



Thurrock Flexible Generation Plant

**Environmental Statement Volume 6
Appendix 9.4: Foreshore Wintering Bird Surveys 2019-2020**

Date: April-November 2020

Environmental Impact Assessment
Environmental Statement

Volume 6
Appendix 9.4

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Table of Contents

1. Introduction.....	3
1.1 Background.....	3
2. Methods.....	5
2.1 Survey methods.....	5
2.2 Definitions.....	6
2.3 Assessment criteria.....	6
3. Results.....	9
4. Evaluation.....	20
4.1 Species of conservation interest.....	20
5. Initial assessment of potential impacts on wintering bird species.....	23
5.1 Species excluded from further analysis.....	23
5.2 Species included for further analysis.....	23
6. Conclusions.....	42
7. References.....	45

List of Tables

Table 2.1: Intertidal waterbird survey dates, tide times and observers.....	5
Table 3.1: Conservation status and peak counts of wintering bird species.....	10
Table 3.2: Summary of wintering bird survey results (September – October).	15
Table 3.3: Summary of wintering bird survey results (November – December).	16
Table 3.4: Summary of wintering bird survey results (January – February).	17
Table 3.5: Summary of wintering bird survey results (March).	18
Table 4.1: Wintering bird species of conservation interest.....	21
Table 5.1: Thames Estuary & Marshes Qualifying Species.....	26
Table 5.2: Summary of waterbird counts (whole survey area).....	27
Table 5.3: Maximum waterbird counts (Area 1a+1b+1c).....	29
Table 5.4: Redshank distribution.....	37

List of Figures

Figure 1.1: Thurrock Flexible Generation Plant development zones.....	4
Figure 2.1: Winter bird survey compartments.....	8
Figure 5.1: Avocet distribution.....	32
Figure 5.2: Curlew distribution.....	34
Figure 5.3: Dunlin distribution.....	36
Figure 5.4: Ringed plover distribution.....	39
Figure 5.5: Teal distribution.....	41

Summary

This appendix reports the survey methods, results, evaluation of intertidal wintering bird populations surveyed in Zone G and adjacent intertidal habitat, and initial impact assessment, for surveys undertaken between September 2019 and March 2020 inclusive.

Qualifications

This document has been prepared by Matthew Fasham, a Chartered Environmentalist and full Member of the Chartered Institute of Ecology and Environmental Management, who has fifteen years' experience of environmental impact assessment.

It has been checked by Mike Barker, BSc, MSc, a Chartered Environmentalist and Fellow of the Chartered Institute of Ecology and Environmental Management Director of Ecology at RPS who has 25 years' experience of environmental impact assessment.

1. Introduction

1.1 Background

- 1.1.1 Volume 3, Chapter 9: Onshore Ecology of the Environmental Statement (ES) for the Thurrock Flexible Generation Plant, and the Habitats Regulations Assessment Report (HRAR, application document A5.2), produced in 2019 and submitted in March 2020, assessed impacts on wintering birds using the foreshore in the vicinity of Zone G (see Figure 1.1 overleaf).
- 1.1.2 It is proposed to construct a causeway in the intertidal area of Zone G to deliver the gas engines to the main construction site in Zone A by barge. Due to the evolution of the project, and the timing of the addition of the causeway to the scheme, wintering bird surveys of the foreshore in the winter of 2018-2019 were not undertaken because at that time, the causeway option was not part of the proposed scheme.
- 1.1.3 Instead, analysis of the potential impact on wintering birds was undertaken using a review of previous surveys undertaken by RWE (2017-2018) and Bioscan (2016-2017), and also drew on the analysis and documentation submitted by Tilbury2 as part of the Examination for that project (see Volume 6, Appendix 9.1: Ecological desk study and surveys).
- 1.1.4 The RWE wintering bird survey report is included in Volume 6, Appendix 2: Third Party Surveys, and an overall summary and review of available data was conducted by Bioscan on behalf of Tilbury2 (Bioscan, 2018).
- 1.1.5 This review concluded that multiple surveys indicated sporadic to occasional use by low numbers of SPA species between London International Cruise Terminal and Coalhouse Point, with numbers generally lower at the west end of the survey area closest to the proposed causeway.
- 1.1.6 It was therefore concluded that the foreshore in the vicinity of Zone G was not used to any significant extent by significant numbers of wintering birds associated with the Thames Estuary & Marshes Special Protection Area (SPA) / Ramsar site.
- 1.1.7 This conclusion was accepted in the formal HRAR produced for Tilbury2.
- 1.1.8 However, the Thurrock Flexible Generation Plant project team took the decision to undertake a further round of surveys between September 2019 and March 2020 to ensure that a robust and up-to-date dataset of winter bird foreshore surveys was available, and to validate the conclusions of the analyses of previous survey data.

- 1.1.9 This Appendix presents the methods, results and initial evaluation of those surveys, and identifies species requiring further assessment in the HRAR.

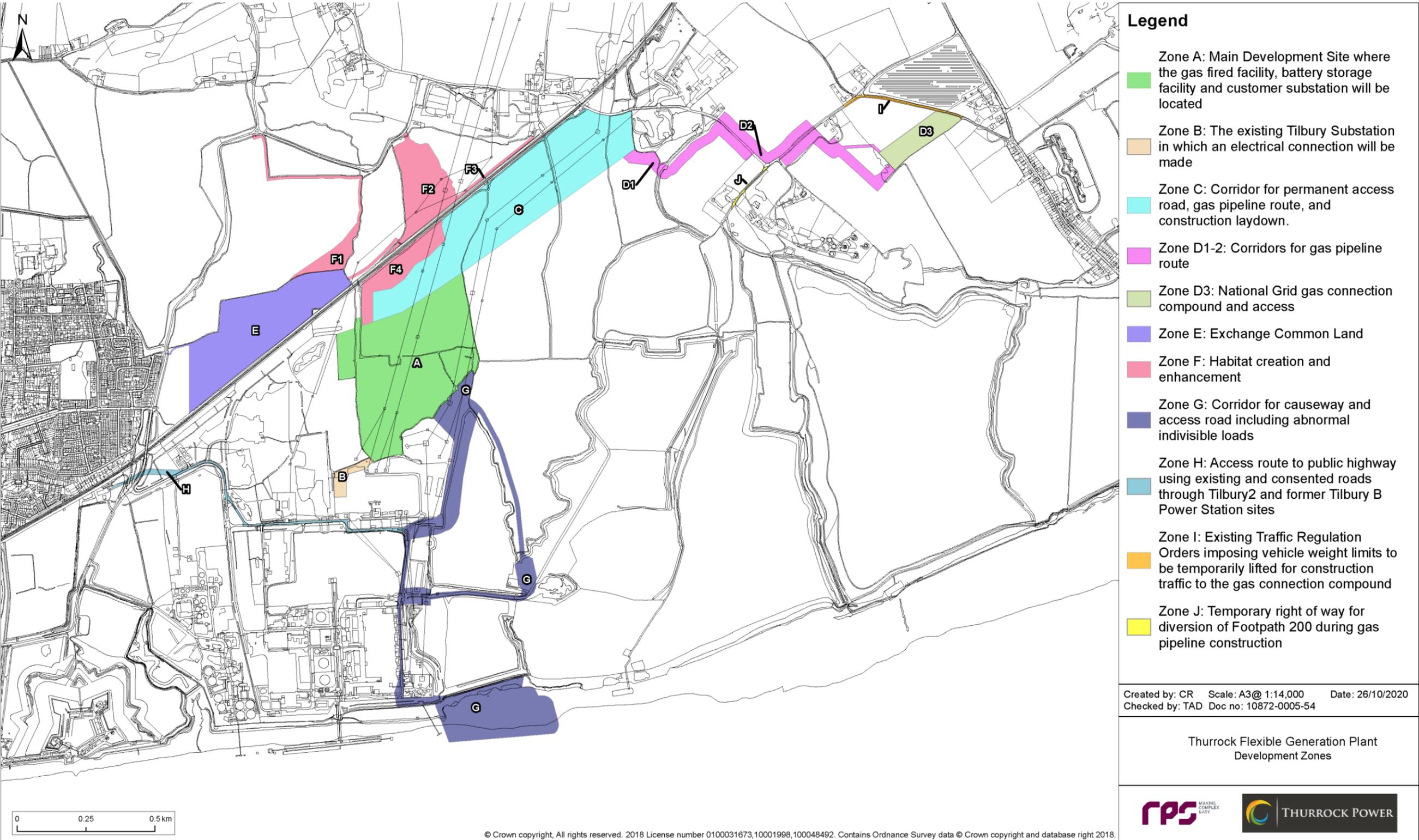


Figure 1.14-4: Thurrock Flexible Generation Plant development zones.

2. Methods

2.1 Survey methods

- 2.1.1 The aim of the intertidal survey was to undertake one survey at low tide and one survey at high tide each month. Each survey covered a six hour period (three hours either side of high/low tide).
- 2.1.2 For the purposes of the analysis, the tidal cycle is divided into two periods. The term 'low tide' is used to indicate the period three hours either side of low tide, 'high tide' the period three hours either side of high tide.
- 2.1.3 A total of 14 survey visits were undertaken between September 2019 and March 2020 to cover autumn passage and the winter period. The survey dates and tide details are tabulated in Table 2.1.

Table 2.12.4: Intertidal waterbird survey dates, tide times and observers

Date	Time of low tide	Tide Height (m)	Time of high tide	Tide Height (m)
17/09/19	09:55	0.9		
26/09/19			11:44	5.8
02/10/19	10:40	0.7		
09/10/19			10:46	5.3
19/11/19	11:15	1.1		
26/11/19			12:25	6.6
03/12/19	10:57	1.2		
12/12/19			12:55	6.4
09/01/20			11:48	6.1
16/01/20	11:18	0.4		
07/02/20			11:24	6.0
14/02/20	10:59	0.2		
09/03/20			12:50	6.7
16/03/20	11:36	0.9		

2.1.4 Observations during the survey were made from the sea wall and public footpath starting at the main jetty for old Tilbury Power Station and ending west of the old East Tilbury Radar Tower. The public footpath in general provided a suitable vantage point to observe all birds without causing undue disturbance. An experienced ornithologist, equipped with binoculars and telescope of appropriate magnification, walked slowly along the entire survey area on an hourly basis. The observer retraced their route of the first count during the second count, the procedure thereafter repeated for the remaining counts of the survey. As the site was a linear area with good visibility, birds could be observed from distance to avoid disturbance and minimise risk of double-counting.

2.1.5 The location and extent of flocks and individual waterbirds were recorded directly into ESRI Arcpad GIS Software on handheld PDA devices, with a 1:10,000 scale Ordnance Survey base map with the proposed development application boundary included. The distance from the recorder to birds was assessed through the use of landmarks present in the landscape and on the base map, which could be scaled as desired in the field. Birds were either plotted as individual counts at a location or as a flock, the extent of which could be plotted electronically directly onto the base map on the hand-held PDAs. The observers were proficient in the use of this method and equipment having undertaken such surveys on numerous occasions previously across the UK at coastal, estuarine and inland wetland sites. This is considered to be a robust and reliable method for recording birds and plotting their distribution.

2.1.6 The collected data, contained on flash memory cards, were then downloaded into ESRI ArcGIS software and distribution maps produced.

2.1.7 In addition to the waterbirds recorded along the intertidal areas, any observations of high tide wader roosts or raptors on the surrounding terrestrial areas were also recorded.

2.1.8 For the purposes of analysis, the survey area was divided up into three Areas, each of which was divided into three subzones (Figure 2.1). The Areas were defined as:

- Area 1: Works area plus a 500m buffer (considered to be the zone within which impacts from construction or use of the causeway on birds is most likely to occur)
- Areas 2 and 3: Equal-sized subsections of the remaining survey area east of Zone 1.

2.1.9 The subzones were defined as follows:

- Subzone a: subtidal (below Mean Low Water)

- Subzone b: intertidal (between MLW and the sea wall / coast path)
- Subzone c: Terrestrial (landside of sea wall / coast path).

2.1.10 This gives a total of nine areas within which birds were counted. (In practice, the results use 8 zones as no birds were recorded in Zone 3c.)

~~2.1.7~~

2.2 Definitions

- 2.2.1 The definition of waterbirds used in this study is in accordance with the Ramsar convention upon which the SPA citation was based, i.e. "birds ecologically dependent on wetlands".
- 2.2.2 For the purposes of analysis of intertidal birds over winter, spring and autumn the term 'spring' is used to indicate the period March to May; 'autumn' to indicate the period of August to October and 'winter' November-February. Within this assessment, data has been collected between September 2019 and March 2020. The period of time between June and July is considered of low activity and usually left out when assessing activity on intertidal areas.

2.3 Assessment criteria

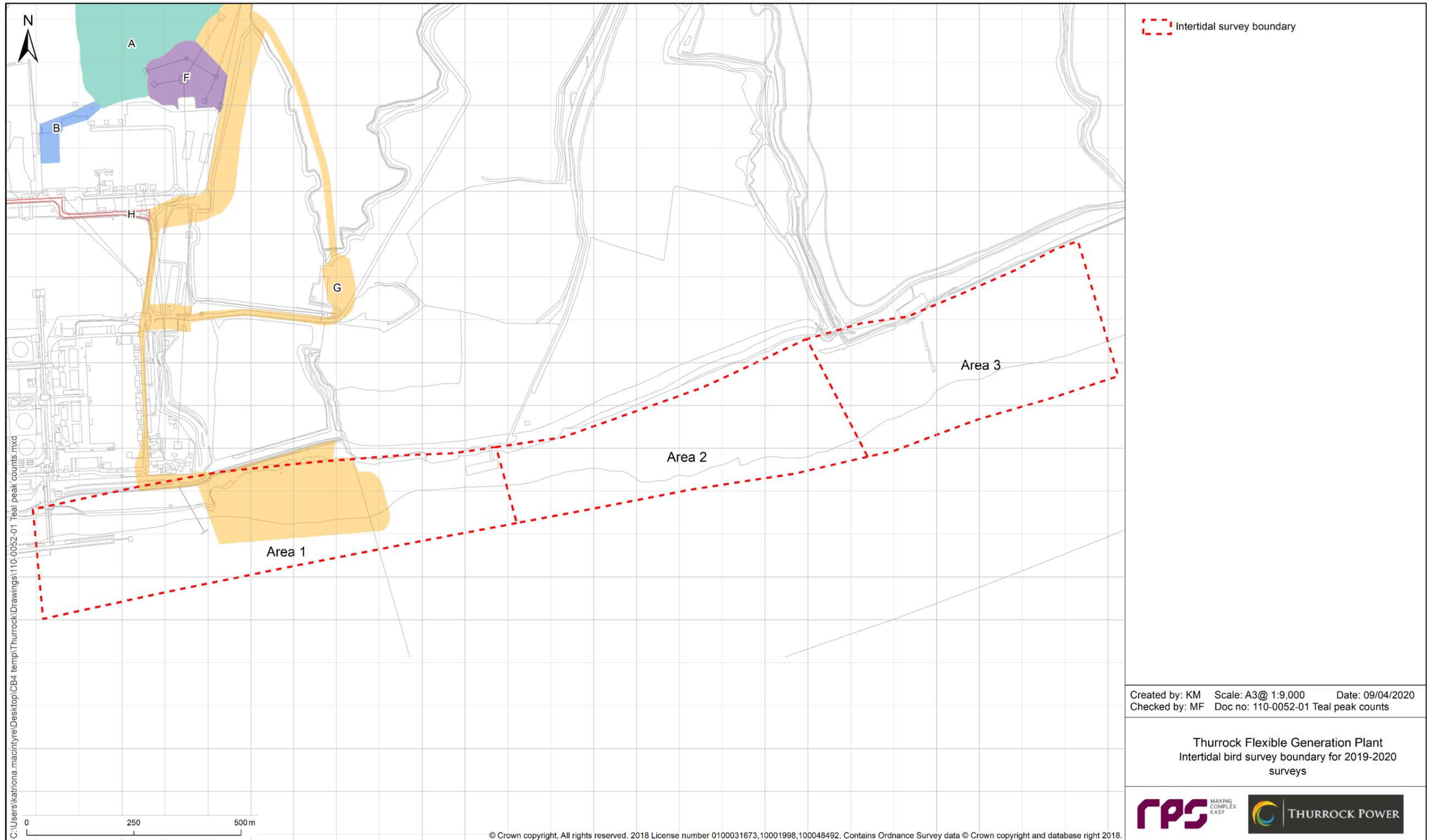
- 2.3.1 The assessment of the wintering bird community includes a focus on species that are afforded special statutory protection or those included on one, or more, of the lists of species of conservation interest. These include:
- Species listed on Annex 1 of the EC Birds Directive (Directive 2009/147/EC);
 - Species included in the Birds of Conservation Concern (BoCC) Red and Amber Lists (Eaton *et al* 2015), and priority species within the UK Biodiversity Action Plan (UKBAP) (Anon, 2008) or Essex Local BAP species (EBAP, 2011); and
 - Those occurring in nationally, regionally or locally important numbers.
 - Annex 1 species are those for which the UK Government are required to take special measures, including the designation of Special Protection Areas, to ensure the survival and reproduction of these species throughout their area of distribution.
 - Species which are qualifying features of the Thames Estuary & Marshes SPA/Ramsar site.

- 2.3.2 The NERC list of Species of Principal Importance is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006; under section 40 every public authority (e.g. a local authority or local planning authority) must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. In addition, with regard to those species on the list of Species of Principal Importance prepared under section 41, the Secretary of State must:

"(a) take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section", or

"(b) promote the taking by others of such steps."

- 2.3.3 Species listed on the BoCC Red List are those that have declined in numbers by 50% over the last 25 years, those that have shown an historical population decline between 1800 and 1995 and species that are of global conservation concern. The 67 species on the Red List are of the most urgent conservation concern.
- 2.3.4 Species listed on the BoCC Amber List, of which there are currently 96, include those that have shown a moderate decline in numbers (25%-49%) over the last 25 years and those with total populations of less than 300 breeding pairs. Also included are those species which represent a significant proportion (greater than 20%) of the European breeding or wintering population, those for which at least 50% of the British population is limited to 10 sites or less, and those of unfavourable conservation status in Europe.
- 2.3.5 The remaining species are placed on the Green List, indicating that they are of low conservation priority. These species still receive full protection through the provisions of the Wildlife and Countryside Act 1981, as amended.
- 2.3.6 The UKBAP was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority species of conservation concern were published and have subsequently been amended and updated. Species listed as priority bird species on the Essex local BAP are also included as evaluation criteria.



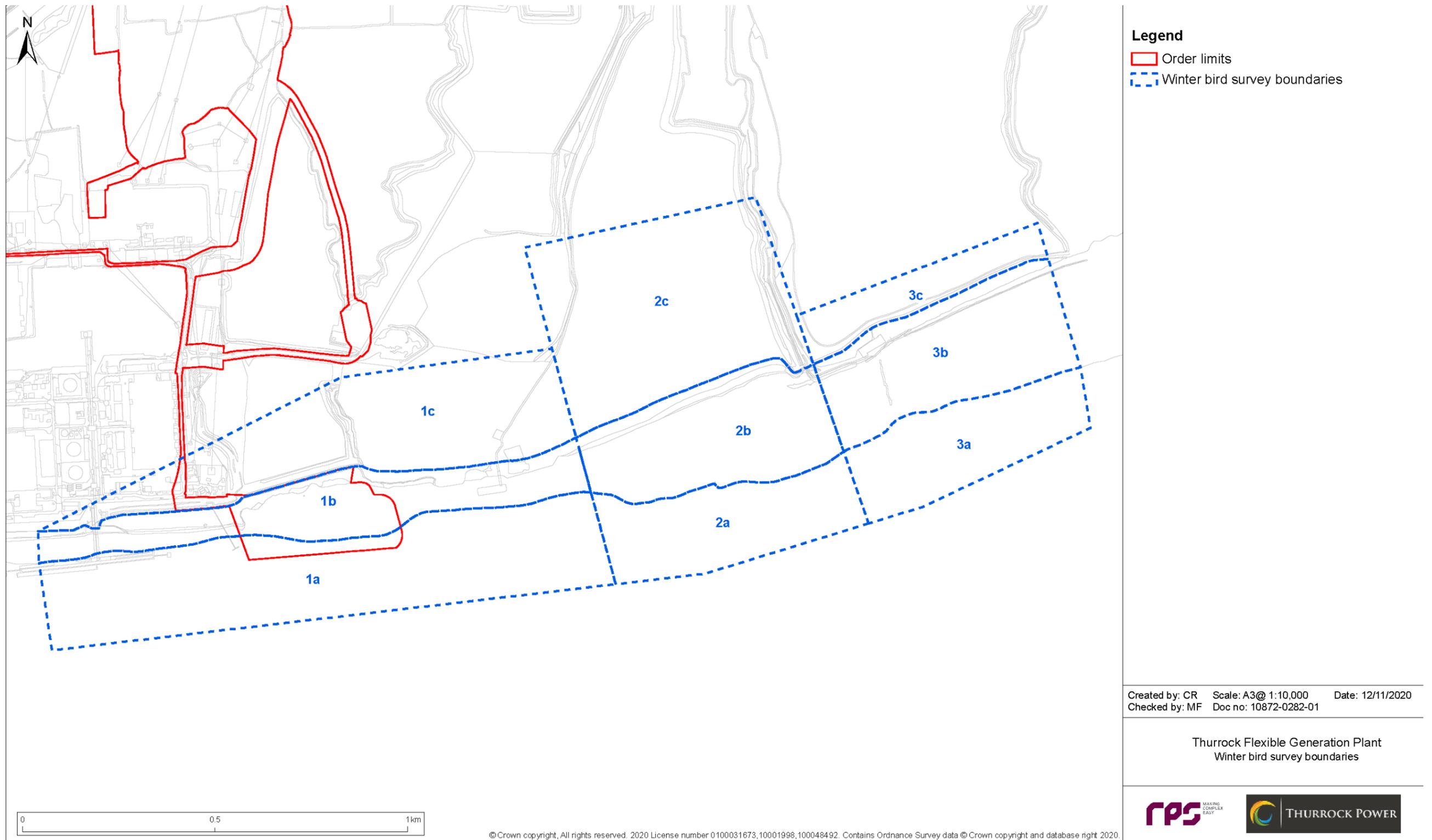


Figure 2.2.14: Winter bird survey compartments.

3. Results

A total of 29 bird species were recorded during the surveys. The peak count across the whole survey period for each species in each of the ~~three~~ survey areas and peak counts across the combined survey area is provided in

- 3.1.1 Table 3.1, along with the conservation status of each species (as defined in Section 2.3) and an assessment of the county status of each species.
- 3.1.2 A summary of the results from the surveys, giving peak counts recorded on each survey visit in each of the ~~three-eight~~ survey areas is provided in Table 3.2 (September – October), Table 3.3 (November-December), Table 3.4 (January – February) and Table 3.5 (March).

Table 3.13.4: Conservation status and peak counts of wintering bird species

Species	Peak count September – March									Conservation Status	County Status
	1a	1b	1c	2a	2b	2c	3a	3c	Whole survey area		
Avocet		49			11			15	49	Qualifying species for Thames Estuary & Marshes SPA/Ramsar Sch1, BoCC Amber.	Increasing summer visitor, passage migrant and winter visitor.
Bar-tailed Godwit					12			12	14	BoCC Amber	Common passage migrant and winter visitor.
Black-headed Gull	150	240	22	150	372		31	360	903	BoCC Amber	Abundant resident and passage migrant.
Black-tailed Godwit		2			12			340	340	Qualifying species for Thames Estuary & Marshes SPA/Ramsar, Sch1, NERC SPI, BoCC Red, UK BAP	Much increased passage migrant and winter visitor.
Canada Goose					48				48		Common resident, winter visitor and passage migrant.
Common Gull	3	6		3	12				12		An introduced resident with a stable breeding population.
Common Sandpiper		1							1	BoCC Amber	Common passage migrant and winter visitor.
Cormorant	2	2	1		3			2	3	BoCC Amber	Common passage migrant. A few winter.
Curlew		27	2	1	21		1	5	29	NERC SPI, BoCC Red, UK BAP	Common passage migrant and winter visitor.
Dunlin		124	1		113			250	250	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Amber,	Very common passage migrant and winter visitor.
Gadwall	11	11			2			3	16	Annex 1	Rapidly increasing visitor at all seasons. First bred 2000.
Great Black-backed Gull	7			1	5		4	7	9	BoCC Amber	Slowly increasing winter visitor and passage migrant. Stable breeding population.
Green Sandpiper			1						1	BoCC Amber	Winter visitor and passage migrant. Small non-breeding population in summer
Grey Heron		1			1			1	2	Sch1, BoCC Amber	Common passage migrant and much increased winter visitor.
Grey Plover					2			3	4	BoCC Amber	Common winter visitor and passage migrant.
Herring Gull	1	19		30	101		10	27	135		Common resident, winter visitor and passage migrant.
Kingfisher		1							1	NERC SPI, BoCC Red, UK BAP	Common winter visitor and passage migrant. Breeds in small numbers.

Species	Peak count September – March									Conservation Status	County Status
	1a	1b	1c	2a	2b	2c	3a	3c	Whole survey area		
Lapwing					6			9	9	Annex 1, Sch1, BoCC Amber	Resident and passage migrant.
Lesser Black-backed Gull		2		1	11		4	6	17	NERC SPI, BoCC Red, UK BAP	Declining breeding population. Numerous passage migrant and winter visitor.
Little Egret		2			1			1	2	BoCC Amber	Common passage migrant. Present all year. Breeds in small numbers, but increasing.
Mallard	58	60			6			4	60	BoCC Amber	Common and widespread resident, winter visitor and passage migrant.
Oystercatcher		6			6			12	16	BoCC Amber	Resident, passage migrant and winter visitor.
Redshank		5			10			28	38	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Amber	Resident, passage migrant and winter visitor.
Ringed Plover		65	25		54	17			65	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Red	Resident, passage migrant and winter visitor.
Shelduck	1	8		0	26		2	25	37	BoCC Amber	Locally common breeding species, numbers greatly augmented in winter.
Teal	35	33			167		40	477	480	BoCC Amber	Common winter visitor and passage migrant. Very scarce breeding species.
Turnstone								1	1	BoCC Amber	Passage migrant and winter visitor.
Wigeon		6		7	24		13	31	32	BoCC Amber	Common often abundant, winter visitor and passage migrant. Erratic breeder.
Yellow-legged Gull	1	3			3		12	3	12	BoCC Amber	Late summer visitor to the Thames. Scarce elsewhere and at other times.

Species	Peak count September – March				Conservation Status	County Status
	Area-1	Area-2	Area-3	Whole survey area		
Avocet	44	5	15	44	Qualifying species for Thames Estuary & Marshes SPA/Ramsar Sch1, BoCC Amber,	Increasing summer visitor, passage migrant and winter visitor.
Bar-tailed Godwit	0	10	11	21	BoCC Amber	Common passage migrant and winter visitor.
Black-headed Gull	196	250	260	630	BoCC Amber	Abundant resident and passage migrant.
Black-tailed Godwit	2	12	333	333	Qualifying species for Thames Estuary & Marshes SPA/Ramsar, Sch1, NERC SPI, BoCC Red, UK BAP	Much increased passage migrant and winter visitor.
Cormorant	2	4	3	3		Common resident, winter visitor and passage migrant.
Canada Goose	0	48	0	48		An introduced resident with a stable breeding population.
Common Gull	4	10	4	14	BoCC Amber	Common passage migrant and winter visitor.
Common Sandpiper	4	0	0	4	BoCC Amber	Common passage migrant. A few winter.
Curlew	27	19	3	34	NERC SPI, BoCC Red, UK BAP	Common passage migrant and winter visitor.
Dunlin	124	44	250	255	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Amber,	Very common passage migrant and winter visitor.
Little Egret	4	4	4	2	Annex 1	Rapidly increasing visitor at all seasons. First bred 2000.

Species	Peak count September – March				Conservation Status	County Status
	Area 1	Area 2	Area 3	Whole survey area		
Gadwall	9	2	3	14	BoCC Amber	Slowly increasing winter visitor and passage migrant. Stable breeding population.
Great Black-backed Gull	1	7	7	14	BoCC Amber	Winter visitor and passage migrant. Small non-breeding population in summer.
Green Sandpiper	1	1	0	1	Sch1, BoCC Amber	Common passage migrant and much increased winter visitor.
Grey Plover	0	2	3	4	BoCC Amber	Common winter visitor and passage migrant.
Grey Heron	1	1	1	3		Common resident, winter visitor and passage migrant.
Herring Gull	16	50	14	71	NERC SPI, BoCC Red, UK BAP	Common winter visitor and passage migrant. Breeds in small numbers.
Kingfisher	1	0	0	1	Annex 1, Sch1, BoCC Amber	Resident and passage migrant.
Lapwing	0	6	9	12	NERC SPI, BoCC Red, UK BAP	Declining breeding population. Numerous passage migrant and winter visitor.
Lesser Black-backed Gull	2	7	4	10	BoCC Amber	Common passage migrant. Present all year. Breeds in small numbers, but increasing.
Mallard	60	6	3	64	BoCC Amber	Common and widespread resident, winter visitor and passage migrant.
Oystercatcher	2	3	5	9	BoCC Amber	Resident, passage migrant and winter visitor.

Species	Peak count September – March				Conservation Status	County Status
	Area-1	Area-2	Area-3	Whole survey area		
Redshank	3	4	20	26	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Amber	Resident, passage migrant and winter visitor.
Ringed Plover	23	25	0	48	Qualifying species for Thames Estuary & Marshes SPA/Ramsar BoCC Red	Resident, passage migrant and winter visitor.
Shelduck	4	17	15	32	BoCC Amber	Locally common breeding species, numbers greatly augmented in winter.
Teal	46	145	350	433	BoCC Amber	Common winter visitor and passage migrant. Very scarce breeding species.
Turnstone	0	0	1	1	BoCC Amber	Passage migrant and winter visitor.
Wigeon	0	16	24	34	BoCC Amber	Common often abundant, winter visitor and passage migrant. Erratic breeder.
Yellow-legged Gull	3	2	12	12	BoCC Amber	Late summer visitor to the Thames. Scarce elsewhere and at other times.

Table 3.23.2: Summary of wintering bird survey results (September – October).

Species	Maximum count by survey section																															
	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b
Avocet																1																
Bar-tailed Godwit																					1				2							
Black-headed Gull	13	240		150	249			360	27	154	22			9		4	47	147		9	159			81	63	98			1		3	
Black-tailed Godwit		2			2			1																5								
Canada Goose					48																											
Common Gull																		1				4										
Common Sandpiper										1																						
Cormorant					2			2									1												2			
Curlew		2			2			4		22	2			1		2		19			7			3			27		1		3	
Dunlin					65					10				10													7		7			
Gadwall																																
Great Black-backed Gull				1	5																			1								
Green Sandpiper																																
Grey Heron																																
Grey Plover																																
Herring Gull		1		30	23			10	14		1			1			9			12	101		3	27								
Kingfisher																																
Lapwing																																
Lesser Black-backed Gull					11			6									2		1	4			2									
Little Egret		1			1			1										1			1			1								
Mallard	58	60						1		15							32	13			3				4	24						
Oystercatcher																																
Redshank								1																1								
Ringed Plover					12					65				54							1					6			23			
Shelduck																																
Teal																																
Turnstone																																
Wigeon																																
Yellow-legged Gull		2														1		3			3			3	1							

Table 3.3: Summary of wintering bird survey results (November – December).

Species	Maximum count by survey section																																	
	19/11/29						26/11/19						03/12/19						12/12/19															
	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b		
Avocet		23						2		44								49		2								16						
Bar-tailed Godwit					12			8												10					12									
Black-headed Gull		85			372		1	220	12	21			6				3	44		2	162		30	133			100							
Black-tailed Godwit		1			4			9																	3					12				
Canada Goose																																		
Common Gull	1				2												1	2			3													
Common Sandpiper																																		
Cormorant	1				1			1		1							1										1				1			
Curlew		17			21			5		7						1		13			21		1	5			2			1				
Dunlin					113			250																	90			124						
Gadwall																											11	1						
Great Black-backed Gull	1			1	2				1												1				1									
Green Sandpiper			1																															
Grey Heron		1			1			1										1			1				1									
Grey Plover					2			3																	3									
Herring Gull		5			14			4										19		2	28				5									
Kingfisher		1																																
Lapwing					6			6																		9								
Lesser Black-backed Gull					1																													
Little Egret		2			1					1											1													
Mallard	3	25			6			4	5	21								35			4			3	16	12								
Oystercatcher																																		
Redshank		3			6			28										5			10			26		3			4					
Ringed Plover																					6													
Shelduck					26			25					1												12									
Teal	5	4			84			229		4			19		19			15			99			477	5	5			89				4	
Turnstone																									1									
Wigeon					10			31					8		10			6			3			23										
Yellow-legged Gull										1											1													

Table 3.4: Summary of wintering bird survey results (January – February).

Species	Maximum count by survey section																																			
	09/01/20						16/01/20						07/02/20						14/02/20																	
	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b				
Avocet		13								9								7			1								12		11			3		
Bar-tailed Godwit																																				
Black-headed Gull		150			3				150	167		15	361		30	253	34	119			1					9	100		0	127		20	266			
Black-tailed Godwit																																				
Canada Goose																																				
Common Gull								3			3	7					1									6			12							
Common Sandpiper																																				
Cormorant					3				2								1													1						
Curlew					1					2		1	6			5		1			2						1			10				4		
Dunlin																										1	1		1							
Gadwall		10															4	11			2				3											
Great Black-backed Gull									7				5			7														1		4	1			
Green Sandpiper																			1																	
Grey Heron										1																										
Grey Plover																																				
Herring Gull		2							1			2	4			4		1												2		1	3			
Kingfisher																																				
Lapwing																																				
Lesser Black-backed Gull																																1		2	2	
Little Egret		1																																		
Mallard		40			2				12	11							20	40			5						4			1						
Oystercatcher													2					4			1						3			3					6	
Redshank																1																				
Ringed Plover																						18					24	25		25						
Shelduck					2					8			12			4	1	4		0	14		2	2		2			17					25		
Teal	6	25			95				250	30	28		3			439	35	33			167			279	2	11			5					295		
Turnstone																																				
Wigeon																13	17				24			16				7	6						6	
Yellow-legged Gull																																1		12	0	

Table 3.5. Summary of wintering bird survey results (March).

Species	Maximum count by survey section															
	09/03/20						16/03/20									
	1a	1b	1c	2a	2b	2c	3a	3b	1a	1b	1c	2a	2b	2c	3a	3b
Avocet		6						15		23						
Bar-tailed Godwit								1								
Black-headed Gull	16	202		15	181		31	97	13	126			18			
Black-tailed Godwit								340								
Canada Goose																
Common Gull	1				1											
Common Sandpiper																
Cormorant	1								1							1
Curlew				1			1	1								
Dunlin																
Gadwall																
Great Black-backed Gull																
Green Sandpiper																
Grey Heron																
Grey Plover																
Herring Gull					10			6								
Kingfisher																
Lapwing																
Lesser Black-backed Gull					2		4									
Little Egret																
Mallard					2			2		3						
Oystercatcher		6			6			12		6			3			
Redshank													3			
Ringed Plover		2			4						19		2	17		
Shelduck					4			11								
Teal		15			22		40	106	10	20			23			2
Turnstone																
Wigeon							11	30					12			1
Yellow-legged Gull																

Species	Maximum count by survey section																																										
	17/09/2019			26/09/2019			02/10/2019			09/10/2019			19/11/2019			26/11/2019			03/12/2019			12/12/2019			09/01/2020			16/01/2020			07/02/2020			14/02/2020			09/03/2020			16/03/2020			
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Avocet						1								22		2	44			42	2		14			7			9			3	1		7	5	3	6		15	21		
Bar-tailed Godwit								1	2					8	7					40	11																			4			
Black-headed Gull	150	220	260	12	9	3	80	74	60	120	1	2	16	250	200	21	5		25	150	80	78			85	3		125	250	250	116	1		85	75	250	196	140	60	99	18		
Black-tailed Godwit	2		2						5				1	2	7					3		12																			333		
Cormorant		1	1				1			2			1	1	1	1			1			1	1			3	2				1			1			1			1		1	
Canada Goose		48																																									
Common Gull							1	4	1				2						3								4		1						10	1	1	1	1				
Common Sandpiper				1																																							
Curlew	2	1	2	2	1	2	14	5	2	27	1	3	17	12	1	6		1	11	19	1	2	1		1	2	4	2	1	2		1	4	2				1					
Dunlin		41			10						7		5	250						90	124													1	1								
Little Egret		1	1					1	1				1	1		1				1				1																			
Gadwall																						7			6					9	2	3											
Great Black-backed gull		5							1				1	2		1			1	1							7	7						1	4								
Green Sandpiper													1																	1													
Grey Plover														2	2						3																						
Grey Heron													1	1	1				1	1	1					1	1																
Herring Gull	1	30	14	1	1	1	9	50	12					7	4				16	30	4				2			2	4	1					2	2		10	4				
Kingfisher													1																														
Lapwing														6	6						9																						
Lesser Black-backed gull		7	3				2	3	2					1																							1	2		1	4		
Mallard	60		1	5			22	3		24			25	6	2	21			33	4	3	10	4		30	2		13			32	4		4	1			2	2	3			
Oystercatcher																												2		2	1		2	2	4	2	2	5	2	3			
Redshank			1						1				2	3	17				3	3	20	2	4					1														3	
Ringed Plover		12			2			1			23								6											18		23	25				4			18	17		
Shelduck													6	15		1					12			2		4	12	4	3	10	2	2	17	13		2	8						
Teal													4	60	136	3	19	19	14	40	350	5	52	4	16	95	250	46		240	38	145	250	11	3	201	8	16	70	20	23	2	
Turnstone																				1																							
Wigeon													10	24		8	10		6	23							20		16	10		7	6					18				13	
Yellow-legged Gull	1					1	3	2	2	1						1				1																							12

4. Evaluation

4.1 Species of conservation interest

4.1.1 Twenty-six of the 29 species recorded during the survey qualify as being of 'conservation interest' by meeting one, or more, of the criteria listed under Section 2.3.

Specially protected species

4.1.2 Two species afforded special protection due to their inclusion on Annex 1 of the EU Birds Directive were recorded during the survey: Little Egret and Kingfisher.

4.1.3 Four of the species are protected under the Wildlife and Countryside Act 1981, namely Avocet, Black-tailed Godwit, Green Sandpiper and Kingfisher.

Species of principal importance

4.1.4 Four species recorded as wintering within the survey area, Black-tailed Godwit, Curlew, Herring Gull and Lapwing, are listed in Section 41 of the NERC Act 2006 as being of principal importance for the conservation of biodiversity in England.

Species of Conservation Concern

4.1.5 Five species recorded during the survey are included on the BoCC Red List. The species and reasons for Red list status are given below:

- Black-tailed Godwit – moderate breeding population decline over 25 years (-35%); and is Threatened in Europe (Vulnerable).
- Curlew – moderate breeding population decline over 25 years (-49%) and severe longer term (-62%); and is Threatened in Europe (Vulnerable).
- Herring Gull – severe breeding population decline over 25 years (-60%); and severe non-breeding population decline over 25 years (-53-60%).
- Lapwing – severe breeding population decline over 25 years (-57%) and the longer term (-63%); and is Threatened in Europe (Vulnerable).
- Ringed Plover – moderate breeding decline over 25 years (-37%); and severe non-breeding decline (-52%) over the last 25 years.

4.1.6 Twenty species recorded during the survey are included on the BoCC Amber List. The species and reasons for Amber list status are given below:

- Avocet – UK non-breeding population is of international importance.
- Bar-tailed Godwit – UK non-breeding population is of international importance.

- Common Sandpiper – moderate breeding population decline over 25 years (-45%).
- Dunlin – moderate long-term non-breeding population decline over long term (-49%); and moderate breeding range decline over last 25 years (-27%).
- Gadwall – UK non-breeding population is of international importance.
- Greater Black-backed Gull – moderate breeding population long term decline (-29%); and non-breeding population decline over last 25 years (33 to -58%).
- Green Sandpiper – very rare breeding species in UK 1-3 pairs.
- Grey Plover – UK non-breeding population is of international importance.
- Lesser Black-backed Gull - UK non-breeding population is of international importance.
- Oystercatcher – UK non-breeding population is of international importance; and is Threatened in Europe (Vulnerable).
- Redshank – moderate breeding population decline over last 25 years (-44%); and non-breeding decline (-32%).
- Mallard – moderate non-breeding population decline over 25 years (-38%).
- Black-headed Gull - moderate non-breeding population decline over 25 years (-33% to -41%).
- Common Gull – UK non-breeding population is of international importance.
- Kingfisher – Threatened in Europe (Vulnerable).
- Shelduck – moderate breeding population decline; and UK non-breeding population of international importance.
- Teal – UK non-breeding population is of international importance.
- Turnstone – moderate none-breeding population decline over last 25 years.
- Wigeon – UK non-breeding population is of international importance.
- Yellow legged Gull – very rare breeding species in UK 1-4 pairs.

4.1.7 Four species are listed as a priority species in the UK Biodiversity Action Plan.

4.1.8 No species are listed as priority species in the Essex Biodiversity Action Plan.

Geographical importance

4.1.9 The following geographical frames of reference and selection criteria, based on the Guidelines for Ecological Impact Assessment in the United Kingdom (CIEEM, 2019), are used to ascribe nature conservation value or potential value to the bird populations within the survey area.

- International importance – a species which is cited as part of the designated interest of a SPA *and* occurs in internationally or nationally important numbers.
- National importance – a species which is cited as part of the designated interest of a SSSI *and* occurs in nationally important numbers.

- Regional importance – NERC Species of Principal Importance, BoCC Red List species or UK BAP Priority species that regularly occur in regionally important numbers.
- County importance – NERC Species of Principal Importance, BoCC Red List species, UK or BAP Priority Species that regularly occur in numbers that are important on a county basis.
- Local importance – NERC Species of Principal Importance, BoCC Red or Amber List species, UK or BAP Priority Species which occur regularly in locally sustainable populations.
- Site – all common and widespread species.

4.1.10 The number of birds recorded during survey is compared to the species national wintering population estimate and county status. National winter population estimates are derived from Musgrove, et al. (2013). County wintering population estimates are not available, therefore a descriptive status derived from the Essex Bird List (Essex Birdwatching Society, 2019) has been used in this evaluation. No regional (south-east England) or local population estimates are available for the species concerned to enable comparative quantification of the population at these geographic levels; as a result, professional judgment and comparisons with population estimates at higher geographical levels have been used to inform this evaluation.

4.1.11 Table 4.1 summarises the maximum counts of species of conservation interest recorded in Survey Area 1a-c (the works area and a 500m buffer within which where impacts from causeway construction and use are most likely) and across the whole survey area, the national population estimate and county status, for these species and the geographical importance of the populations within the survey area as derived from the criteria outlined above.

Table 4.14.1: Wintering bird species of conservation interest

Species	Maximum Count (areas <u>1a-c</u>)	Maximum count (whole survey area)	UK wintering population	County status	Geographical importance
Avocet Avocet	<u>4944</u>	<u>4944</u>	9,500	Increasing summer visitor, passage migrant and winter visitor.	Local
Bar-tailed Godwit Bar-tailed Godwit	<u>00</u>	<u>1424</u>	41,000	Common passage migrant and winter visitor.	Local

Species	Maximum Count (areas <u>1a-c</u>)	Maximum count (whole survey area)	UK wintering population	County status	Geographical importance
Black-headed Gull Black-headed Gull	<u>240496</u>	<u>903630</u>	2.2 million	Abundant resident and passage migrant.	Local
Black-tailed Godwit Black-tailed Godwit	<u>22</u>	<u>340333</u>	44,000	Much increased passage migrant and winter visitor. A few usually summer.	Local
Common Gull Common Gull	<u>64</u>	<u>1244</u>	710,000	Common passage migrant and winter visitor.	Negligible
Common Sandpiper Common Sandpiper	<u>14</u>	<u>14</u>	890	Common passage migrant. A few winter.	Negligible
Curlew Curlew	<u>2727</u>	<u>2934</u>	150,000	Common passage migrant and winter visitor.	Local
Dunlin Dunlin	<u>124424</u>	<u>250255</u>	360,000	Very common passage migrant and winter visitor.	Local
Gadwall Gadwall	<u>119</u>	<u>1644</u>	25,000	Slowly increasing winter visitor and passage migrant. Stable breeding population.	Local
Great Black-backed Gull Greater Black-backed Gull	<u>74</u>	<u>944</u>	77,000	Winter visitor and passage migrant. Small non-breeding population in summer.	Negligible
Green Sandpiper Green Sandpiper	<u>14</u>	<u>14</u>	910	Common passage migrant and much increased winter visitor.	Local
Grey Plover Grey Plover	<u>00</u>	<u>44</u>	43,000	Common winter visitor and and passage migrant.	Negligible

Species	Maximum Count (areas <u>1a-cA</u>)	Maximum count (whole survey area)	UK wintering population	County status	Geographical importance
Herring Gull Herring-Gull	<u>1946</u>	<u>13574</u>	730,000	Common winter visitor and passage migrant. Breeds in small numbers.	Negligible
Kingfisher Kingfisher	<u>14</u>	<u>14</u>	12,800	Resident and passage migrant.	Negligible
Lapwing Lapwing	<u>00</u>	<u>942</u>	650,000	Declining breeding population. Numerous passage migrant and winter visitor.	Negligible
Lesser Black-backed Gull Lesser Black-backed Gull	<u>22</u>	<u>1740</u>	130,000	Common passage migrant. Present all year. Breeds in small numbers, but increasing.	Negligible
Little Egret Little Egret	<u>24</u>	<u>22</u>	6,500	Rapidly increasing visitor at all seasons. First bred 2000.	Negligible
Mallard Mallard	<u>6060</u>	<u>6064</u>	710,000	Common and widespread resident, winter visitor and passage migrant.	Local
Oystercatcher Oystercatcher	<u>62</u>	<u>169</u>	340,000	Resident, passage migrant and winter visitor.	Negligible
Redshank Redshank	<u>53</u>	<u>3826</u>	130,000	Resident, passage migrant and winter visitor.	Negligible
Ringed Plover Ringed Plover	<u>6523</u>	<u>6548</u>	36,000	Resident, passage migrant and winter visitor.	Local
Shelduck Shelduck	<u>84</u>	<u>3732</u>	66,000	Locally common breeding species, numbers greatly augmented in winter.	Negligible
Teal Teal	<u>4646</u>	<u>480433</u>	194,000	Common winter visitor and passage migrant. Very scarce breeding species.	Local

Species	Maximum Count (areas <u>1a-cA</u>)	Maximum count (whole survey area)	UK wintering population	County status	Geographical importance
Turnstone Turnstone	<u>00</u>	<u>14</u>	51,000	Passage migrant and winter visitor.	Negligible
Wigeon Wigeon	<u>60</u>	<u>3234</u>	450,000	Common often abundant, winter visitor and passage migrant. Erratic breeder.	Negligible
Yellow-legged Gull Yellow-legged Gull	<u>33</u>	<u>1242</u>	1100	Late summer visitor to the Thames. Scarce elsewhere and at other times.	Local

5. Initial assessment of potential impacts on wintering bird species

5.1 Species excluded from further analysis

5.1.1 Species which are either not of conservation interest, not present in Survey Area 1 (where impacts from construction or use are most likely to occur) or present across the whole survey area but in very low numbers, are not considered further in terms of potential impacts.

5.1.2 Species **excluded** from assessment on this basis are:

- Bar-tailed Godwit
- Cormorant
- Canada Goose
- Common Gull
- Common Sandpiper
- Little Egret
- Gadwall
- Great Black-backed Gull
- Green Sandpiper
- Grey Plover
- Grey Heron
- Herring Gull
- Kingfisher
- Lapwing
- Lesser Black-backed Gull
- Mallard
- Oystercatcher
- ~~Redshank (although this species is discussed as part of the assessment of impacts on qualifying species of the Thames Estuary & Marshes SPA)~~
- Shelduck
- Turnstone
- Wigeon
- Yellow-legged Gull

5.2 Species included for further analysis

5.2.1 The following species accounts relate to the species present within the survey area that are regarded as being of conservation interest and present in non-negligible numbers across the survey area as a whole.

5.2.2 Figures showing distributions of the species across the survey area are provided for waterbird species that were present in non-negligible numbers within Area 1, or recorded regularly across the survey area. Bird numbers on figures are displayed either as point counts (with size of dot indicating size of count), or as 'rafts', where an ellipse containing a particular number of birds was drawn during surveys. Therefore, the figure keys contain both methods of displaying bird count and location, and not every figure contains all dot sizes shown in the key.

Avocet

5.2.3 Across the whole survey area, a maximum count of ~~494~~ Avocets was recorded on ~~26/11/19 and 03/12/19~~, with a maximum count of 44 from 26/11/19. Counts from January ~~– mid February onwards~~ were generally lower (between 7-1~~35~~), increasing again from mid February onwards to with the exception of March when counts across the whole survey area increased to 21 ranged from 21-26. The March counts are likely to have been boosted by Avocets on passage, and therefore the peak months for wintering Avocet on the survey area are November and December.

5.2.4 No Avocets were recorded from Zone 1 in September or October. The peak counts of Avocet in Area 1 were 44 in November and ~~492~~ in December, indicating that across the survey area as a whole, Area 1 was most favoured by Avocet.

5.2.5 The peak count of ~~494~~ Avocet in Area 1 represents approximately 0.5% of the estimated UK winter population of 9,500. Avocet is also a qualifying feature of the Thames Estuary & Marshes SPA. On this basis, further assessment of the potential impacts of the Thurrock Flexible Generation Plant on Avocet has been undertaken in the HRAR (Section 6).

5.2.6 The distribution of Avocets across the survey area is shown on Figure 5.1.

Black-headed Gull

5.2.7 Across the whole survey area, a maximum count of ~~630-903~~ Black-headed Gulls was recorded on 17/09/19. Counts from October onwards were highly variable, ranging from ~~24-21~~ on ~~26/09/19~~ 26/11/19 to ~~657-25~~ on 16/01/20. This indicates a mobile and fluctuating use of the survey area across the wintering period.

5.2.8 The maximum count within Area 1 was ~~240~~¹⁹⁶ in ~~March-September~~ 2020. Overall, counts tended to be higher in Areas 2 and / or 3 in the majority of months.

5.2.9 The peak count of ~~630-903~~ Black-headed Gulls represents approximately 0.0~~43~~% of the estimated UK winter population of 2,200,000. Black-headed Gulls are an abundant resident species and are known to habituate to disturbance events. On the basis that a very small percentage of the national population is present on site and that it is unlikely the species would be affected by construction or use of the causeway in Area 1, it is not considered that impacts on Black-headed Gull would be significant.

Black-tailed Godwit

5.2.10 Across the whole survey area, a maximum count of ~~340~~³³ Black-tailed Godwits was recorded on 09/03/20, all from Area 3~~b~~. These are likely to be passage birds given that no other count higher than 12 was recorded in any other month.

5.2.11 The maximum count of Black-tailed Godwit in Area 1 was two birds, recorded on in September 2019. This indicates that overall the species rarely uses the survey area, with the exception of a single high count in Area 3 in March.

5.2.12 The peak count of ~~340~~³³ Black-tailed Godwits represents approximately 0.7~~76~~% of the estimated UK winter population of 44,000. However, as this count was recorded in Area 3~~b~~ which is sufficiently distant from the causeway to be unaffected by disturbance during construction or use, and the species was not recorded elsewhere in the survey area, it is not considered that impacts on Black-tailed Godwit would be significant.

Curlew

5.2.13 Across the whole survey area, a maximum count of ~~34-29~~ Curlew was recorded on 02/10/19 and 09/10/19. Higher numbers were recorded in ~~October, November and September -~~ December compared to other months, although low numbers (typically below 10) birds were recorded throughout the survey season. The peak count of Curlew in Area 1 was 27 birds, recorded on 09/10/19.

5.2.14 The peak count of ~~34-29~~ Curlew represents approximately 0.02% of the estimated UK winter population of 150,000. On this basis it is not considered that impacts on Curlew would be significant.

5.2.15 The distribution of Curlew across the survey area is shown on Figure 5.2.

Dunlin

5.2.16 Across the whole survey area, a maximum count of ~~250~~⁵ Dunlin was recorded on 19/11/19 (all from Area 3~~b~~). The maximum count of Dunlin in Area 1 was 124 from 12/12/19 (in a single hour out of a 6-hour survey period). Another count of 90 Dunlin was recorded from Area 3 on 3/12/19 but otherwise counts of this species were generally very low or zero. This suggests a mobile and fluctuating population that only sporadically uses the survey area and Area 1.

5.2.17 The peak count of ~~250~~⁵ Dunlin represents approximately 0.7% of the estimated UK winter population of 360,000. ~~Although~~ Dunlin is a qualifying feature of the Thames Estuary & Marshes SPA, and although the Dunlin only sporadically use by this species of the survey area, and Area 1 in particular, where impacts from construction and use of the causeway would be most likely to occur, further assessment of the potential impacts of the Thurrock Flexible Generation Plant on Dunlin has been undertaken (in the HRAR), ~~indicates that the construction and use of the causeway is unlikely to have significant impacts on Dunlin.~~

5.2.18 The distribution of Dunlin across the survey area is shown on Figure 5.3.

Redshank

5.2.19 Across the whole survey area, a maximum count of 38 Redshank was recorded on 03/12/19, from Areas 2 and 3. Another count of 31 birds was recorded on 19/11/19, mostly from Area 3. All other counts were between 1-7 birds.

5.2.20 Redshank were absent entirely from Area 1 in 11 of the 14 surveys – they were recorded in Area 1 on three occasions, in November and December, with 3 birds recorded on two occasions and 5 birds on another occasion. This indicates that the area likely to be affected by construction and use of the causeway is only sporadically used by very low numbers of Redshank.

5.2.21 The peak count of 38 Ringed Plover represents approximately 0.03% of the estimated UK winter population of 130,000. Redshank is a qualifying feature of the Thames Estuary & Marshes SPA, and although Redshank only sporadically use Area 1, where impacts from construction and use of the causeway would be most likely to occur, further assessment of the potential impacts of the Thurrock Flexible Generation Plant on Redshank has been undertaken in the HRAR.

5.2.22 The distribution of Redshank across the survey area is shown on Figure 5.4.

Ringed Plover

~~5.2.195.2.23~~ Across the whole survey area, a maximum count of ~~48-65~~ Ringed Plover was recorded on ~~1417/092/2019, from Area 1b. The maximum count of Ringed Plover in Area 1 was 23 from 14/02/20.~~

~~5.2.205.2.24~~ Ringed Plover were absent entirely from Area 1 in ~~12-9~~ of the 14 surveys – they were ~~only~~ recorded in Area 1 on ~~two-five~~ occasions, with ~~the other another four~~ counts ~~of ranging from 2-48-25~~ birds ~~recorded in March 2020~~. This indicates that the area likely to be affected by construction and use of the causeway is only sporadically used by Ringed Plover.

~~5.2.215.2.25~~ The peak count of ~~6548~~ Ringed Plover represents approximately 0.1~~83~~% of the estimated UK winter population of 36,000. ~~Although~~ Ringed Plover is a qualifying feature of the Thames Estuary & Marshes SPA, ~~and although Ringed Plover only sporadically use the sporadic use by this species of the survey area, and~~ Area 1 ~~in particular~~, where impacts from construction and use of the causeway would ~~be most likely to occur, further assessment of the potential impacts of the Thurrock Flexible Generation Plant on Ringed Plover has been undertaken in the HRAR, occur, indicates that the construction and use of the causeway is unlikely to have significant impacts on Ringed Plover.~~

~~5.2.225.2.26~~ The distribution of Ringed Plover across the survey area is shown on Figure 5.5.

Teal

~~5.2.235.2.27~~ Across the whole survey area, a maximum count of ~~48033~~ Teal was recorded on ~~037/12/2019~~. The maximum count of Teal in Area 1 was 46 from 16/01/20.

~~5.2.245.2.28~~ Teal were absent entirely from the survey area in September and October. They were recorded in all three survey areas on every survey visit from November onwards, with counts in Area 1 ranging from 4-46 ~~with the majority of counts being 20 or below.~~

~~5.2.255.2.29~~ On every survey visit where Teal were recorded, they were recorded in higher numbers in Areas 2 and 3 ~~combined~~ than in Area 1, and were generally recorded in higher numbers in Area 3 compared to the other two survey compartments.

~~5.2.265.2.30~~ This indicates that while the area likely to be affected by construction and use of the causeway is used regularly by Teal, Area 1 is not regularly used by high numbers relative to the rest of the survey area.

~~5.2.275.2.31~~ The peak count of ~~433-480~~ Teal represents approximately 0.1~~91~~% of the estimated UK winter population of 450,000, and the peak count of 46 from Area 1 is only 0.01% of the UK population. This indicates that the construction and use of the causeway is unlikely to have significant impacts on Teal.

~~5.2.285.2.32~~ The distribution of Teal across the survey area is shown on Figure 5.6.

Thames Estuary & Marshes SPA/Ramsar qualifying features

Individual species

~~5.2.295.2.33~~ This section looks specifically at interest features associated with the Thames Estuary and Marshes SPA. Table 5.1 lists the individual species interest features from the SPA citation, along with recent estimates of the Thames Estuary population obtained from BTO Wetland Bird Survey (WeBS) data, accessed online via <https://app.bto.org/webs-reporting/>.

~~5.2.305.2.34~~ Species highlighted in grey are those that were not recorded at all during the survey and are therefore excluded from further analysis.

~~5.2.315.2.35~~ Species highlighted in green are species that were recorded during the survey but ~~not~~ in ~~significant~~ very low numbers in Area 1 (~~Redshank – maximum count in Area 1 of three birds and~~ Black-tailed Godwit – maximum count in Area 1 of two birds) and hence where no likely significant effect on the SPA population would occur.

~~5.2.325.2.36~~ Species highlighted in yellow are species where occasional higher counts were recorded in Area 1 but where assessment ~~of the~~ numbers elsewhere in the survey area were generally higher (Dunlin), or where low numbers of birds were recorded but Natural England requested further assessment during consultation relative to the survey area as a whole, indicate that no likely significant effect on the SPA population would occur (Redshank, Dunlin and Ringed Plover).

~~5.2.37~~ Species highlighted in orange are species where higher counts were recorded in Area A than elsewhere in the survey area, ~~and or~~ where the numbers recorded represent a not insignificant proportion of the SPA citation population (Avocet and Ringed Plover).

~~5.2.335.2.38~~ A likely significant effect (LSE) on Avocet, Dunlin, Redshank and Ringed Plover ~~Avocet~~ has therefore been identified on a precautionary basis, and further assessment of impacts on ~~this these~~ species ~~is required for ES / HRA purposes has been undertaken in the HRAR (Section 6).~~

Wintering bird assemblage

5.2.345.2.39 The Thames Estuary & Marshes SPA is also designated for its waterbird assemblage. At designation (93/94-98/99 mean peak count) this was 75,019 waterbirds (wildfowl and waders).

5.2.355.2.40 A summary of the peak counts across the whole survey area for all wildfowl and waders is presented in Table 5.2. A summary of the peak counts in Area 1 is presented in Table 5.3.

5.2.365.2.41 Across the whole survey area, the maximum count of waterbirds was 79423, from 3/12/19. This represents 10.9606% of the 93-99 peak count of total waterbirds for the Thames Estuary & Marshes SPA.

5.2.375.2.42 In Area 1, where impacts from construction and use of the causeway are most likely to occur, the maximum count of waterbirds was 17764, from 12/12/19. This represents 0.242% of the 93-99 peak count of total waterbirds for the Thames Estuary & Marshes SPA.

5.2.385.2.43 On the basis that less than 1% of the SPA citation population of waterbirds would be potentially affected by construction and use of the causeway in Area 1, it is considered that there would be no significant effect on the overall SPA waterbird assemblage.

Qualifying Feature	Present in survey area?	Present in Area 1?	SPA citation population (5 year mean 93/94-98/99)	<u>Current SPA population (5 year mean winter 14/15-18/19)</u>	Current Thames Estuary population (5 year mean 14/15- 18 19) (WeBs)
Redshank	Yes	Yes	3251	<u>470</u>	2403
Ringed Plover	Yes	Yes	1324	<u>115</u>	775

Table 5.15.4: Thames Estuary & Marshes Qualifying Species

Qualifying Feature	Present in survey area?	Present in Area 1?	SPA citation population (5 year mean 93/94-98/99)	<u>Current SPA population (5 year mean winter 14/15-18/19)</u>	Current Thames Estuary population (5 year mean 14/15- 18 19) (WeBs)
Avocet	Yes	Yes	283	<u>1033</u>	3255
Black-tailed Godwit	Yes	Yes	1699	<u>2140</u>	5690
Dunlin	Yes	Yes	29646	<u>11850</u>	27630
Grey Plover	No	No	N/a	<u>N/a</u>	N/a
Hen harrier	No	No	N/a	<u>N/a</u>	N/a
Knot	No	No	N/a	<u>N/a</u>	N/a

Table 5.25.2: Summary of waterbird counts (whole survey area)

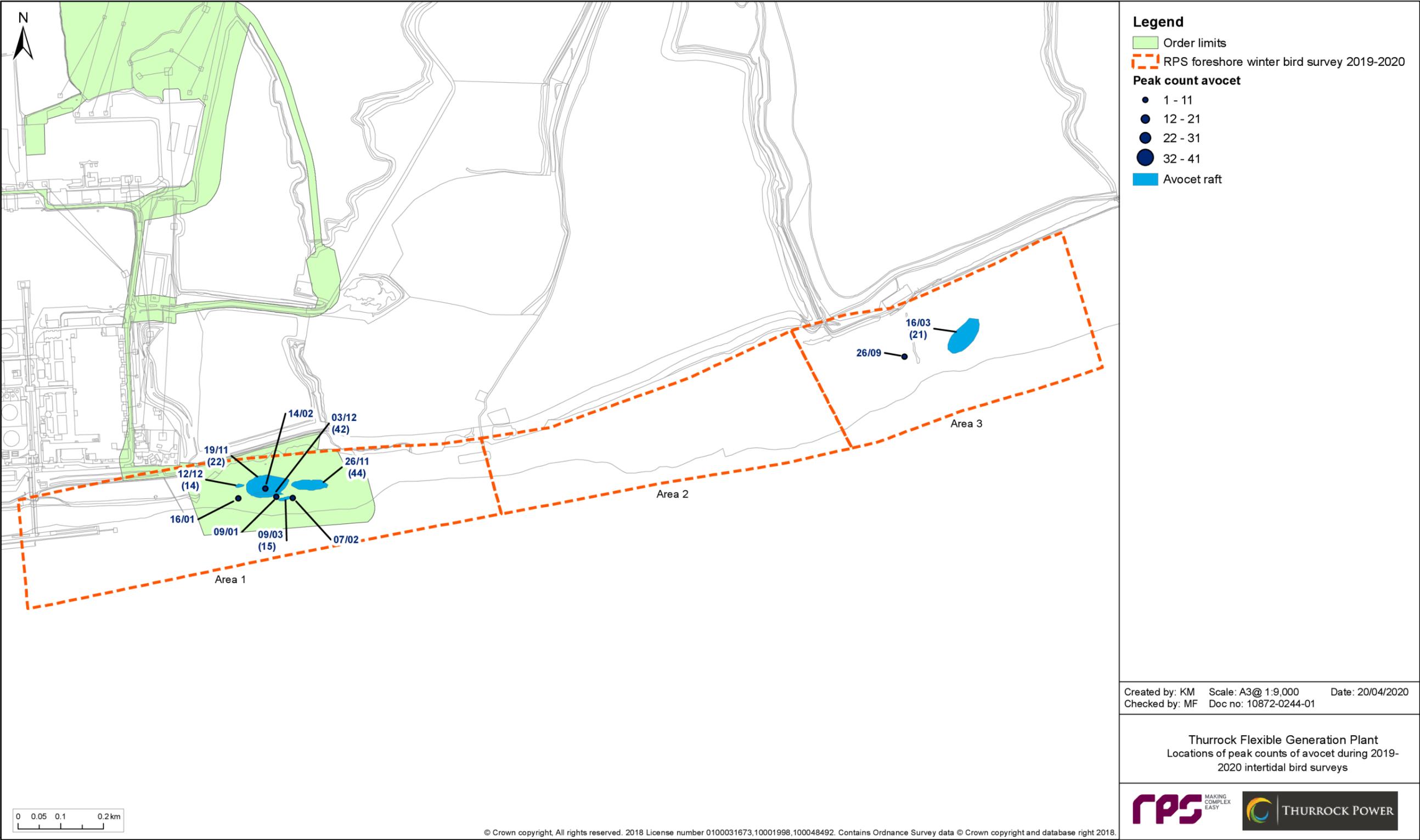
Species	Survey date													
	17/09/19	26/09/19	02/10/19	09/10/19	19/11/19	26/11/19	03/12/19	12/12/19	09/01/20	16/01/20	07/02/20	14/02/20	09/03/20	16/03/20
Avocet		1			24	44	49	16	13	9	7	26	21	23
Bar-tailed Godwit			3		13		14						1	
Black-tailed Godwit	3		5		12		3	12					340	
Canada Goose	48													
Common Sandpiper		1												
Curlew	7	25	29	29	27	7	23	2	1	11	2	13	2	
Dunlin	65	10		7	250		90	124				1		
Gadwall								11	10		16			
Green Sandpiper					1						1			
Grey Heron					1		2			1				
Grey Plover					4		3							
Lapwing					6		9							
Little Egret	1		2		2	1	1		1					
Mallard	60	15	41	24	32	21	37	16	40	18	43	4	2	3
Oystercatcher										2	5	8	16	9
Redshank	1		1		31		38	7		1				3
Ringed Plover	12	65	1	23			6				18	50	4	19
Shelduck					37	1	12		2	18	17	36	14	
Teal					294	23	480	94	345	457	467	295	112	27
Turnstone							1							
Wigeon					32	12	26			20	32	8	30	13
Total	197	117	82	83	766	109	794	282	412	537	608	441	542	97
Avocet		4			24	44	44	14	7	9	4	15	21	24
Bar-tailed godwit			3		15		24						4	
Black-tailed-godwit	4		5		40		3	42					333	
Canada-goose	48													
Common sandpiper		4												
Curlew	5	5	21	31	30	7	34	3	4	8	3	7	4	
Dunlin	41	10		7	255		90	124				2		
Little egret	2		2		2	4	4		4					
Gadwall								7	6		14			
Green sandpiper					4						4			
Grey plover					4		3							
Grey heron					3		3			2				

Lapwing					12		9							
Mallard	61	5	25	24	33	21	40	14	32	13	36	5	4	3
Oystercatcher										2	3	8	9	5
Redshank	4		4		22		26	6		4				3
Ringed plover	12	2	4	23			6				18	48	4	35
Shelduck					21	4	12		2	20	15	32	10	
Teal					200	41	404	61	361	286	433	215	94	45
Turnstone							4							
Wigeon					34	18	29			20	26	13	18	13
Total	174	24	58	85	666	133	723	241	410	361	553	345	495	125

Table 5.35.3: Maximum waterbird counts (Area 1a+1b+1c)

Species	Survey date													
	17/09/19	26/09/19	02/10/19	09/10/19	19/11/19	26/11/19	03/12/19	12/12/19	09/01/20	16/01/20	07/02/20	14/02/20	09/03/20	16/03/20
Avocet					23	44	49	16	13	9	7	12	6	23
Black-tailed Godwit	2				1									
Common Sandpiper		1												
Curlew	2	24	19	27	17	7	13	2		2	1	1		
Dunlin		10		7				124				1		
Gadwall								11	10		11			
Green Sandpiper					1						1			
Grey Heron					1		1			1				
Little Egret	1		1		2	1			1					
Mallard	60	15	39	24	28	21	35	16	40	18	43	4		3
Oystercatcher											4	3	6	6
Redshank					3		5	3						
Ringed Plover		65		6								25	2	19
Shelduck										8	4	2		
Teal					5	4	15	5	31	46	40	11	15	20
Wigeon							6							
Total	65	115	59	64	81	77	124	177	95	84	111	59	29	71
Avocet					22	44	42	44	7	9	3	7	6	24
Bar-tailed-godwit														
Black-tailed-godwit	2				4									
Canada-geese														
Common-sandpiper		4												
Curlew	2	2	14	27	17	6	14	2		2	4	4		
Dunlin								124				4		
Little-egret					4	4			4					
Gadwall								7	6		9			
Green-sandpiper					4									
Grey-plover														
Grey-heron					4		4			4				
Lapwing														
Mallard	60	5	22	24	25	21	33	10	30	13	32	4		3
Oystercatcher											2	2	2	2
Redshank					2		3	2						
Ringed-plover												23		18

Shelduck										4	3	2		
Teal					4	3	14	5	16	46	38	11	8	20
Turnstone														
Wigeon														
Total	64	8	36	51	74	75	104	164	60	75	88	51	16	64



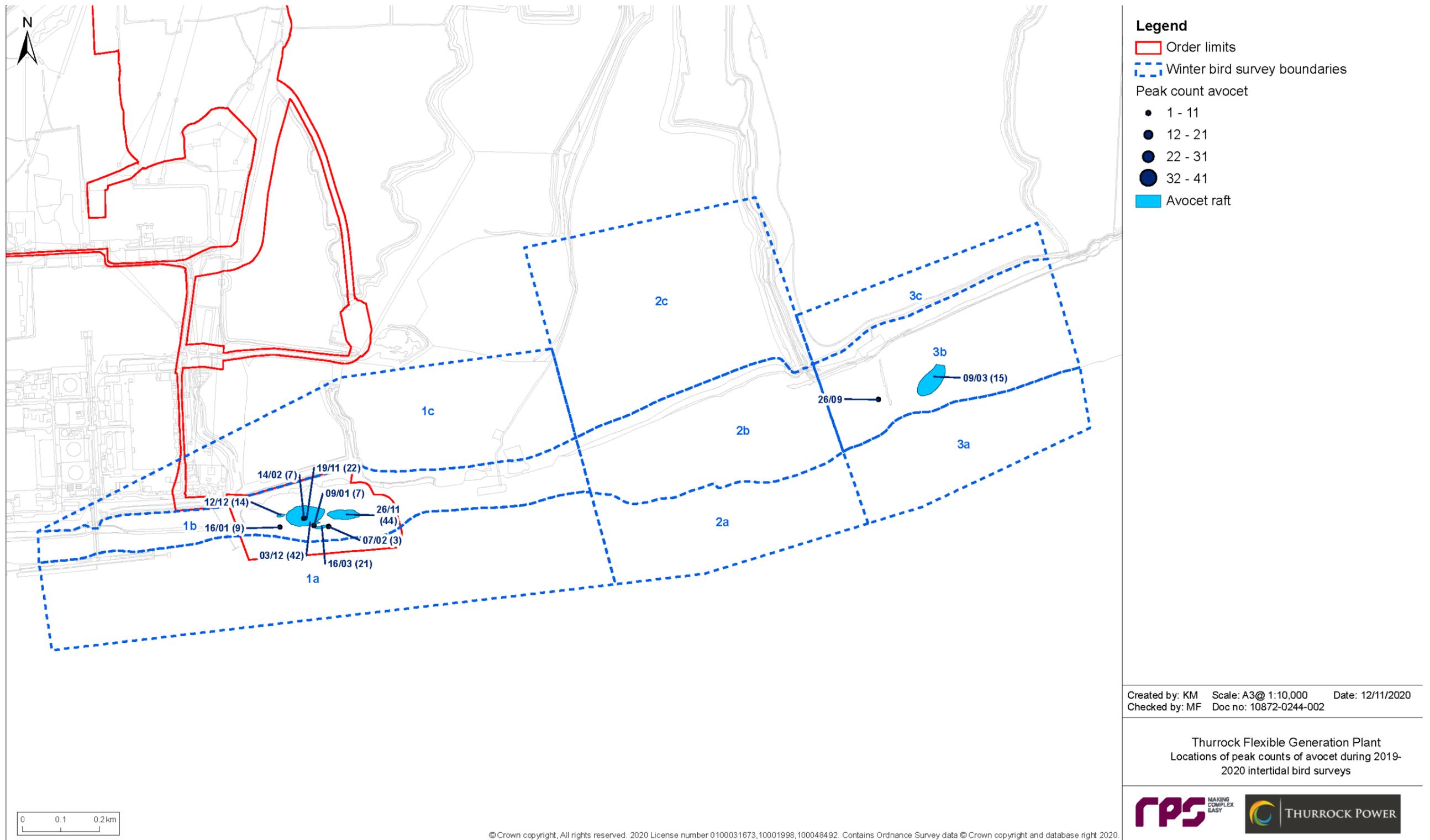


Figure 5.15-1: Avocet distribution.



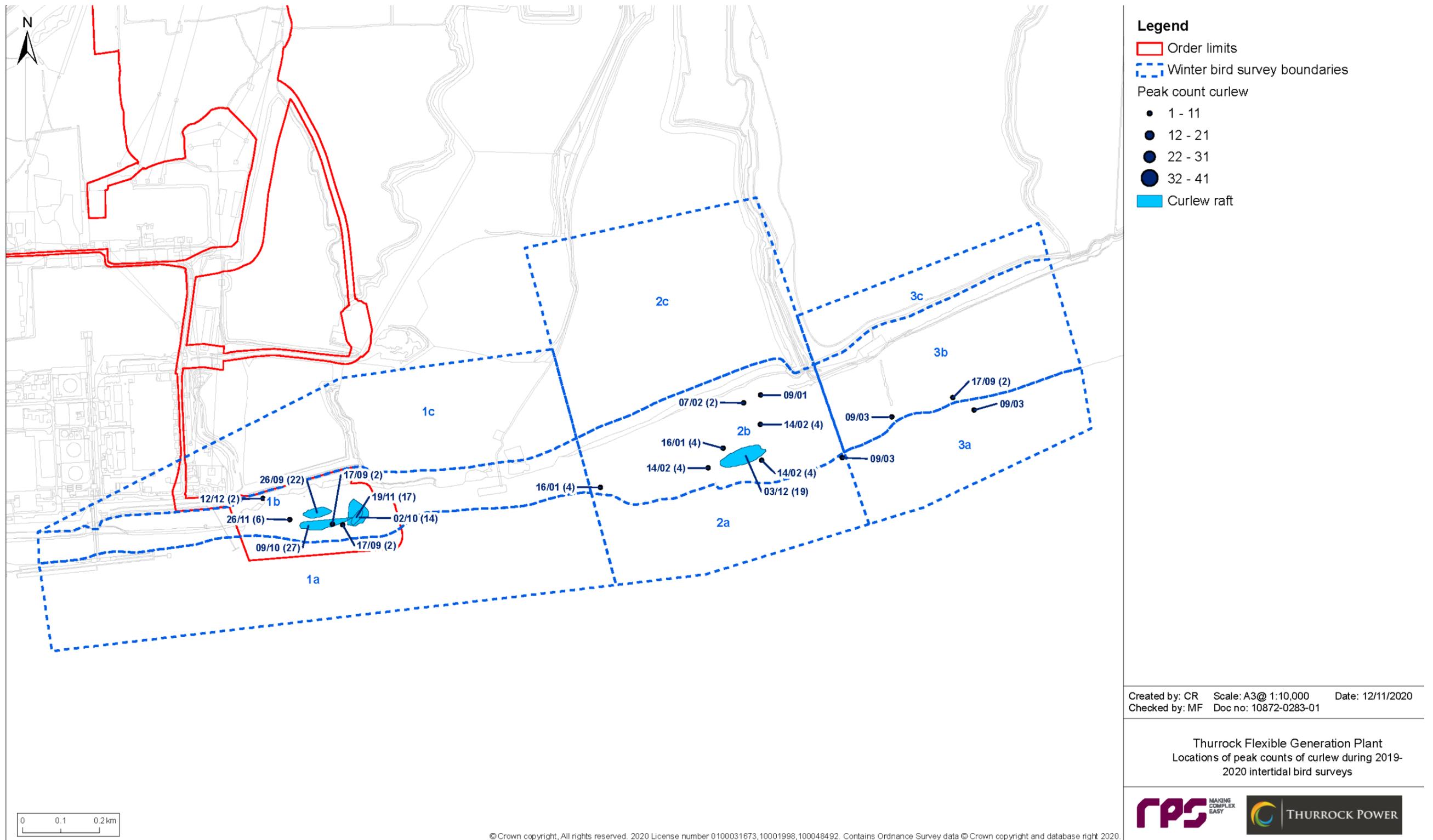
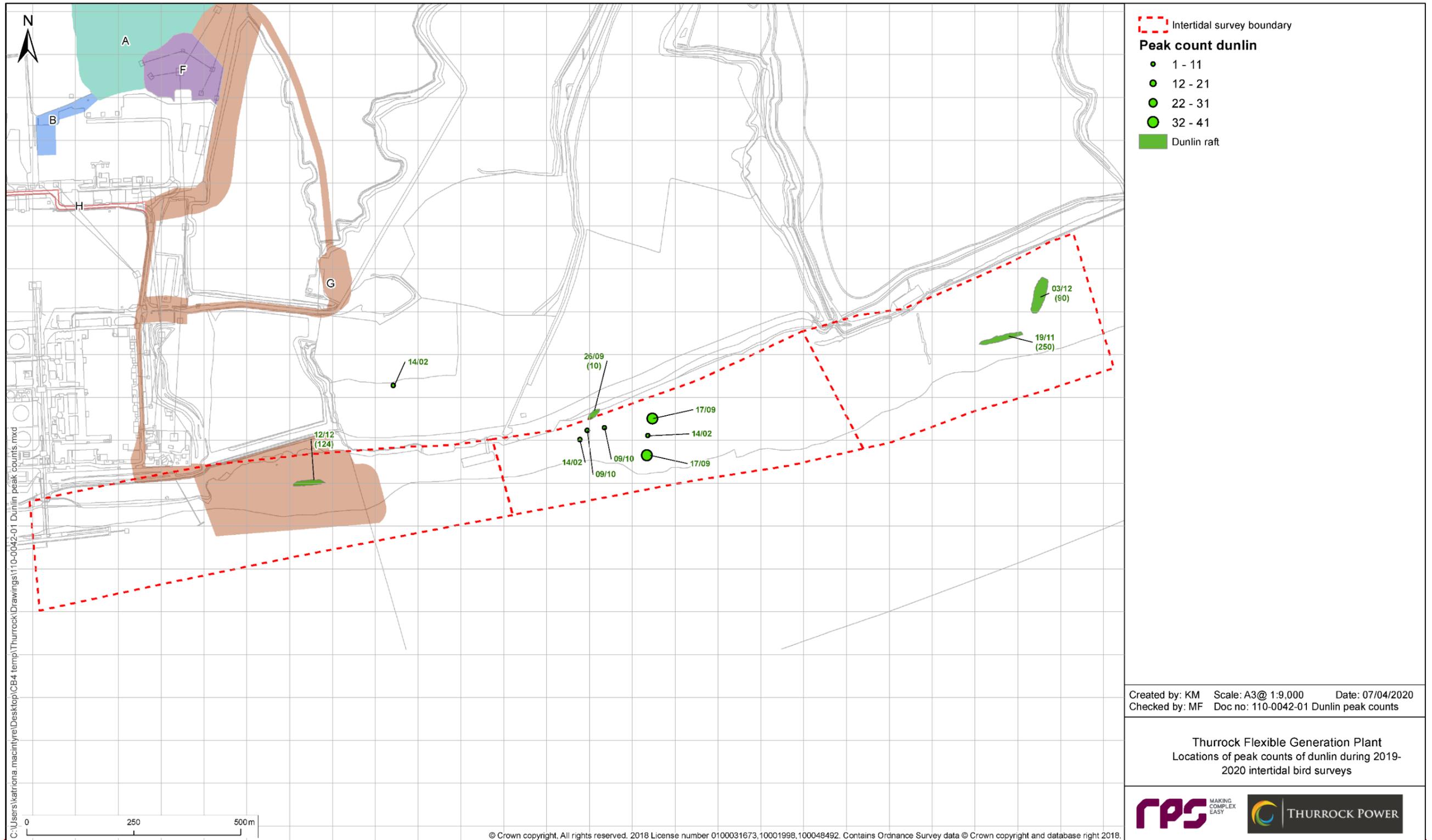


Figure 5.25.2: Curlew distribution.



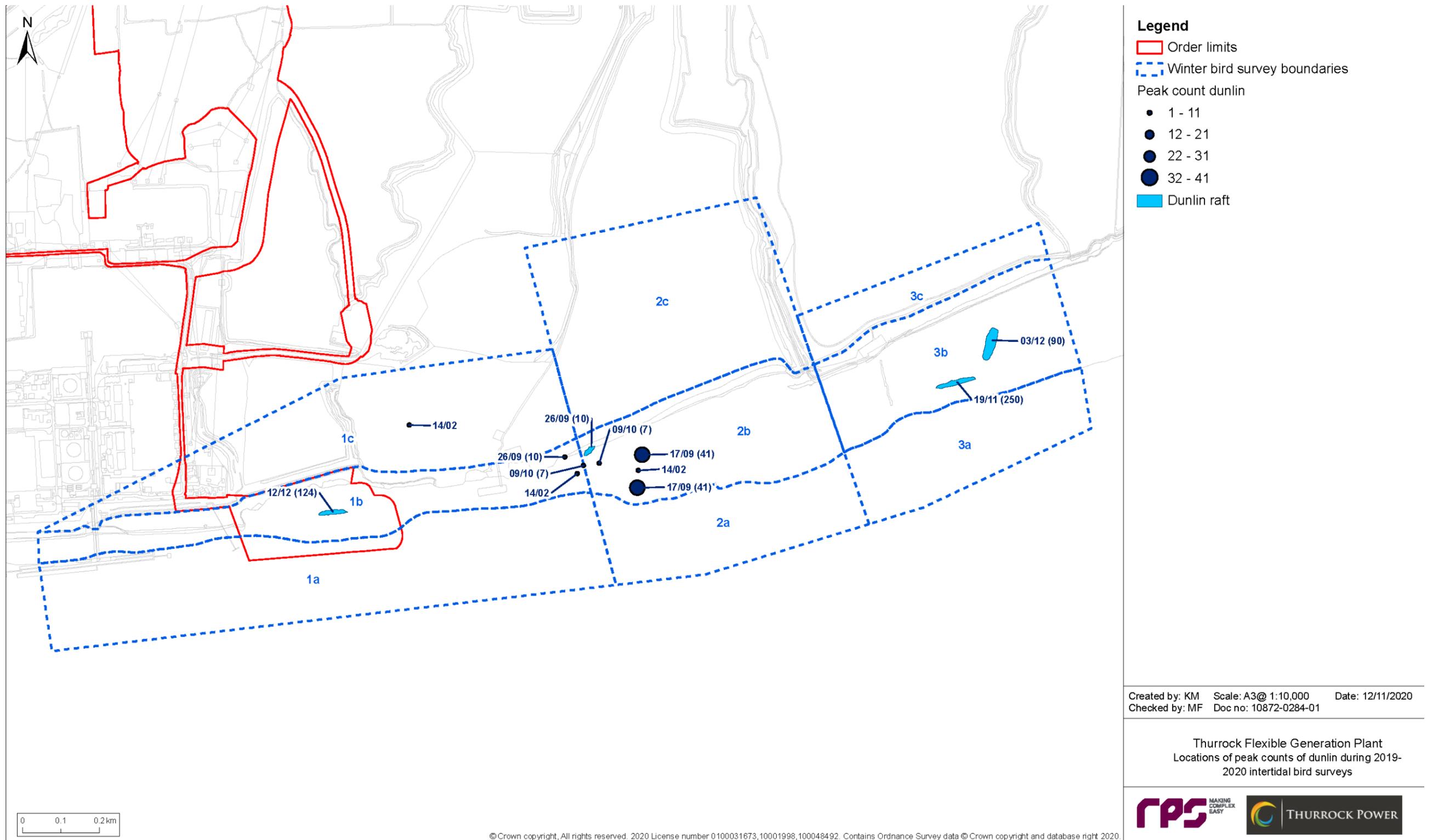


Figure 5.35.3: Dunlin distribution

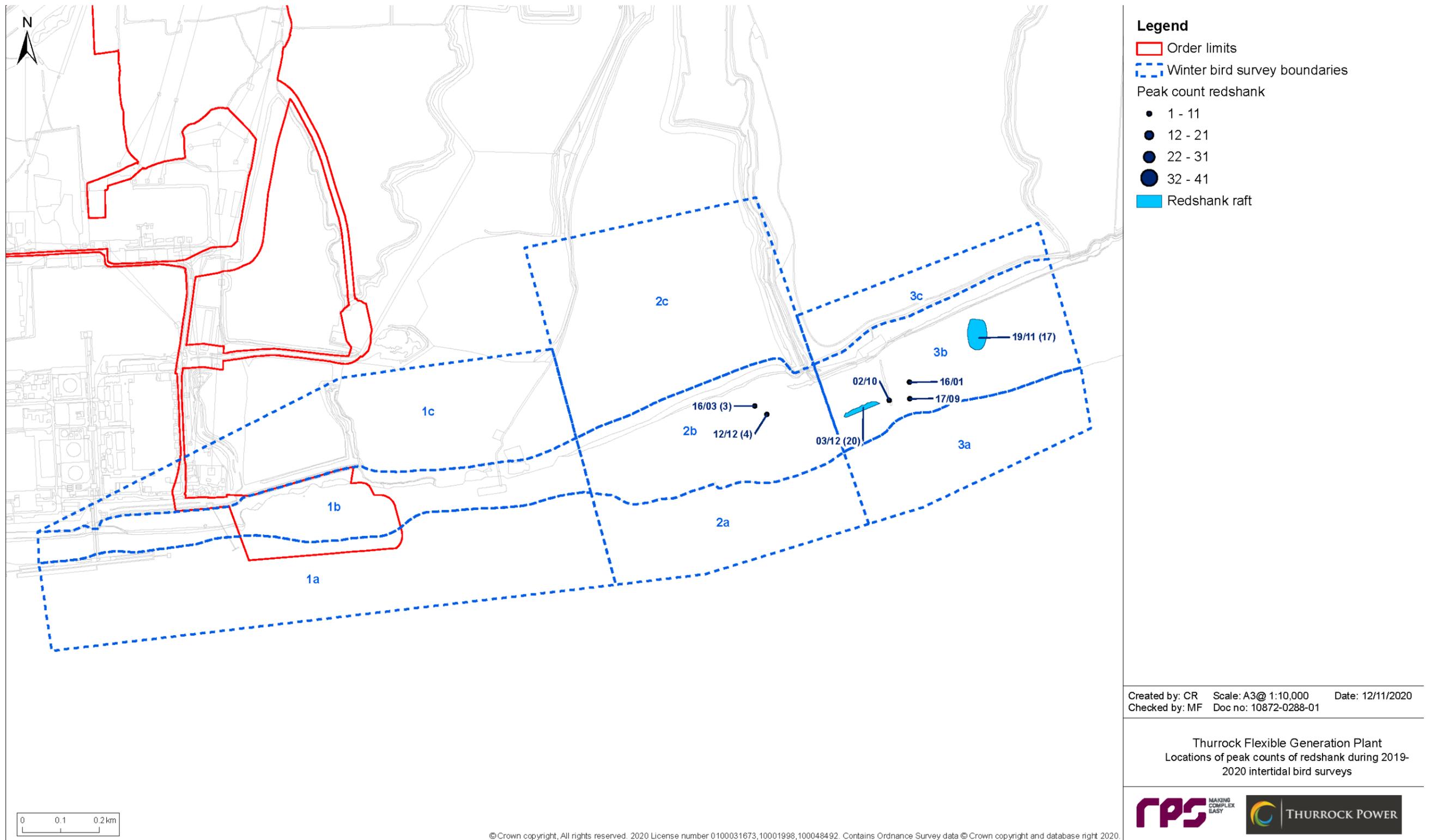
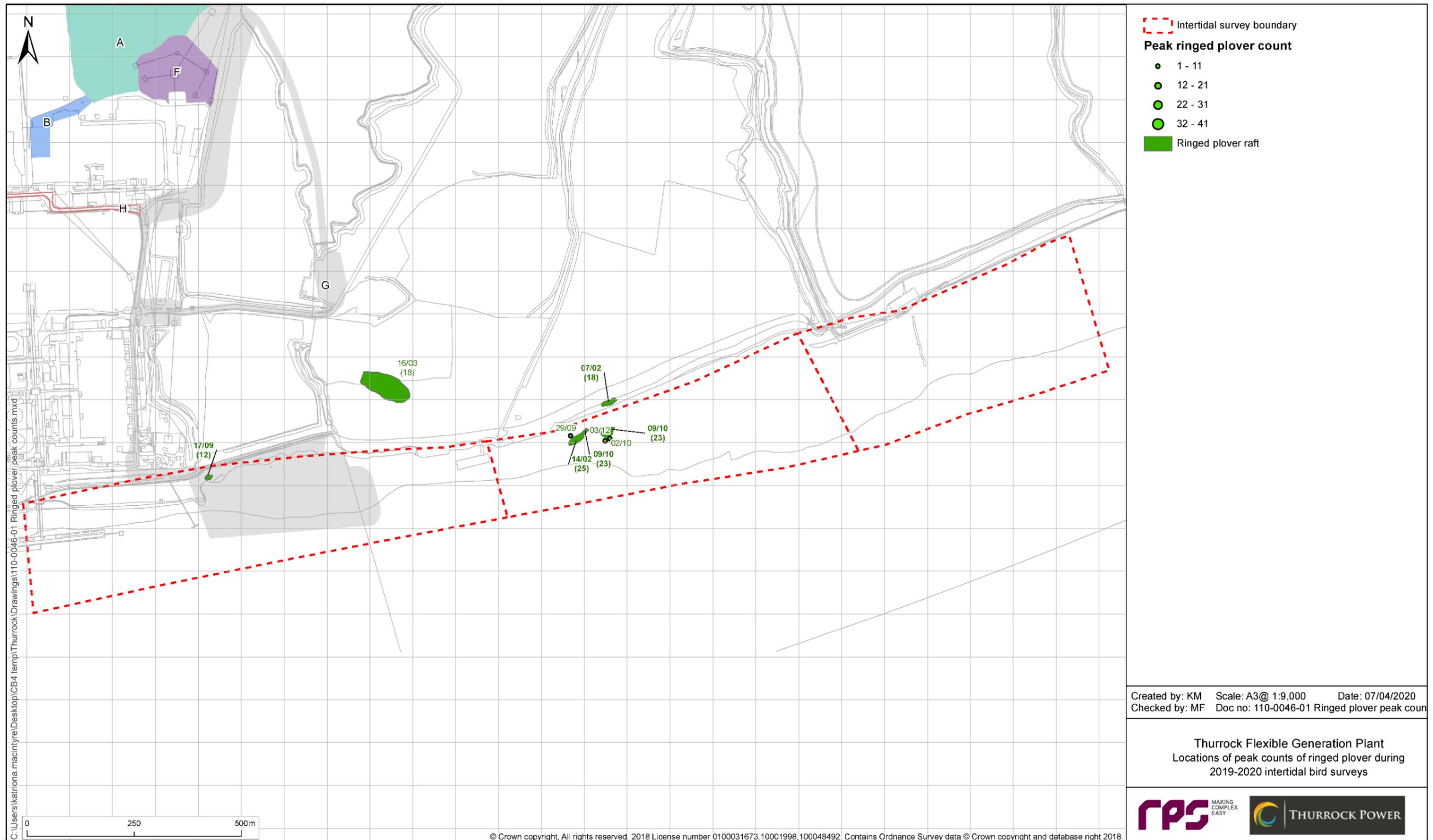


Figure 5.4. Redshank distribution



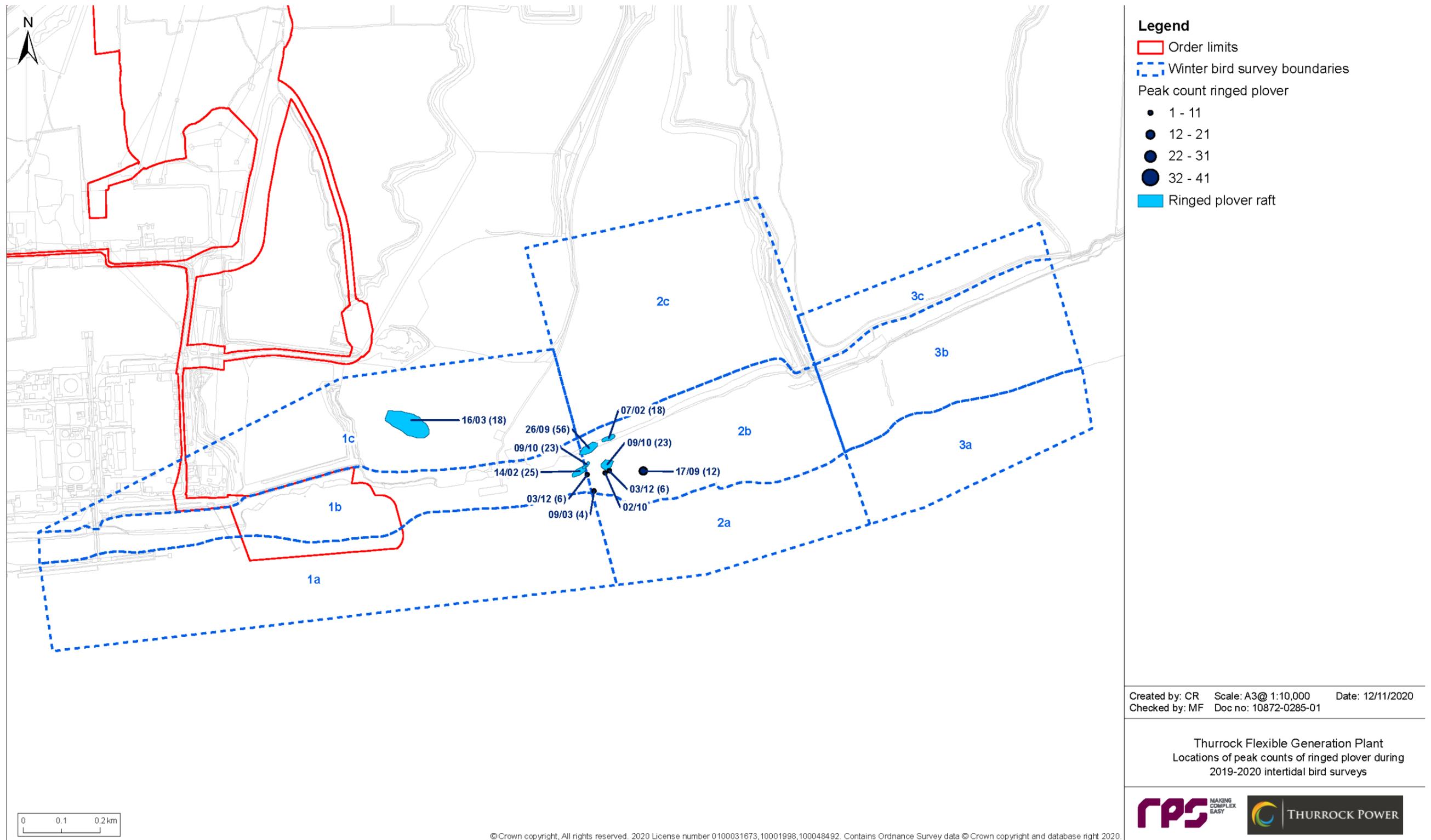
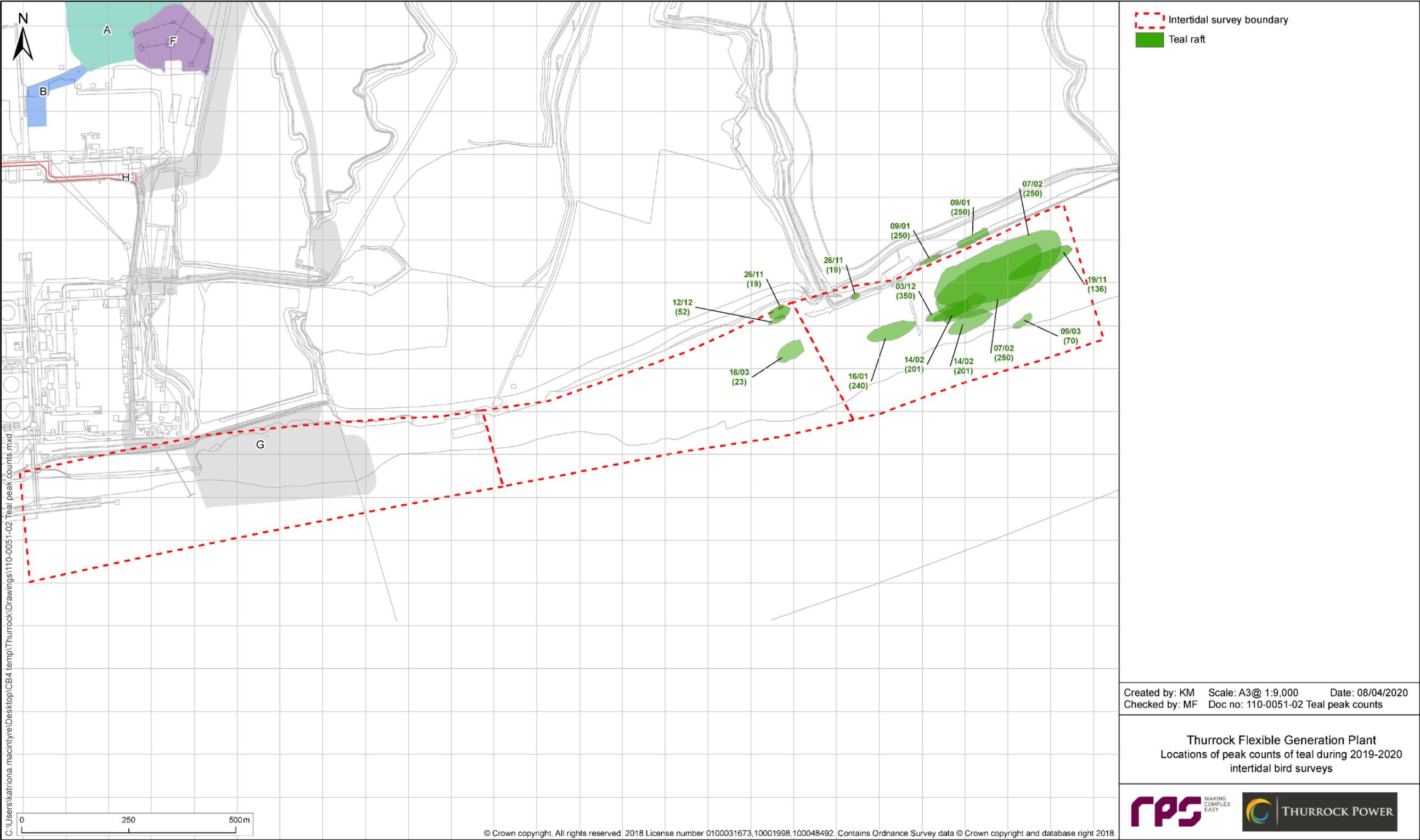


Figure 5.5.4. Ringed plover distribution



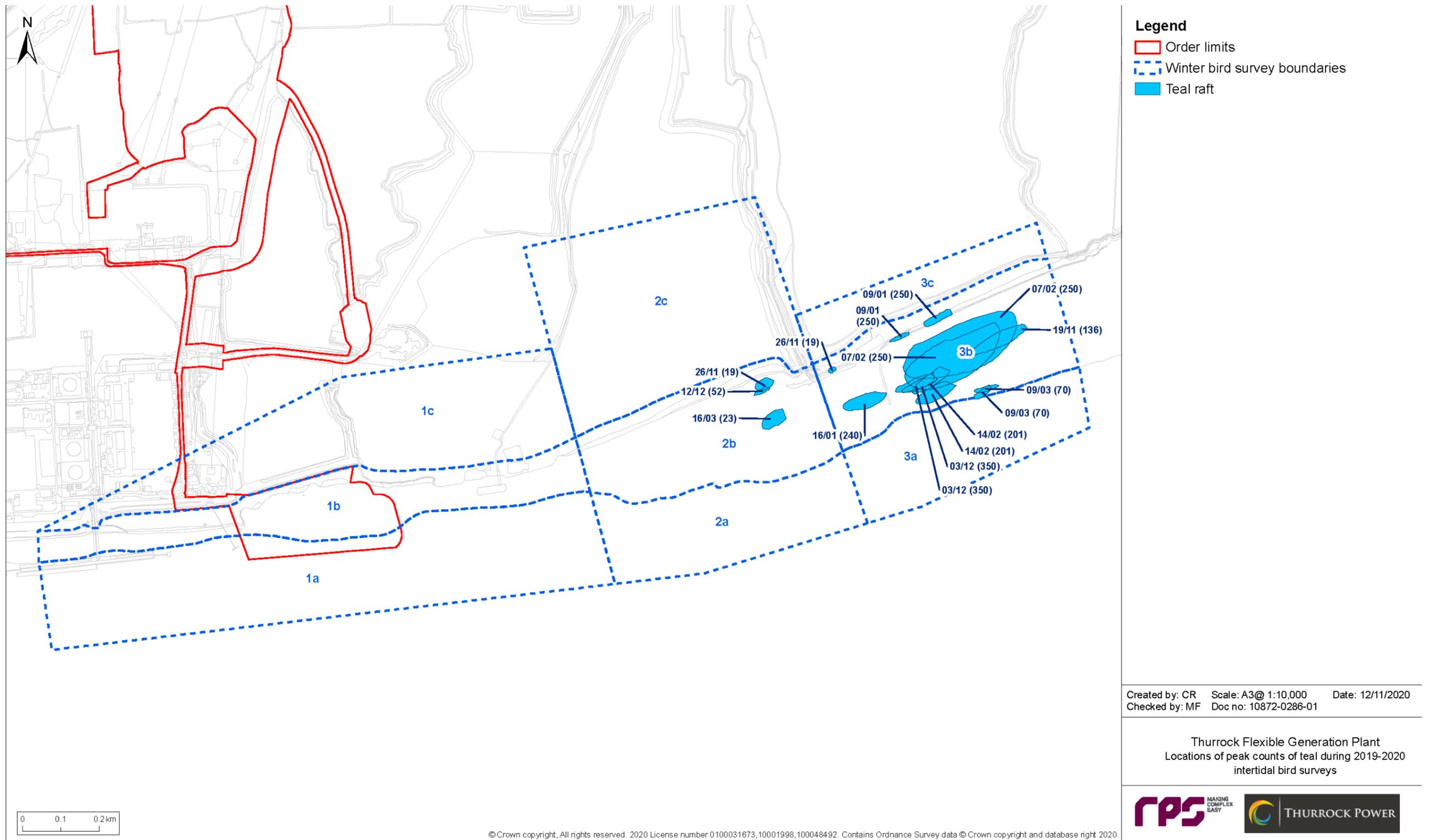


Figure 5.65.5. Teal distribution

6. ~~Further assessment of potential impacts on wintering birds~~ Conclusions

- 6.1.1 The analysis of winter bird numbers and distribution undertaken in Section 5 indicates that no significant impacts from construction or use of the causeway are expected for the ~~vast~~ majority of the species recorded during the survey or for the waterbird assemblage as a whole.
- 6.1.2 These findings of the 2019/20 wintering bird surveys are generally in line with the 2017-2018 and 2016-2017 surveys previously reviewed, and continue to support the conclusion in the HRAR that the foreshore in the vicinity of Zone G was not used to any significant extent by significant numbers of wintering birds associated with the Thames Estuary & Marshes Special Protection Area (SPA) / Ramsar site and therefore no significant effects from construction and use of the proposed causeway in this zone are likely.
- 6.1.3 However, the 2019/20 surveys have indicated that between November to March, Avocets were regularly recorded in Area 1, and as Figure 5.1 indicates, the birds that were recorded are mostly within Zone G, the area of foreshore affected by the causeway. Further assessment of the impacts on this species is therefore required for the HRAR.
- 6.1.4 The SPA species Dunlin, Redshank and Ringed Plover are also assessed in further detail in the HRAR, as a precautionary basis following consultations with Natural England during the pre-examination period. Redshank are present in Area 1 in very low numbers (peak count of 5 birds, and was only recorded on 3 out of 14 winter surveys). A maximum count of 65 Ringed Plover was recorded in the Area 1, and the species was present in Area 1 on 5 out of 14 winter surveys. A peak count of 124 Dunlin was recorded in Area 1 in 4 out of 10 winter surveys., Further assessment of the impacts on this species is therefore required for the ES and HRAR.
- ~~6.1.5 A drawing showing the locations of the Avocets recorded during the survey is provided in Figure 6.1.~~
- ~~6.1.6 This drawing indicates that the majority of the Avocet records in Area 1 are within or directly adjacent to the causeway itself or the dredge pocket that will be created for the barges delivering the gas engines to the site.~~
- ~~6.1.7 Potential impacts on Avocet during the construction and use of the causeway are summarised in the sections below~~

~~Disturbance during construction of the causeway~~

- ~~6.1.8 Causeway construction would generate noise and visual disturbance that is likely to displace birds within and adjacent to the construction site. However, construction of the causeway and dredge pocket in the intertidal zone is not proposed between November to March inclusive unless further evidence supports a conclusion that potentially significant effects on the SPA integrity due to construction during this period would not occur.~~
- ~~6.1.9 The Applicant considers that there may be alternative mitigation measures (such as visual screening) or further evidence from wider wintering bird surveys in the area (such as those understood to be being undertaken for Tilbury2) and intends to explore this further in discussion with Natural England.~~

~~Disturbance during use of the causeway~~

- ~~6.1.10 A total of up to sixty barge deliveries for gas engines and other large components use the causeway. This will result in a total of 120 barge movements to and from the causeway. The barges will dock on the causeway at high tide, when the mudflats are covered and hence no Avocets will be present. The barges will also depart at high tide and therefore again no disturbance impacts would occur as a result of the barge movements.~~
- ~~6.1.11 Any disturbance events will therefore occur at low tide when the engines are unloaded. The sequence of events for each unloading will comprise:~~
- ~~1) A crane will lift out a section of the sea wall and, depending on barge model, may also move down to the causeway to lower the barge unloading ramp.~~
 - ~~2) The self-propelled transporter vehicle from the barge will move the engine to beyond the sea wall and up to the main development site. An empty transporter will move down the causeway onto the barge.~~
 - ~~3) The barge front will be closed and the mobile crane will then move back up the causeway and replace the sea wall gate.~~
- ~~6.1.12 These operations will take approximately 1-2 hours to complete. This is the period within which disturbance impacts on Avocets might occur; birds would be displaced, probably moving eastwards to mudflats closer to the SPA.~~
- ~~6.1.13 The barge deliveries may occur in one phase or in two separate phases of 30 deliveries each. Based on the winter months when Avocets were present during the survey, the worst case scenario to consider in terms of concentrated disturbance events would be for each set of 30 movements to occur in two consecutive November – March periods.~~

6.1.14 — It is expected that the deliveries would be between 1-3 days apart, and therefore each phase of 30 deliveries could last for 1-3 months. Therefore disturbance events are of relatively short duration and intermittent with up to two days between each event. Even if deliveries are one day apart, that only directly affects every other tidal cycle, and avocets would have the opportunity to feed on the mudflats at night.

6.1.15 — Clearly, if timing allows, deliveries could be undertaken outside of the period when Avocets are present (November — March inclusive), in which case no disturbance events would occur. However, this would be a highly onerous restriction on use of the causeway, as the delivery period depends on the charter availability of a suitable ro-ro barge, port facilities for the abnormal load trans-shipment, and the applicant's construction programme.

6.1.16 — If deliveries occur inside that period, some displacement of birds to areas of alternative habitat will be expected. Over the course of a 6-hour period 3 hours each side of low tide, disturbance events would occur for 1-2 hours, i.e. between 17-30% of a tidal cycle. Birds could return to feed when the disturbance events have ceased.

6.1.17 — Given the large amount of mudflat habitat available within and outside the SPA, and the relatively small area likely to be affected by disturbance, it is considered that the maximum number of birds likely to be disturbed (44) would be able to find alternative foraging habitat reasonably close by.

6.1.18 — Furthermore, and with reference to the SPA citation population, it is noted that numbers of Avocets in the Thames Estuary have increased significantly in the 20 years since the population estimates underpinning the SPA citation were made. BTO WeBS data gives a 5-year mean for the Thames Estuary of 3255 birds, considerably in excess of the 5-year peak mean count of 283 from the SPA citation. Therefore, regardless of the disturbance effect on a small number of birds, this is highly unlikely to have any significant effect on the integrity of the Avocet population associated with the SPA.

Displacement by habitat loss

6.1.19 — As Figure 6.1 indicates, Avocets were recorded feeding adjacent to or within the area directly affected by habitat loss from the causeway itself and the dredge pocket for the barges. This habitat will not be available to foraging Avocet even when no barge movements are being undertaken.

6.1.20 — The construction of the causeway will result in a permanent loss of c. 610m² of saltmarsh habitat and 0.47 ha of intertidal mudflat. To put this in context, 0.47 ha is approximately 0.01% of the size of the Thames Estuary and Marshes SPA, and the habitat losses occur outside of the SPA and within an area where additional mudflat habitats are available.

6.1.21 — A further 1.11 ha of mudflat is expected to accrete sediment and develop into saltmarsh over time, representing a permanent loss of mudflat. However, the surveys indicate that the area over which saltmarsh accretion is expected to occur is only minimally used by Avocets. As such, the effect of permanent habitat loss is not considered to be significant.

6.1.22 — The barge pocket will be dredged and kept open for the duration of the period required for all of the barge deliveries to occur. The worst case assumption for this is that the phases occur in two consecutive years. It is likely that the dredge pocket will take up to two years to recharge, and therefore the mudflat habitat lost for the dredge pocket will be unavailable to Avocets for four years in the worst case.

6.1.23 — Given the large amount of mudflat habitat available within and outside the SPA, and the relatively small area of habitat outside the SPA affected by permanent or temporary habitat loss, it is considered that the small number of displaced birds would be able to find alternative foraging habitat reasonably close by in other parts of the estuary. There is therefore not predicted to be any decline in the wintering avocet population associated with the SPA as a result of loss of a very small proportion of available mudflat.

6.1.24 — As noted above, with reference to the SPA citation population, numbers of Avocets in the Thames Estuary have increased significantly since the population estimates underpinning the SPA citation were made. Therefore, regardless of the potential effect on a small number of birds from habitat loss, this is highly unlikely to have any significant effect on the integrity of the Avocet population associated with the SPA.

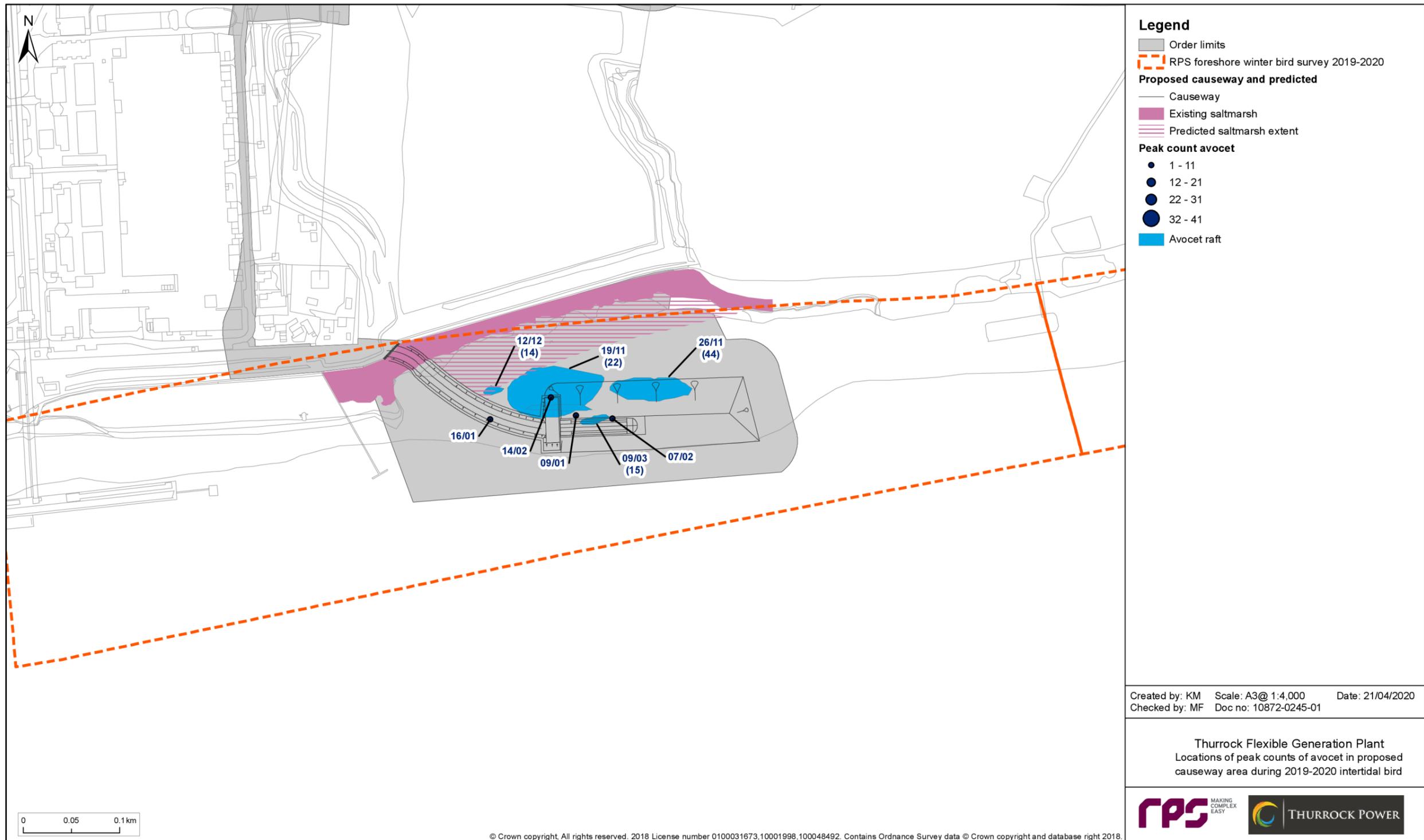


Figure 6.1. Avocet distribution near Zone G causeway

7. References

Bioscan (2018) Habitats Regulations Assessment (HRA) Stage 2 Report Appendix 9: Proposed port terminal at former Tilbury Power Station: Tilbury2 note on winter bird use of the intertidal area. [Online] Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/TR030003/TR030003-000995-Port%20of%20Tilbury%20London%20-%20Habitats%20Regulations%20Stage%202%20report%20-%20Clean.pdf> [Accessed 02 December 2019]

Chartered Institute of Ecology and Environmental Management (CIEEM) (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland. Third Edition. Winchester, CIEEM.

Eaton, M., 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 United Kingdom, Channel Islands and Isle of Man. *British Birds*, pp. 108, 708-746

~~Frost, T.M., Austin, G.E., Calbrade, N.A., Holt, C.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. 2016. Waterbirds in the UK 2014/15: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.~~