



Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

**Annex 5-13: Intertidal Waterfowl Data
Analysis in relation to Onshore Works**

June, 2018, Revision A

Document Reference: 6.5.5.13

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

Vattenfall Wind Power Ltd

Intertidal Waterfowl Data
Analysis in relation to
Onshore Works

Thanet Extension Offshore Wind Farm

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Works

June, 2018

Drafted By:	SLR Consulting Ltd
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Date of Approval	June 2018
Revision	A

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THANET EXTENSION OFFSHORE WIND FARM

**Intertidal Waterfowl Data Analysis in relation to
Onshore Works**

Prepared for: GoBe Consultants

SLR Ref: 414.05356.00003
Version No: 1
May 2018



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CONTENTS

1.0	INTRODUCTION	1
1.1	Background	1
1.2	Purpose and Scope of Works	1
1.3	Existing Data	1
1.3.1	Transect surveys:	1
1.3.2	Through the tidal cycle counts (TTTCC).....	2
1.4	Potential Disturbance to Birds	2
1.4.1	The Landfall Options and Associated Disturbance Sources	2
1.4.2	Disturbance and Habitat Loss due to Works on the Intertidal Area below MHWS	3
2.0	METHODOLOGY	4
2.1	Target Species	4
2.2	Data Analysis	5
2.2.1	Buffer Areas	5
2.2.2	Peak Monthly Counts: All Categories (Feeding/Loafing/Other Activities).....	5
2.2.3	Peak Monthly Counts: Feeding Birds Only	6
2.2.4	Bird Feeding Effort (Bird Feeding Hours)	6
3.0	RESULTS	7
3.1	Count Data	7
3.1.1	All Activity Categories.....	7
3.1.2	Feeding Birds Only.....	8
3.2	Time Present (Hours)	9
3.2.1	Time Present (All Categories).....	9
3.2.2	Bird Feeding Effort.....	9
3.2.3	Peak Counts and Feeding Effort of Foraging Birds in B1 and B2.....	10
3.2.4	Peak Counts and Peak Time Present for all Bird Categories in B1 and B2	11
4.0	CONCLUSIONS	12
4.1	Species Summaries	12
4.1.1	Thanet Coast and Sandwich Bay SPA: Qualifying Features	12
4.1.2	Sandwich Bay to Hacklinge Marshes SSSI.....	13
4.1.3	Species Present in Nationally Important Numbers.....	13

DOCUMENT REFERENCES

TABLES

Table 2-1: Target Species: SPA and Ramsar Qualifying Features, SSSI Notified Features and Birds Present in Nationally Important Numbers.....	4
Table 3-1: Monthly Peak Counts of all Birds including Birds classed as Feeding, Loafing and undertaking Other Activities within 250m and 500m of the Potential Zone of the Seawall Cofferdam	7
Table 3-2: Peak counts feeding birds only within 250m and 500m of the Potential Zone of the Seawall Cofferdam	8
Table 3-3: Monthly Feeding, Loafing and Other Activities (Total Bird Hours) within 250m and 500m of the Potential Zone of the Seawall Cofferdam	9

FIGURES

- Figure 1: Distribution of European Golden Plover by Tidal State (Nov 2016 – March 2017 Combined)
- Figure 2: Distribution of Lapwing by Tidal State (Nov 2016 – March 2017 Combined)
- Figure 3: Distribution of Grey Plover by Tidal State (Nov 2016 – March 2017 Combined)
- Figure 4: Distribution of Ringed Plover by Tidal State (Nov 2016 – March 2017 Combined)
- Figure 5: Distribution of European Golden Plovers at 5-6m ACD in November 2016 showing Indicative Extent of Proposed Seawall Extension
- Figure 6: Distribution of Lapwing at 2-3m and 3-4m ACD in November 2016 showing Indicative Extent of Proposed Seawall Extension

1.0 Introduction

1.1 Background

SLR Consulting was commissioned by GoBe Consultants (on behalf of Vattenfall Wind Power Ltd) in January 2018 to carry out the onshore biodiversity assessment as part of the Environmental Impact Assessment (EIA) for the proposed Thanet Extension Offshore Wind Farm (TEOW). The commission included the production of various associated reports, including this report which presents the results of an analysis of existing survey data for non-breeding waterbirds using intertidal habitats within Pegwell Bay.

1.2 Purpose and Scope of Works

The aim of this report is to present the results of a spatial analysis of existing waterfowl (wader and wildfowl) data for Pegwell Bay (see Amec Foster Wheeler 2017¹ and APEM 2017²) and explicitly within buffers of 250m and 500m of the proposed landfall for TEOW, within Pegwell Bay Country Park. A 250m buffer is determined to be the maximum extent to which birds feeding or roosting on the adjacent intertidal area may be significantly affected by a source of disturbance at the landfall (Cutts *et al.*, 2009³; Collop *et al.*, 2016⁴) whilst a 500m buffer has also been analysed to provide useful contextual information.

The analyses consider the peak survey counts and the mean of peak monthly counts of a number of waterfowl species within these buffers in relation to national and site-specific thresholds and also consider the relative importance of this area for foraging birds. The latter has been determined by calculating the number of bird feeding hours for each species in each buffer for each survey month.

The output from the analyses has been used to identify whether unrestricted works at the landfall could potentially cause disturbance to significant numbers of birds. Detailed assessment of impacts and the development of mitigation measures are beyond the scope of this report however and are covered in the Environmental Statement (ES), Volume 3, Chapter 5: Onshore Biodiversity.

1.3 Existing Data

The data used in this report were collected during monthly surveys carried out between November 2016 and March 2017 by APEM. A full account of the study areas involved, the surveys methods used and the results of these surveys is given in APEM (2017). For clarity within this report and with reference to APEM (2017) a summary of these surveys is given here.

1.3.1 Transect surveys:

All bird species using and flying over the land above Mean High Water Springs (MHWS) were recorded. Although these data provide useful context for the data collected for the intertidal below MHWS they are not used in this report as the data relate to terrestrial habitats and there were very few records of waterfowl species within the zone of potential disturbance around the proposed landfall.

¹ Amec Foster Wheeler (2017) Thanet Extension Offshore Wind Farm: Ornithology Baseline Report.

² APEM (2017) Thanet Extension Offshore Wind Farm: Export Cable Route Intertidal and Terrestrial Wintering Bird Surveys.

³ Cutts, N., Phelps, A. and Burdon, D. (2009) Construction and waterfowl: defining sensitivity, response, impacts and guidance. Report to Humber INCA. IECS. Hull.

⁴ Collop, C., Stillman, R.A., Garbutt, A., Yates, M.G., Rispin, E. & Yates, T. (2016). Variability in the area, energy and time costs of wintering waders responding to disturbance. *Ibis*. DOI: 10.1111/ibi.12399.

1.3.2 Through the tidal cycle counts (TTCC)

Bird numbers, distribution and activity (such as feeding or roosting) were recorded throughout a tidal cycle of six hours, from low to high tide or vice versa during six one hour survey periods. Birds counted were classified as:

- 1) Feeding;
- 2) Roosting/loafing; or
- 3) Other activity.

1.4 Potential Disturbance to Birds

In terms of the proposed works which could potentially affect non-breeding waterfowl these can essentially be split into two:

- a) Works at or near to the landfall site; and
- b) Works within the intertidal between MHWS and Mean Low Water Springs (MLWS).

1.4.1 The Landfall Options and Associated Disturbance Sources

There are three options for the landfall site and as such three variations of direct habitat loss and or indirect habitat loss via disturbance and displacement. Note that the feasibility of Options 1 and 3 is dependent on the results of Site Investigation works which have yet to take place. These options are detailed in the ES, Volume 3, Chapter 1: Project Description (Onshore) and summarised below along with the associated disturbance potential:

Option 1: The use of Horizontal Directional Drilling (HDD) from the Pegwell Bay Country Park to the intertidal mudflats. This would require a larger onshore temporary works compound than Options 2 and 3, to house the HDD rig and associated equipment, but does not require excavation and reinstatement of the sea wall as required under Options 2 and 3. Installation of a cofferdam at the seawall will not be required for this option.

These works are likely to generate noise and vibration disturbance sources. Visual disturbance is also possible depending on the location of the HDD compound within Pegwell Bay Country Park. There would be no loss of saltmarsh habitat.

Option 2: A seaward extension of the existing sea wall to allow the export cables to interface from burial within the intertidal mudflat and upper saltmarsh to a surface laid berm within the Pegwell Bay Country Park. This option would require the installation of a temporary cofferdam within the upper intertidal/saltmarsh area and a permanent extension of the existing sea wall by a maximum of 18.5m, resulting in the loss of up to 1,399m² of upper saltmarsh habitat.

These works are likely to generate noise and vibration and visual disturbance sources over a construction period of up to five months. Noise disturbance could include noise from percussive piling which would generate noise levels of up to 132dB, which would be irregular in character and could last for up to 16 days. Noise generated by other construction activities would be more regular in character but could still be significant. After construction of the seawall extension and installation of the cables the cofferdam would be removed.

Option 3: Open trenching through the existing sea wall and Pegwell Bay Country Park. This would not involve any permanent loss of upper saltmarsh but as with Option 2 would require the installation of a temporary cofferdam before excavating through from the upper intertidal, through the existing sea wall.

Here, similar levels of disturbance would result during the period of construction as those detailed for Option 2.

The analysis of the bird count and distribution data in relation to these three options seeks to understand the potential numbers of birds which could be affected by unrestricted works. That is, what are the numbers of birds which could be impacted by disturbance and direct and indirect habitat loss due to construction works at the landfall. For the purposes of this report, the analysis focuses on the winter months, i.e. November to March, as that is the

only period for which sufficiently detailed spatial data are available. It is also the key period during which disturbance to non-breeding waterfowl is most likely to be significant. This is because cold weather and shorter day length make birds more susceptible to negative effects resulting from disturbance. During cold periods birds must feed more quickly and forage more successfully to maintain their basal metabolic rate in order to survive. As days are short they also have to feed at night, using different types of food searching strategies in the dark; their prey will also tend to burrow deeper during periods of cold weather. As such any disturbance to birds during this sensitive period that prevents them from obtaining enough food can have impacts on their survival.

1.4.2 Disturbance and Habitat Loss due to Works on the Intertidal Area below MHWS

Where the cable route corridor crosses the intertidal area there is the potential for construction-related disturbance to birds that may be foraging, roosting or loafing in this area at that time. The core overwintering period for waders and wildfowl in the UK is broadly accepted to fall between October to March.

Mitigation embedded into the proposed development from an early stage includes a timing restriction on works within intertidal habitats to avoid significant disturbance to non-breeding waterfowl. Construction works on the intertidal will therefore not be undertaken during the period October to March. As such, no quantitative assessment of disturbance to wintering waterfowl due to cable-laying within intertidal habitats has been undertaken as no effects are predicted. Also the cable laying activities will not result in any permanent habitat loss in this area.

2.0 Methodology

2.1 Target Species

A wide range of bird species have been recorded using Pegwell Bay and the surrounding intertidal areas. The results of the TTTCC's are given in Table 9 of APEM (2017) which shows the peak count of each bird species on each of the monthly visits between November 2016 and March 2017. These counts represent the peak numbers seen in the entire vantage point viewshed for Pegwell Bay which is shown in Figure 2 of APEM (2017).

The species for consideration in this report (henceforth referred to as target species) have been chosen because of their conservation status in that they are: a qualifying feature of the Thanet Coast and Sandwich Bay SPA and/or RAMSAR site; and/or a notified feature for the Sandwich Bay to Hacklinge Marshes SSSI; or because they have been recorded in Pegwell Bay in nationally important numbers, i.e. > 1% of the GB population. 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. The Wetland Bird Survey (WeBS) data (Frost *et al.* 2017⁵) for Pegwell Bay (2011/12 to 2015/16) have been compared with the GB 1% threshold to determine which species are present in nationally important numbers and these figures are set out in full in Table 3.2 of Amec Foster Wheeler (2017).

The full list of target species is given in Table 2.1 which provides the baseline data from SPA or SSSI citations where available, the 5 year peak mean for the Pegwell Bay WeBS count sector where relevant, the GB 1% threshold and the percentage of this threshold for birds present in nationally important numbers. The most recent 5 year peak mean is also calculated as a percentage of the baseline population for the qualifying features of the Thanet Coast and Sandwich Bay SPA.

Table 2-1: Target Species: SPA and Ramsar Qualifying Features, SSSI Notified Features and Birds Present in Nationally Important Numbers

Species	Conservation status within Pegwell Bay	Thanet Coast and Sandwich Bay Baseline population (JNCC 2015)	Sandwich Bay to Hacklinge Marshes SSSI citation population	WeBS 5 year peak mean in Pegwell Bay 2011/12 – 2015/16	GB 1% Threshold	% of GB threshold	Current Pegwell Bay 5 year peak mean as a % of the SPA baseline
European golden plover	SPA qualifying feature and SSSI notified feature	411	Not given	2537	4000	63	617
Ruddy turnstone	SPA and Ramsar qualifying feature	940	n/a	46	480	10	4.9

⁵ Frost, T.M., Austin, G.E., Calbrade, N.A., Hall, C., 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 and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

Species	Conservation status within Pegwell Bay	Thanet Coast and Sandwich Bay Baseline population (JNCC 2015)	Sandwich Bay to Hacklinge Marshes SSSI citation population	WeBS 5 year peak mean in Pegwell Bay 2011/12 – 2015/16	GB 1% Threshold	% of GB threshold	Current Pegwell Bay 5 year peak mean as a % of the SPA baseline
Grey plover	SSSI notified feature	n/a	> 210	312	430	73	n/a
Sanderling	SSSI notified feature	n/a	> 140	118	160	74	n/a
Ringed plover	SSSI notified feature	n/a	> 300	154	340	45	n/a
Brent goose	Nationally important numbers	n/a	n/a	1532	910	168	n/a
Great crested grebe	Nationally important numbers	n/a	n/a	216	190	114	n/a
Lapwing	Nationally important numbers	n/a	n/a	9093	6200	147	n/a
Red throated diver	Nationally important numbers	n/a	n/a	175	170	103	n/a

2.2 Data Analysis

2.2.1 Buffer Areas

The analyses presented in this report focus on two distinct buffers away from the landfall, as measured from the eastern extent of the potential zone of the seawall cofferdam (see Figures 1-4):

1. **0m to 250m.** This is also referred to as Buffer 1 or B1 and represents the maximum range within which birds may be disturbed by works at the cofferdam.
2. **250m to 500m.** This is also referred to as Buffer 2 or B2 and acts as a comparative area to B1 to determine whether there is a preference for birds to use the higher level area of the intertidal or whether birds spend more time away from the potential disturbance zone and in greater numbers.

2.2.2 Peak Monthly Counts: All Categories (Feeding/Loafing/Other Activities)

For each of the monthly six hour surveys (November 2016 to March 2017) the peak count for each of the target species within 250m buffer of the cofferdam has been calculated. The peak count is used rather than the sum of all birds as it is highly likely that many of the same birds are repeatedly counted on each of the six one hour survey periods. The peak count therefore represents the maximum number of birds that were present at any one time during the survey.

These peak counts include all birds identified using all three categories: feeding, roosting/loafing and other activity. The monthly peak count shows the variability of activity throughout the survey period and the highest monthly peak count for each species is shown in bold red. The full five month survey period is characterised by using the *mean of the peak counts* (see Table 3.1).

In order to compare the number of birds within the potential disturbance buffer of 250m to the numbers feeding further out the peak counts were also calculated out to 500m giving two 250m buffers to compare, B1 (0-250m) and B2 (250m to 500m). The results of this analysis indicate the proportion of birds which are found closer to the cofferdam within a 500m buffer, i.e. are birds preferring the area within 250m? High level areas of estuarine mudflats, i.e. <200m from the MHWS have been shown to be preferred by some species throughout the tidal cycle (Bullman 2003⁶).

Figures 1 to 4 show the distributions of target species across the different tidal states i.e. 2m to 7m Admiralty Chart Datum (ACD). These figures combine all spatial data collected during each of the surveys from November 2016 to March 2017. Figures 5 and 6 focus on the potential zone of the sea wall cofferdam and illustrate where there was some slight overlap of bird distribution and the potential zone of the cofferdam during a specific tidal state.

2.2.3 Peak Monthly Counts: Feeding Birds Only

The peak numbers of feeding birds are shown in Table 3.2. This differentiates the birds that are actively foraging from those which are either roosting, loafing or undertaking other non-feeding related activities. These figures are just counts of birds and do not consider the amount of time they are feeding for.

2.2.4 Bird Feeding Effort (Bird Feeding Hours)

Peak counts can be misleading as the peak may be very ephemeral in relation to the amount of time that all the birds are actually present. For example a single bird might be present during five of the one hour survey periods and then 50 birds are present for just one of the periods. The peak count for the survey is 50 but the feeding effort is just 55 bird feeding hours. If the 50 birds had been present for the whole six hours then the feeding effort would have been 300 bird feeding hours although the peak count remains 50 birds.

Bird feeding effort per species is simply calculated by summing the total number of feeding birds registered across a six hour survey period (or six single hour periods). For the sake of this calculation it is assumed that the birds recorded on each survey sheet were present for the full 60 minutes of each survey hour in which they were present, although in practice this may not be the case.

A similar calculation has been done to calculate the number of hours that both feeding and loafing birds (all activities) were present during the surveys as there were often large numbers of loafing birds present.

⁶ Bullman, R. (2003) Spatial and temporal distribution of shorebirds: predicting the impacts of habitat loss on the Forth Estuary, PhD, University of Stirling.

3.0 Results

3.1 Count Data

3.1.1 All Activity Categories

Table 3.1 shows that of the nine target species considered only four were present either feeding, loafing or undertaking other activities within 500m of the potential zone of the seawall cofferdam: European golden plover, grey plover, lapwing and ringed plover. In subsequent tables only these four species are considered further. The peak counts recorded within 250m during the survey period are shown in red bold.

Table 3-1: Monthly Peak Counts of all Birds including Birds classed as Feeding, Loafing and undertaking Other Activities within 250m and 500m of the Potential Zone of the Seawall Cofferdam

Species	November		December		January		February		March		Mean of peak counts	
	250 m	500 m	250 m	500 m	250 m	500 m	250 m	500 m	250 m	500 m	250 m	500 m
Brent goose	0	0	0	0	0	0	0	0	0	0	0	0
European Golden plover	390	280	118	212	0	0	40	30	0	0	109.6	104.4
Great crested grebe	0	0	0	0	0	0	0	0	0	0	0	0
Grey plover	0	1	0	0	7	5	0	0	0	2	1.4	1.6
Lapwing	250	266	503	421	42	420	388	297	0	0	236.6	280.8
Red-throated diver	0	0	0	10	0	0	0	0	0	0	0	2
Ringed plover	0	0	0	0	0	4	0	0	0	0	0	0.8
Sanderling	0	0	0	0	0	0	0	0	0	0	0	0
Ruddy turnstone	0	0	0	0	0	0	0	0	0	0	0	0

European Golden plover were not present on the January and March surveys. Although the peak count for all the surveys (390 birds) was within B1 the mean of the peak counts for B1 and B2 were quite similar with only a difference of 5.2.

The distributions of European golden plover are shown in Figures 1 and 5. Figure 1 illustrates the combined data for all survey months by tidal state and shows that during the 5m to 6m ACD tidal period there was some overlap between the European golden plover distribution and the potential zone of the seawall cofferdam. This involves a group of 45 birds out of a flock of 300 (albeit that assumes a homogenous distribution within that polygon) that were loafing in this area for one hour (09:00 to 10:00) during the November 2016 survey.

Grey plover numbers were very low over all the surveys and they were not present during the December and March surveys. The peak count of seven birds was within B1 but again the mean of the peak counts for both buffers were

almost the same. The distribution of grey plover is illustrated in Figure 3 where it can be seen that the birds in B1 were only present when the tidal state was 5m to 6m ACD. Other birds were present outside the B2 buffer.

Lapwing numbers were the highest of any of the target species overall although they were not present in March. The highest peak count of 503 birds was within B1 although the mean of the peaks across all the surveys shows a greater number of birds in B2.

The distributions of lapwing are shown in Figures 2 and 6. Figure 2 illustrates the combined data for all survey months by tidal state and shows that during the 2m to 3m ACD and 3m to 4m ACD tidal periods there was some overlap between the lapwing distribution and the potential zone of the seawall cofferdam. This involves a maximum of nine loafing birds (albeit that assumes a homogenous distribution within that polygon) present in this area over two one-hour periods during the November 2016 survey.

Ringed plover were only present in January with only four birds present in B2 during the 1m to 2m ACD tidal period (see Figure 4).

Overall, the March surveys recorded virtually no birds of each the target species chosen for this study. The only species present was grey plover and the peak for that species was only two birds.

3.1.2 Feeding Birds Only

Table 3.2 shows the peak counts in B1 and B2 of feeding birds only, the peak counts in B1 are shown in bold red.

Table 3-2: Peak counts feeding birds only within 250m and 500m of the Potential Zone of the Seawall Cofferdam

Species	November		December		January		February		March		Mean of peak counts	
	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m
European Golden plover	0	0	29	104	0	0	40	30	0	0	13.8	26.8
Grey plover	0	0	0	0	7	5	0	0	0	2	1.5	1.4
Lapwing	0	14	82	352	0	0	273	227	0	0	71	118.6
Ringed plover	0	0	0	0	0	4	0	0	0	0	0	0.8

For European golden plover it is apparent that with reference to Table 3.1 all the birds recorded in November were not foraging and of the birds present in B1 in December and February 24.5% and 100% respectively were actively feeding.

Feeding lapwing numbers were very low in November at just 2.5% of all birds present in B2 only. When considering birds in B1 only 16.3% of the peak counts were feeding in December and 70.3% in February. There were no feeding birds recorded in January and March. The mean of the peak counts show that across all the surveys

All records of grey plover and ringed plover were of feeding birds.

3.2 Time Present (Hours)

3.2.1 Time Present (All Categories)

The time in bird hours that birds in all activity categories were present in buffers B1 and B2 is shown in Table 3.3. This includes time spent feeding, roosting/loafing and other activities. Table 3.3 includes the species previously noted as feeding (Table 3.2). The peak time in bird hours within 250m is given in bold red.

Table 3-3: Monthly Feeding, Loafing and Other Activities (Total Bird Hours) within 250m and 500m of the Potential Zone of the Seawall Cofferdam

Species	November		December		January		February		March		Sum	
	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m
European golden plover	847	423	161	494	0	0	61	59	0	0	1069	976
Grey plover	0	1	0	0	7	9	0	0	0	2	7	12
Lapwing	795	754	1294	1710	42	1752	1377	1102	0	0	3468	5358
Ringed plover	0	0	0	0	0	4	0	0	0	0	0	4

The peak counts of European golden plover within B1 and B2 were broadly similar (Table 3.1) and it is clear from Table 3.3 that the amount of time that the birds spent in B1 and B2 during the surveys was also fairly similar with a longer overall time (by 93 hours) being spent in B1. The peak time present for all the surveys was recorded in B1 in November. There were no records in March.

Lapwing spent more time on average in B2 (by 1890 hours) across all the surveys. The peak time spent in B1 was in February and the highest overall time within B1 and B2 combined was in December. No birds were recorded in March.

Grey plover and ringed plover were mostly present in B2.

3.2.2 Bird Feeding Effort

Table 3.4 shows total bird feeding effort (in hours) only and does not include birds categorised as loafing or undertaking other activity. Feeding effort is measured in bird feeding hours within B1 or B2 separately. The peak period of feeding time within 250m of the potential zone of the seawall cofferdam is shown in bold red and only applies to European golden plover, lapwing and ringed plover.

Table 3.4 Monthly Feeding Effort Only (Hours) within 250m and 500m of the Potential Zone of the Seawall Cofferdam

Species	November		December		January		February		March		Sum	
	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m
European Golden plover	0	0	29	104	0	0	40	30	0	0	69	134
Grey plover	0	0	0	0	7	8	0	0	0	2	7	10
Lapwing	0	14	86	575	0	0	273	227	0	0	359	816

Species	November		December		January		February		March		Sum	
	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m	250m	500m
Ringed plover	0	0	0	0	0	4	0	0	0	0	0	4

In November, January and March the feeding effort for European golden plover within B1 was zero. In total 65 more bird feeding hours were spend in B2 compared with the feeding effort in B1. This is in contrast to the amount of time that all categories of birds spend in B2 which was less than B1. B2 is therefore apparently more important for feeding and B1 more important for roosting and other activities.

The relative distribution of lapwing feeding effort closely matches the peak counts for feeding birds (Table 3.2). Ringed plover and grey plover feeding effort also closely matched the sum of feeding birds as numbers were so small in B1 and B2.

3.2.3 Peak Counts and Feeding Effort of Foraging Birds in B1 and B2

Chart 3.1 below shows that across all the target species recorded in B1 and B2 the peak counts were generally higher in B2, 250m to 500m away from the potential zone of the seawall cofferdam showing that fewer birds were feeding closer to the seawall. This does not apply to grey plover but the numbers present feeding were very low with peaks of only 7 and 5 in B1 and B2 respectively.

Chart 3.1: Peak Count for all Feeding Birds only within 250m and 500m of the Potential Zone of the Seawall Cofferdam

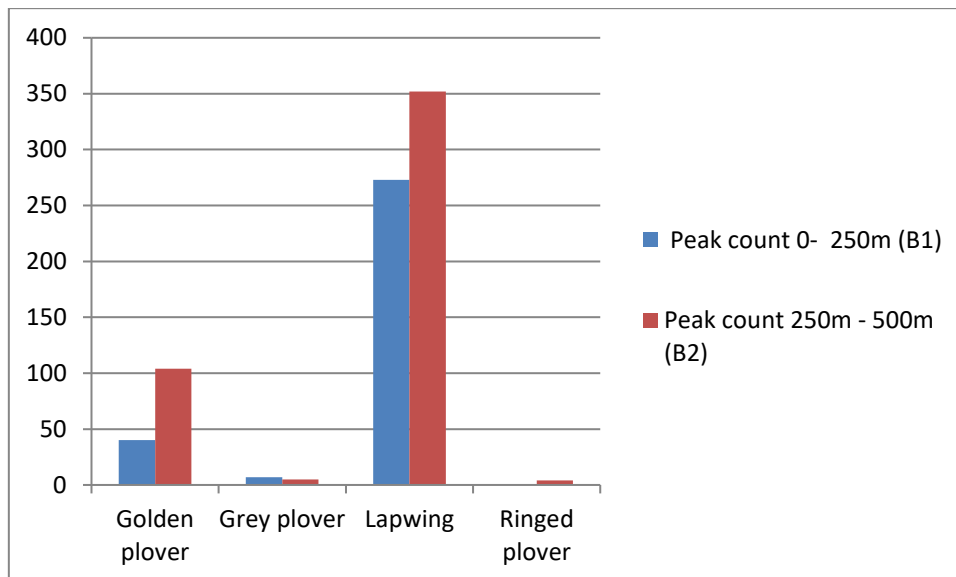
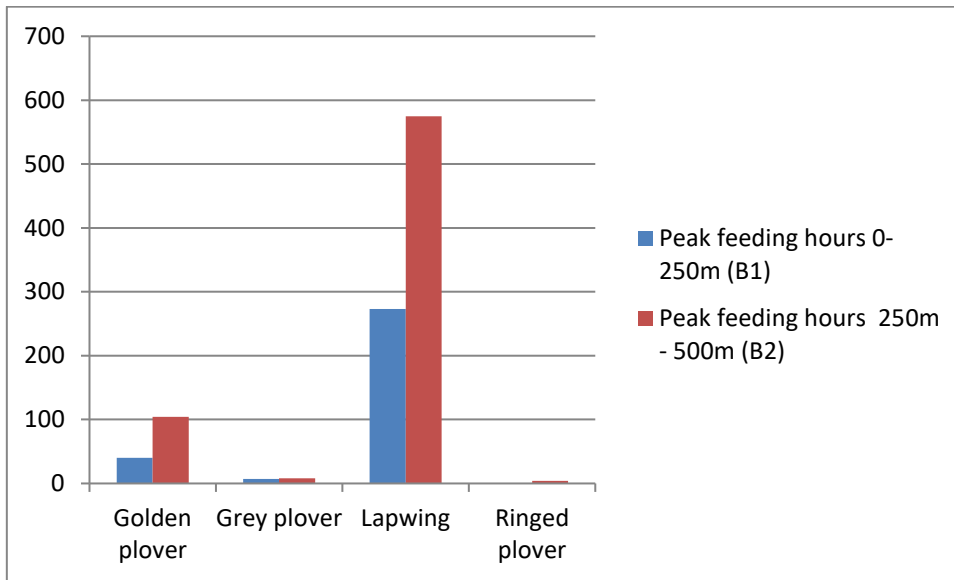


Chart 3.2 below shows that along with the peak counts for feeding birds being higher in B2 the amount of feeding effort in bird feeding hours was also higher in B2, i.e. outwith the potential disturbance zone of B1.

Chart 3.2 Peak Bird Feeding Hours within 250m and 500m of the Potential Zone of the Seawall Cofferdam

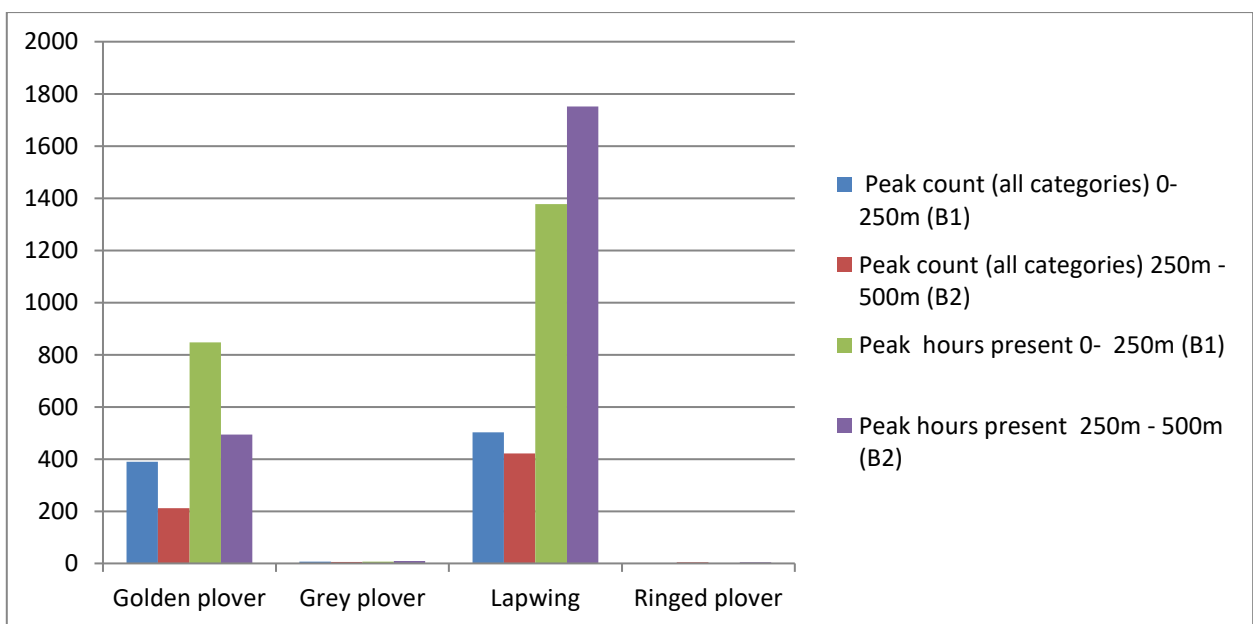


3.2.4 Peak Counts and Peak Time Present for all Bird Categories in B1 and B2

Chart 3.3 below shows the peak counts of birds for all activity categories in B1 and B2 plotted next to the peak amount of hours that the birds were present. Although the peak numbers are important for comparison to the baseline numbers of designated sites the number of hours that birds are present in a given area indicates how important a site is for essential activities such as feeding and loafing.

The European golden plover peak count of all bird categories was highest within B1 and the time present was proportionally similar. For lapwing it can be seen that although there were less birds present in B2 compared to B1 the time present in B2 was higher, potentially showing a preference for using the area further away from the disturbance source at the seawall cofferdam. Numbers of ringed plover and grey plover were too low to make any useful comparisons.

Chart 3.3: Peak Counts (All Categories) in B1 and B2 compared to Peak Hours Present in B1 and B2



4.0 Conclusions

4.1 Species Summaries

4.1.1 Thanet Coast and Sandwich Bay SPA: Qualifying Features

The two non-breeding qualifying features of the Thanet Coast and Sandwich Bay SPA are European golden plover and ruddy turnstone. Little tern is a breeding feature and not considered here.

European Golden Plover

JNCC (2015)⁷ states that the population for the Thanet Coast and Sandwich Bay SPA is 411 non-breeding individuals, derived from the five year mean peak counts over the period 1991/2 – 1995/6. Although these data are now more than 20 years old this is the initial baseline population against which to assess any impact due to displacement. The current 5 year peak mean for the Pegwell Bay count sector alone is 2537 birds which represents 617% of the baseline figure for the SPA.

The peak count (of all feeding and roosting birds) recorded on the TTTCC surveys in Pegwell Bay was 670 individuals in November 2016, which amounts to 163% of the SPA population given on the Natura 2000 standard data form. The peak count (all birds) recorded within 250m of the potential zone of the seawall cofferdam during the survey period of November 2016 to March 2017 was 390 birds in November 2016 which is 77.6% of the SPA population. The mean of all the monthly peak counts (all birds) over the survey period within 250m of the cofferdam however was 109.6 which is 26.6% of the SPA population.

A peak of 847 bird hours was recorded within 250m of the landfall and when compared to the peak count of birds it is evident that B1 (the area within 250m of the potential zone of the seawall cofferdam) is used for roosting more than it is for feeding.

Overall more birds were recorded within B1 than B2. Based on these data and the fact there is a small overlap of European golden plover distribution and the potential zone of the seawall cofferdam there is the potential for unrestricted works to disturb and potentially displace significant numbers of European golden plover. A small amount of permanent and temporary habitat loss is also possible, depending which option for the landfall works is taken forward. Further assessment of potential impacts and details of proposed mitigation measures are provided in the ES Volume 3, Chapter 5: Onshore Biodiversity.

Ruddy Turnstone

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. The most recent WeBS data show a 5 year peak mean for the Pegwell Bay count sector of 46 which represents <5% of the SPA population.

The peak count recorded within 250m of the landfall was zero. There were also no ruddy turnstones found within 500m of the potential zone of the seawall cofferdam so based on the 2016/17 data ruddy turnstone has no potential to be disturbed by the construction works at the landfall.

⁷ JNCC (2015) Thanet Coast and Sandwich Bay SPA Natura 2000 Standard Data Form (update version 2015-12). JNCC, Peterborough.

4.1.2 Sandwich Bay to Hacklinge Marshes SSSI

Grey Plover

The SSSI citation does not give a definitive figure for the baseline population at this site and only states that there are greater than 210 individuals. Even if an assessment were possible against the minimum figure of 210 there were very few birds recorded within 250m of the potential zone of the seawall cofferdam with a maximum (all birds) peak count of seven which is only 3.3% of this baseline. These seven birds were recorded during a single hourly count with no other records during other counts. The potential for significant disturbance impacts as a result of works at the landfall is therefore negligible.

Sanderling

Again the SSSI citation is not conclusive and only gives a baseline figure of greater than 140 birds. However, no birds at all were recorded either within 250m or 500m of the potential zone of the seawall cofferdam therefore this species will not be affected by works at the landfall based on the data collected in the 2016 – 17 surveys.

Ringed Plover

The SSSI citation gives a figure of greater than 300 birds as the baseline population, although it is noted that peak counts for this species occur during spring and autumn passage which has not been assessed within this report. The 2016 – 17 winter surveys only recorded four birds within the 500m buffer in January 2017 and none within the 250m buffer. As such, based on 2016 – 17 data there will be no disturbance impacts on wintering ringed plover due to works at the landfall.

4.1.3 Species Present in Nationally Important Numbers

Brent Goose

The WeBS data for the Pegwell Bay count sector 2011/12 to 2015/16 gives a five year peak mean of 1532 birds which is 168% of the GB 1% threshold for this species (see Table 2.1). However the 2016 – 17 TTTCC surveys recorded no brent geese within either 250m or 500m of the potential zone of the seawall cofferdam so this species will not be affected by disturbance or displacement from works at the landfall.

Great Crested Grebe

The same WeBS data series as above gives a five year peak mean of 216 birds for great crested grebe which is 114% of the GB 1% threshold for this species (see Table 2.1). During the 2016 -17 TTTCC survey no birds were recorded within 500m of the potential zone of the seawall cofferdam so again this species will not be affected by disturbance or displacement from works at the landfall.

Lapwing

For Lapwing the five year peak count for Pegwell Bay is 9093 birds which is 147% of the GB 1% threshold of 6200 birds. During the 2016 – 17 TTTCC counts lapwing were recorded in buffers B1 and B2 in every survey month apart from March 2017 (see Table 2.1). The peak count within 250m was 503 in December 2016 which is only 8% of the GB 1% threshold. The mean of the peak counts within 250m was 236.6 birds or 5% of the GB 1% threshold. Based on these data and the fact there is a small overlap of lapwing distribution and the potential zone of the seawall cofferdam there is the potential for unrestricted works to disturb and potentially displace significant numbers of lapwing. A small amount of permanent and temporary habitat loss is also possible, depending which option for the landfall works is taken forward. Further assessment of potential impacts and details of proposed mitigation measures are provided in the ES Volume 3, Chapter 5: Onshore Biodiversity.

FIGURES

Figure 1: Distribution of European Golden Plover by Tidal State (Nov 2016 – March 2017 Combined)

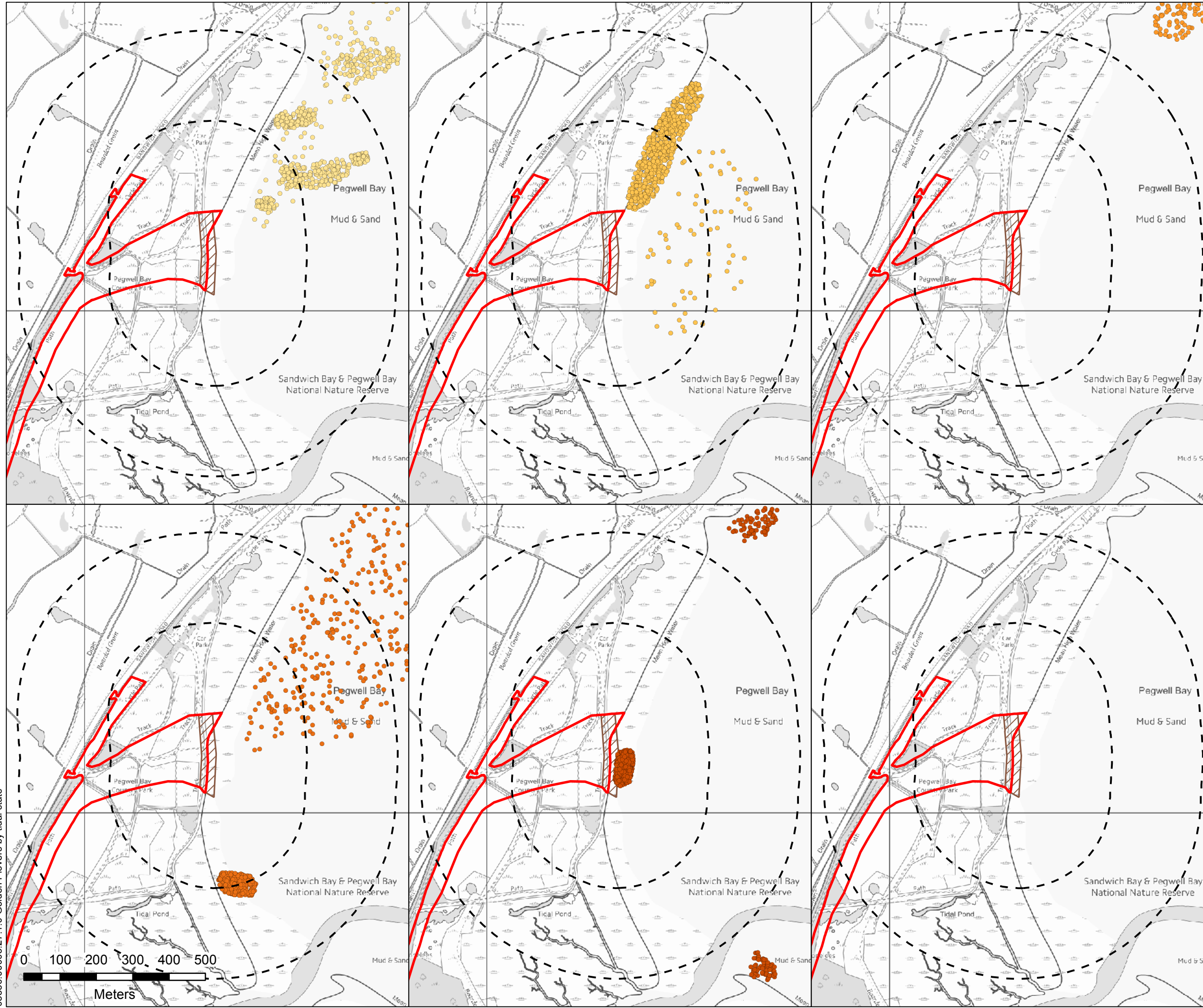
Figure 2: Distribution of Lapwing by Tidal State (Nov 2016 – March 2017 Combined)

Figure 3: Distribution of Grey Plover by Tidal State (Nov 2016 – March 2017 Combined)

Figure 4: Distribution of Ringed Plover by Tidal State (Nov 2016 – March 2017 Combined)

Figure 5: Distribution of European Golden Plovers at 5-6m ACD in November 2016 showing Indicative Extent of Proposed Seawall Extension

Figure 6: Distribution of Lapwing at 2-3m and 3-4m ACD in November 2016 showing Indicative Extent of Proposed Seawall Extension



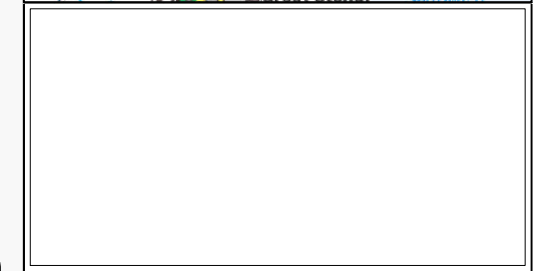
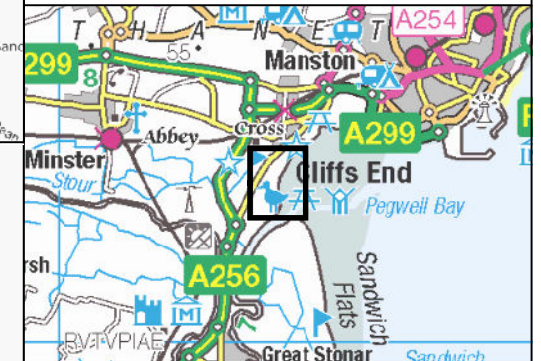
NOTES
 1. TIDAL HEIGHTS AVERAGED FROM BRITISH OCEANOGRAPHIC DATA CENTRE (BODC) FOR DOVER TIDE GAUGE (PLUS HALF AN HOUR). ADMIRALTY CHART DATUM (ACD) = ORDNANCE DATUM NEWLYN (ODN) - 3.67M

LEGEND

- ONSHORE SITE BOUNDARY
- POTENTIAL ZONE OF SEA WALL COFFERDAM
- POTENTIAL ZONE OF SEA WALL COFFERDAM 250m and 500m OFFSET BOUNDARY

EUROPEAN GOLDEN PLOVER BY ADMIRALTY CHART DATUM (ACD)

- 1 - 2m ACD
- 2 - 3m ACD
- 3 - 4m ACD
- 4 - 5m ACD
- 5 - 6m ACD
- 6 - 7m ACD



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THANET EXTENSION OFFSHORE WIND FARM

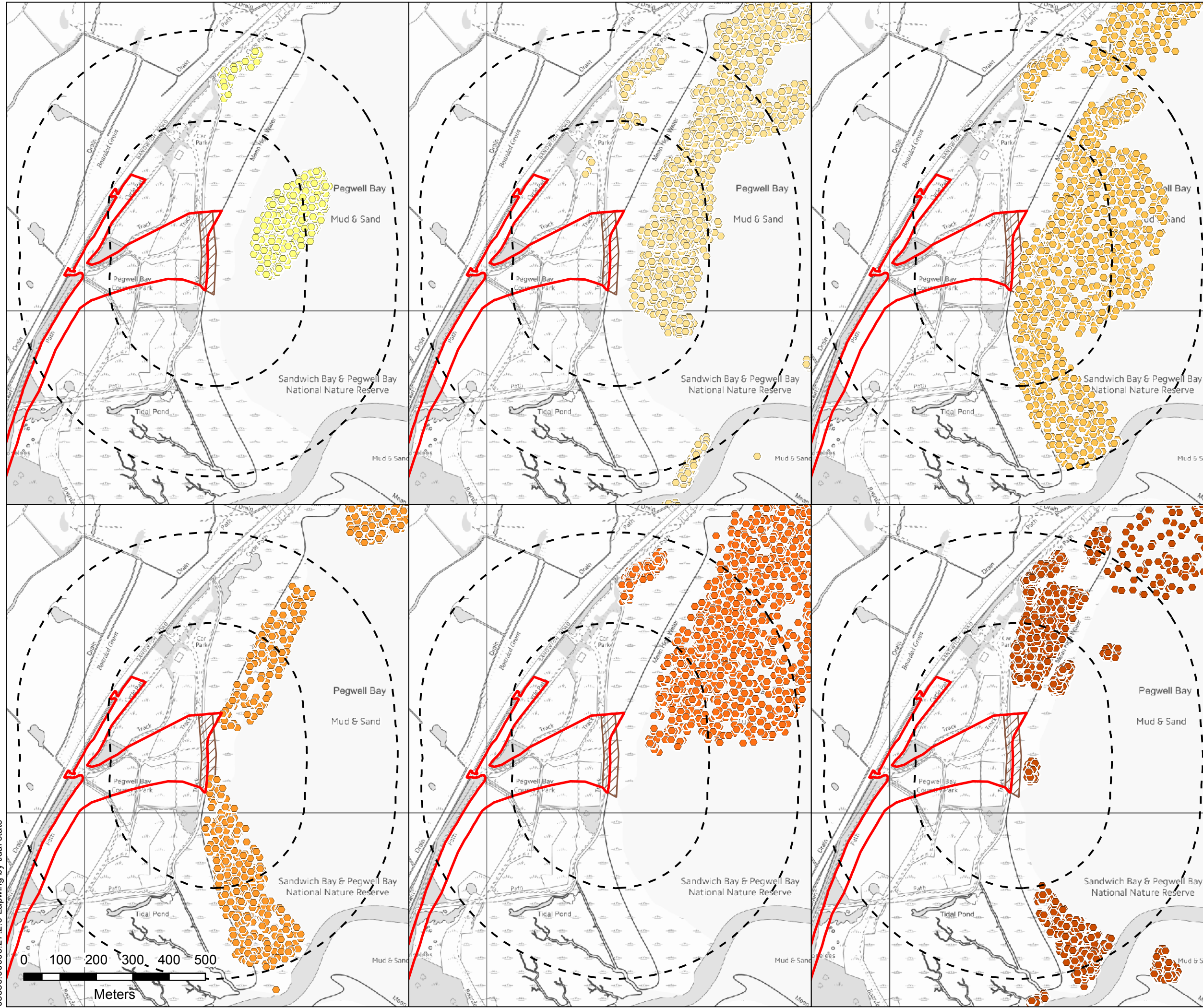
INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS

DISTRIBUTION OF EUROPEAN GOLDEN PLOVER BY TIDAL STATE (NOV 2016 – MARCH 2017 COMBINED)

1

Scale 1:10,000 @ A3 Date APRIL 2018

05356.00003.27.1.0 Golden Plovers by tidal state



NOTES
 1. TIDAL HEIGHTS AVERAGED FROM BRITISH OCEANOGRAPHIC DATA CENTRE (BODC) FOR DOVER TIDE GAUGE (PLUS HALF AN HOUR). ADMIRALTY CHART DATUM (ACD) = ORDNANCE DATUM NEWLYN (ODN) - 3.67M

LEGEND

- ONSHORE SITE BOUNDARY
- POTENTIAL ZONE OF SEA WALL COFFERDAM
- POTENTIAL ZONE OF SEA WALL COFFERDAM 250m and 500m OFFSET BOUNDARY

LAPWING BY ADMIRALTY CHART DATUM (ACD)

- 0-1m ACD
- 1-2m ACD
- 2-3m ACD
- 3-4m ACD
- 4-5m ACD
- 5-6m ACD

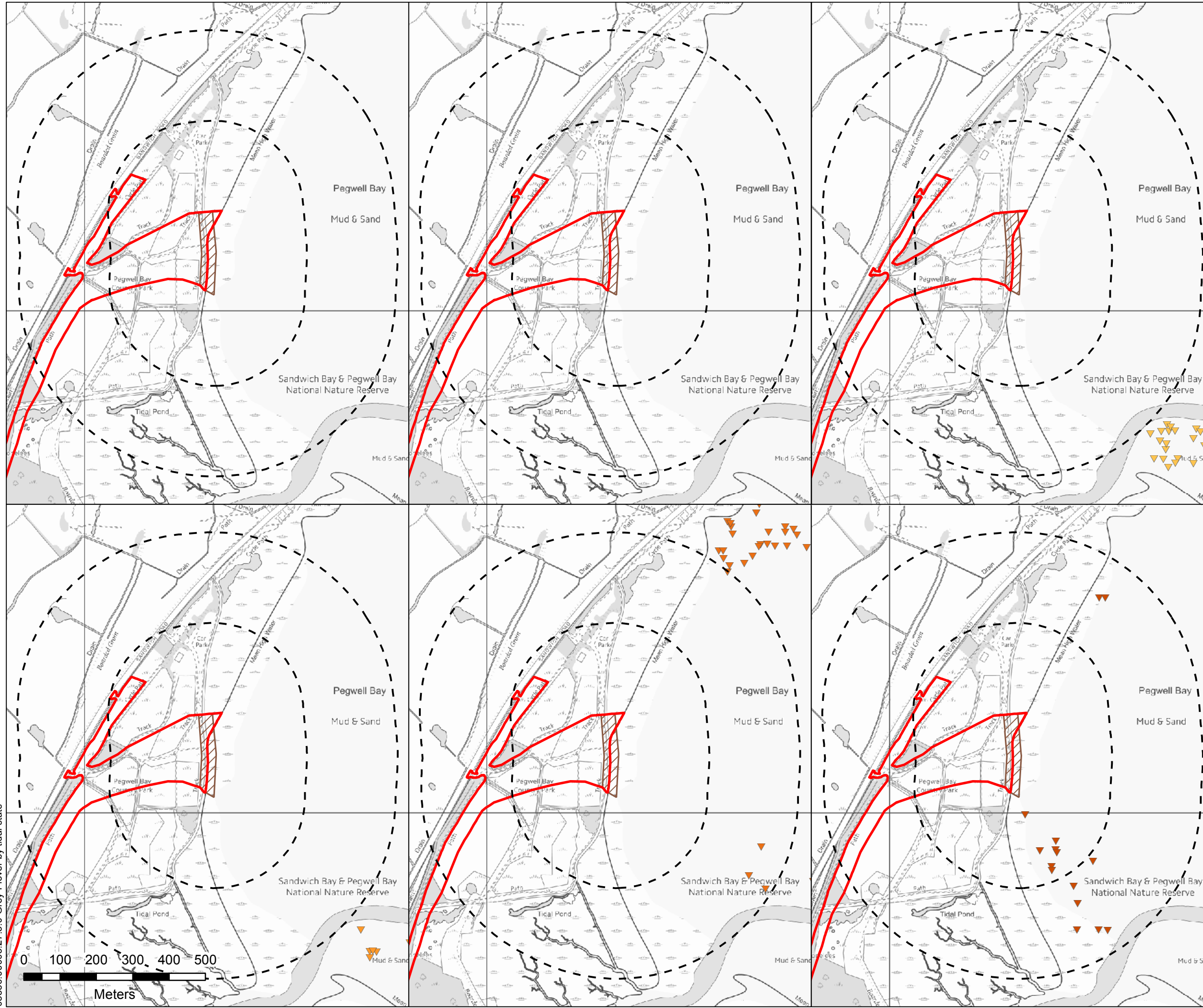


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THANET EXTENSION OFFSHORE WIND FARM
 INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS
 DISTRIBUTION OF LAPWING BY TIDAL STATE (NOV 2016 – MARCH 2017 COMBINED)

2
 Scale 1:10,000 @ A3 Date APRIL 2018

05356.00003.27.2.0 Lapwing by tidal state



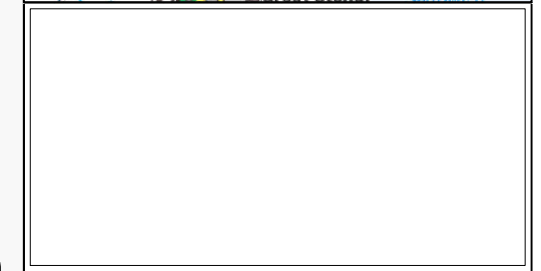
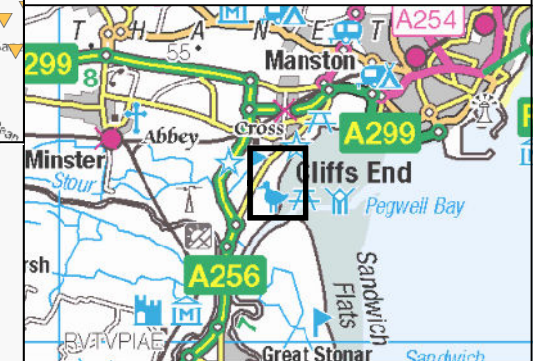
NOTES
 1. TIDAL HEIGHTS AVERAGED FROM BRITISH OCEANOGRAPHIC DATA CENTRE (BODC) FOR DOVER TIDE GAUGE (PLUS HALF AN HOUR). ADMIRALTY CHART DATUM (ACD) = ORDNANCE DATUM NEWLYN (ODN) - 3.67M

LEGEND

- ONSHORE SITE BOUNDARY
- POTENTIAL ZONE OF SEA WALL COFFERDAM
- POTENTIAL ZONE OF SEA WALL COFFERDAM 250m and 500m OFFSET BOUNDARY

GREY PLOVER BY ADMIRALTY CHART DATUM (ACD)

- 0-1m ACD
- 1-2m ACD
- 2-3m ACD
- 3-4m ACD
- 4-5m ACD
- 5-6m ACD



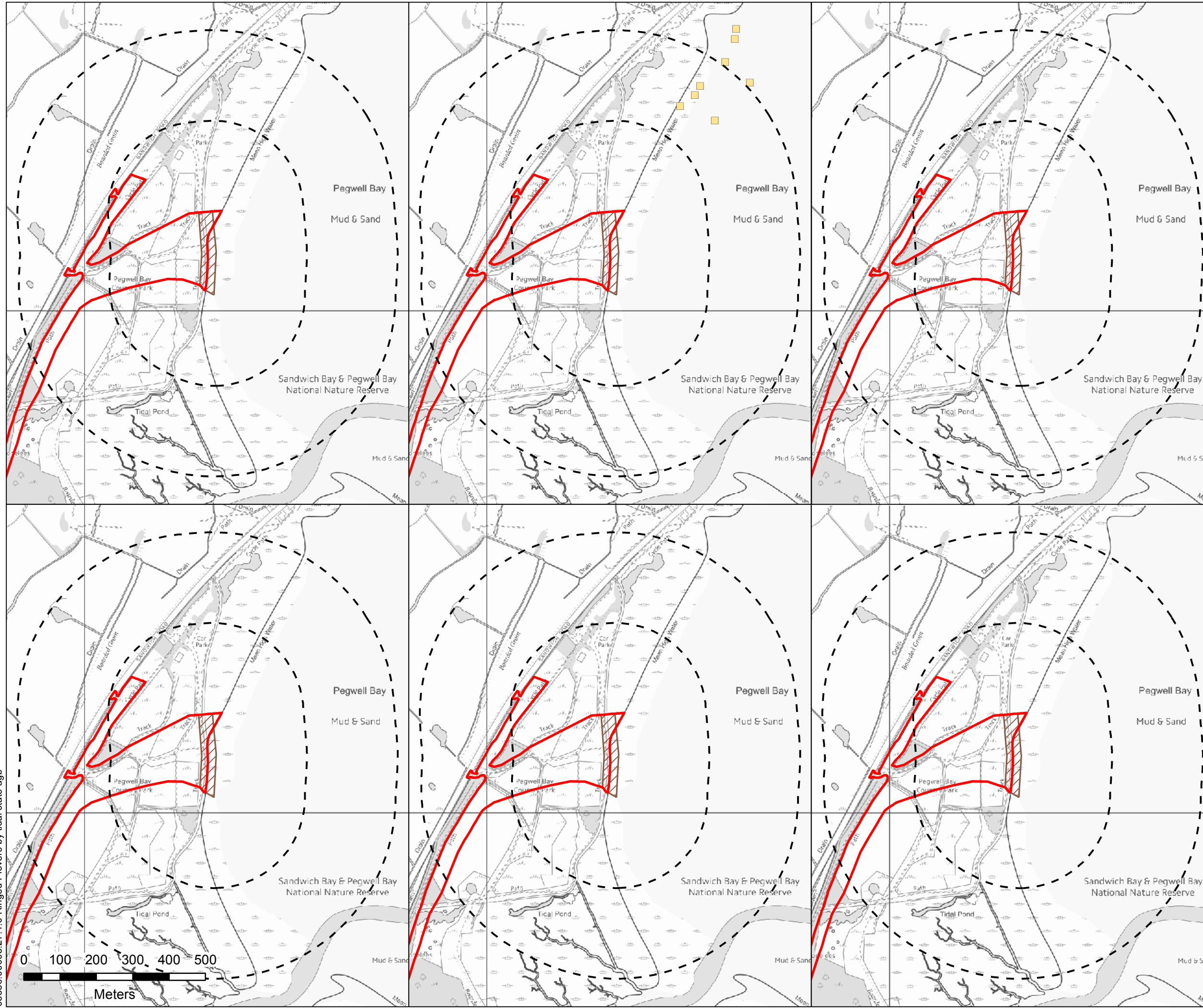
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THANET EXTENSION OFFSHORE WIND FARM
 INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS
 DISTRIBUTION OF GREY PLOVER BY TIDAL STATE (NOV 2016 – MARCH 2017 COMBINED)

3

Scale 1:10,000 @ A3 Date APRIL 2018

05356.00003.27.3.0 Grey Plover by tidal state



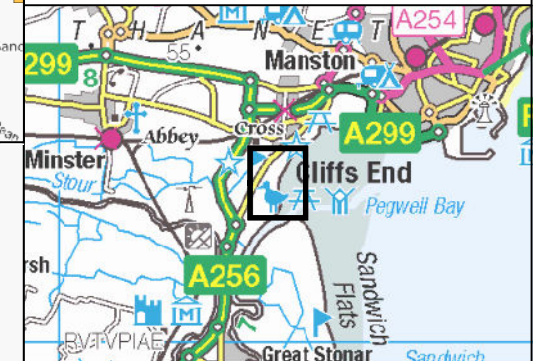
NOTES
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LEGEND

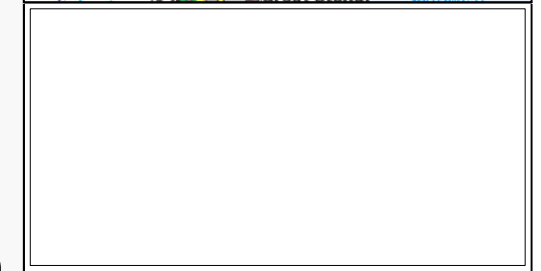
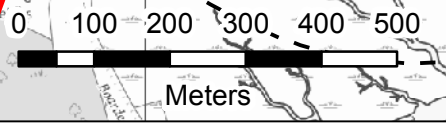
- ONSHORE SITE BOUNDARY
- POTENTIAL ZONE OF SEA WALL COFFERDAM
- POTENTIAL ZONE OF SEA WALL COFFERDAM 250m and 500m OFFSET BOUNDARY

RINGED PLOVER BY ADMIRALTY CHART DATUM (ACD)

- 0-1m ACD
- 1-2m ACD
- 2-3m ACD
- 3-4m ACD
- 4-5m ACD
- 5-6m ACD



05356.00003.27.4.0 Ringed Plovers by tidal state agb



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THANET EXTENSION OFFSHORE WIND FARM
 INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS
DISTRIBUTION OF RINGED PLOVER BY TIDAL STATE (NOV 2016 – MARCH 2017 COMBINED)
4
 Scale 1:10,000 @ A3 Date APRIL 2018

634200

634300

634400





634500



NOTES

1. TIDAL HEIGHTS AVERAGED FROM BRITISH OCEANOGRAPHIC DATA CENTRE (BODC) FOR DOVER TIDE GAUGE (PLUS HALF AN HOUR). ADMIRALTY CHART DATUM (ACD) = ORDNANCE DATUM NEWLYN (ODN) - 3.67M

LEGEND

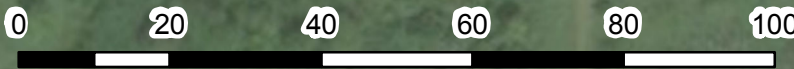
-  ONSHORE SITE BOUNDARY
-  INDICATIVE ROCK ARMOUR REPLACEMENT AREA
-  POTENTIAL ZONE OF SEA WALL COFFERDAM
-  EUROPEAN GOLDEN PLOVER AT 5 - 6m ACD

Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

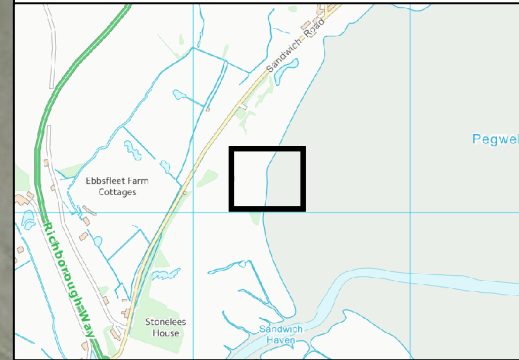
163200

163100

05356.0000327.5.0 Distribution of GP at 5 to 6m ACD



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THANET EXTENSION OFFSHORE WIND FARM

INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS






DISTRIBUTION OF EUROPEAN GOLDEN PLOVER AT 5-6M ACD IN NOVEMBER 2016, SHOWING INDICATIVE EXTENT OF PROPOSED SEAWALL EXTENSION

5

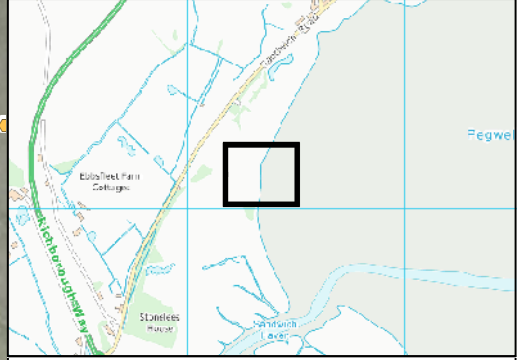
Scale	1:1,000 @ A3	Date	APRIL 2018
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NOTES
 1. TIDAL HEIGHTS AVERAGED FROM BRITISH OCEANOGRAPHIC DATA CENTRE (BODC) FOR DOVER TIDE GAUGE (PLUS HALF AN HOUR). ADMIRALTY CHART DATUM (ACD) = ORDNANCE DATUM NEWLYN (ODN) - 3.67M

- LEGEND**
-  ONSHORE SITE BOUNDARY
 -  INDICATIVE ROCK ARMOUR REPLACEMENT AREA
 -  POTENTIAL ZONE OF SEA WALL COFFERDAM
 -  LAPWING AT 2 - 3m ACD
 -  LAPWING AT 3 - 4m ACD

Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



05356.00003.27.6.0 Distribution of LP at 2 to 4m ACD agb



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THANET EXTENSION OFFSHORE WIND FARM

INTERTIDAL WATERFOWL DATA ANALYSIS IN RELATION TO ONSHORE WORKS

DISTRIBUTION OF LAPWING AT 2-3M & 3-4M ACD IN NOVEMBER 2016, SHOWING INDICATIVE EXTENT OF PROPOSED SEAWALL EXTENSION

6

Scale 1:1,000 @ A3 Date MAY 2018

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