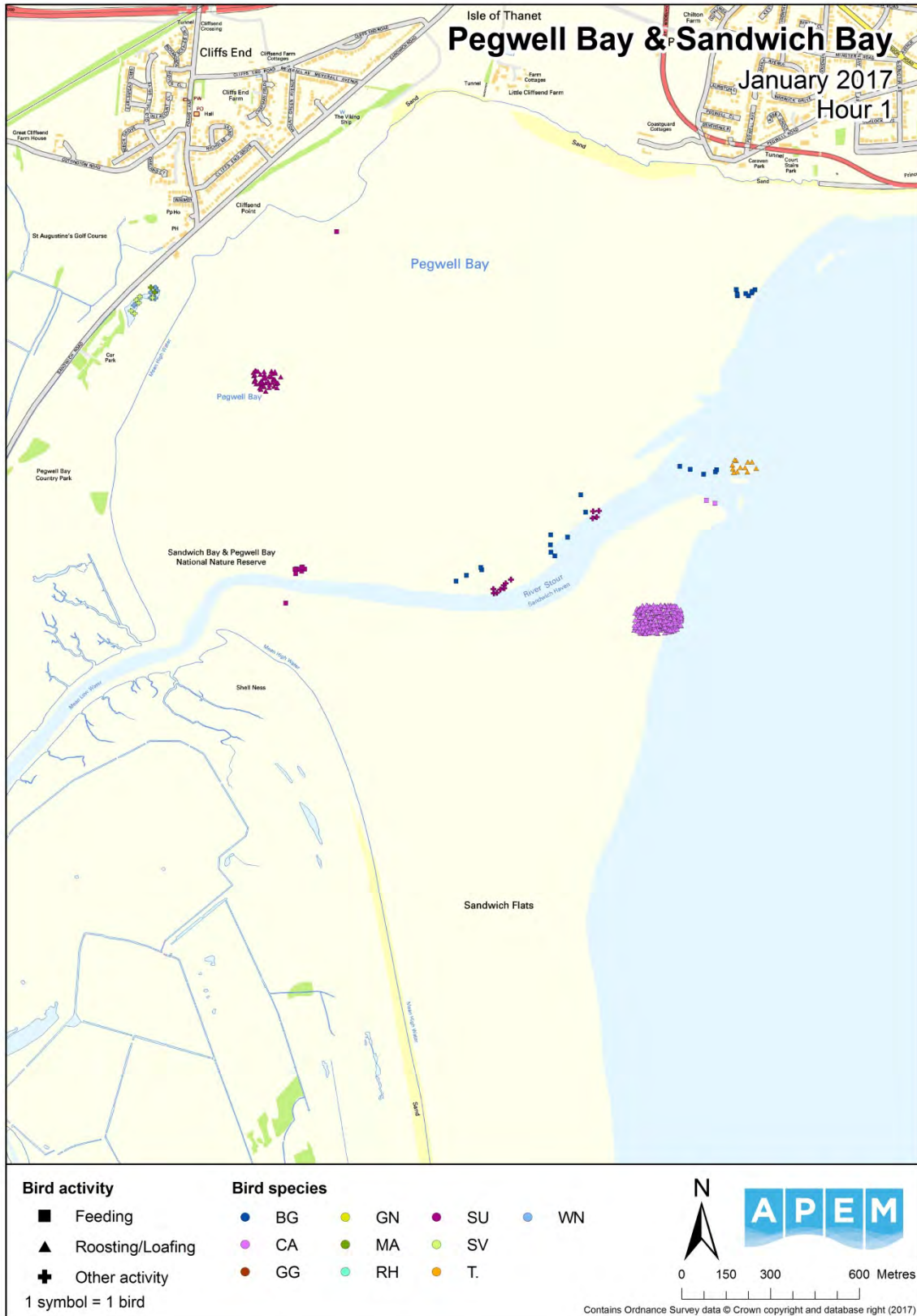


Figure 80 Pegwell Bay & Shell Ness TTTCC observations January 2017: Wildfowl & seabirds Hour 1



Figure 82 Pegwell Bay & Shell Ness TTTCC observations January 2017: Wildfowl & seabirds Hour 3



Figure 83 Pegwell Bay & Shell Ness TTTCC observations January 2017: Wildfowl & seabirds Hour 4



Figure 84 Pegwell Bay & Shell Ness TTTCC observations January 2017: Wildfowl & seabirds Hour 5



Figure 85 Pegwell Bay & Shell Ness TTTCC observations January 2017: Wildfowl & seabirds Hour 6

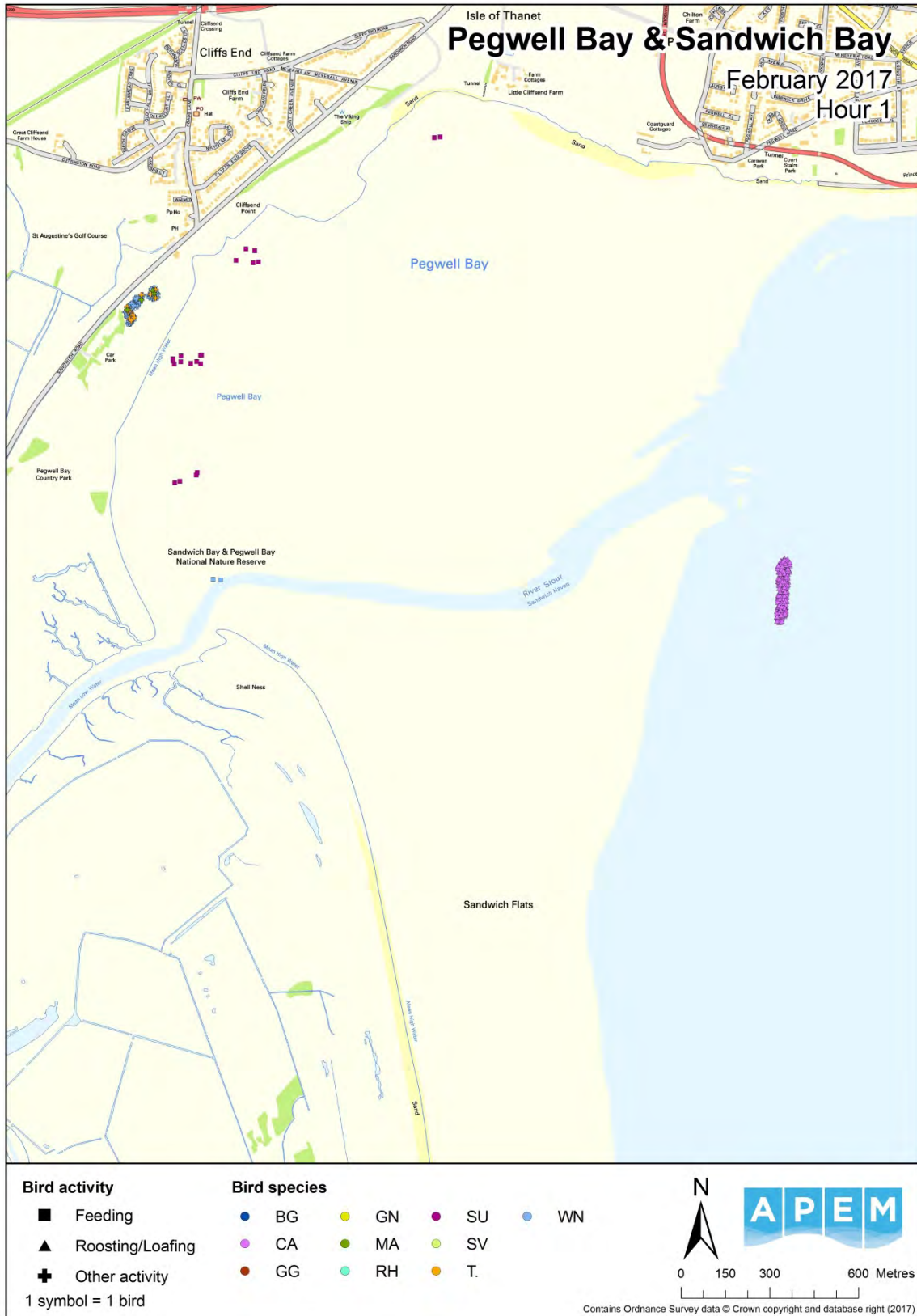


Figure 86 Pegwell Bay & Shell Ness TTTCC observations February 2017: Wildfowl & seabirds Hour 1



Figure 87 Pegwell Bay & Shell Ness TTTCC observations February 2017: Wildfowl & seabirds Hour 2



Figure 88 Pegwell Bay & Shell Ness TTTCC observations February 2017: Wildfowl & seabirds Hour 3

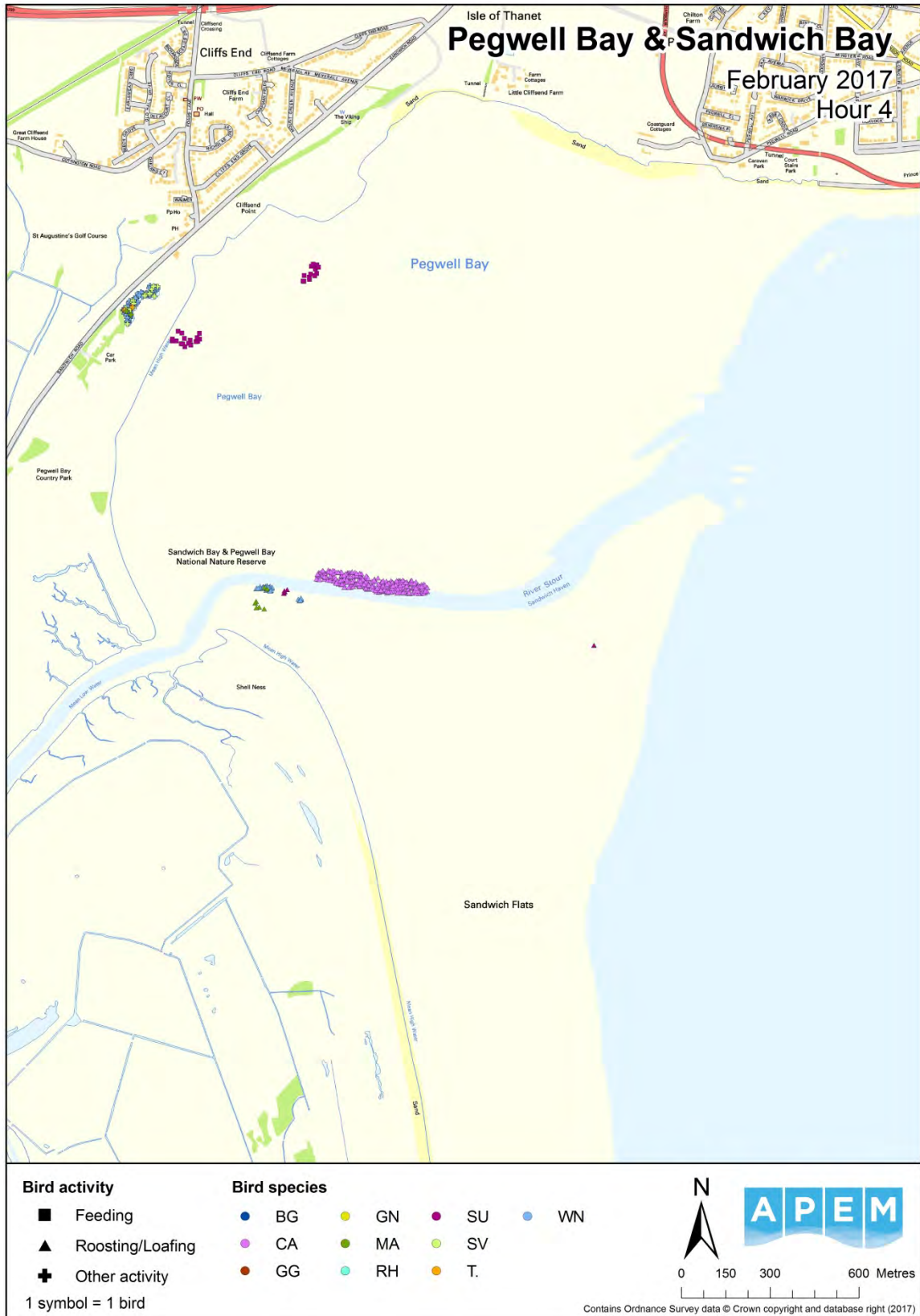


Figure 89 Pegwell Bay & Shell Ness TTTCC observations February 2017: Wildfowl & seabirds Hour 4



Figure 90 Pegwell Bay & Shell Ness TTTCC observations February 2017: Wildfowl & seabirds Hour 5

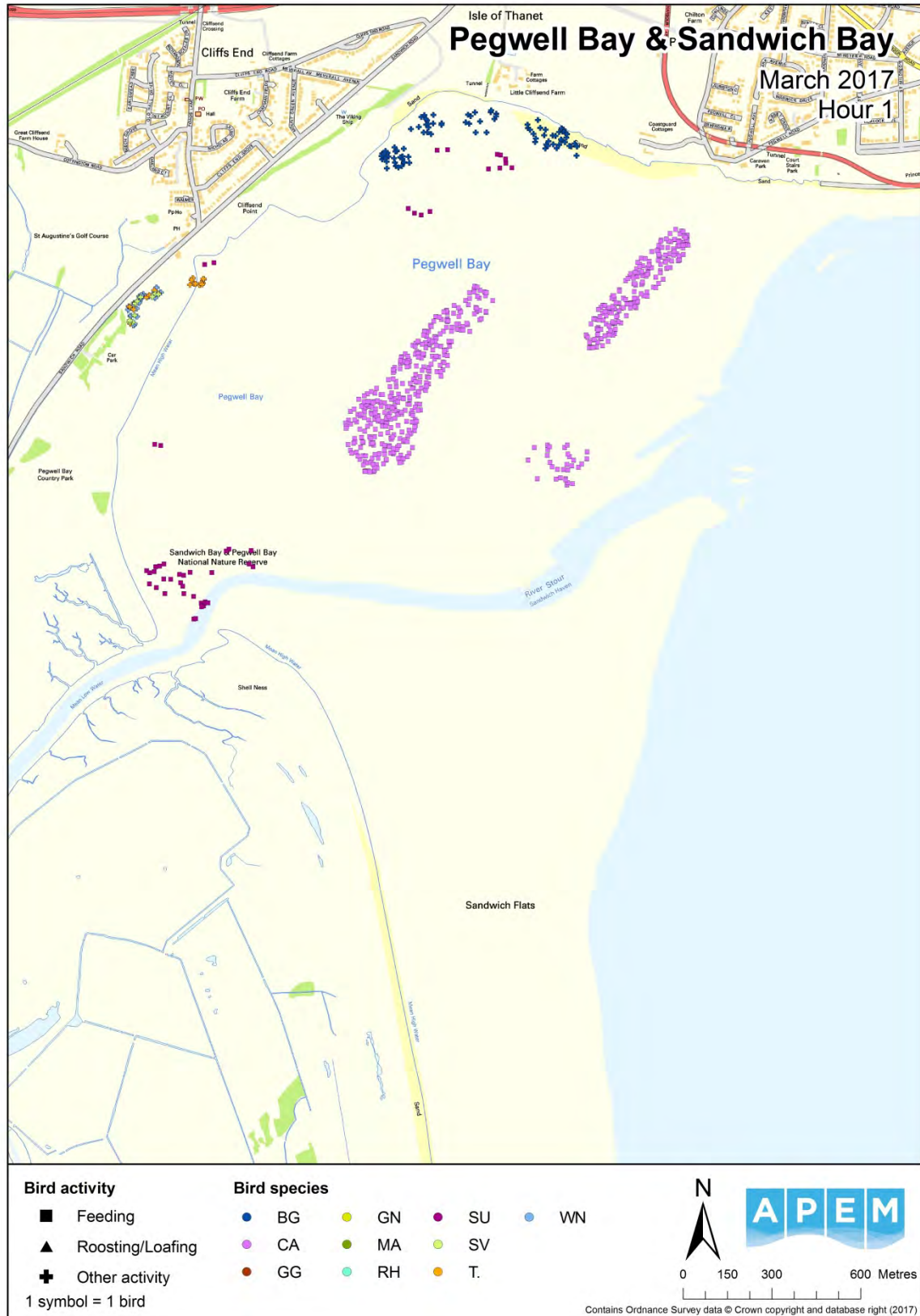


Figure 92 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 1



Figure 93 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 2



Figure 94 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 3

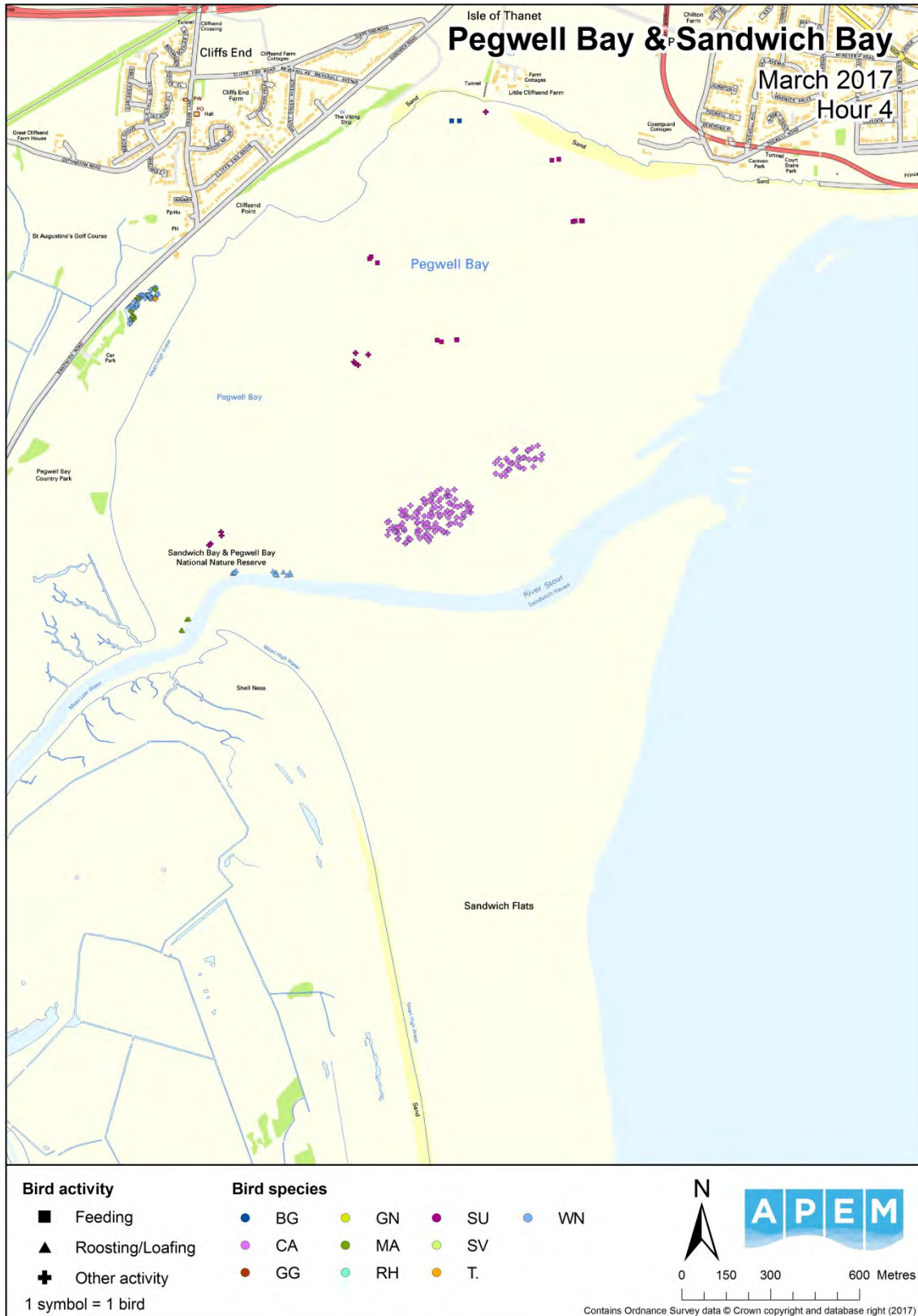


Figure 95 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 4



Figure 96 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 5

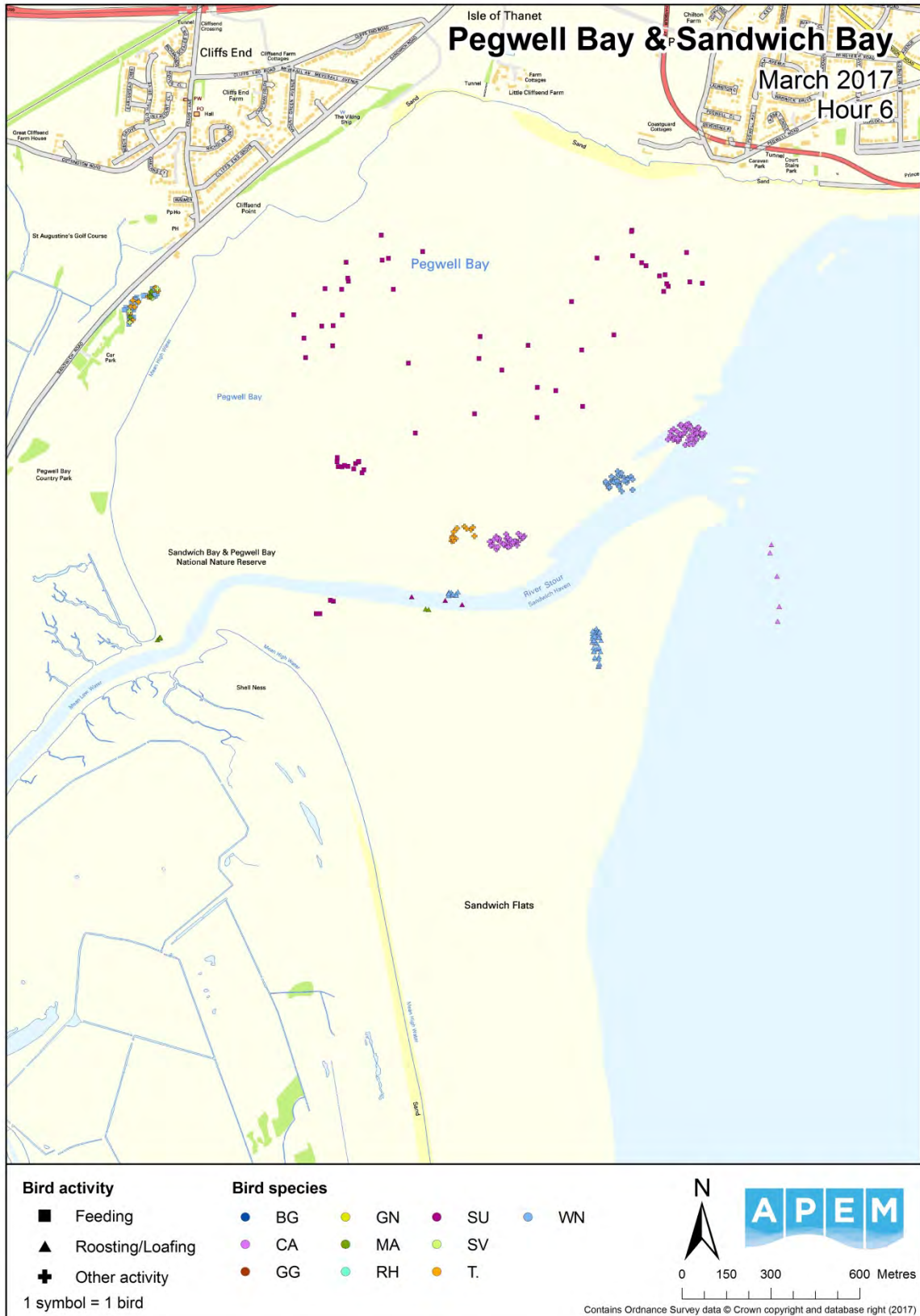


Figure 97 Pegwell Bay & Shell Ness TTTCC observations March 2017: Wildfowl & seabirds Hour 6



E1

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Appendix E

Survey Visit Details



Table E1 Breeding Bird Survey 2017, Visit Details

Visit Number	Date	Start time	End time	Cloud (Oktas)	Wind direction	Wind speed (Beaufort Scale)	Visibility	Temperature (°C)	Precipitation
1	22-Mar-17	06:00	11:45	8	SE	2-4	Very good (3 km+)	6 to 8	Rain showers
1	23-Mar-17	06:00	11:45	4	NE	3-4	Very good (3 km+)	6 to 10	None
1	26-Mar-17	06:00	11:45	0	NE	3	Very good (3 km+)	5 to 10	None
1	27-Mar-17	06:00	11:30	0	NE	0-2	Foggy at first	6 to 15	None
2	11-Apr-17	07:45	12:15	1-3	WNW	2	Very good (3 km+)	7 to 13	None
2	12-Apr-17	05:30	11:30	6	WNW	3	Very good (3 km+)	5 to 11	None
2	13-Apr-17	05:30	11:30	3-4	SW	2-4	Very good (3 km+)	13 to 22	None
3	24-Apr-17	05:30	11:30	6	SW	2	Very good (3 km+)	7 to 13	None
3	25-Apr-17	05:30	11:30	0	N	2-3	Very good (3 km+)	-1 to 8	None
3	26-Apr-17	05:30	11:00	0	N	3-4	Very good (3 km+)	3 to 8	None
3	27-Apr-17	05:30	11:30	0-4	NW	2-3	Very good (3 km+)	-2 to 10	None
4	08-May-17	05:00	11:30	8	NNW	2-3	Very good (3 km+)	8 to 10	Occasional light rain
4	09-May-17	05:00	11:30	0-4	NNE	2-3	Very good (3 km+)	5 to 10	None
4	10-May-17	05:00	11:30	0-4	E	1-3	Very good (3 km+)	1 to 13	None
4	11-May-17	05:00	11:00	0	E	2-4	Hazy	5 to 16	None
5	25-May-17	05:00	11:00	0	SE	1-2	Hazy at first	12 to 20	None
5	26-May-17	05:00	11:00	0	SW	1-2	Very good (3 km+)	15 to 22	None
5	27-May-17	05:00	11:00	0-5	SW	1-3	Very good (3 km+)	13 to 20	None
5	28-May-17	05:00	11:00	1	SW	1	Very good (3 km+)	13 to 20	None
6	06-Jun-17	05:00	11:00	4-6	SW	3-4	Very good (3 km+)	10 to 15	Rain showers
6	07-Jun-17	05:00	11:00	4-8	W	4	Very good (3 km+)	11 to 17	None
6	09-Jun-17	05:00	11:00	2-4	WSW	1-4	Very good (3 km+)	12 to 18	None
6	10-Jun-17	05:00	11:30	0-6	SSW	1-4	Very good (3 km+)	14 to 20	None





Appendix F

Confidential Results

CONFIDENTIAL



CONFIDENTIAL



Appendix G Figures

Figure 5.4.1 Ornithological Study Area.

Figure 5.4.2 CBC Survey Area and Habitat Appraisal Area.

Figure 5.4.3.1a Statutory Sites of International Ornithological Importance within 20 km of the Study Area.

Figure 5.4.3.1b Statutory Sites of National and Local Ornithological Importance within 20 km of the Study Area.

Figure 5.4.3.1c Non-statutory Designated Sites with Ornithological Interest within 2 km of the Study Area.

Figure 5.4.3.2a Pegwell Bay WeBS Core Count Sector.

Figure 5.4.3.2b Pegwell Bay WeBS Low Tide Count Sector.

Figure 5.4.3.3 Peak Counts of Golden Plover in Winter 2016/17, from Henderson & Sutherland (2017).

Figure 5.4.3.4 Sandwich Bay Bird Observatory Recording Area.

Figure 5.4.3.5 Richborough Power Station, Bird Surveys.

Figure 5.4.3.6 St Augustine's Golf Course, Bird Surveys.

Figure 5.4.3.7 NEMO Link, Breeding Bird Survey.

Figure 5.4.3.8a Location of Bird Territories: Cetti's Warbler.

Figure 5.4.3.8b Location of Bird Territories: PSI / BoCC Red Listed Species (1).

Figure 5.4.3.8c Location of Bird Territories: PSI / BoCC Red Listed Species (2).

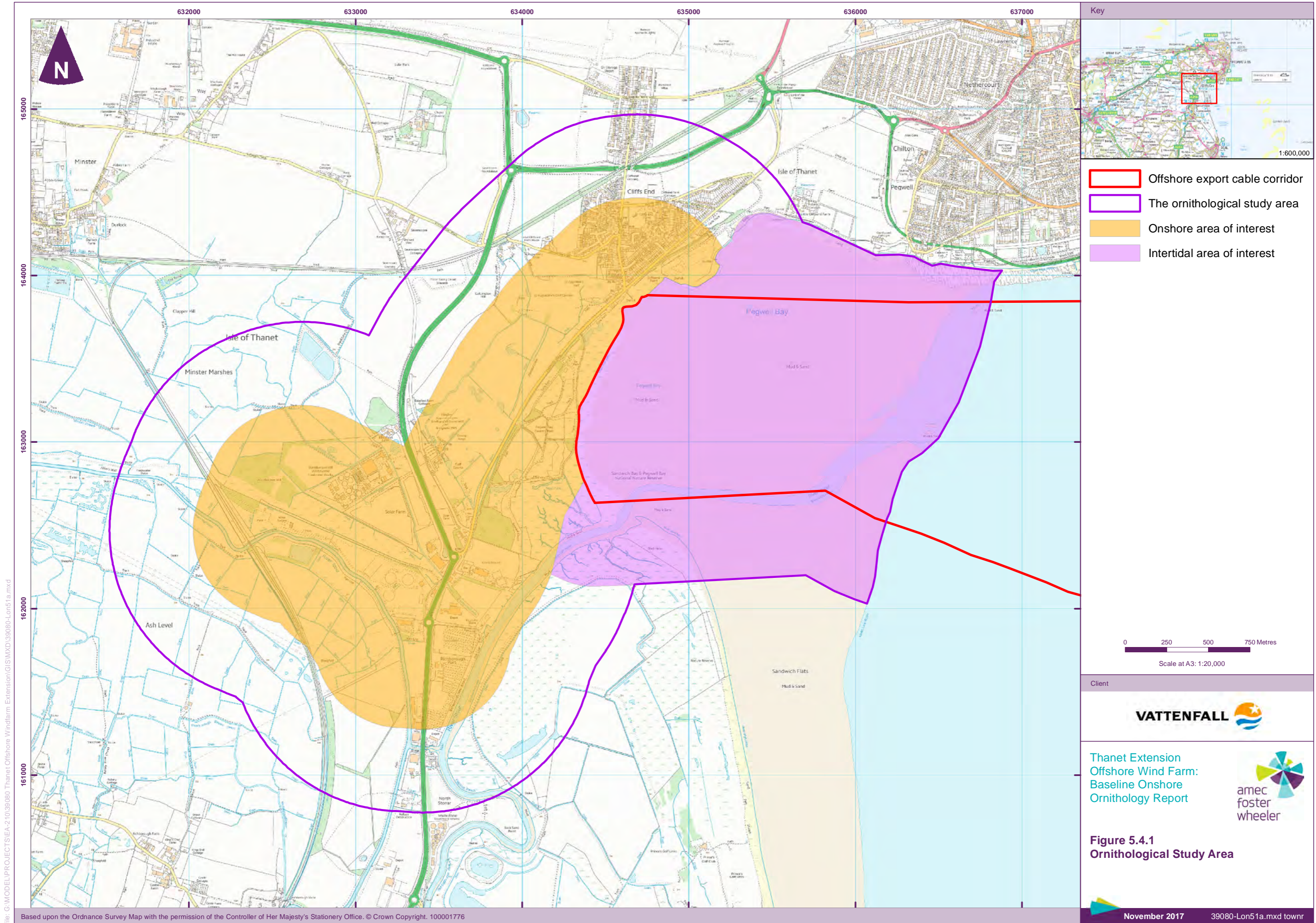
Figure 5.4.3.8d Location of Bird Territories: PSI / BoCC Red Listed Species (3).

Figure 5.4.3.8e Location of Bird Territories: PSI / BoCC Red Listed Species (4).

Figure 5.4.3.8f Location of Bird Territories: Waders and Shelduck.

Figure 5.4.F.1 CONFIDENTIAL Location of Bird Territories: Sensitive Schedule 1 Species.

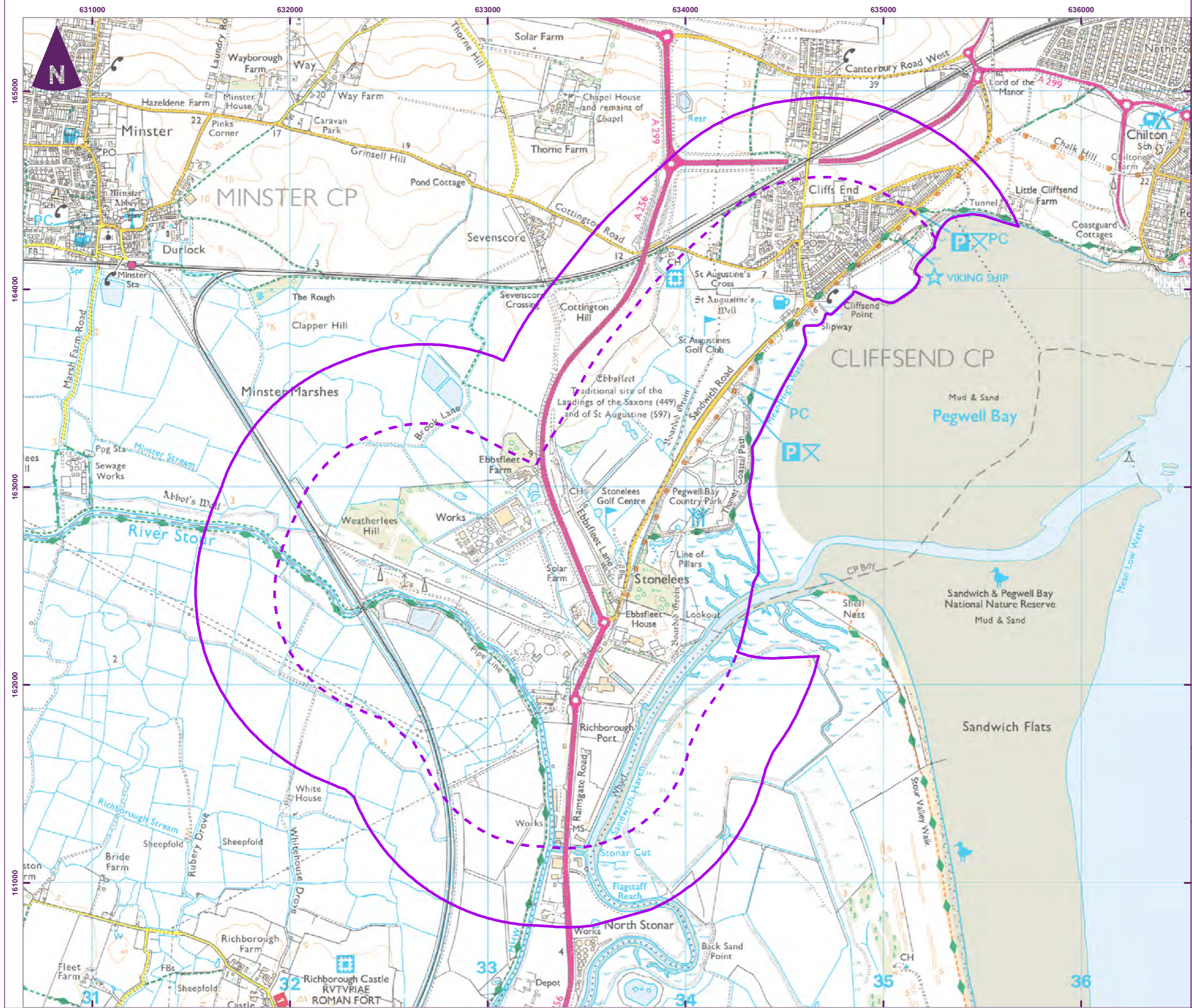




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- Key
- CBC survey area (onshore Aol plus 100m buffer)
 - Habitat appraisal area (onshore Aol plus 500m buffer)

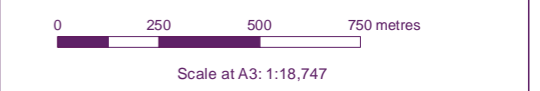
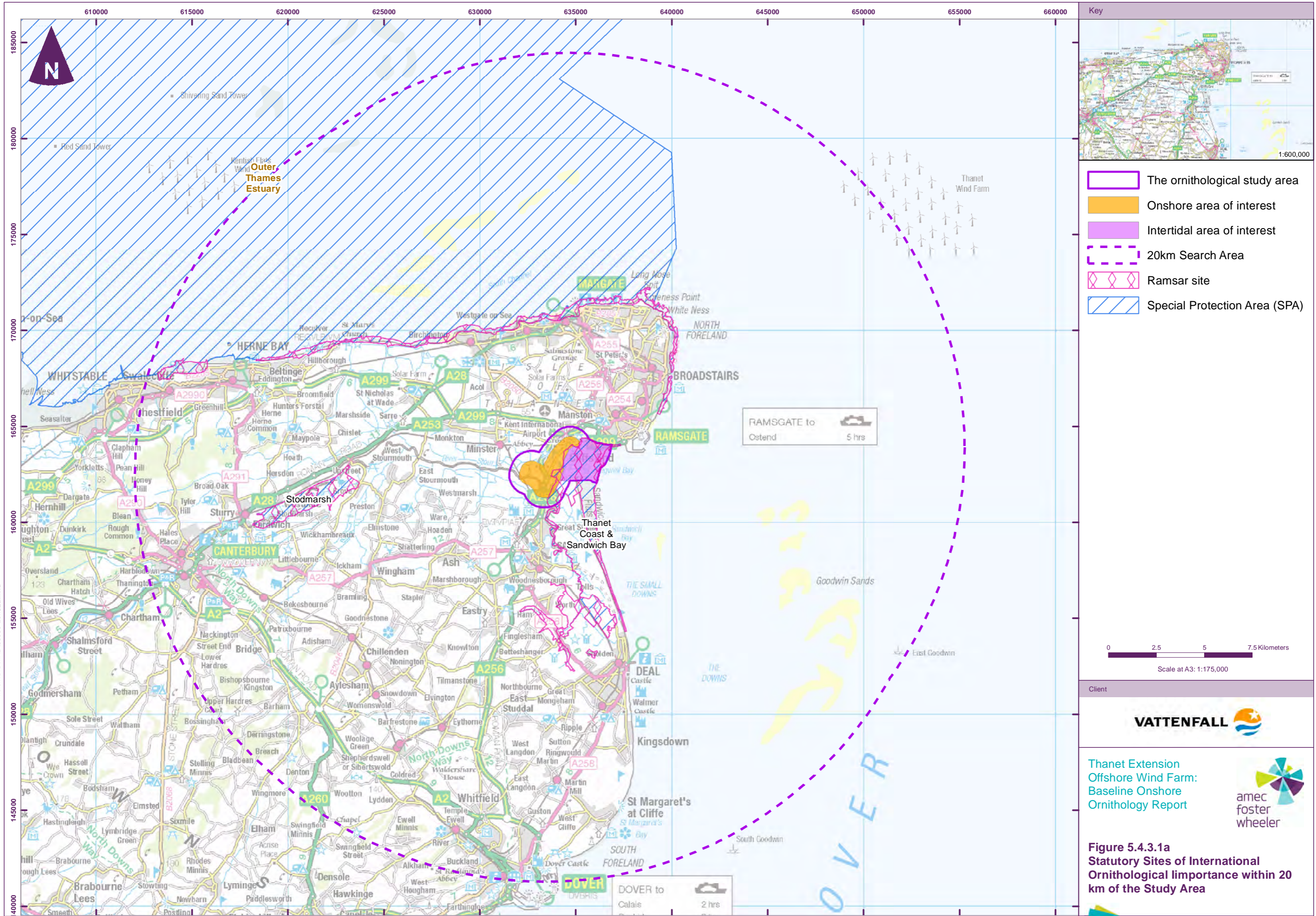


Figure 5.4.2
CBC Survey Area and Habitat
Appraisal Area



- Key**
- The ornithological study area
 - Onshore area of interest
 - Intertidal area of interest
 - 20km Search Area
 - Ramsar site
 - Special Protection Area (SPA)

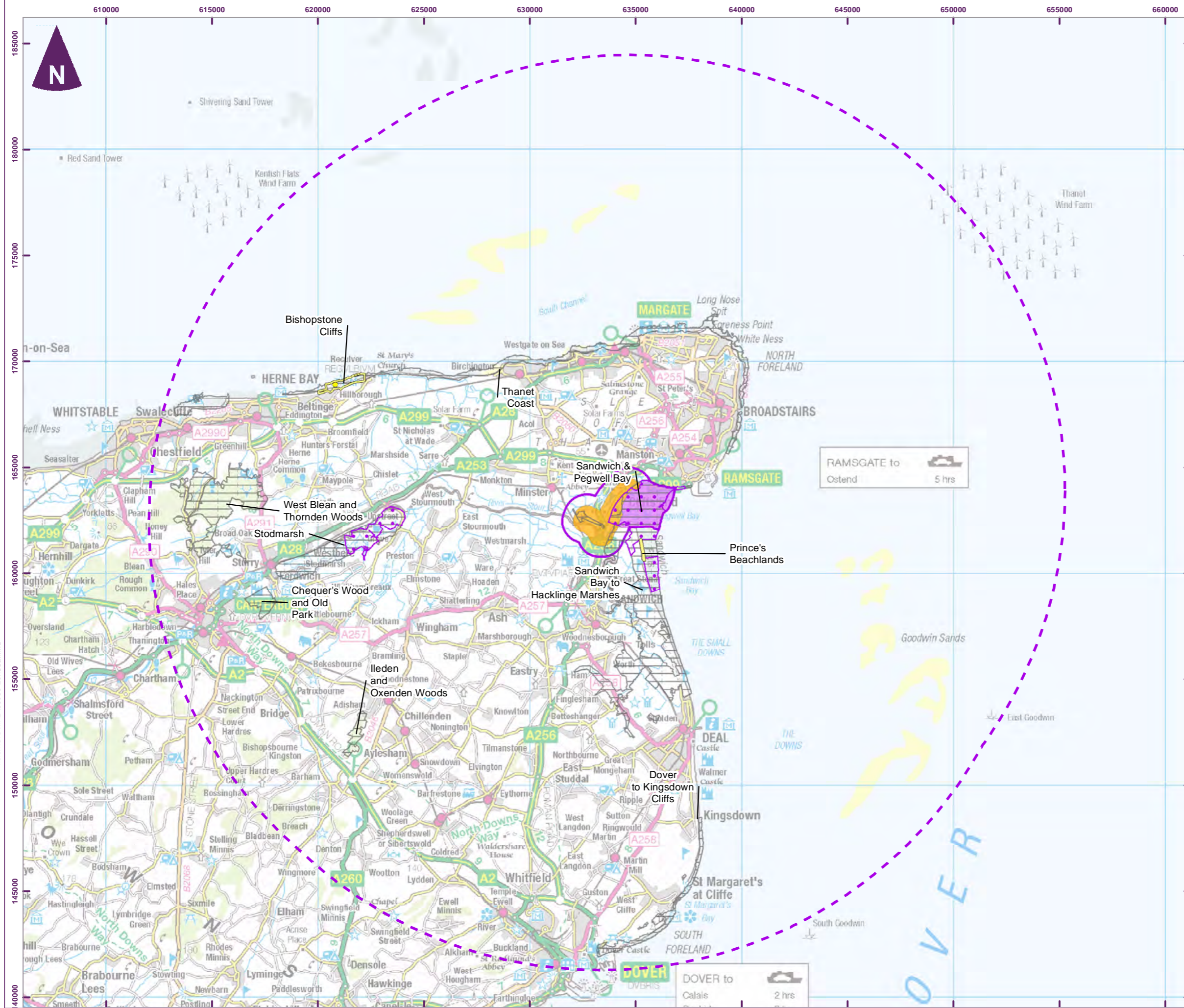
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Figure 5.4.3.1a
Statutory Sites of International
Ornithological Importance within 20
km of the Study Area



- The ornithological study area
- Onshore area of interest
- Intertidal area of interest
- 20km Search Area
- Local Nature Reserve (LNR)
- National Nature Reserve (NNR)
- Site of Special Scientific Interest (SSSI)

0 2.5 5 7.5 Kilometers
Scale at A3: 1:175,000

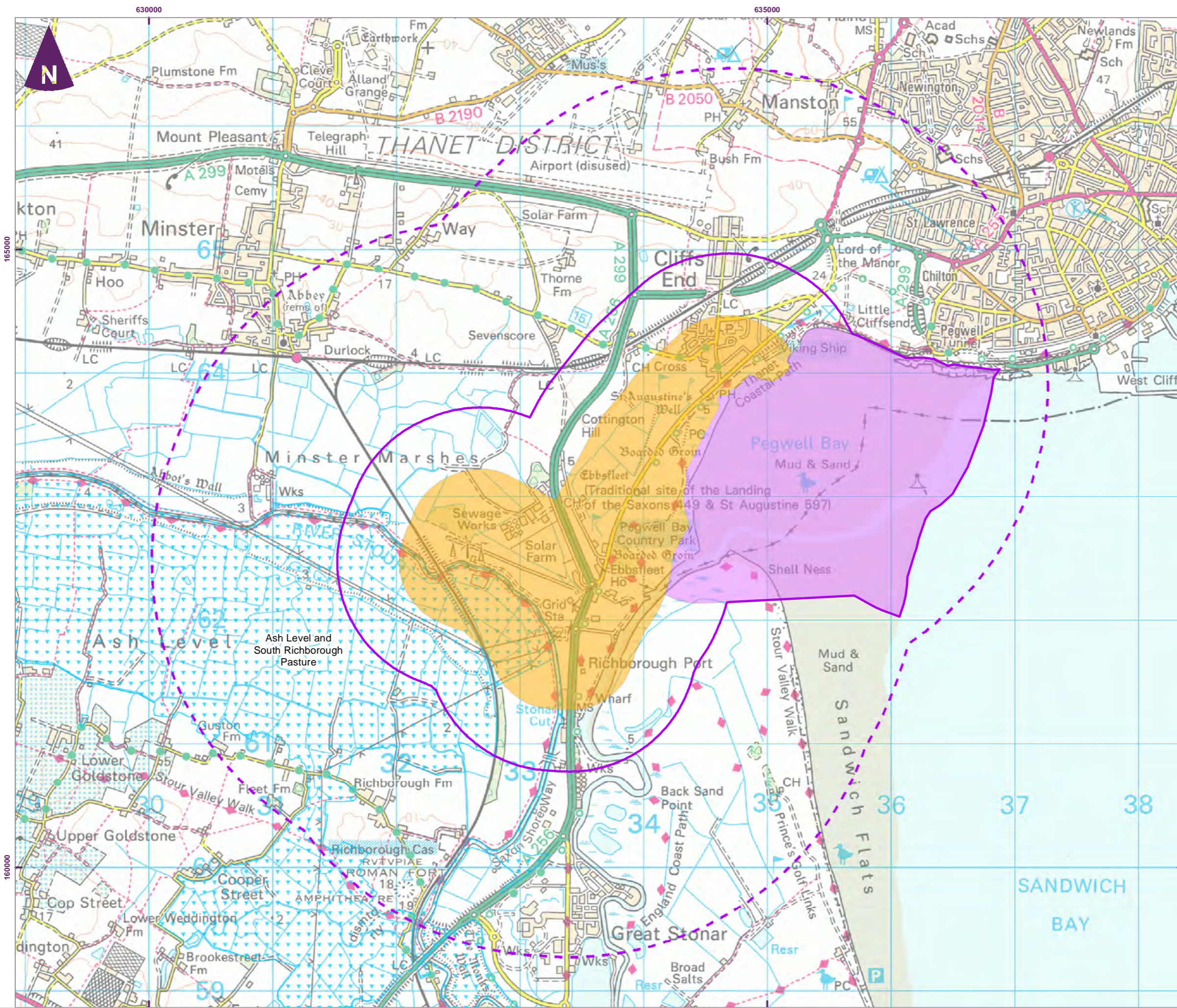
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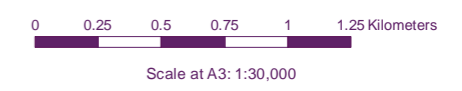
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amec foster wheeler

Figure 5.4.3.1.b
Statutory Sites of National and Local
Ornithological Importance within 20
km of the Study Area



- The ornithological study area
- Onshore area of interest
- Intertidal area of interest
- 2km Search Area
- Local Wildlife Site (LWS)



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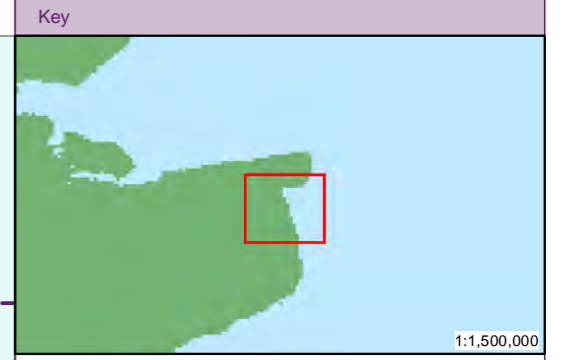
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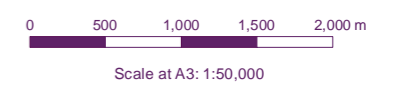
amec
foster
wheeler

Figure 5.4.3.1c
Non-statutory Designated Sites with
Ornithological Interest within 2 km of
the Study Area

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-  The ornithological study area
-  Pegwell Bay WeBS core count sector



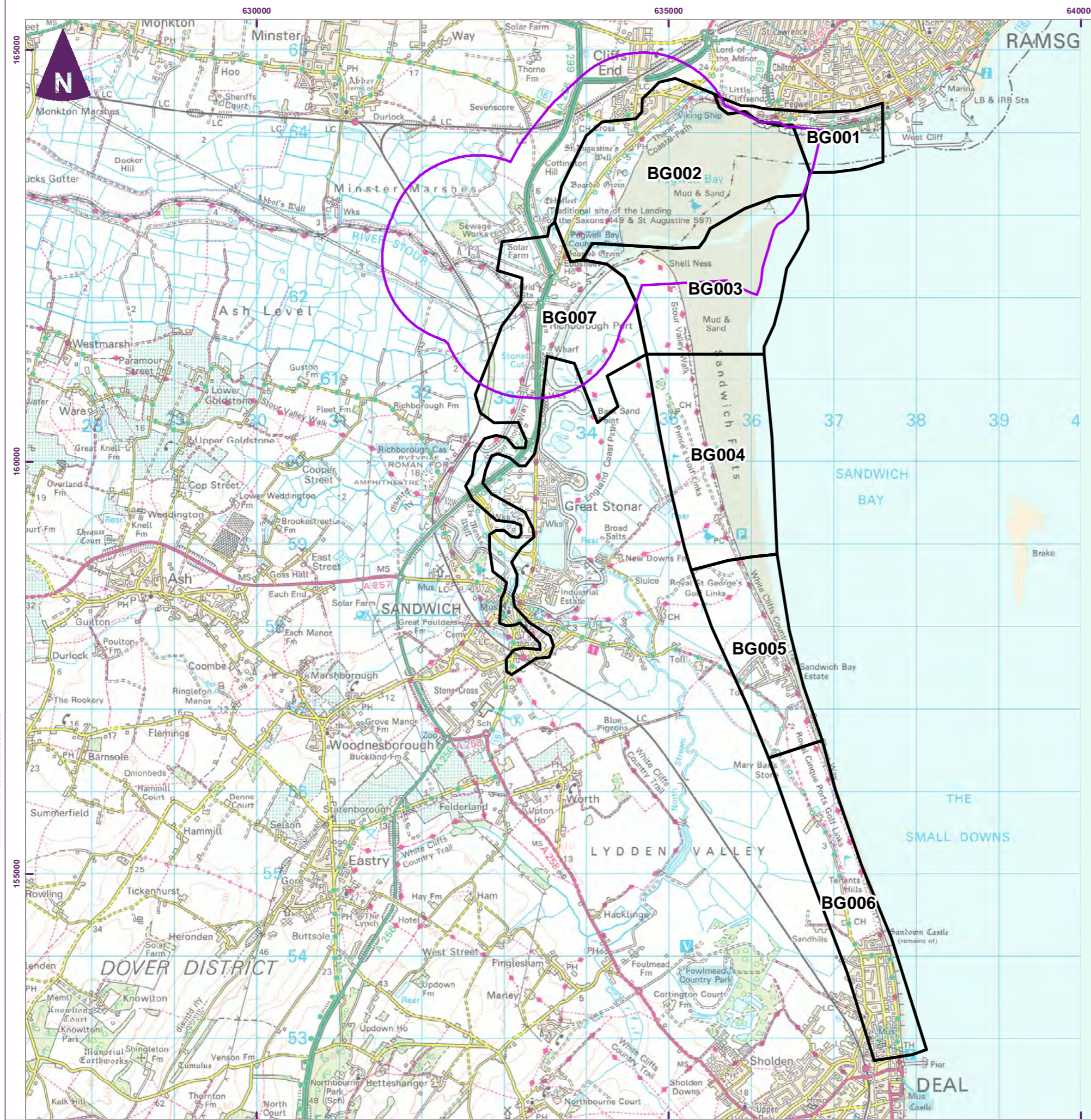
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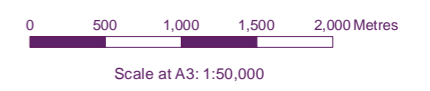
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Figure 5.4.3.2a
Pegwell Bay WeBS Core Count Sector



- The ornithological study area
- Pegwell Bay WeBS low tide count sector



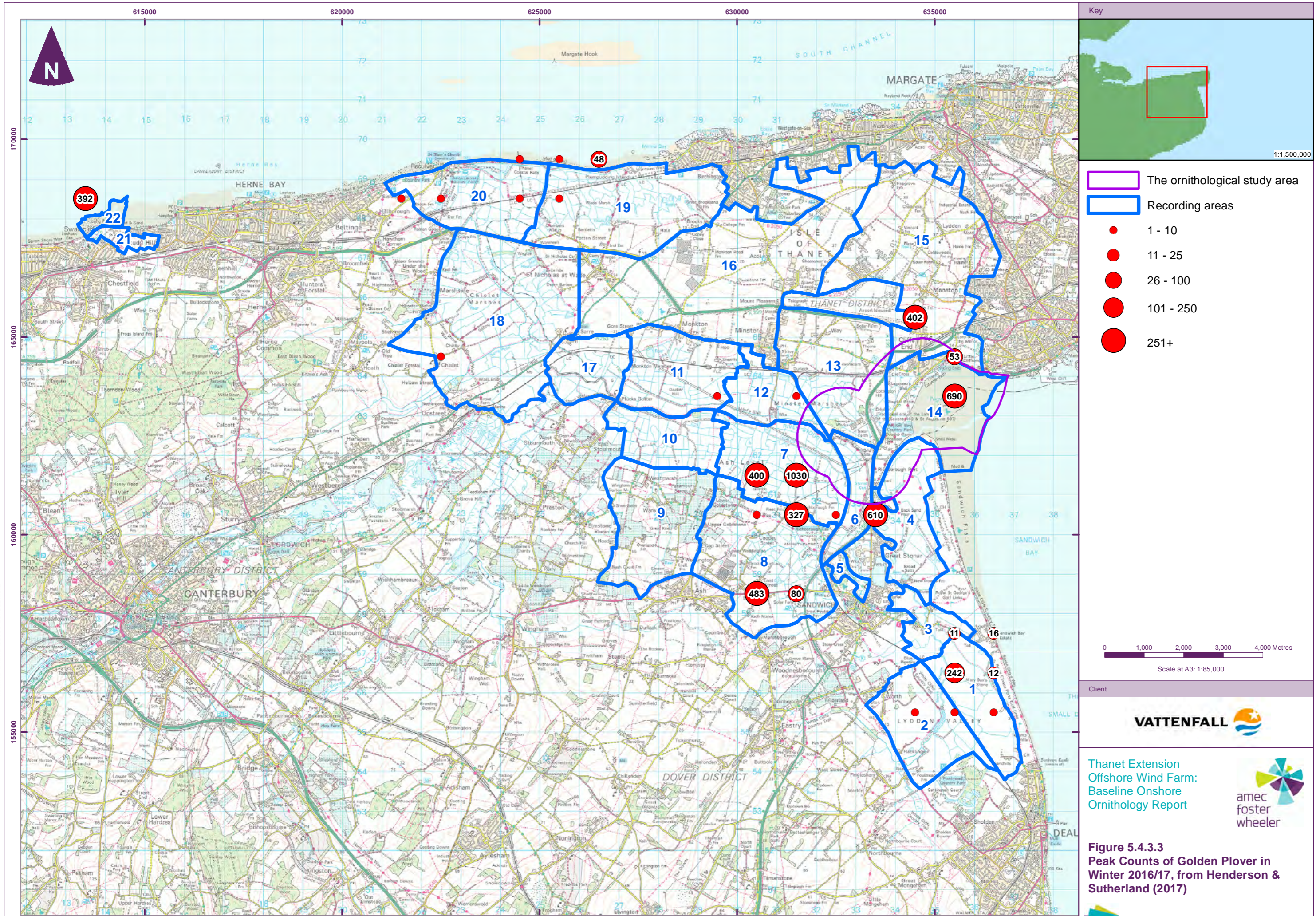
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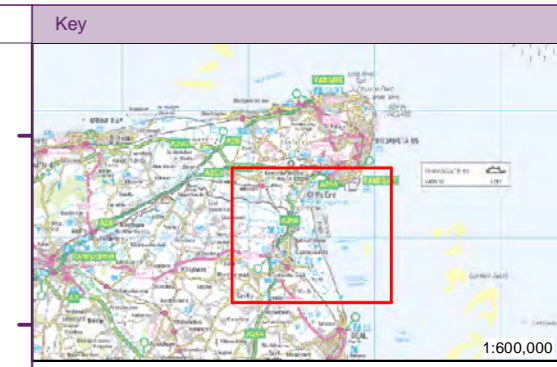
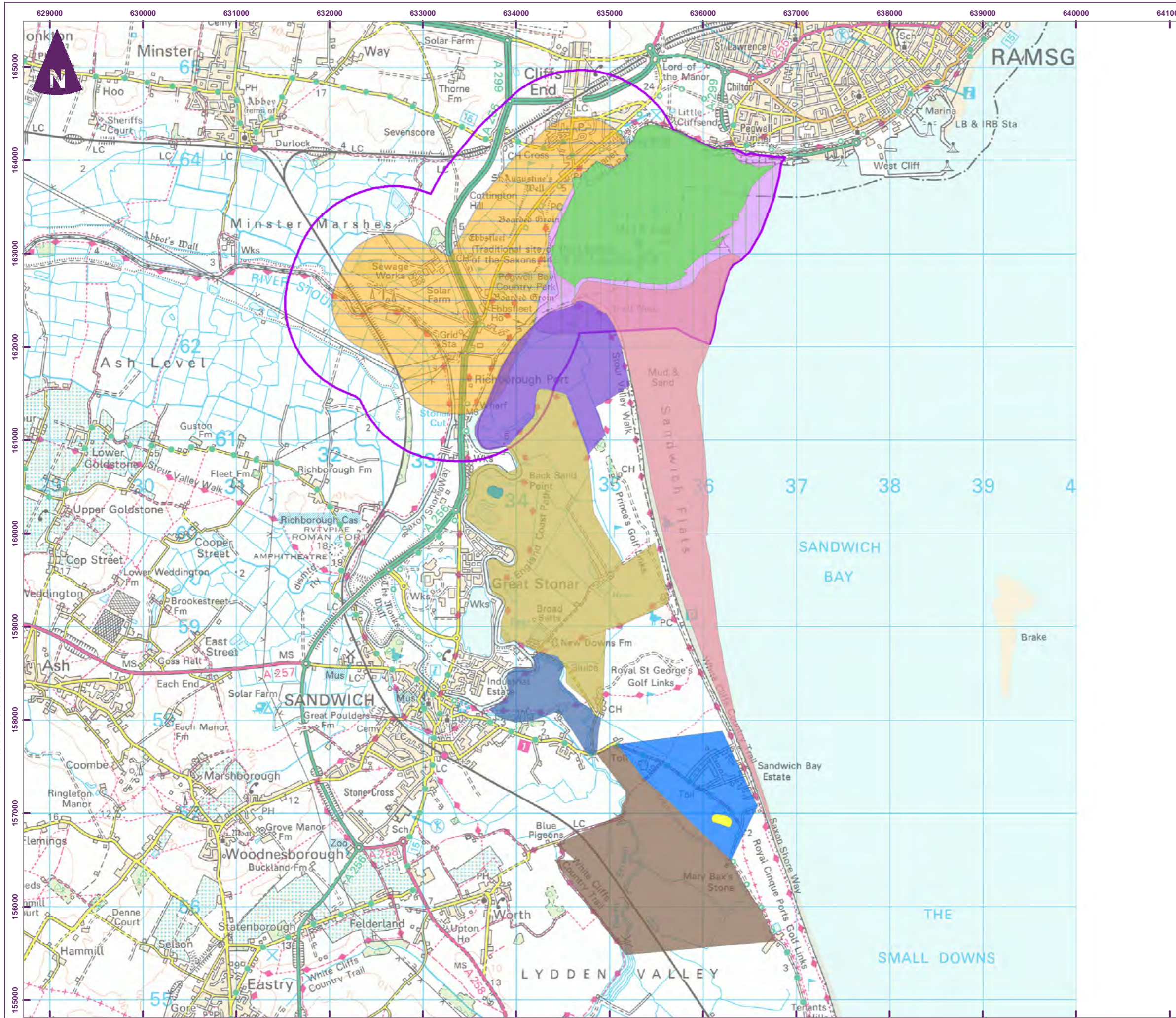
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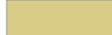

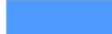


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wheeler

Figure 5.4.3.2b
Pegwell Bay WeBS Low Tide Count Sector



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-  The ornithological study area
-  Onshore area of interest
-  Intertidal area of interest
-  Shellness Point
-  Recording compartment 1
-  Recording compartment 2
-  Recording compartment 3
-  Recording compartment 4
-  Recording compartment 5
-  Recording compartment 6
-  Recording compartment 7
-  Recording compartment 8

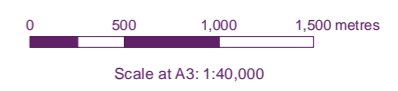
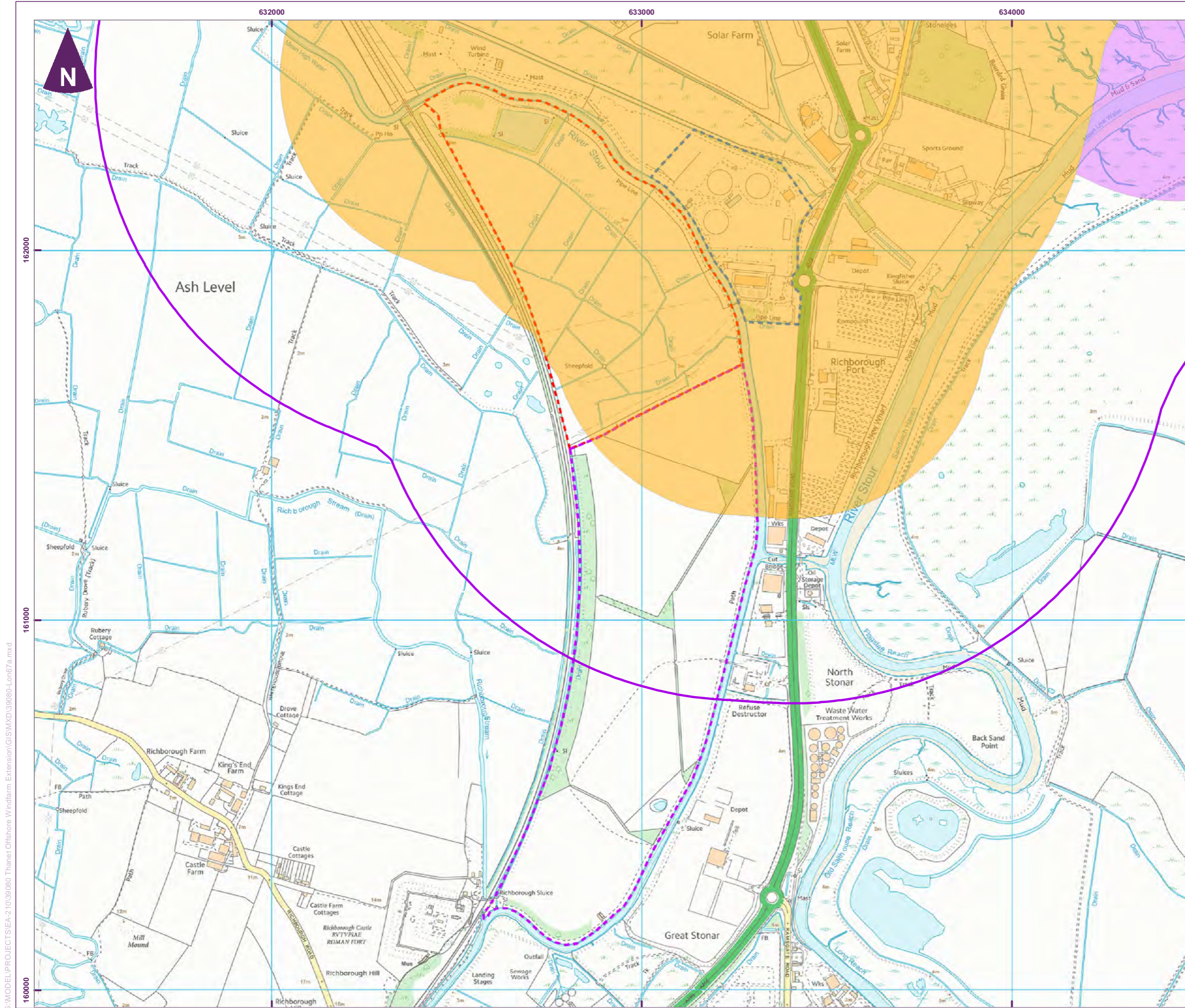






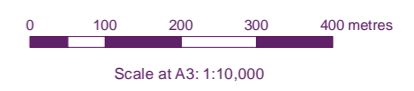


Figure 5.4.3.4
Sandwich Bay Bird Observatory Recording Area



-  The ornithological study area
-  Onshore area of interest
-  Intertidal area of interest
-  Plot A
-  Plot B
-  Plot C



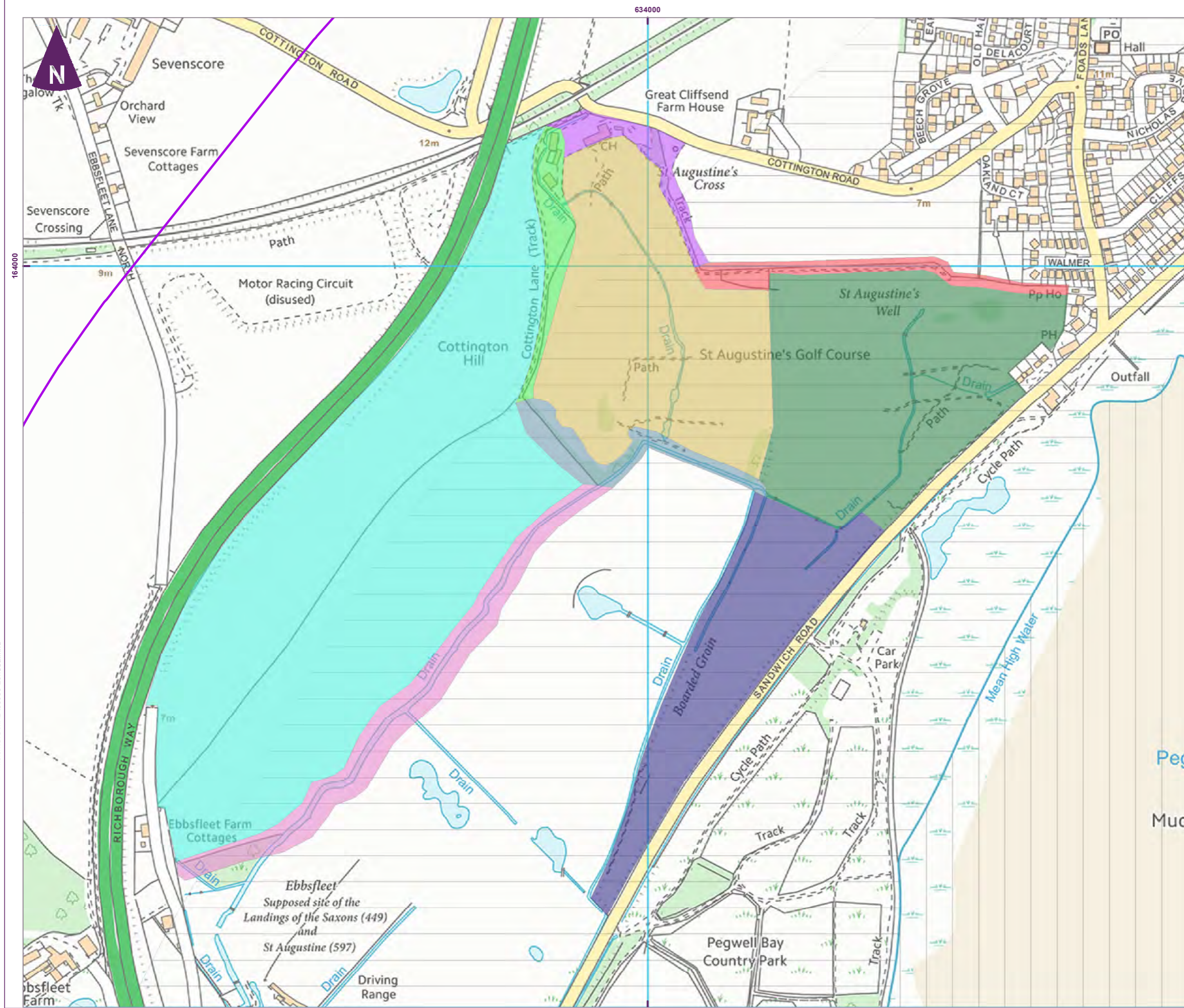
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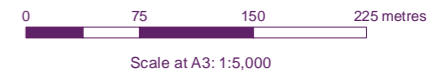
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Figure 5.4.3.5
Richborough Power Station Bird Surveys



- Key**
- The ornithological study area
 - Onshore area of interest
 - Intertidal area of interest
- Recording Compartments**
- A
 - B
 - C
 - D
 - E
 - F
 - G
 - H
 - I



Client

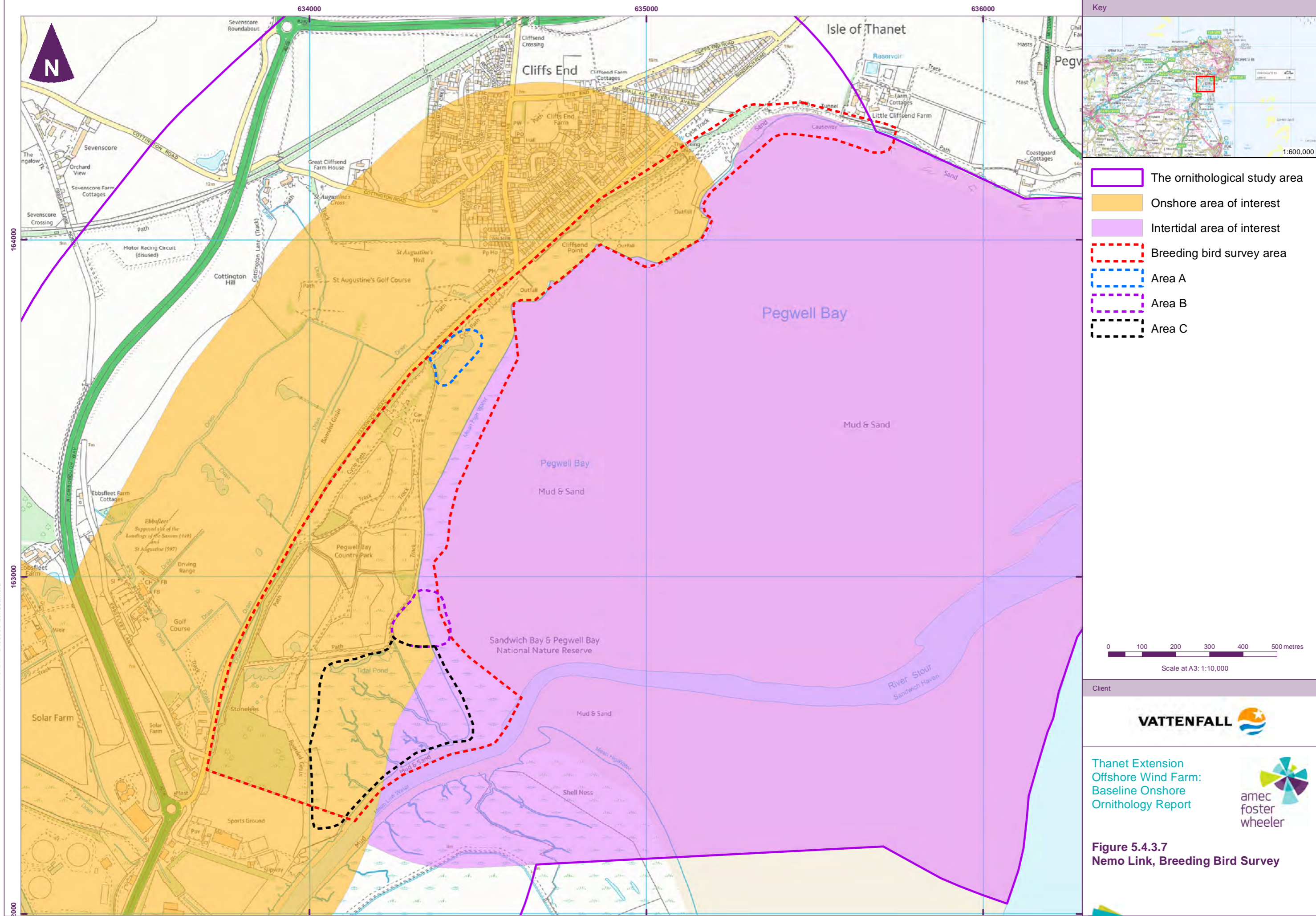
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Figure 5.4.3.6
St Augustine's Golf Course, Bird Surveys

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-  The ornithological study area
-  Onshore area of interest
-  Intertidal area of interest
-  Breeding bird survey area
-  Area A
-  Area B
-  Area C

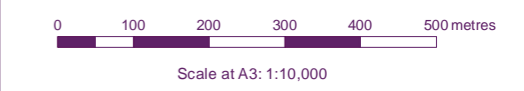
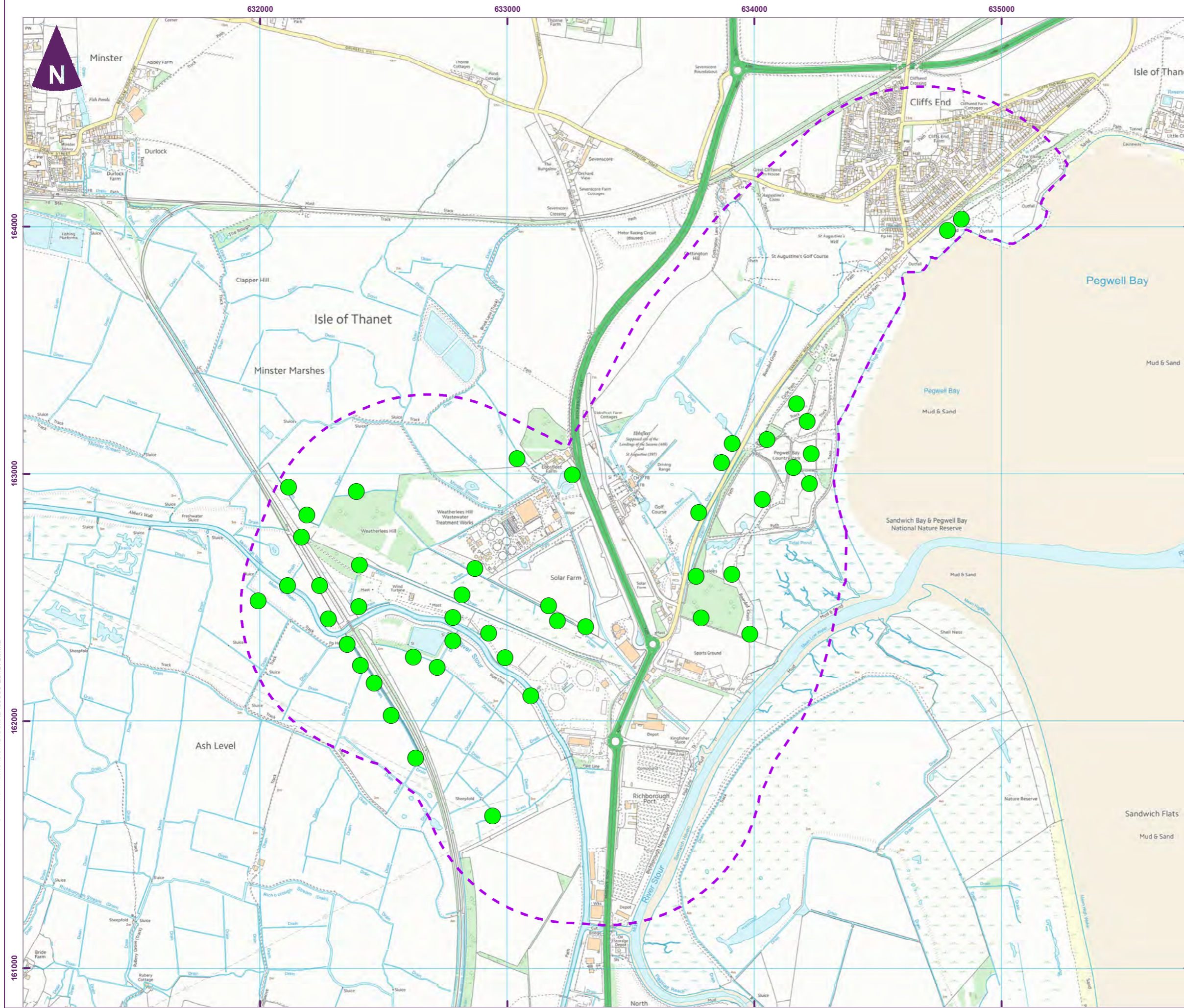


Figure 5.4.3.7
Nemo Link, Breeding Bird Survey



- Key**
- CBC survey area
 - Cetti's Warbler



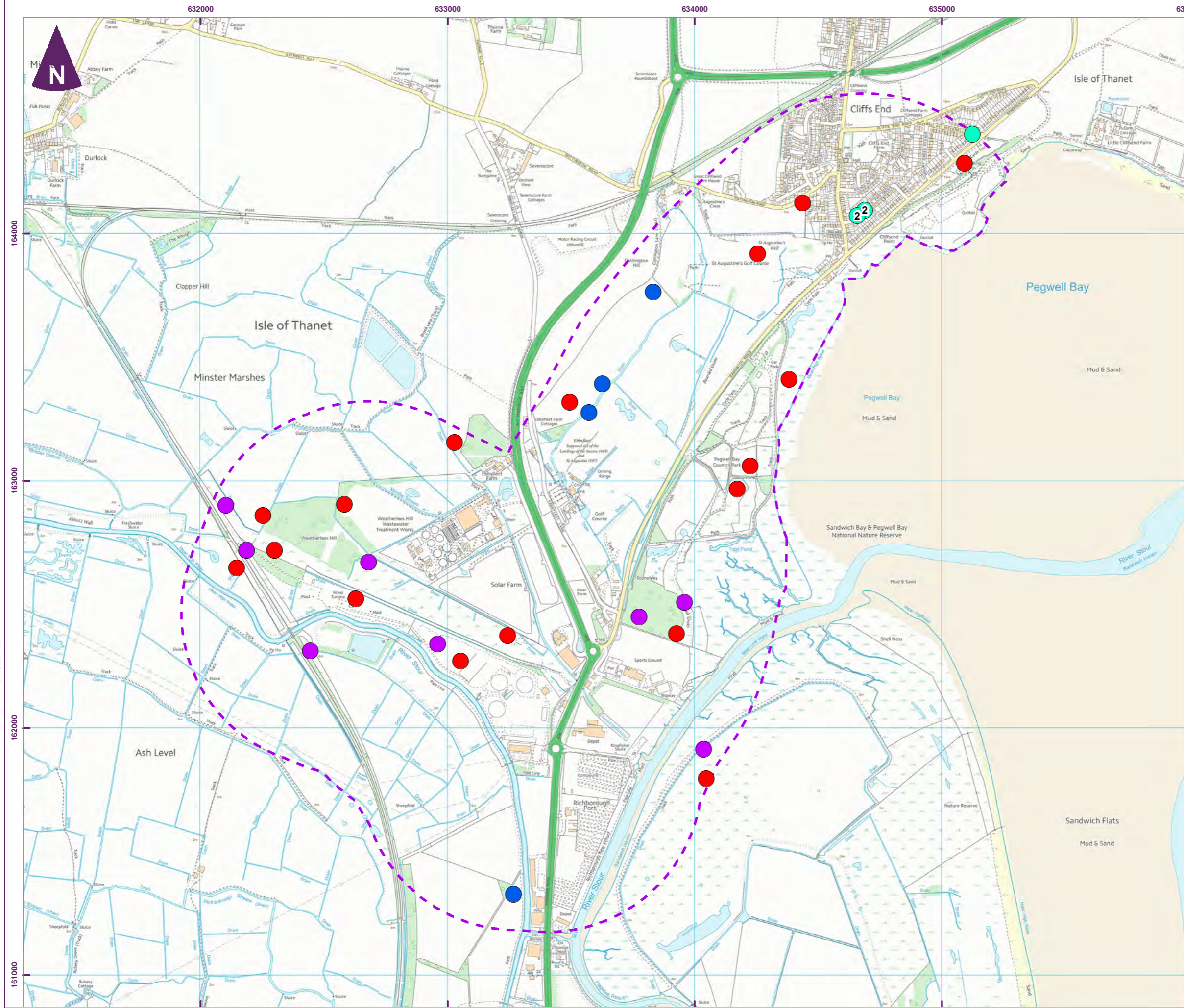
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Figure 5.4.3.8a
Location of Bird Territories: Cetti's
Warbler

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- Key
- CBC survey area
 - Cuckoo
 - Grey partridge
 - Herring gull
 - Turtle dove

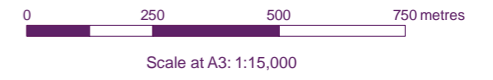
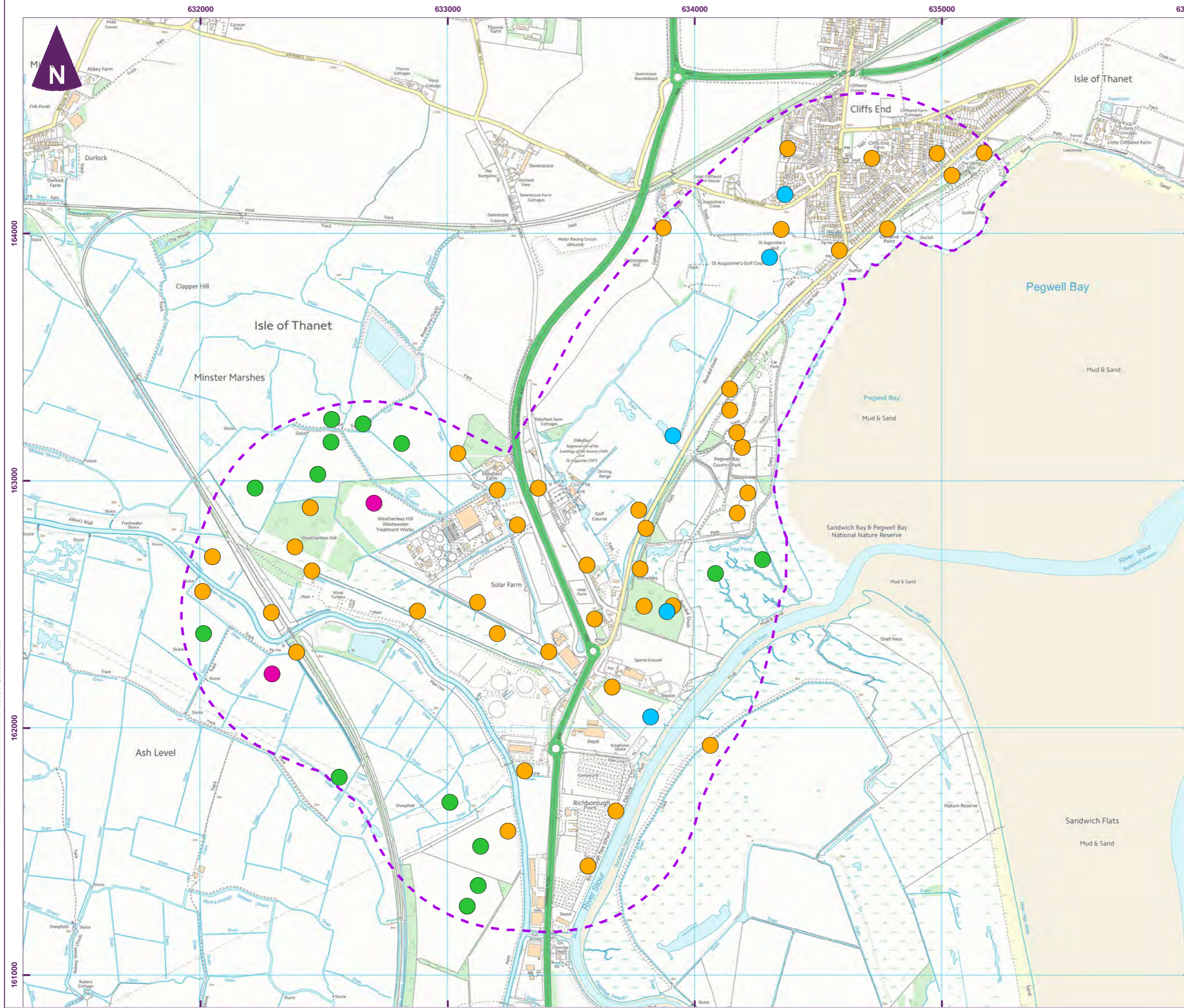
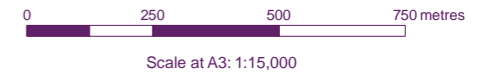


Figure 5.4.3.8b
Location of Bird Territories: PSI /
BoCC Red Listed Species (1)

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- Key
- CBC survey area
 - Mistle thrush
 - Skylark
 - Song thrush
 - Yellow Wagtail

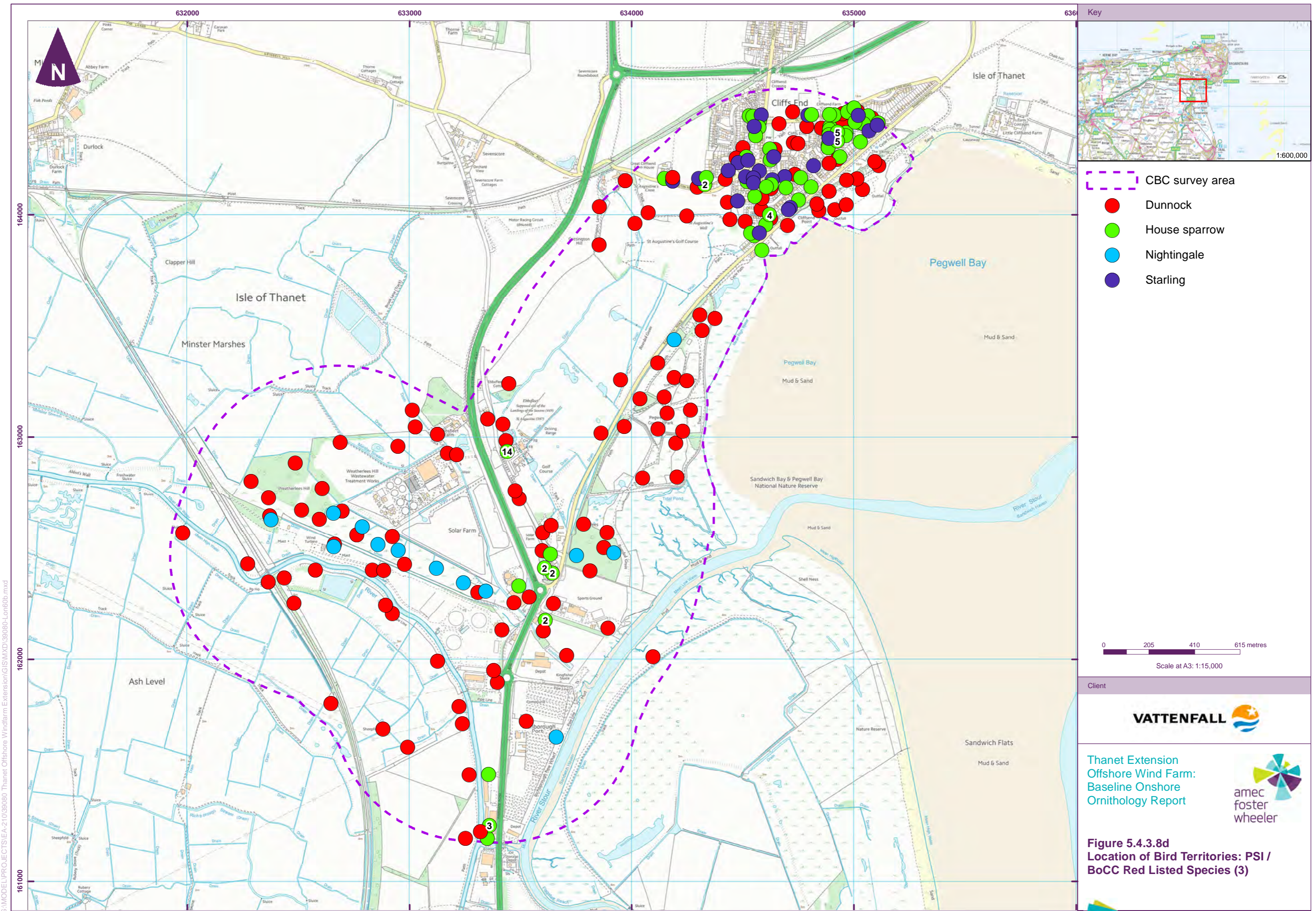


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Figure 5.4.3.8c
Location of Bird Territories: PSI /
BoCC Red Listed Species (2)



- Key
- CBC survey area
 - Dunnock
 - House sparrow
 - Nightingale
 - Starling

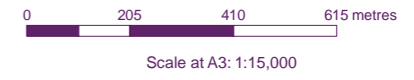
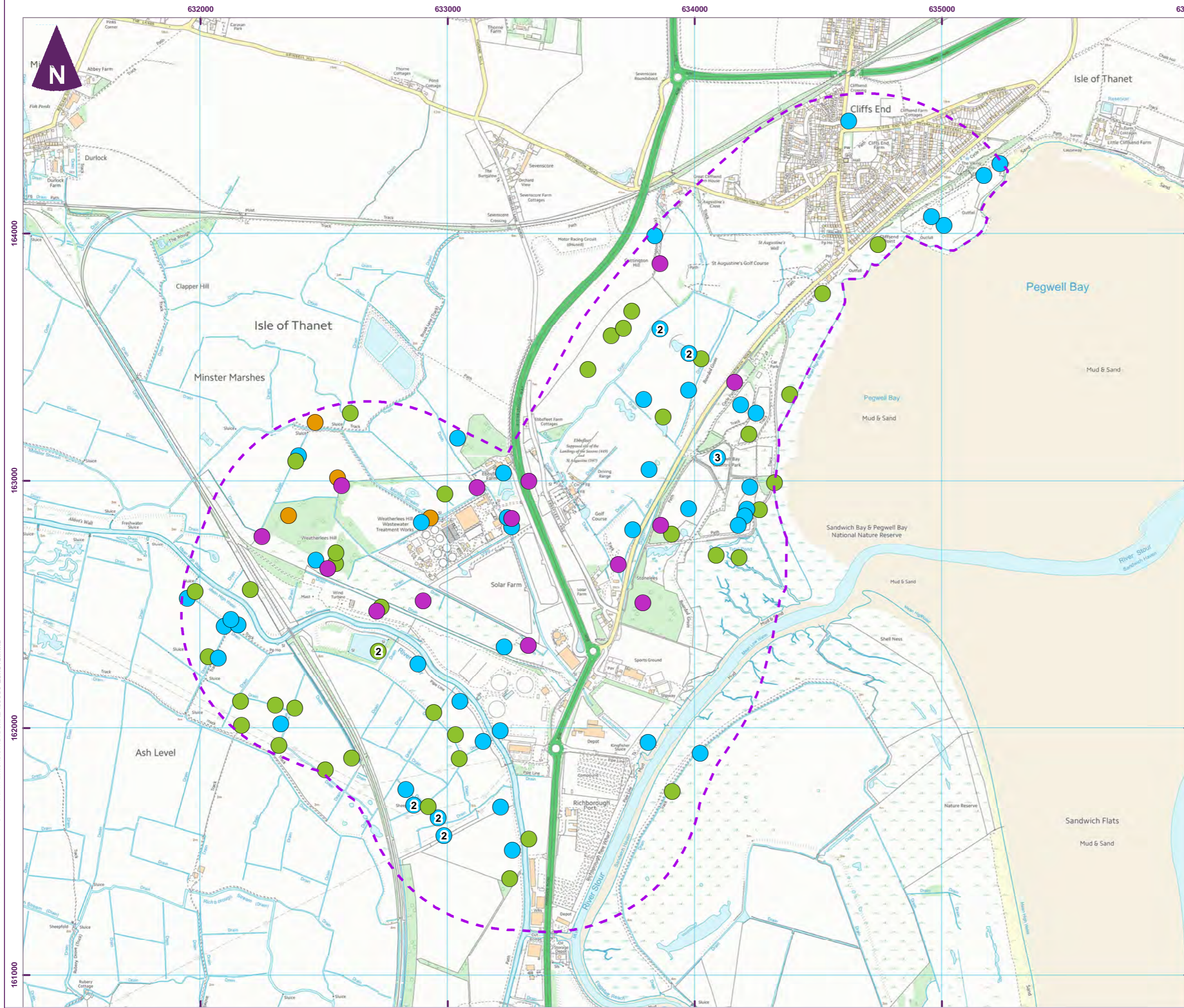
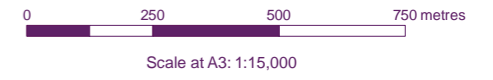


Figure 5.4.3.8d
Location of Bird Territories: PSI /
BoCC Red Listed Species (3)



- Key
- CBC survey area
 - Bullfinch
 - Linnet
 - Reed bunting
 - Yellowhammer



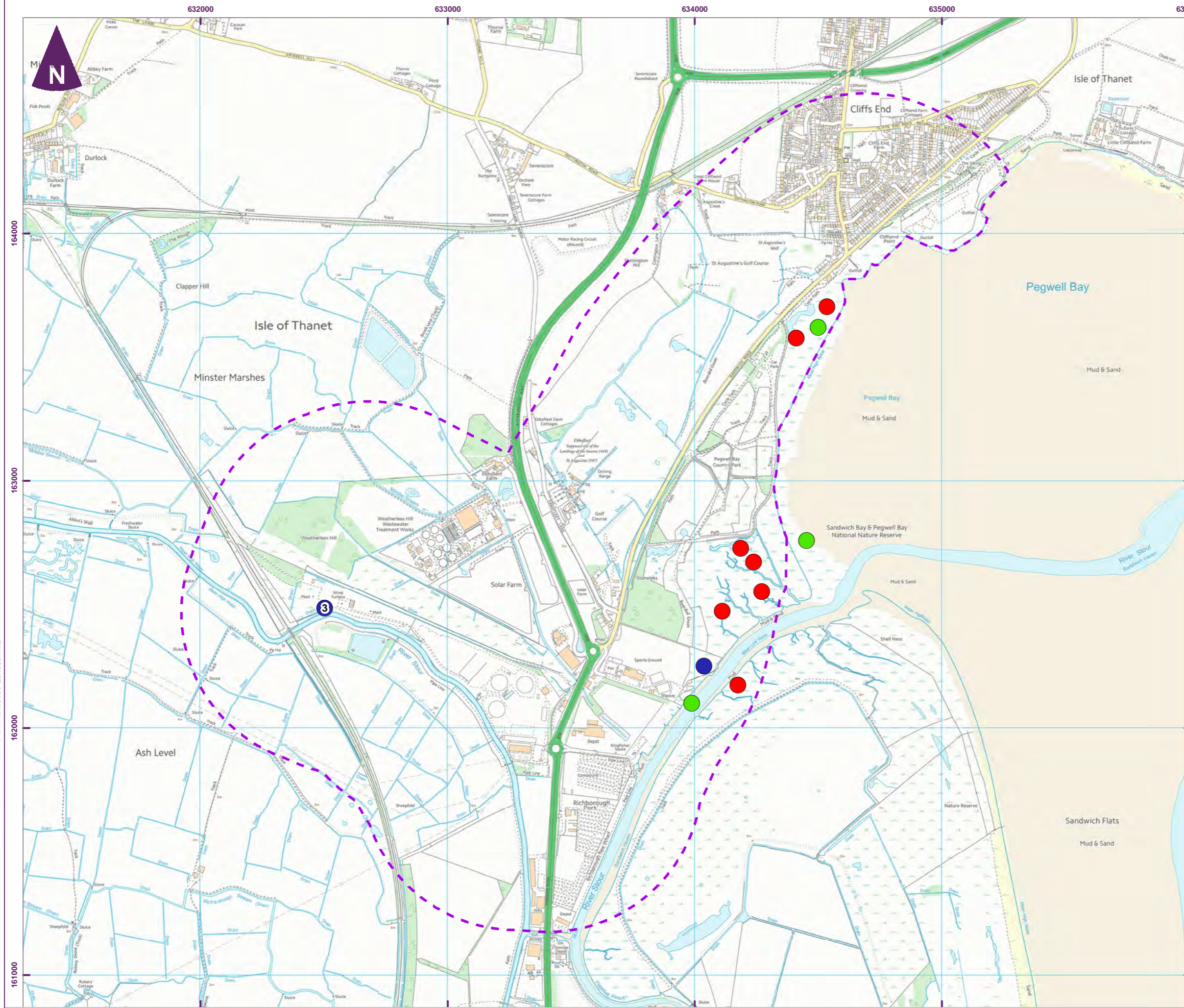
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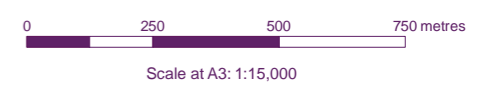
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Figure 5.4.3.8e
Location of Bird Territories: PSI /
BoCC Red Listed Species (4)

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- Key
- CBC survey area
 - Oystercatcher
 - Redshank
 - Shelduck



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Figure 5.4.3.8f
Location of Bird Territories: Waders and Shelduck

