



FIVE ESTUARIES OFFSHORE WIND FARM ENVIRONMENTAL STATEMENT

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FIVE ESTUARIES OFFSHORE WIND FARM

Wintering Bird Survey (Landfall Locations)
Prepared for: GoBe Consultants (on behalf of Five
Estuaries Offshore Wind Farm Ltd)

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SLR 

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1.0 Introduction and Background

Five Estuaries Offshore Wind Farm (VE OWF) is a Nationally Significant Infrastructure Project (NSIP). An Environmental Impact Assessment (EIA) will be undertaken as part of a Development Consent Order (DCO) application under the Planning Act 2008.

SLR Consulting was initially commissioned by GoBe Consultants, on behalf of Five Estuaries Offshore Wind Farm Ltd, in August 2021 to undertake onshore ecological work necessary to inform the EIA. This report presents the results of wintering bird surveys, focussing on inter-tidal areas, at two possible landfall locations, situated between Holland-on Sea and Frinton-on-Sea on the Essex coast, carried out during the winter of 2021-2022.

1.1 Survey Area

The wintering bird survey area covered by this report specifically targeted intertidal and adjacent wetland habitats and coastal grasslands at two possible landfall locations, which could potentially be used by wintering waterbirds¹. Surveys of wintering birds across other areas potentially affected by the project were commissioned separately and are the subject of separate reports by MacArthur Green.

Potential impacts on wintering waterbirds need to be considered beyond the proposed landfall locations themselves owing to the potential for noise and visual disturbance to arise during construction. Cutts *et al.* (2013)² state that for most wader species, behavioural responses to visual disturbance are unlikely beyond a maximum distance of 250m. Noise disturbance is also unlikely beyond 250m, except in the case of very loud, irregular noise such as the noise generated by driven piling. However, at the landfall, where it is possible that driven piling may be required, the survey covered a wider area, extending to at least 500m either side of each possible landfall zone.

1.2 Purpose of this Report

This report provides details of the survey methodology (Section 2) and presents the results of the survey (Section 3). It also includes a brief discussion regarding the importance of the bird populations recorded (Section 4). The assessment of impacts resulting from the proposed development is beyond the scope of this report however and will be covered in the Terrestrial Ecology and Nature Conservation chapter of the Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES).

1.3 Evidence of Technical Competence and Experience

Surveys were largely carried out by MKA Ecology Ltd, with surveyors including Marcus Kohler MCIEEM, Andy Symes ACIEEM and Felix Bird Grad CIEEM. Some of the initial surveys were also carried out by SLR Senior Field Ecologist Edmund Austin. All surveyors are experienced ornithologists with several years of field survey experience.

This report has been authored by Michelle Robertson, SLR Senior Ecologist and a full member of CIEEM (MCIEEM). The scoping and consultation process was undertaken by Duncan Watson who has provided technical support and a Quality Assurance review of this report. Duncan is a Technical Director at SLR Consulting with over 24 years' professional ecological experience. He is also a Chartered Environmentalist (CEnv) and MCIEEM. Both Michelle and Duncan specialise in ornithology.

¹ The definition of waterbirds follows that used by the Wetland Bird Survey (WeBS) and includes wildfowl (ducks, geese and swans), waders, rails, divers, grebes, cormorants and herons. Gulls are also included as waterbirds for the purposes of this study.

² Cutts, N., Hemingway, K. and Spencer, J. 2013. Waterbird Disturbance Mitigation Toolkit. Information for Estuarine Planning and Coastal Projects. Produced by Institute of Estuarine and Coastal Studies (IECS), University of Hull. Available at: https://tide-toolbox.eu/tidetools/waterbird_disturbance_mitigation_toolkit/

2.0 Methodology

2.1 Desk Study

Desk study was undertaken as part of the Preliminary Ecological Appraisal (PEA)³, a summary of relevant data pertaining to non-breeding birds in the vicinity of the proposed landfall locations is provided in this report. Sources of relevant information include:

- Essex Field Club (EFC).
- British Trust for Ornithology (BTO) WeBS data (freely available data only⁴).
- Essex Birdwatching Society (brief review of recent records⁵).
- North Falls Offshore Wind Farm (NF OFW) Onshore Landfall Area: 2020/2021 Non-Breeding Bird Surveys MacArthur Green 21st May 2021.
- NF OFW Ornithology Desk Study: 2021-22 Non-breeding Season Surveys MacArthur Green 8th September 2021.

2.2 Field Survey

2.2.1 Intertidal Bird Survey

Intertidal surveys were undertaken at each of the proposed landfall zones under consideration at the time of survey (Drawings 1 and 2, Appendix 01). At both locations surveys took place from suitable vantage point locations along the seawall, from which all waterbirds within at least 500m of the relevant landfall zone (including birds on the sea) were recorded. Priority was given to recording birds using inter-tidal habitats, although birds using adjacent terrestrial habitats inland of each proposed landfall zone were also recorded, where visible from the seawall (adjacent terrestrial habitats were also covered during separate surveys, undertaken by MacArthur Green). Particular attention was paid to the identification of any high-tide roost sites, if present.

Surveys specifically focused on the recording of waterbird species, although other notable sightings (e.g. raptor/owl species listed on Annex 1 of the EC Birds Directive or Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) or particularly large flocks of any species) were recorded incidentally. All surveys were undertaken using binoculars and a telescope, as required.

Surveys took place twice per month from September 2021 to March 2022 inclusive (i.e. 14 surveys in total). In order to account for changes in bird numbers and distribution due to the tidal state, each survey was undertaken 'through the tide', either starting at low tide and ending at high tide or starting at high tide and ending at low tide. Surveys began at either high or low tide. Tidal phases are defined as:

- High-Mid – first three hours periods following high tide;
- Mid-Low – hours periods 4-6 following high tide;
- Low-Mid – first three hours periods following low tide; and
- Mid-High – hours 4-6 following low tide.

During each survey, counts were undertaken hourly. On each count the number and location of all wildfowl, waders and notable gull species (e.g. Mediterranean gull *Ichthyaetus melanocephalus*) visible within the relevant survey area were mapped. Frequently occurring gull species (black-headed gull (*Chroicocephalus ridibundus*), herring gull (*Larus argentatus*), lesser black-backed gull (*Larus fuscus*)) were excluded from the counts so that

³ SLR (2022) Five estuaries offshore wind farm PEA report (onshore). Version 5, May 2022.

⁴ <https://www.bto.org/our-science/projects/wetland-bird-survey/publications/webs-annual-report>

⁵ <https://www.ebws.org.uk/sightings/search/species-distribution?year=2022&species=hen%20harrier#main-content>

time was focused on waterbird species of greater importance and more likely to be impacted by disturbance from the proposed development. The behaviour of each bird or flock was noted to provide an indication of how birds use the survey area. There were four primary flock behaviours observed in all species. These behaviours are listed below together with their definitions:

- Foraging – Obvious feeding behaviours such as searching in flight above the water, diving for prey, searching along the shore on foot and probing the substrate for prey.
- Loafing – Idle behaviour not connected with feeding or travelling in any specific direction.
- Roosting – Resting on the water, groynes, shoreline, or fields.
- Maintenance – Preening, bathing, and drying of feathers.
- Other – behaviour that does not fit into any of the categories above.

Where flocks in which individuals were observed displaying more than one behaviour (e.g., loafing, then briefly preening, then loafing), this was recorded as Behaviour + Behaviour (e.g., Loafing + Maintenance).

The survey dates, times, tide times and weather conditions for the intertidal surveys are detailed in Table 2-1 for Location 1 and Table 2-2 for Location 2. Locations 1 and 2 are shown in Drawings 1 and 2 respectively (Appendix 01).

Table 2-1: Summary of weather conditions during surveys at Location 1

Survey date	Start	End	Tidal flow	Tide time	Average wind speed (Beaufort scale and direction)	Precipitation	Cloud cover (oktas n/8) and visibility
08/09/2021	07:35	13:20	Rising	Low tide 07:35	2 E	None	0-1/8 3-5km
23/09/2021	08:11	13:52	Rising	Low tide 08:11	2 W	None	1-2/8 >5km
06/10/2021	06:32	12:15	Rising	Low tide 06:32	4 W	None	6-8/8 >5km
21/10/2021	07:11	13:10	Rising	Low tide 07:11	4-5 W/NW	None	7-8/8 >5km
09/11/2021	08:36	14:07	Rising	Low tide 08:36	2 SE	None	1-7/8 >5km
23/11/2021	07:53	14:15	Rising	Low tide 07:53	2 N	None	2-6/8 3-5km
01/12/2021	08:44	15:15	Ebbing	High tide 08:44	4 SW	None	5-7/8 >5km
14/12/2021	08:15	14:15	Ebbing	High tide 08:12	3 SW	None	3-7/8 >5km
06/01/2022	08:32	14:32	Rising	Low tide 08:31	3 SW	None	0-7/8 >4km
23/01/2022	09:10	15:19	Rising	Low tide 09:10	1 SW	None	8/8 3-5 km

Survey date	Start	End	Tidal flow	Tide time	Average wind speed (Beaufort scale and direction)	Precipitation	Cloud cover (oktas n/8) and visibility
04/02/2022	07:55	14:30	Rising	Low tide 08:18	4 NW	Heavy shower in 2/6 hours	4-8/8 1->5km
24/02/2022	10:44	17:00	Rising	Low tide 10:51	4 W	Drizzle and light rain for one hour each	3-8/8 >5km
07/03/2022	08:55	14:55	Rising	Low tide 08:49	4 E/SE	None	6-7/8 >5km
23/03/2022	09:00	15:30	Rising	Low tide 09:04	3 N/NE	None	0/8 1-3km

Table 2-2: Summary of weather conditions at Location 2

Survey date	Start	End	Tidal flow	Tide time	Average wind speed (Beaufort scale and direction)	Precipitation	Cloud cover (oktas n/8) and visibility
09/09/2021	08:09	13:58	Rising	Low tide 08:09	2 E	None	8-1/8 1-5km
24/09/2021	08:43	14:10	Rising	Low tide 08:43	2 W	None	2-8/8 3-5km
05/10/2021	11:44	17:15	Ebbing	High tide 11:55	2 W	Drizzle 2/6 hrs	4-8/8 >5km
20/10/2021	12:39	19:06	Rising	Low tide 12:39	4.5 SW	None	2-4/8 >5km
10/11/2021	09:27	15:13	Rising	Low tide 09:27	2 SW	Drizzle 2/6 hrs	8/8 1-3km
24/11/2021	08:27	14:30	Rising	Low tide 08:24	1 W	None	7-8/8 1-3km
02/12/2021	09:30	15:10	Ebbing	High tide 09:37	5 NW	None	1-3/8 >5km
15/12/2021	08:45	14:20	Ebbing	High tide 09:09	2 SW	None	8/8 >5km
07/01/2022	09:16	15:20	Rising	Low tide 09:16	3 SW	None	2-6/8 >5km
24/01/2022	09:47	15:47	Rising	Low tide 09:47	1 S	None	8/8 1-3km
07/02/2022	09:45	16:05	Rising	Low tide 10:00	3 W	None	1-6/8 >4km

Survey date	Start	End	Tidal flow	Tide time	Average wind speed (Beaufort scale and direction)	Precipitation	Cloud cover (oktas n/8) and visibility
23/02/2022	09:43	16:10	Rising	Low tide 09:58	4 SW	None	0-8/8 >5km
08/03/2022	09:16	15:16	Rising	High tide 15:34	4 SE	None	0/8 >4 km
24/03/2022	09:30	15:45	Rising	Low tide 09:41	0 E	None	8/8 1-3km

2.2.2 Disturbance Events

Any potential anthropogenic disturbance events that took place during each count were recorded incidentally in order to provide an indication of the levels of existing disturbance within the survey area (although a detailed study of existing disturbance was not carried out as the primary focus of the survey was to record bird numbers, distribution and activity).

Potential disturbance events were limited to events considered likely to cause disturbance to waterbirds (based on observations – so for example walkers using the beach were included but walkers using the existing track on the seawall were not as these did not usually result in noticeable disturbance to birds) and included:

- Walkers;
- Dogs;
- Anglers;
- Bait Diggers;
- Shell-Fishers;
- Vehicles;
- Unpowered Boats;
- Powered Boats; and
- Other.

The 'other' category included any potential anthropogenic disturbance events that could not be attributed to one of the other categories. Examples might include runners, or people on stand-up paddleboards or kayaks, etc. The nature of each 'other' disturbance event was recorded on each occasion and for these specific surveys, the only 'other' disturbance noted was photographers.

Where possible and relevant, the response of any waterbirds to each disturbance event was also recorded in accordance with the following scale:

- Weak – birds move slightly away from disturbance but continue their behaviour;
- Moderate – birds move to another part of the study area, may return to original position; and
- High – birds move out of the study area completely and are not observed returning.

2.2.3 Survey Limitations

The surveys were undertaken on a rising tide more frequently than on an ebbing tide, meaning that there is disproportionately more data for low to mid and mid to high than high to mid and mid to low. This was largely unavoidable, owing to the difficulty of identifying dates during which a full survey could be completed during daylight hours, particularly during the months of November to February when daylight hours are short. This is not considered to represent a significant limitation as bird distribution is unlikely to be substantially different between rising and ebbing tides at this site.

The weather was suitable during all surveys for viable data collection and weather conditions therefore did not present a significant limitation.

2.3 Data Analysis

On completion of the field surveys bird count data were digitised in ArcGIS (version 10.5) and the attribute data captured. The distribution and relative abundance of the species in each survey area, where more than ten individuals were recorded, are presented as 'heat maps' (see Drawings 3-4 in Appendix 01). Points to represent individual birds were uniformly distributed across the areas recorded in the field by the survey team as the extent of any flocks. From these point distributions heat maps were generated using kernel densities. Kernel densities calculates the magnitude-per-unit by area using a kernel function, in this instance a circular kernel or neighbourhood, 100m in diameter, to fit a smoothly tapered surface to each point. The total value of the neighbourhood is one, for each individual bird, with its highest value in the centre dropping to 0 at its edges. Overlapping neighbourhoods at each grid cell are then totalled to provide the values presented in the figures.

The number of birds represented by the highest density value was estimated by comparing the species with highest density value for a survey area to the survey data from which it was calculated. All other species data were then reclassified to provide results on the same scale as the most abundant species.

Where individual birds were recorded by the surveyor the locations are presented as point data, with each point representing a single bird. Where small flocks were recorded over a wide area, the birds were distributed across the area as described above.

For species where less than ten individuals were observed, these sightings are displayed on separate drawings (refer to Drawings 5 and 6, Appendix 01).

3.0 Results

3.1 Desk Study

The desk study data obtained for the PEA included records for a wide range of legally protected or otherwise notable bird species within the study area used for the PEA, which included the landfall areas, cable corridors and substation zones under consideration at that time, plus a 2km buffer. These include 28 species that are protected through inclusion on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), 24 Section 41 (of the Natural Environment and Rural Communities (NERC) Act 2006) species, 45 species listed under Annex 1 of the EU Birds Directive, 48 species red listed as 'Birds of Conservation Concern'⁶ and 76 species amber listed as 'Birds of Conservation Concern'⁷. However, not all of these records relate to the landfall areas and not all of these records relate to non-breeding species. A summary of data relevant to the landfall areas is provided below.

3.1.1 Designated Sites

There are three Special Protection Areas (SPA), three Ramsar sites and one Site of Special Scientific Interest (SSSI) within 15km of the landfall areas that support wintering bird qualifying or notified features, refer to Table 3-1 and for full data forms see Appendix 02.

Table 3-1 Statutory designated sites specifically with non-breeding bird qualifying features within 15km of the landfall areas

Site name & Designation	Closest distance from the landfall zones (m)	Reason for Notification / Designation, focused on wintering/non-breeding birds (population ⁸ given in brackets)
Hamford Water SPA	5,979	<p>Qualifying species (non-breeding):</p> <p>Teal (<i>Anas crecca</i>) (36,311)</p> <p>Brent goose (<i>Branta bernicla</i>) (6,892)</p> <p>Ringed plover (<i>Charadrius hiaticula</i>) (520)</p> <p>Black-tailed godwit (<i>Limosa limosa</i>) (1,121)</p> <p>Grey plover (<i>Pluvialis squatarola</i>) (3,251)</p> <p>Avocet (<i>Recurvirostra avosetta</i>) (317)</p> <p>Redshank (<i>Tringa totanus</i>) (1,461)</p> <p>Shelduck (<i>Tadorna tadorna</i>) (1,629)</p>
Hamford water Ramsar site	5,979	<p>Qualifying species passage:</p> <p>Ringed plover (1,169)</p> <p>Redshank (2,099)</p> <p>Qualifying species winter:</p> <p>Brent goose (3,629)</p> <p>Black-tailed godwit (377)</p> <p>Possible further consideration:</p>

⁶ Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and Second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114, 723–747.

⁷ *NB – Some species will have more than one designation.

⁸ Population data taken from individual citations, refer to Appendix 2 for full documents including dates.

Site name & Designation	Closest distance from the landfall zones (m)	Reason for Notification / Designation, focused on wintering/non-breeding birds (population ⁸ given in brackets)
		Grey plover (2,749)
Stour and Orwell Estuaries SPA	13,636	<p>Qualifying winter species: Brent goose (2,627) Pintail (<i>Anas acuta</i>) (741) Grey plover (3,261) Knot (<i>Calidris canutus</i>) (5,970) Dunlin (<i>Calidris alpina</i>) (19,114) Black-tailed godwit (2,559) Redshank (3,687)</p> <p>Qualifying species autumn passage: Redshank (2,588)</p>
Stour and Orwell Estuaries Ramsar site	13,636	<p>Assemblage of international importance (63,017 waterfowl)</p> <p>Qualifying species winter: Brent goose (2,627) Grey plover (3,261) Knot (5,970) Dunlin (19,114) Black-tailed godwit (2,559) Redshank (3,687)</p> <p>Qualifying species passage: Redshank (2,588)</p>
Colne Estuary (Mid-Essex Coast Phase 2) SPA	8,736	<p>Qualifying species winter: Assemblage of over 20,000 waterfowl Brent goose (5,315) Redshank (1,252) Hen harrier (<i>Circus cyaneus</i>) (19) Cormorant (243) Mute swan (<i>Cygnus olor</i>) (354) Shelduck (1,237) Goldeneye (<i>Bucephala clangula</i>) (262) Ringed plover (355) Grey plover (1,168) Sanderling (<i>Calidris alba</i>) (219) Dunlin (11,272) Black-tailed godwit (606) Curlew (938)</p>
Colne Estuary	10,517	Assemblage of international importance (32,041 waterfowl)

Site name & Designation	Closest distance from the landfall zones (m)	Reason for Notification / Designation, focused on wintering/non-breeding birds (population ⁸ given in brackets)
(Mid-Essex Coast Phase 2) Ramsar Site		<p>Qualifying species winter: Brent goose (3,165) Redshank (1,624)</p> <p>Species identified after designation: Black-tailed godwit (402)</p>
Holland Haven Marshes SSSI	0	<p>Species detailed in citation utilising site over winter:</p> <p>Hen harrier Short-eared owl (<i>Asio flammeus</i>) Wigeon (<i>Mareca penelope</i>) (1,000, max 6,500) Teal (several hundred) Pintail (max 35) Shoveler (<i>Anas clypeata</i>) (max 20) Pochard (<i>Aythya ferina</i>) (max 10) Ruff (<i>Calidris pugnax</i>) (max 90) Snipe (<i>Gallinago gallinago</i>) Brent geese (several hundred) Twite (<i>Linaria flavirostris</i>) (max 160) Lapland bunting (<i>Calcarius lapponicus</i>) (max 70) Purple sandpiper (<i>Calidris maritima</i>) (10-15)</p>

3.1.2 Non-Breeding Birds Species Records

Non-breeding bird survey was undertaken at the proposed landfall area and surroundings in the winter of 2020/2021⁹, focussing on the habitats inland of the seawall and extending inland north to Great Holland and west towards Little Clacton. It concluded that a reasonably large number of species were recorded, although distribution was not even, with areas around the wetland habitats within Holland Haven Marshes SSSI being favoured. In total, 52 species of wader, wildfowl, raptors and/or otherwise notable bird species were recorded. The findings are incorporated into the area summaries provided below, which also draw on other relevant data sources.

Of particular relevance to this report, the following sites produced records of legally protected or otherwise notable bird species during the non-breeding season:

- Holland Haven Marshes SSSI and Holland Haven LNR** – Avocet, barn owl (*Tyto alba*), bearded tit (*Panurus biarmicus*), black-tailed godwit, dark-bellied brent goose (the BTO WeBS Online data shows that Holland Haven Marshes SSSI regularly hosts >1000 wintering brent geese), Cetti's warbler (*Cettia cetti*), curlew, Dartford warbler (*Curruca undata*), Dunlin, European white-fronted goose (*Anser albifrons*), firecrest (*Regulus ignicapilla*), gadwall, great crested grebe, great white egret (*Ardea alba*), green sandpiper (*Tringa ochropus*), greylag goose (*Anser anser*), kingfisher (*Alcedo atthis*), lapwing (*Vanellus vanellus*), little egret (*Egretta garzetta*), little grebe (*Tachybaptus ruficollis*), mallard (*Anas*

⁹ MacArthur Green. (2021). North Falls Offshore Wind Farm Onshore Landfall Area: 2020/2021 Non-Breeding Bird Surveys

platyrhynchos), merlin (*Falco columbarius*), moorhen (*Gallinula chloropus*), oystercatcher (*Haematopus ostralegus*), peregrine (*Falco peregrinus*), pink-footed goose (*Anser brachyrhynchus*), pintail, purple sandpiper, redshank, spotted redshank (*Tringa erythropus*), ruff, shag (*Gulosus aristotelis*), shelduck, hen harrier, short-eared owl, shoveler, snipe, teal, tundra bean goose (*Anser serrirostris*), turnstone, water rail (*Rallus aquaticus*), whimbrel (*Numenius phaeopus*), wigeon and wood sandpiper (*Tringa glareola*). The 2020/21 MacArthur Green surveys recorded notable counts of brent geese, white-fronted geese, greylag geese, teal, wigeon, shoveler and shelduck. A notable wader assemblage was also present and included avocet, curlew, snipe, lapwing and purple sandpiper;

- **Little Clacton** – Barn Owl, Cetti's warbler, European white-front goose, gadwall, greylag goose, little grebe, little owl (*Athene noctua*), mallard, marsh harrier (*Circus aeruginosus*), moorhen, oystercatcher, peregrine, pintail, shelduck, teal, tufted duck, wigeon and woodcock. The 2020/21 MacArthur Green surveys recorded notable numbers of European white fronted geese, teal, pintail and wigeon in this area;
- **Great Holland** - Cetti's warbler, European white-fronted goose (albifrons), golden plover, greylag goose, lapwing, mallard, moorhen, shoveler, teal, water rail and wigeon. The 2020/21 MacArthur Green surveys recorded relatively low diversity here, but with notable records of European white fronted geese, greylag geese, lapwing and golden plover; and
- **Frinton Golf Club** – Cetti's warbler, dark-bellied brent goose, corn bunting, curlew, golden plover, lapwing, little owl, mallard, moorhen, oystercatcher, peregrine, teal, wigeon and woodcock. The 2020/21 MacArthur Green non-breeding bird survey recorded notable counts of brent geese and lapwing at this location.

The results of an ornithological desk study for the area¹⁰ concluded that the majority of habitats within the relevant study area (which included Holland Haven Marshes and the area immediately inland, north to Great Holland and west towards Little Clacton) are predominantly agricultural in nature and theoretically suitable for feeding and roosting wildfowl and waders in the winter months. It was considered likely that most individuals will utilise inland habitats that are closest to the nearby SPAs and Holland Haven Marshes SSSI. The literature review reported in the desk study suggested that key species may range widely between feeding and roost sites during the non-breeding season, with values quoted of 5km for brent geese, up to 10km for European white-fronted geese, and up to 10-12km for lapwing and golden plover.

3.2 Field Survey

The surveys recorded a total of 49 bird species, of which 40 were waterbirds or notable gull species. A total of 42 species in total, 37 of which were waterbirds or notable gull species were observed at Location 1 and 33 species were observed at Location 2, 29 of which were waterbirds or notable gull species.

- A total of 15 species are specially protected under Schedule 1 of the Wildlife and Countryside Act (1981) (as amended), 10 of which were waterbirds.
- Eleven species in total, including nine waterbird species, are red listed birds of conservation concern.
- Twenty-four species, including 22 species of waterbird are amber listed birds of conservation concern.
- Thirteen species, including eight waterbird species, are green listed birds of conservation concern.
- One species had no conservation status, Canada goose (*Branta canadensis*) as an introduced species.
- Observations of other notable (non-waterbird) species, e.g., species listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), Annex 1 of the EC Birds Directive or S41 of the NERC Act 2006 included:
 - One sighting of hen harrier (Schedule 1, Annex 1 and S41);

¹⁰ MacArthur Green. (2021). North Falls Offshore Wind Farm Ornithology Desk Study: 2021-22 Non-breeding Season Surveys.

- six sightings of peregrine falcon (Schedule 1);
- fifteen records of Cetti's warbler (Schedule 1);
- four records of Dartford warbler (Schedule 1, Annex 1);
- one record of Merlin (Schedule 1, Annex 1); and.
- In addition, sedge warbler (*Acrocephalus schoenobaenus*), long eared owl (*Asio otus*), stonechat (*Saxicola rubicola*) and sparrowhawk (*Accipter nisus*) were also recorded, despite not being waterbirds or otherwise notable. These observations are not discussed further within this report.

3.2.1 Relative Abundance and Species Distribution

The relative abundance and distribution of individual waterbird species that were observed on at least 10 occasions within the survey area are shown in Drawings 3.1 to 3.26 for the Landfall Location 1 and Drawings 4.1-4.17 for Landfall Location 2 (Appendix 01). These drawings illustrate how the various species tend to use the relevant parts of the survey area across the winter season. The species are presented taxonomically in order to best illustrate any taxonomic variations or similarities in site usage by species assemblages. For waterbird and other notable species that were recorded less frequently (less than 10 occasions), the location of the observations is shown on Drawing 5 for Location 1 and Drawing 6 for Location 2 (Appendix 01).

A total of 37 waterbird and notable gull species were observed at Location 1 and 29 species were observed at Location 2. Of the total waterbird sightings, 69% were observed at Location 1, with 31% observed at Location 2.

3.2.2 Peak Count Data

The peak counts of each waterbird species recorded on each survey date throughout the survey period are detailed in Table 3-2 and Table 3-3 for Locations 1 and 2 respectively. The tables also show the proportional frequency of observation for each species, i.e., the proportion of survey periods in which each species was recorded (n=84), in order to show how regularly each species uses the survey area. Species are arranged taxonomically in order.

Table 3-2: Peak count of waterbird species recorded at Landfall Location 1 on each survey date, the number of hourly counts in which each species was observed and the proportional frequency of those observations

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	8/9/21	23/9/21	6/10/21	21/10/21	9/11/21	23/11/21	1/12/21	14/12/21	6/1/22	23/01/22	4/2/22	24/2/22	7/3/22	23/3/22
Brent Goose	13	15.48	0	0	0	0	20	21	2	900	0	73	4	0	0	0
Canada goose	24	28.57	0	0	0	0	6	4	8	8	2	18	7	0	4	2
Greylag goose	50	59.52	45	30	20	20	140	10	215	120	260	91	2	0	0	0
European white fronted goose	12	14.29	0	0	0	0	0	0	0	0	0	238	35	0	44	0
Mute swan	8	9.52	0	0	0	0	0	0	0	0	1	4	0	0	2	1
Shelduck	52	61.90	1	0	0	0	8	6	6	4	14	6	5	1	4	4
Shoveler	58	69.05	0	1	6	6	5	20	11	18	0	3	22	10	19	4
Gadwall	7	8.33	10	0	0	0	0	0	1	0	0	0	0	0	0	10
Wigeon	51	60.7	0	10	5	15	45	18	72	150	0	0	150	15	140	20
Mallard	21	25.00	0	0	0	6	0	0	0	5	3	2	9	2	7	6
Teal	68	80.95	0	40	130	110	20	30	93	260	0	58	50	60	69	26
Common scoter (<i>Melanitta nigra</i>)	3	3.57	0	0	2	10	0	0	0	0	2	0	0	0	0	0
Moorhen	31	36.90	0	0	0	0	0	2	2	2	3	3	5	3	4	0

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	8/9/21	23/9/21	6/10/21	21/10/21	9/11/21	23/11/21	1/12/21	14/12/21	6/1/22	23/01/22	4/2/22	24/2/22	7/3/22	23/3/22
Great crested grebe	3	3.57	0	0	0	0	0	1	0	0	0	2	0	0	0	0
Oystercatcher	24	28.57	0	0	1	0	0	1	0	0	0	0	1	2	2	4
Avocet	53	63.10	10	10	10	0	0	0	0	0	2	3	2	2	2	45
Lapwing	67	79.76	11	150	4	0	20	250	195	80	325	98	100	10	78	4
Golden plover	2	2.38	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	42	50.00	5	5	4	4	0	0	0	0	17	47	45	28	17	40
Black-tailed godwit	42	50.00	12	0	1	0	0	6	1	0	0	5	15	13	12	10
Turnstone	37	44.05	3	3	7	2	8	8	5	2	5	4	1	0	0	16
Ruff	3	3.57	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Sanderling	1	1.19	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Dunlin	6	7.14	1	1	0	0	0	0	0	0	0	0	0	1	0	0
Purple sandpiper	35	41.67	0	0	0	0	5	7	12	8	4	4	4	9	7	3
Little stint (<i>Calidris minuta</i>)	2	2.38	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Snipe	10	11.90	4	7	0	0	0	1	0	0	4	0	1	1	0	0
Common sandpiper (<i>Actitis hypoleucos</i>)	4	4.76	1	1	0	0	0	0	0	0	0	0	0	0	0	0

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	8/9/21	23/9/21	6/10/21	21/10/21	9/11/21	23/11/21	1/12/21	14/12/21	6/1/22	23/01/22	4/2/22	24/2/22	7/3/22	23/3/22
Green sandpiper	3	3.57	0	0	0	0	2	0	0	0	0	1	0	0	0	1
Redshank	6	7.14	0	0	0	0	2	0	0	0	0	0	0	0	0	4
Mediterranean gull	6	7.14	5	0	0	0	0	1	0	0	0	0	1	1	1	0
Great black backed gull (<i>Larus marinus</i>)	2	2.38	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill (<i>Alca torda</i>)	1	1.19	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Red-throated diver (<i>Gavia stellata</i>)	5	5.95	0	0	0	0	0	2	1	0	1	8	0	0	0	0
Cormorant	47	55.95	0	0	0	0	0	0	3	4	4	28	6	6	3	3
Grey heron (<i>Ardea cinerea</i>)	11	13.10	0	0	0	0	0	1	1	1	0	1	1	0	0	0
Little egret	8	9.52	0	0	1	0	0	1	0	0	0	0	0	1	0	0

Table 3-3: Peak count of waterbird species recorded at Landfall Location 2 on each survey date, the number of hourly counts in which each species was observed and the proportional frequency of those observations

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	9/9/21	24/9/21	6/10/21	20/10/21	10/11/21	24/11/21	2/12/21	15/12/21	7/1/22	24/1/22	7/2/22	23/2/22	8/3/22	24/3/22
Brent Goose	18	21.43	0	0	0	0	20	2	0	1100	1	35	0	2	2	2
Canada goose	2	2.38	0	0	0	0	0	0	8	0	15	0	0	0	0	0
Greylag goose	7	8.33	0	0	0	0	0	0	0	0	282	3	0	0	0	0
European white fronted goose	11	13.11	0	0	0	0	0	0	0	0	3	11	2	0	0	0
Mute swan	1	1.19	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Shelduck	5	5.95	0	0	0	0	0	0	0	0	12	0	0	0	0	30
Shoveler	6	7.14	0	0	0	0	0	0	0	0	8	0	0	0	0	0
Wigeon	23	27.38	0	0	0	0	10	38	0	80	243	40	30	10	65	0
Mallard	9	10.71	0	0	0	0	0	0	0	0	3	2	3	2	3	4
Teal	8	9.52	0	0	0	0	0	0	0	0	121	0	0	0	0	4
Common scoter	1	1.19	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Moorhen	3	3.57	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Oystercatcher	10	11.90	0	0	0	0	0	0	0	0	0	0	0	2	1	5
Avocet	7	8.33	0	0	0	0	0	0	0	0	2	0	0	0	0	40

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	9/9/21	24/9/21	6/10/21	20/10/21	10/11/21	24/11/21	2/12/21	15/12/21	7/1/22	24/1/22	7/2/22	23/2/22	8/3/22	24/3/22
Lapwing	3	3.57	0	0	0	0	0	0	0	0	2	0	65	0	0	0
Ringed plover	1	1.19	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Whimbrel	3	3.57	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Curlew	28	33.33	3	3	2	0	0	5	0	3	19	22	48	1	2	66
Black tailed godwit	3	3.57	0	0	0	0	0	0	0	0	1	2	0	0	0	0
Turnstone	15	17.86	3	0	3	3	1	0	1	0	1	0	1	1	10	4
Sanderling	2	2.38	0	0	0	4	0	0	0	0	2	0	0	0	0	0
Purple sandpiper	14	16.67	0	0	0	0	0	1	0	0	4	1	6	7	7	2
Common sandpiper	1	1.19	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Green sandpiper	4	4.76	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Mediterranean gull	3	3.57	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Razorbill	1	1.19	0	0	0	0	0	1	0	0	0	0	0	0	0	0

Species	# counts in which species observed	Proportional frequency of counts in which species observed (%)	9/9/21	24/9/21	6/10/21	20/10/21	10/11/21	24/11/21	2/12/21	15/12/21	7/1/22	24/1/22	7/2/22	23/2/22	8/3/22	24/3/22
Guillemot (<i>Uria aalge</i>)	1	1.19	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Red-throated diver	33	39.29	0	0	0	0	0	1	1	2	1	7	0	0	1	5
Cormorant	33	39.29	0	0	0	0	0	0	18	0	9	10	1	5	2	5

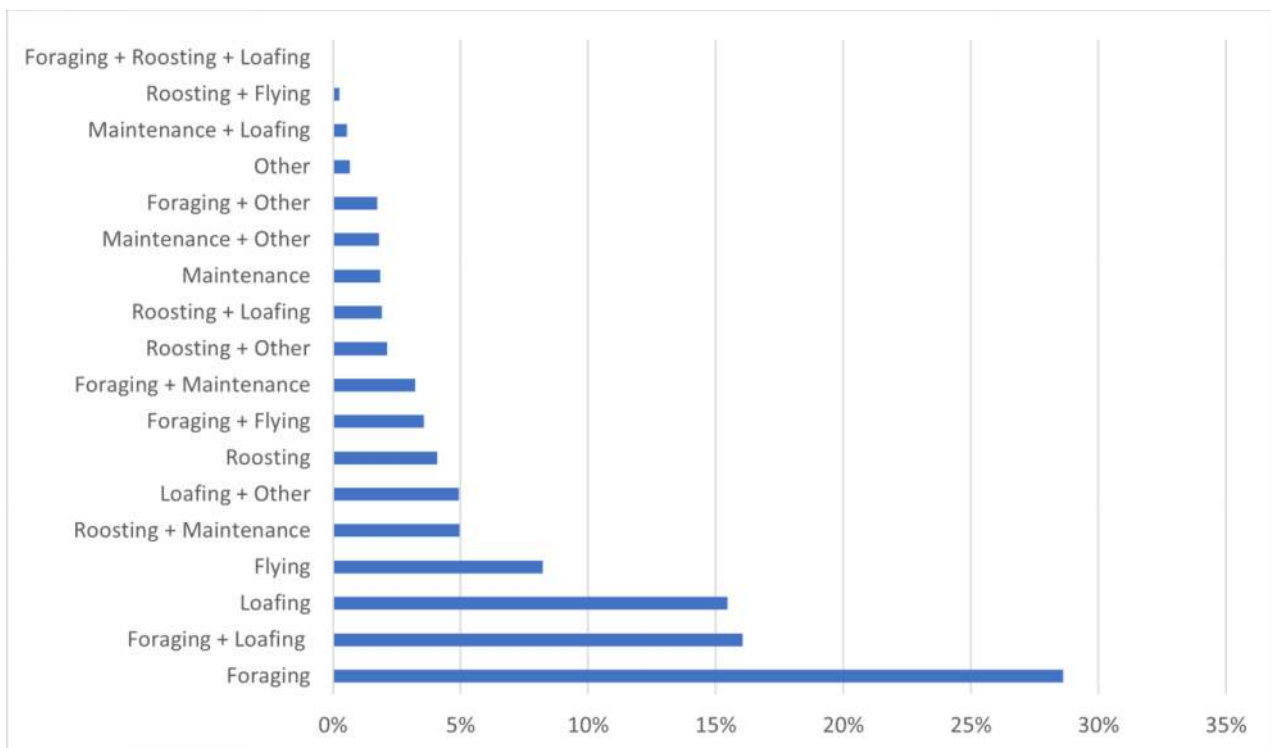
3.2.3 Flock behaviour

The behaviours displayed by each individual species are described in the species accounts in Section 3.2.6 (Table 3-8).

Landfall Location 1

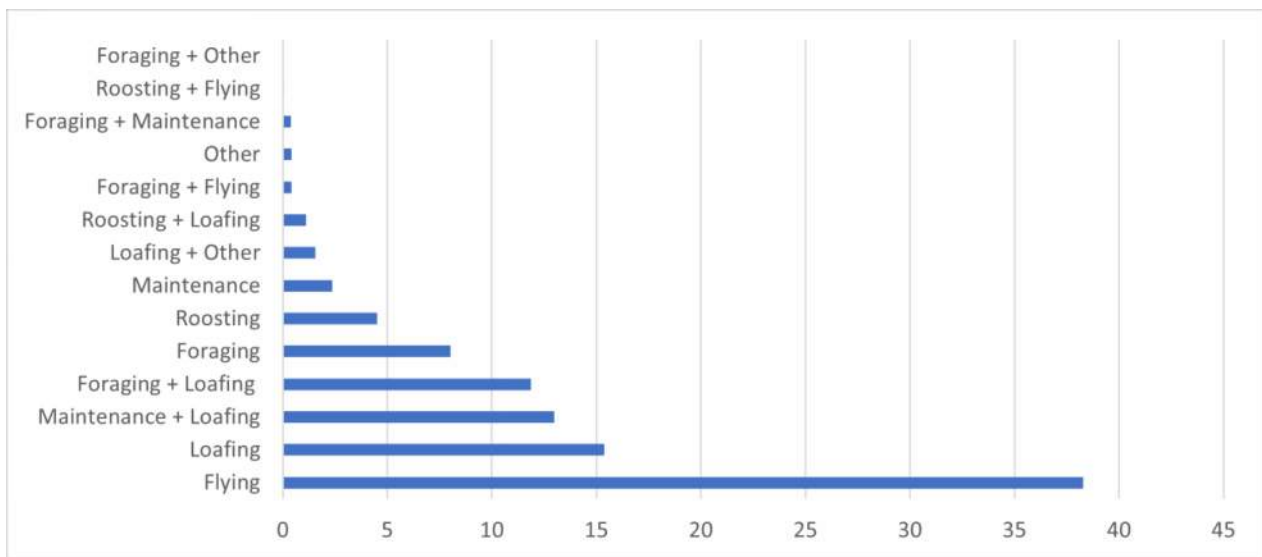
The most frequent behaviour observed among all waterbird species combined throughout the survey season at Landfall Location 1 was foraging (28.8%), followed by foraging and loafing (16.0%) and loafing (15.4%), refer to Chart 3-1.

Chart 3-1 Proportion of different behaviours observed among all waterbirds at Landfall Location 1



Landfall Location 2

The most frequent behaviour observed at Landfall Location 2 among all waterbird species combined was flying (38.3%), followed by loafing (15.4%) and loafing and maintenance (13%), refer to Chart 3-2.

Chart 3-2 Proportion of different behaviours observed among all waterbirds at Landfall Location 2

3.2.4 Tidal State

For each species that made up at least 1% of the observations, the percentage of total sightings over all surveys, for each tidal cycle, and the behaviour observed across these species within each tidal cycle, is detailed in Table 3-4 (Landfall Location 1) and Table 3-5 (Landfall Location 2).

As noted in Section 2.2.3, there were fewer surveys undertaken from high to low tide than from low to high tide, therefore high – mid tide and mid – low tide are under-represented in the data. Likely due to the skew in the data, more species were observed in the low – mid and mid – high tidal cycles than high – mid and mid – low, although the behaviour data presented in Table 3-5 are not likely to be significantly affected. Foraging represented the greatest proportion of the recorded activity in the low – mid, mid – low and mid – high tidal cycles.

Foraging in intertidal habitats would usually be anticipated to occur most frequently at the low tidal states (low to medium and medium to low) and specifically when any substrate is recently accessible (medium – low). The relatively high proportion of foraging activity also recorded in the mid – high tidal cycle may be due to birds utilising fields and inland water bodies, which were also included in the survey data.

Table 3-4: Species assemblage observed during each tidal cycle and behaviours observed, shown as a proportion of all sightings in each tidal state at Landfall Location 1

Tidal State	No. Species Recorded Over Survey Season	Proportion of each species observed across specified tidal state and all surveys (>1% only reported)	Recorded Behaviours (% of all sightings in the specified tidal state, all species combined)
L-M	29	Lapwing (26.05%) Teal (18.70%) Greylag goose (17.43%) Wigeon (12.6%) European white fronted goose (6.62%) Curlew (3.34%) Avocet (2.61%) Shoveler (2.55%) Brent goose (2.36%) Black-tailed godwit (1.16%) Shelduck (1.12%) Cormorant (1.00%)	Foraging 33.75% Loafing 22.02 % Flying 8.59% Foraging + maintenance 8.25% Foraging + Loafing 7.98% Foraging + Flying 2.75% Roosting + loafing 4.34% Roosting + Other 3.77% Foraging + other 3.47% Roosting 3.44%% Roosting + maintenance 2.77% Maintenance 2.07% Other 1.81%
M-H	33	Lapwing (23.62%) Teal (19.60%) Wigeon (19.27%) Greylag goose (16.67%) Curlew (5.08%) Avocet (2.53%) Shoveler (2.37%) Purple sandpiper (1.53%) Turnstone (1.48%) Shelduck (1.20%) Cormorant (1.19%)	Foraging 31.31% Foraging + loafing 22.86% Loafing 7.34% Roosting + maintenance 10.61% Roosting 7.7% Flying 4.95% Maintenance 4.07% Roosting + other 2.25% Foraging + flying 1.93% Foraging + other 1.42% Foraging and maintenance 1.14% Maintenance + Loafing 1.28% Roosting + Loafing 1.2%
H-M	12	Brent Goose (43.55%) Greylag goose (23.17%) Teal (20.38%) Wigeon (6.83%)	Loafing (inc. loafing +other) 45.27% Flying 18.75% Foraging and flight 10.45% Maintenance 9.36% Foraging 8.81% Foraging + loafing 7.3%
M-L	10	Teal (60%) Wigeon (27.7%) Greylag goose (4.16%)	Foraging 38.52% Foraging and loafing 31.83% Loafing 28.88% Flying 0.41%

Tidal State	No. Species Recorded Over Survey Season	Proportion of each species observed across specified tidal state and all surveys (>1% only reported)	Recorded Behaviours (% of all sightings in the specified tidal state, all species combined)
			Other 0.32% Roosting 0.04%

Table 3-5: Species assemblage observed during each tidal cycle and behaviours observed, shown as a proportion of all sightings in each tidal state at Landfall Location 2

Tidal State	No. Species Recorded Over Survey Season	Proportion of each species observed across specified tidal state in all surveys (>1% only reported)	Recorded Behaviours (% of all sightings in the specified tidal state, all species combined)
L-M	24	Greylag goose (38.0%) Teal (16.0%) Curlew (11.8%) European white fronted goose (8.1%) Lapwing (6.7%) Wigeon (6.2%) Brent goose (3.9%) Red throated diver (3.16%)	Foraging (20.3%) Roosting (20.7%) Loafing (19.8%) Foraging +Loafing (15.6%) Flying (6.44%) Loafing + Other (3.6%) Foraging + Flying (0.8%) Roosting +Flying (0.2%)
M-H	22	Wigeon (30.3%) Greylag goose (27.8%) Teal (12.9%) Curlew (10.4%) European white fronted goose (3.1%) Brent goose (2.3%) Shelduck (2.3%) Cormorant (2.4%) Red throated diver (1.8%) Avocet (1.7%) Purple sandpiper (1.6%)	Foraging +Loafing (32.3%) Loafing (17.0%) Foraging (13.1%) Flying (10.9%) Maintenance + loafing (9.2%) Maintenance (8.8%) Roosting +Loafing (4.1%) Foraging + Maintenance (1.4%) Other (1.5%)
H-M	6	Brent goose (94.5%) Wigeon (4.7%)	Flying (59.2%) Maintenance + Loafing (32.4%) Loafing (5.9%) Loafing +other (2.4%) Foraging (0.3%)
M-L	8	Brent goose (96.6%) Wigeon (1.9%)	Flying (74.7%) Loafing (24.15%)

Tidal State	No. Species Recorded Over Survey Season	Proportion of each species observed across specified tidal state in all surveys (>1% only reported)	Recorded Behaviours (% of all sightings in the specified tidal state, all species combined)
			Foraging (0.9%) Foraging +Flight (0.2%) Maintenance (0.05%)

3.2.5 Disturbance Events and Responses

A total of 22 disturbance events were logged over all surveys at both Landfall Locations, 77.3% of disturbance events occurred at Location 1. Walkers with dogs were the most frequently recorded disturbance events (45.5% of incidents recorded at both Locations combined), followed by aircraft (18.2% of incidents recorded from both locations combined). The types of disturbance, response from the birds and number of disturbance events from both the vantage points are provided in Table 3-6.

Table 3-6: Type of disturbance event, response and number of occurrences, at Landfall Locations 1 and 2

Disturbance response	High		Moderate		Weak		No disturbance		Total
	Loc. 1	Loc. 2	Loc. 1	Loc. 2	Loc. 1	Loc. 2	Loc. 1	Loc. 2	
Aircraft	0	0	0	0	1	2	3	0	6
Photographers	0	0	0	0	1	0	0	0	1
Powered boats	0	0	0	1	0	0	0	0	1
Vehicle	0	0	0	0	1	0	0	0	1
Walker	1	1	0	0	1	0	0	0	3
Walker + dog	1	0	1	0	0	1	7	0	10
TOTAL	2	1	1	1	4	3	10	0	22

The species most frequently recorded as being disturbed was purple sandpiper, with this species being disturbed four times in total across both survey locations. Table 3-7 shows the number of behavioural responses recorded per species over the survey season.

Table 3-7: Number of disturbance responses recorded by species at both Landfall Locations

Species	Number of disturbance responses		Disturbance response					
			High		Moderate		Weak	
	Loc. 1	Loc. 2	Loc. 1	Loc. 2	Loc. 1	Loc. 2	Loc. 1	Loc. 2
Brent goose	0	0	0	0	0	0	0	1
Wigeon	0	1	0	0	0	1	0	0
Oystercatcher	1	0	1	0	0	0	0	0
Avocet	1	0	0	0	0	0	1	0
Curlew	1	0	0	0	0	0	1	0
Black-tailed godwit	0	1	0	0	0	0	0	1
Turnstone	2	1	0	0	1	0	1	1
Purple sandpiper	2	2	1	1	0	0	1	1
TOTAL	7	5	2	1	1	1	4	3

3.2.6 Species Accounts

Summary accounts of the conservation status, behaviours, and numbers and distribution of each recorded waterbird species are given in Table 3-8. Analyses of most frequently displayed behaviour types are based on the number of flocks or individuals observed exhibiting that behaviour. Flocks and individuals of a single species may have been recorded more than once during a single survey period where they were displaying different behaviours and/or were distributed in different locations within the same survey area, refer to Drawings 3, 4, 5 and 6 in Appendix 01.

Table 3-8: Species accounts

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Brent goose	Amber S41	<ul style="list-style-type: none"> • Hamford Water SPA & Ramsar site • Stour and Orwell Estuaries SPA & Ramsar site • Colne Estuary SPA & Ramsar site • Holland Haven Marshes SSSI 	<p>Location 1- Brent geese were observed from Location 1 on 24 occasions, with a peak count of 900 individuals (14/12/21). Numbers ranged from 1 to 900 (mean= 85.42), the majority of records (79.2%) were of flying brent geese. The majority (79%) of sightings were located offshore, with birds in flight the other 21% of sightings were onshore, with flying birds most frequently observed, although a flock of 240 was observed undertaking maintenance in December in the fields beyond the B1032 road and at the waterbody near Location 1.</p> <p>Location 2- A total of 36 brent goose sightings were recorded during the survey period, a peak count of 1,100 individuals were recorded on 15/12/21. Flock size ranged from 1 to 1,100 (mean= 148.86). The majority of records were of brent geese in flight (70.6% of observations) and most observations were offshore (77% of observations) where birds were predominately in flight (78.5% of offshore observations) or were loafing/ undertaking maintenance. The rest were recorded on land and were foraging in 62.5 % of observations.</p>
Canada goose	None- non-native	None	<p>Location 1- Canada geese were observed on 26 occasions, with a peak count of 18, flock size ranged from two -18 (mean 6.15). The majority of observations were on land (77% of observations). Canada geese were observed mostly foraging (55% of on land observations) on land. Loafing and maintenance were more frequently observed in the sightings offshore. .</p> <p>Location 2- Only observed on three occasions, flock size ranged from four- 15 (mean = 9). Two observations were on land and one offshore. Loafing was the most frequently recorded activity, recorded for two of the flocks, although one was loafing then flying and the other flock was observed foraging.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Greylag goose	Amber	None	<p>Location 1- Total of 54 observations, peak count of 260 individuals, flock size ranged from 1-260 (mean=75.6). 98% of all observations were on land, with one sighting of a single individual loafing offshore. Greylag geese were most frequently observed foraging (69.9%) or foraging with another behaviour.</p> <p>Location 2- Greylag geese were observed a total of seven times during the surveys, with a peak flock size of nine birds, the range for the flock size was between three and 282 individuals (mean = 229). Predominant behaviour recorded was foraging, with some loafing and observations were all on land.</p>
Mute swan	Green	<ul style="list-style-type: none"> • Colne Estuary SPA 	<p>Location 1- There were a total of nine occasions where mute swan was recorded, a peak flock size of four was observed (mean=1.7). All sightings were on land and foraging was the most commonly observed behaviour.</p> <p>Location 2- Mute swan was observed on one occasion, where two individuals were observed roosting on land.</p>
European white fronted goose	Amber Annex 1, S41	None	<p>Location 1- A total of 17 occasions where white fronted goose were recorded, peak flock size was 238 (mean = 62.17). All sightings were on land. Foraging and foraging and loafing were the most frequently observed behaviours (64%), with flying observed once only.</p> <p>Location 2 – White fronted geese were observed on 11 occasions, peak flock size was 40 (mean – 23.9), all observations were on land. Observations were primarily of foraging individuals, with one observation of a flock foraging and loafing and one flock observed roosting.</p>
Shelduck	Amber	<ul style="list-style-type: none"> • Hamford Water SPA • Colne Estuary SPA 	<p>Location 1- Shelduck were observed on 57 occasions, maximum flock size was 14 (mean=4.16). The majority of observations, 93.4%, were on land, with 6.6% (three observations) being observed offshore, two of these observations were in flight and one was foraging. Foraging, or foraging and another behaviour (loafing, flying or other) attributed 45.7% of all observations.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
			Location 2- A total of six observations of shelduck were made at Location 2, flock size ranged from one to 30 (mean=12.5). Two observations were offshore of an individual and a flock of 30, which were flying and foraging respectively. The other four observations were on land and were of loafing birds.
Shoveler	Amber	<ul style="list-style-type: none"> Holland Haven Marshes SSSI 	<p>Location 1- A total of 60 observations, flock size ranged from one to 22 (mean = 8.98). All observations were on land. Foraging and loafing were the most frequently observed behaviours, 38% and 39% respectively.</p> <p>Location 2- A total of six observations were made from Location 2, flock size ranged from three to eight (mean=5.16). All observations were of birds on land. Foraging was most frequently observed, with four of the six observations, two observations were of loafing birds.</p>
Gadwall	Amber	None	<p>Location 1-A total of eight observations of gadwall were made, flock size ranged from one to a peak count of 10 individuals (mean=6.75). The most frequently observed behaviour was foraging (96.9%), all observations were on land.</p> <p>Location 2- No observations of gadwall.</p>
Wigeon	Amber	<ul style="list-style-type: none"> Holland Haven Marshes SSSI 	<p>Location 1-There were a total of 64 observations of wigeon during the surveys, flock size ranged from 2 to 140 individuals (mean= 46.59). The majority of observations, 89%, were on land. Foraging accounted for 47% of observations and loafing accounted for 18.75% of all observations. Offshore observations were most frequently of loafing birds.</p> <p>Location 2- Wigeon were observed on 12 occasions from Location 2. The peak count was 256 (mean=98.08). 58% of the observations were on land, and a range of behaviours were observed, flying (33% of observations), loafing (25% of observations) and foraging, loafing and other, maintenance, maintenance and loafing and roosting (8.33% of observations for each behaviour). Loafing and flying were associated with observations offshore.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Mallard	Amber	None	<p>Location 1- A total of 26 mallard observations were recorded, flock size ranged from two to a peak of nine individuals (mean=3.69). All observations were on land. Most frequently mallard were observed foraging or loafing (both behaviours 26.9%), roosting was recorded in 23% of the observations and 11.54% were observed flying.</p> <p>Location 2 - A total of 12 observations were recorded, flock size ranged from one to four (mean=2.25). All observations were recorded on land. The most common behaviour observed was flying (58.33%), with other observed behaviours including foraging (8,33%), loafing (16.67%), loafing and other (8.33%) and maintenance (8.33%).</p>
Teal	Amber	<ul style="list-style-type: none"> • Hamford Water SPA • Holland Haven Marshes SSSI 	<p>Location 1 – Teal were observed 82 times from Location 1. Flock size ranged from two individuals, up to the peak count of 260 individuals (mean=60.56). All but one of the 82 observations were on land, with the other instance being along the shoreline to the southwest. Most frequently teal were observed foraging (28.05%). Foraging and loafing were recorded 19.51% of the time, and loafing was recorded 18.29% of the time.</p> <p>Location 2 – Teal were observed from Location 2 on eight occasions. Flock size ranged from one to 121 individuals (mean=88.37). All except one observation were of teal on land, the one observation along the shoreline. Most frequently teal were observed roosting (37.5% of observations) and flying was the next most frequent (25% of observations).</p>
Common scoter	Red, Sch 1, S41	None	<p>Location 1 – Four observations of common scoter were made from Location 1. The flock sizes ranged from one to ten (mean=3.75). All records were offshore. 75% of the observations were of common scoter flying.</p> <p>Location 2 – A single common scoter observation was recorded at Location 2, where four were observed in flight offshore.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Moorhen	Amber	None	<p>Location 1 – There were 28 observations of moorhen from Location 1. Flock sizes ranged from one to five individuals (mean=2.54). All observations were on land. 75% of the observations were foraging, the remaining 25% comprised foraging and loafing and loafing.</p> <p>Location 2 – Three observations of moorhen were recorded from Location 2, all observations were of two individuals. Moorhen were most frequently observed loafing (66.66%), with foraging recorded 33.33% of the time.</p>
Great crested grebe	Green	None	<p>Location 1 – Great crested grebe was recorded 3 times from Location 1. Mean flock size was one individual, with a range of one to two individuals. All observations were offshore. Foraging was recorded for 66.67% of the time observed, flying was recorded for the other 33.33%.</p> <p>Location 2 – No observations of great crested grebe.</p>
Oystercatcher	Amber	None	<p>Location 1 – Oystercatcher were observed on 29 occasions from Location 1. Flock size ranged from one to four individuals (mean=1.58). Observations were predominantly either intertidal (16) or on land (13). Most often oystercatcher were observed roosting (55.17%) or flying (17.24%).</p> <p>Location 2 – Oystercatcher were recorded on 17 occasions from Location 2. Observations were predominately intertidal (82.2%), with some on land (17.6%). Flock size ranged from one to five individuals (mean=1.65). Most observations were of flying individuals (41.18%) or roosting individuals (29.41%).</p>
Avocet	Amber, Sch 1, Annex 1	<ul style="list-style-type: none"> • Hamford Water SPA 	<p>Location 1 – There were 54 records of avocet from Location 1. Flock sizes ranged from one to 45 (mean=8.5). All observations were of avocet on land. Most of the time, avocet were observed foraging (42.59%) or roosting (27.78%).</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
			Location 2 – Avocet were observed on seven occasions from Location 2, all observations were on land. Flock size ranged from two to 40 (mean=7.43). Observations were most frequently of roosting individuals (57.14%), foraging, loafing or other were recorded 14.29% of the time for each behaviour.
Lapwing	Red, S41	None	Location 1 – 86 observations of lapwing were made from Location 1. Flock size ranged from one to 325 (mean=52.47). All observations of lapwing were on land and were spread out, encompassing the waterbody near location 1 and farmland up to Great Holland Lodge. Most of the observations were of foraging (18.60%), loafing (26.74%) or roosting (11.63%) birds. Location 2 – Lapwing were recorded on five occasions. Flock size ranged from one to 65 (mean=29.6). All observations of lapwing were on land, around the waterbody near location 1 and within the arable fields. Most frequent behaviour recorded was loafing (40%) with foraging, roosting and loafing and other recorded 20% of the time each.
Golden plover	Green, Annex 1	None	Location 1 – Golden plover were recorded twice from Location 1. Flock size in both instances was one (mean=1). Both records were of golden plover on land. Location 2 – No observations of golden plover.
Ringed plover	Red	<ul style="list-style-type: none"> • Hamford Water SPA & Ramsar site • Colne Estuary SPA 	Location 1 – No records of ringed plover. Location 2 – One record of ringed plover was recorded from Location 2, a single individual was observed in flight offshore.
Whimbrel	Red, Sch 1	None	Location 1 – No records of whimbrel. Location 2 – Three records of whimbrel, flock size ranged from one to three (mean=2). Two observations were on land and one was off shore. Whimbrel were observed foraging, in flight or both.

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Curlew	Red, S41	<ul style="list-style-type: none"> • Colne Estuary SPA 	<p>Location 1 – A total of 49 records of curlew were made from Location 1. Flock size ranged from one to 47 (mean=15.82). Two records were offshore, the other 47 were on land and observations were spread right across farmland to the northwest, with no specific concentrations in any particular locality. Most of the behaviour recorded was foraging (71.43%).</p> <p>Location 2 – Curlew were recorded on 31 occasions, flock size ranged from one to 66 (mean=17.87). The majority of observations were on land (90%) and 10% were observed offshore. On land the observations were spread across the farmland to the northwest. Foraging was the most frequently observed behaviour (58%), birds in flight were recorded 35.48% of the time.</p>
Black-tailed godwit	Red, Sch1, S41	<ul style="list-style-type: none"> • Hamford Water SPA & Ramsar site • Colne Estuary SPA & Ramsar site • Stour and Orwell Estuaries SPA & Ramsar site 	<p>Location 1 – 43 observations of black-tailed godwit were made from Location 1. Flock size ranged from one to 15 individuals (mean=6.42). All but one of the 43 observations were of godwits on land, the other being offshore. Foraging was the most commonly observed behaviour (79.07%).</p> <p>Location 2 – Black tailed godwit was observed on three occasions from Location 2, flock size ranged from one to two (mean=1.33). All observations were on land, two were foraging and one was flying.</p>
Turnstone	Amber	None	<p>Location 1 – Turnstone were observed 42 times from Location 1. The range of flock sizes was one to 16 individuals (mean=4.83). The majority of observations of turnstone were along the intertidal area. The most commonly observed behaviours were foraging (57.14%) and foraging and flying (23.81%). Roosting behaviour was also observed during one observation of 10 birds in March along the coastline to the south west.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
			Location 2 – Turnstone were recorded on 16 occasions, observations were predominately within the intertidal habitat and one inland observation. Flock size ranged from one to 10 (mean=2.56). Foraging was the most frequently recorded behaviour (50%), with flight and foraging recorded 18.75% of the time. Flight and roosting were recorded 12.5% of the time respectively. Roosting was associated with the onshore sighting at high tide located along a ditch inland, suggesting the inland habitat is used for roosting occasionally.
Ruff	Red, Annex 1, Sch1,	<ul style="list-style-type: none"> Holland Haven Marshes SSSI 	<p>Location 1 – The observations of ruff were all made from Location 1. Flock sizes ranged from one to three individuals (mean=1.66). All observations were of birds on land. Foraging accounted for 100% of the behaviour observed.</p> <p>Location 2 – No ruff observations were made from Location 2.</p>
Sanderling	Amber	<ul style="list-style-type: none"> Colne estuary SPA 	<p>Location 1 – A total of one sanderling observation (of one individual) was recorded. This observation was within the intertidal area. The behaviour recorded from this was foraging and flying which were the only behaviours seen during the recording.</p> <p>Location 2 – Sanderling were observed on two occasions from Location 2. The larger flock size recorded was of four individuals, with a smaller flock size of two individuals recorded. Both observations were recorded within the intertidal zone. One observation recorded the flock foraging and flying, with the other observation recorded the flock foraging.</p>
Dunlin	Red	<ul style="list-style-type: none"> Stour and Orwell Estuaries SPA & Ramsar site Colne Estuary SPA 	<p>Location 1 – A total of six dunlin observations were recorded, with all observations being of one individual (mean=1). Four of the sightings were recorded on land whilst two sightings were recorded within the intertidal zone. The most common behaviours observed were foraging (33.33%) and roosting (33.33%).</p> <p>Location 2 – No sightings of dunlin were recorded at this location.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Purple sandpiper	Red, Sch1	<ul style="list-style-type: none"> Holland Haven Marshes SSSI 	<p>Location 1 – A total of 51 observations of purple sandpiper were recorded, with the largest flock sighted being of 12 individuals and the smallest flock size being of one individual (mean=4.9). The majority of sightings were in the intertidal area and one was on land. The most common behaviour observed was foraging (50.98%) followed by roosting (17.65%) and foraging and flying (15.69%). Roosting was not observed on land.</p> <p>Location 2 – A total of 15 observations of purple sandpiper were recorded at Location 2. The peak flock size recorded was seven with the smallest sighting being of one individual (mean=3.6). One sighting recorded was on land, the rest were within the intertidal area or offshore. The most common behaviour observed was foraging (40%). Other behaviours observed included foraging and flight (20%), flying (13.33%) and roosting (13.33%). Roosting was observed on land, located near the ditch to the northwest on one occasion at high tide.</p>
Little stint	Green	None	<p>Location 1 – Two observations of little stint were recorded which were of single individuals on both occasions (mean=1). These observations were both recorded on land with the only behaviour seen being foraging.</p> <p>Location 2 – No sightings of this species were recorded at Location 2.</p>
Snipe	Amber	<ul style="list-style-type: none"> Holland Haven Marshes SSSI 	<p>Location 1 – A total of six observations were recorded of snipe, with the peak flock size being seven and smallest being of one individual (mean=2.18). All observations were recorded on land. The main behaviour observed was foraging (54.55%), followed by roosting (18.18%).</p> <p>Location 2 – No sightings of this species were recorded at Location 2.</p>
Common sandpiper	Amber	None	<p>Location 1 – One sighting of this species (one individual) was recorded. This sighting was recorded within the intertidal zone, foraging and flying.</p>

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
			Location 2 – One sighting of common sandpiper (one individual) was recorded at this location. This sighting was recorded in the intertidal zone with the only behaviour observed being flying.
Green sandpiper	Amber, Sch1	None	Location 1 – There were three records of green sandpiper, flock size ranged from one to two, (mean=1.3) and all were observed on land. Foraging was most frequently observed with one record of green sandpiper in flight. Location 2 – Four observations of green sandpiper were recorded, all were individual observations on land. Half were roosting and the other half foraging.
Redshank	Amber	<ul style="list-style-type: none"> • Hamford Water SPA & Ramsar site • Stour and Orwell Estuaries SPA & Ramsar site • Colne Estuary SPA & Ramsar site 	Location 1 – A total of six sightings were recorded, with the largest flock size of four and the lowest flock size of one individual (mean=2.33). Out of the six recordings, five were observed on land whilst one sighting was recorded in the intertidal area. The main behaviour observed was foraging (50%). Location 2 – No redshank were observed at Location 2.
Mediterranean gull	Amber, Annex 1, Sch1	None	Location 1 – There were five records of this species, with the peak flock being five individuals and smallest flock being one individual (mean=1.66). Four out of five of these sightings were recorded offshore with one sighting being recorded on land. The main behaviours observed were flying (33.33%) and loafing (33.33%). Location 2 - There were three records of this species, with the flock size being two during each observation (mean=2). All sightings were recorded offshore. The most common behaviour seen was flying (66.67%) with the other behaviour observed being roosting (33.33%).
Great black backed gull	Amber	None	Location 1 – One sighting of this species was recorded with a flock size of one individual. This sighting was recorded offshore.

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
			Location 2 – There were no records of great black backed gull at Location 2.
Guillemot	Amber	None	Location 1 - None observed. Location 2 - A single bird observed loafing offshore.
Razorbill	Amber	None	Location 1 – One sighting of this species was recorded with a flock size of one. This sighting was recorded offshore. Location 2 – One sighting of this species was recorded with a flock size of one. This sighting was recorded offshore.
Red-throated diver	Green, Annex 1, Sch1	None	Location 1 – A total of 26 observations of red-throated diver were recorded, with the peak flock size being eight and the smallest flock size being one individual (mean=2.46). All sightings were recorded offshore. The most common behaviour observed was foraging (50%), followed by flying (26.92%). Location 2 – A total of 31 sightings of this species were recorded, with the peak flock size being 7 and a single individual being the smallest flock size on a number of occasions (mean=1.59). All sightings were observed offshore. The most frequent behaviour observed was foraging (58.75%), with loafing being the next frequently recorded behaviour (20%).
Cormorant	Green	<ul style="list-style-type: none"> Colne Estuary SPA 	Location 1 - A total of 70 observations of cormorant were recorded, with the peak flock size being 28 and lowest being a single individual (mean=3.21). Out of the 70 records, 42 were observed offshore, three within intertidal zones and 25 on land. Behaviours observed most frequently included flying (28.57%), loafing (25.71%) and roosting (17.14%). Location 2 – There were four occasions cormorant were recorded, with the peak flock size being four and the smallest being one individual (mean=2.52). All sightings were recorded on land. The most common behaviour seen was flying (67.39%).

Species	Conservation status	Qualifying species (non-breeding) within nearby statutory designated site	Account
Grey heron	Green	None	<p>Location 1 – A total of 11 records of grey heron were made from Location 1. Peak flock size was one individual. One record was of a heron offshore, the other ten were of birds on land. The most common behaviours recorded were foraging and loafing, both comprising 36.36% of total behaviour recorded.</p> <p>Location 2 – No recordings of grey heron were made from Location 2.</p>
Little egret	Green, Annex 1	None	<p>Location 1 – Little egret were observed eight times from Location 1. Peak flock size was one individual. All observations were on land. Foraging accounted for 87.50% of the behaviour recorded, with roosting making up the remaining 12.50%.</p> <p>Location 2 – No little egret records were made from Location 2.</p>
Non-waterbird records of Schedule 1 and Annex 1 species			
Hen harrier	Red, Annex 1, S41, Sch1	<ul style="list-style-type: none"> • Colne Estuary SPA • Holland Haven Marshes SSSI 	<p>Location 1 - One observation of a flying individual.</p> <p>Location 2 - No records.</p>
Merlin	Red Sch1, Annex 1		<p>Location 1 - One observation of an individual in flight in January.</p> <p>Location 2 - No records</p>
Peregrine falcon	Green, Annex 1, Sch 1		<p>Location 1 - Three records of individual birds.</p> <p>Location 2 - Three records of individual birds.</p>
Cetti's Warbler	Green Sch1		<p>Location 1 - Six observations of Cetti's warbler with single birds observed on all occasions.</p> <p>Location 2 - Nine observations, all single birds.</p>
Dartford warbler	Amber Sch 1, Annex 1		<p>Location 1 - No records.</p> <p>Location 2 - Four records all of single individuals.</p>

4.0 Discussion

4.1 Peak Counts

4.1.1 Peak Counts in relation to UK Wintering Populations

Peak counts for each of the waterbird species recorded within the survey area at each survey location, during the survey period are shown in Table 4-1. By way of providing context to the results of the current study, these data are presented alongside the most recent national UK wintering population estimate for each species¹¹. The potential value of the recorded species populations has been determined using the standard '1% criterion' method¹². Using this, the presence of >1% of the international population of a species is considered internationally important; >1% of the national population is considered nationally important; etc. Any percentage greater than one is highlighted in bold.

Table 4-1 Peak count of species recorded within the survey area at each location and the percentage of the UK wintering population represented at each location

Common name	UK wintering population	Peak count Location 1	% of UK wintering population	Peak Count Location 2	% of UK wintering population
Brent goose	135,000	900	0.667	1100	0.815
Canada goose	165,000	18	0.011	15	0.009
Greylag goose	230,000	260	0.113	282	0.123
Mute swan	52,000	4	0.008	2	0.004
European white fronted goose	14,000	238	1.700	40	0.286
Shelduck	51,000	14	0.027	30	0.059
Shoveler	19,500	22	0.113	8	0.041
Gadwall	31,000	10	0.032	0	0.000
Wigeon	450,000	150	0.033	256	0.057
Mallard	675,000	9	0.001	4	0.001
Teal	435,000	260	0.060	121	0.028
Common scoter	135,000	10	0.007	4	0.003
Moorhen	305,000	5	0.002	2	0.001

¹¹ Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, S. & Noble, D. (2020) APEP 4 - Population estimates of birds in Great Britain and the United Kingdom. British Birds Volume: 113

¹² E.g. Holt, C., Austin, G., Calbrade, N., Mellan, H., Hearn, R., Stroud, D. Wotton, S. & Musgrove, A. 2012. Waterbirds in the UK 2010/11 The Wetland Bird Survey. British Trust for Ornithology, Royal Society for the Protection of Birds and Joint Nature Conservation Committee in association with Wildfowl & Wetlands Trust.

Common name	UK wintering population	Peak count Location 1	% of UK wintering population	Peak Count Location 2	% of UK wintering population
Great crested grebe	18,000	2	0.011	0	0.000
Oystercatcher	305,000	4	0.001	5	0.002
Avocet	8,700	44	0.506	40	0.460
Lapwing	635,000	325	0.051	65	0.010
Golden plover	410,000	1	0.000	0	0.000
Ringed plover	42,500	0	0.000	1	0.002
Whimbrel	41	0	0.000	3	7.317
Curlew	125,000	47	0.038	66	0.053
Black-tailed godwit	41,000	15	0.037	2	0.005
Turnstone	43,000	16	0.037	10	0.023
Ruff	920	3	0.326	0	0.000
Sanderling	20,500	1	0.005	4	0.020
Dunlin	350,000	1	0.000	0	0.000
Purple sandpiper	9,900	12	0.121	7	0.071
Little stint	8	1	12.500	0	0.000
Snipe	1,100,000	7	0.001	0	0.000
Common sandpiper	52	1	1.923	1	1.923
Greensandpiper	290	2	0.690	1	0.345
Redshank	100,000	4	0.004	0	0.000
Mediterranean gull	4,000	5	0.125	2	0.050
Great black backed gull	77,000	1	0.001	0	0.000
Guillemot	950,000	0	0.000	1	0.000
Razorbill	165,000	1	0.001	1	0.001
Red-throated diver	21,500	8	0.037	7	0.033
Cormorant	64,500	28	0.043	18	0.028
Grey heron	45,500	1	0.002	0	0.000
Little egret	11,500	1	0.009	1	0.009

Although the datasets are not directly comparable, and caution must be applied when comparing figures. Table 4-1 indicates that peak counts recorded from each survey location represent considerably less than 1% of the UK wintering population for almost all species recorded during the survey season.

Exceptions to this were: European white fronted goose, whimbrel, little stint and common sandpiper. A flock of 238 European white fronted geese were recorded at Location 1 on 23 January 2022, this constitutes 1.7% of the UK wintering population. There was only one sighting when this occurred, overall there were only 28 sightings of this species across both locations and 25 of those sightings were in numbers representing less than 1% of the UK wintering population. A peak count of three whimbrel was observed from Location 2 in September 2021 and all whimbrel sightings were in September. This is more likely to be birds on passage departing the UK at this time of year, especially as the weather was warm in September 2021. Although detailed figures are not available, the passage population of whimbrel is considerably larger and three individuals is very unlikely to represent more than 1% of the UK passage population. Similarly, common sandpiper was recorded at both locations in September singularly, these are also likely to represent birds on passage and again the count of one individual is very unlikely to represent more than 1% of the UK passage population. Little stint is only a winter and passage visitor to the UK and is more frequently observed on passage, than during the winter. The BTO provide a winter figure of eight and a passage figure of 770¹³ as observations were made in September the passage figure is more realistic. Compared to the passage figure, 0.13% of the UK passage population was observed.

4.1.2 Peak Counts in relation to Nearby Designated Site Populations

For qualifying or notified species for nearby designated sites, the peak counts observed within the survey area have been compared to the non-breeding populations detailed in the relevant designations, refer to Table 4-2. As in Section 4.1.1 the potential importance of the recorded species populations, in relation to nearby designated site populations, has been determined using the '1% criterion' method. Any percentage greater than one is highlighted in bold.

¹³ <https://app.bto.org/birdfacts/results/bob5010.htm>

Table 4-2 Peak count of qualifying or notified non-breeding waterbird species for nearby designated sites recorded during the survey, compared with the population stated in the relevant designated site citations

Common name	Peak count either survey location (location of peak count provided in brackets)	Hamford Water SPA population	% of Hamford Water SPA population	Hamford water Ramsar site population	% of Hamford Water Ramsar site population	Stour and Orwell SPA population	% of Stour and Orwell SPA population	Stour and Orwell Ramsar site population	% of Stour and Orwell Ramsar site population	Colne Estuary SPA population	% of Colne Estuary SPA population	Colne Estuary Ramsar site population	% of Colne Estuary Ramsar site population	Holland Haven Marshes SSSI population	% of Holland Haven Marshes SSSI population
Brent goose	1,100 (LC2)	6,892	15.96	3,629	30.31	2,627	41.87	2,627	41.87	5,315	20.7	3,165	34.76	several hundred	Over 100%
Mute swan	4 (LC1)	/	/	/	/	/	/	/	/	352	0.57	/	/	/	/
Shelduck	30 (LC2)	1,629	1.84	/	/	/	/	/	/	1,237	2.43	/	/	/	/
Shoveler	22 (LC1)	/	/	/	/	/	/	/	/	/	/	/	/	20	110.00
Wigeon	256 (LC2)	/	/	/	/	/	/	/	/	/	/	/	/	1,000	25.60
Teal	260 (LC1)	36,311	0.72	/	/	/	/	/	/	/	/	/	/	several hundred	Likely a high proportion
Avocet	44 (LC1)	317	12.62	/	/	/	/	/	/	/	/	/	/	/	/
Ringed plover	1 (LC2)	520	0.19	1,169	0.09	/	/	/	/	355	0.28	/	/	/	/
Curlew	66 (LC2)	/	/	/	/	/	/	/	/	938	7.04	/	/	/	/
Black-tailed godwit	15 (LC1)	1,121	1.34	377	3.98	2,559	0.59	2,559	43.81	606	2.48	402	0.50	/	/
Ruff	3 (LC1)	/	/	/	/	/	/	/	/	/	/	/	/	90	3.33
Sanderling	4 (LC2)	/	/	/	/	/	/	/	/	219	1.83	/	/	/	/
Dunlin	1 (LC1)	/	/	/	/	19,114	0.01	19,114	0.01	11,271	0.01	/	/	/	/
Purple sandpiper	12 (LC1)	/	/	/	/	/	/	/	/	/	/	/	/	10 to 15	80
Snipe	7 (LC1)	/	/	/	/	/	/	/	/	/	/	/	/	Not specified	/
Redshank	4 (LC1)	1,461	0.27	2,099	0	Winter=3,687 Passage=2,588	Winter=0.11 Passage=0.15	Winter=3,687 Passage=2,588	Winter=0.11 Passage=0.15	1,252	0.32	1,624	0.25	/	/
Cormorant	28 (LC1)	/	/	/	/	/	/	/	/	243	11.52	/	/	/	/
Hen harrier	1 (LC1)	/	/	/	/	/	/	/	/	19	5.26	/	/	Not specified	/

The percentage figures provided in Table 4-2 are based on the assumption that all birds recorded within the survey area potentially form part of the relevant designated site populations. For Holland Haven Marshes SSSI, given that both landfall locations lie within the SSSI, it is reasonable to assume that all birds recorded form part of the relevant SSSI populations. However, for the SPAs and Ramsar sites, due to the intervening distances involved the assumption that the birds recorded form part of the relevant site populations is highly precautionary. In practice most, if not all, of the birds recorded during the surveys are considered unlikely to form part of the relevant SPA/Ramsar populations. However, the possibility that some of the birds recorded within the survey area form part of the relevant SPA/Ramsar populations cannot be excluded.

The peak count of brent geese observed during the surveys was greater than 1% of the population specified in any of the nearby designated site citations, with the numbers exceeding the population given for Holland Haven Marshes SSSI within the SSSI citation. Shelduck exceeded the 1% threshold for Hamford Water SPA and the Colne Estuary SPA and avocet exceeded the 1% threshold for Hamford Water SPA. For the one site where curlew is a qualifying feature, the Colne Estuary SPA, the peak numbers of curlew observed on site exceeded 1%. Peak counts of black-tailed godwit observed during the surveys were over 1% of the specified designated population in all but two of the designated sites where this species is listed on the citation. Although there were few observations of ruff, the numbers recorded represent 3.33% of the population listed in the SSSI citation and for purple sandpiper, 80% of the population given within the SSSI citation listing was recorded at the peak count. The peak count of cormorant represents 11.5% of the Colne Estuary SPA cormorant population. Although hen harrier was only observed once, a single bird represents 5.3% of the Colne Estuary SPA population, due to the population of this species being so small. In addition to the above, a significant proportion of the Holland Haven Marshes SSSI population of shoveler, wigeon and teal were recorded during the surveys.

4.2 Species distribution

Species distribution is described within the species accounts in Section 3.2.6 and shown within Drawings 3-6 provided in Appendix 01. A summary of the key findings is also provided below.

4.2.1 Landfall Location 1

Birds were most frequently observed on land, mainly associated with the pools to the northwest of the proposed landfall location. Gadwall (Drawing 3.6), shoveler (Drawing 3.7), teal (Drawing 3.11), moorhen (Drawing 3.13) and snipe (Drawing 3.21) in particular were associated with the main water body in this vicinity. Some species such as greylag goose (Drawing 3.3), European white fronted goose (Drawing 3.4), mute swan (Drawing 3.5), mallard (Drawing 3.10), shelduck (Drawing 3.6), curlew (Drawing 3.14) and lapwing (Drawing 3.17), were observed over quite a dispersed area of fields inland and occasionally some of those species (Canada goose, greylag goose, shelduck and curlew) were also recorded within the intertidal area, most frequently at low tide. Brent goose and wigeon had a dispersed distribution, observed on land, within the intertidal area and out to sea. Oystercatcher (Drawing 3.15), avocet (Drawing 3.16), black-tailed godwit (Drawing 3.18), turnstone (Drawing 3.19) and purple sandpiper (Drawing 3.20) were observed on land, and along the intertidal area. Observations inland were more frequently recorded at high tide and observations within the intertidal area at lower states of the tide.

Species such as red throated diver and common scoter, were only observed out to sea, as these species are sea faring during the winter months.

4.2.2 Landfall Location 2

Birds were observed most frequently associated with the waterbody to the southwest of the proposed landfall location, the pool in close proximity to Location 1, rather than land in the immediate vicinity of Landfall Location 2, associated with the Frinton golf course. Observations of Canada geese (Drawing 4.2), greylag geese (Drawing 4.3), European white fronted geese (Drawing 4.4), shoveler (Drawing 4.6), teal (Drawing 4.9), avocet (Drawing 4.12) and lapwing (Drawing 4.13) in particular were associated with the waterbody northwest of Location 1.

Similar to Location 1, curlew observations were relatively dispersed, over fields inland and within the intertidal area opposite the landfall location (refer to Drawing 4.10) and lapwing (Drawing 4.13) were observed associated with the waterbody near Location 2 and within fields inland, all observations were at low to mid tide. Brent geese (Drawing 4.1) were observed within the intertidal area, out to sea and in the vicinity of Lodge Farm. Intertidal observations were more frequently made at low tide.

Oystercatcher (Drawing 4.11), turnstone (Drawing 4.14) and purple sandpiper (Drawing 4.15) were most frequently observed along the coastline within the intertidal area and less frequently on land.

Red throated diver were only observed offshore. Cormorant were most frequently observed offshore, with some observations in the intertidal area and near the waterbody located close to Location 2.

4.3 Flock Behaviour

Behaviours displayed by individual species are detailed in the species accounts in Table 3-8.

Across all waterbird species combined, foraging was the most frequently recorded behaviour at Location 1, with 28.6% of observations being recorded as purely foraging with foraging and another behaviour accounting for 53.19% of observations. Loafing, maintenance or other (or a combination of these) was recorded in 25.27% of observations. Flying and foraging and flying were observed in 11.77% of observations and roosting was recorded in 9% of observations. No regularly used high tide roosts were identified.

From Location 2, flying was far more frequently recorded, with 38.3% of observations being just flying birds. Loafing was recorded frequently, with loafing, loafing and maintenance or loafing and other being recorded 29.9% of the time. Foraging or foraging and loafing behaviour was recorded 19.9% of the time. Roosting was recorded only rarely, 4.52% of all observations and no regularly used high tide roosts were identified.

4.4 Disturbance Events

A detailed study of existing disturbance was beyond the scope of this survey, the primary focus of which was to record bird numbers, distribution and activity. However, disturbance events were recorded incidentally during the surveys.

Observations during the surveys indicated that walkers using the track on the seawall did not usually result in noticeable disturbance to birds and therefore people using the track were not included in the incidental recording of disturbance events. Excluding people using the track along the seawall, the number of disturbance events recorded during the surveys was relatively low, with just 22 events recorded.

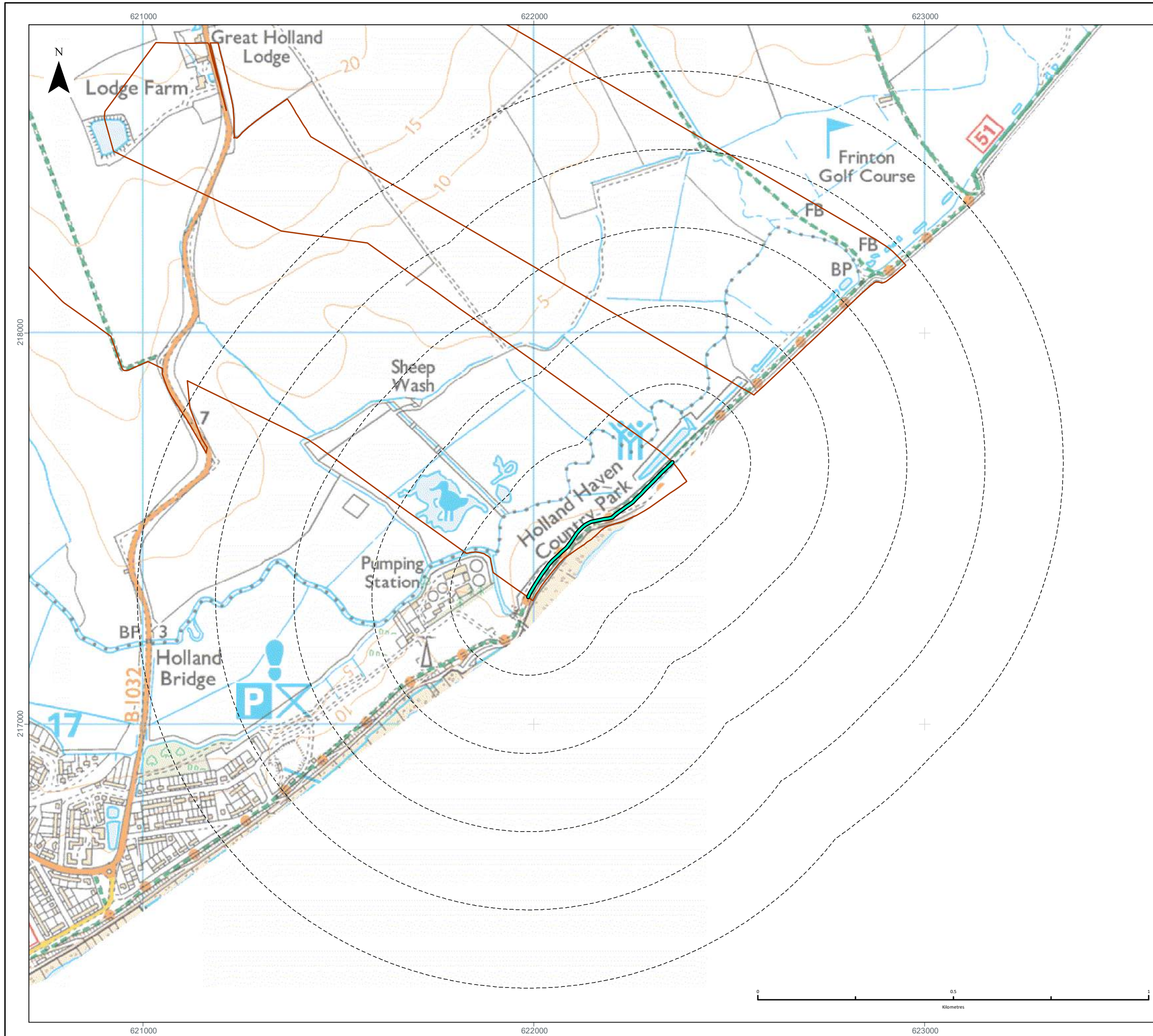
Of the 22 disturbance events recorded, 17 (77%) were recorded from Location 1. Overall walkers and dogs were the most frequently recorded disturbance type, a high disturbance response was only recorded on two occasions (from a walker and dog and a walker) from Location 1 and once from Location 2 (initiated by a walker). Of the 22 disturbance events recorded, 45% resulted in no evident disturbance of birds observed. This suggests that birds are relatively habituated to regular disturbance.

4.5 Comparison between the two Landfall Locations

A total of 980 observations of waterbirds and notable gull species were made from Location 1, and 342 observations were made from Location 2. A greater diversity of bird species was also observed from Location 1 (n=37 species) compared with Location 2 (n=29 species), however a lot of records recorded from Location 2 were actually located within the waterbody nearer to Location 1. Birds were observed more frequently foraging from Location 1, compared to Location 2, where flight was more frequently observed. Overall, the data shows that Location 1 had more bird activity, including birds specifically undertaking important foraging behaviours, and a greater diversity of species than Location 2.

APPENDIX 01

Drawings



- LEGEND**
- Potential Landfall and Route Corridor
 - Survey Location
 - Survey Location 0 - 1 km Buffer (200 m Intervals)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

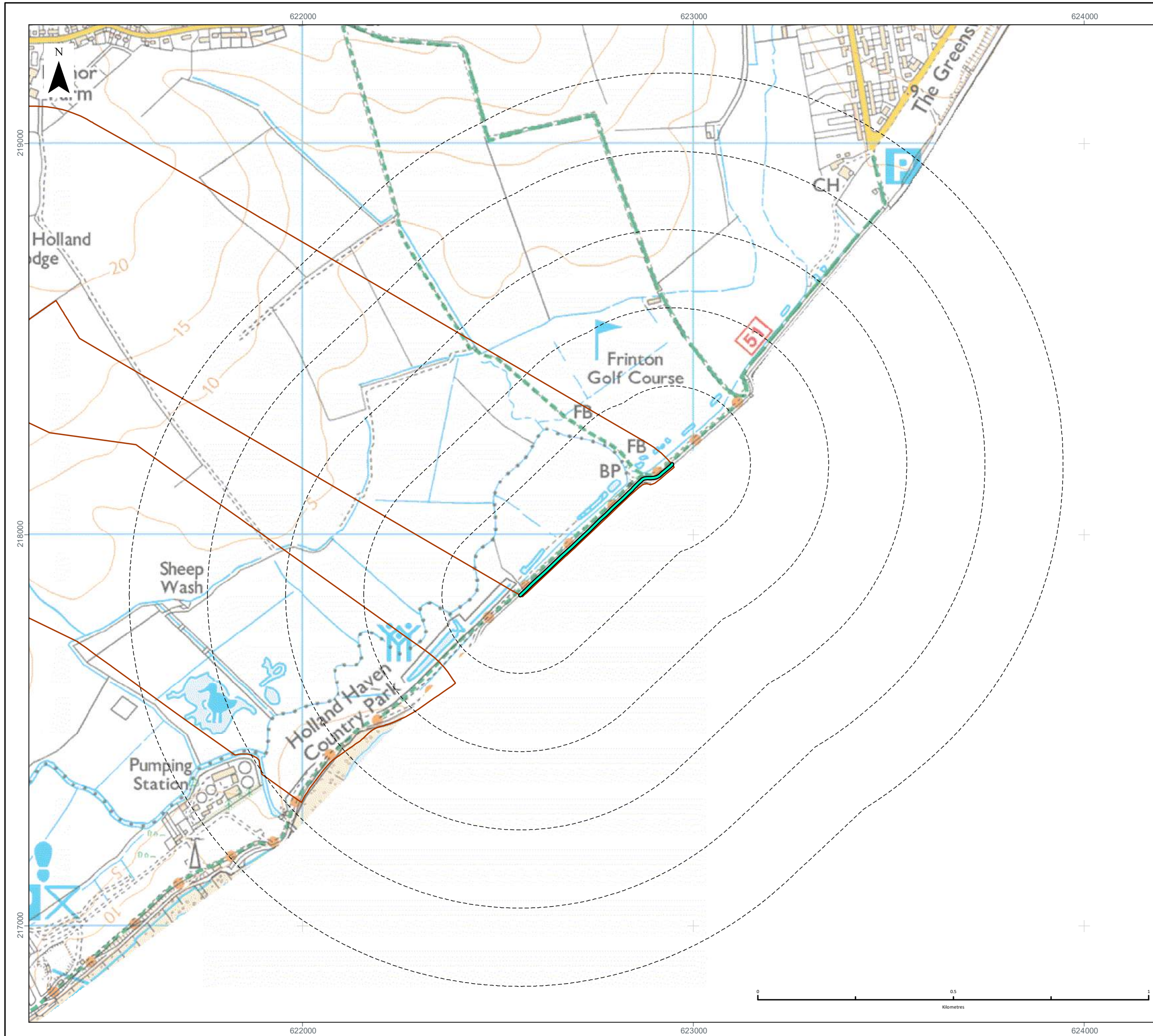
DRAWING TITLE:
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	26/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 1

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





- LEGEND**
- Potential Landfall and Route Corridor
 - Survey Location
 - Survey Location 0 - 1 km Buffer (200 m Intervals)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

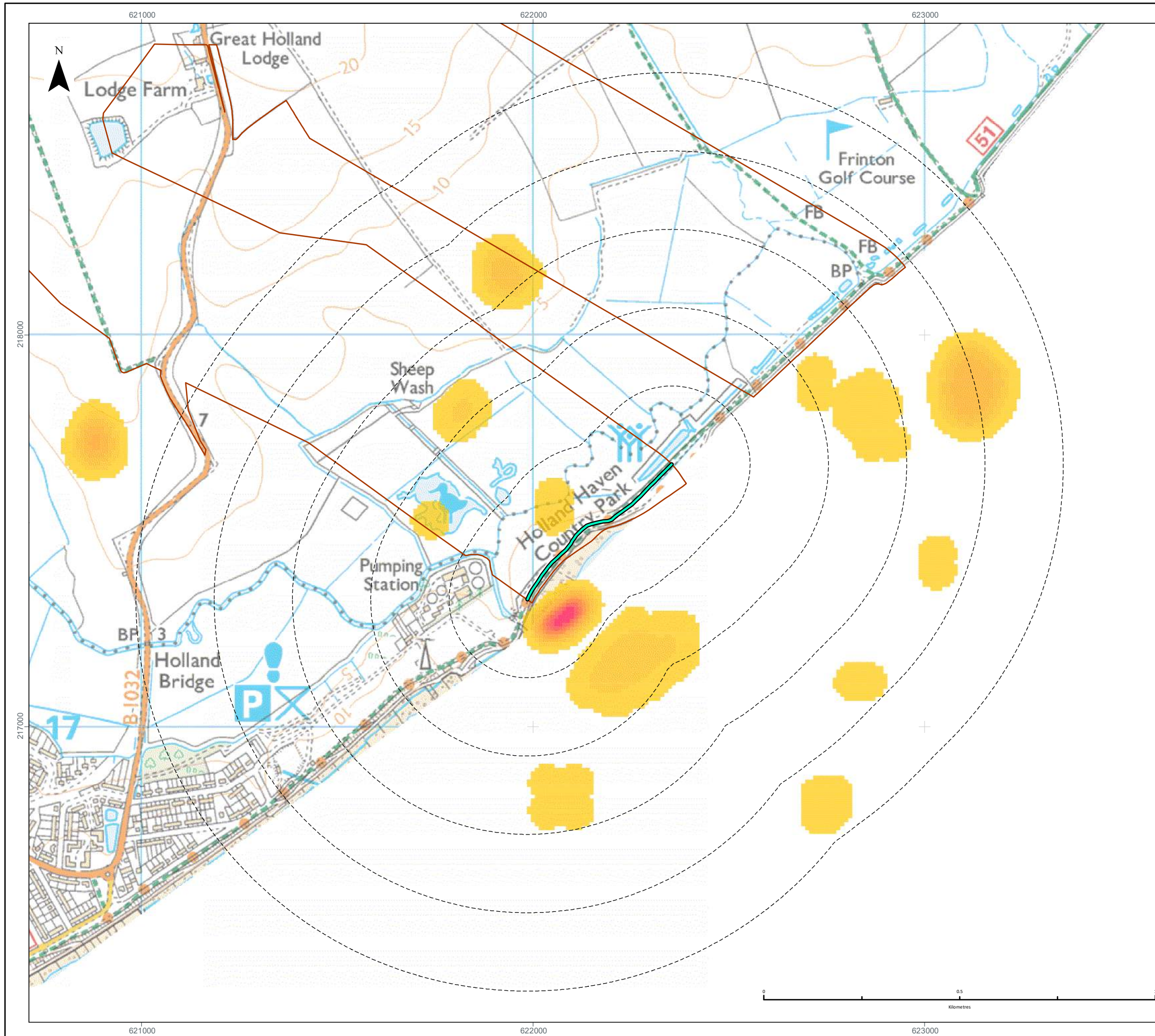
DRAWING TITLE:
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
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2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 2

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Brent Goose Distribution
 (Records/50m²; Total = 2050;
 Highest Density for Species = 14.02)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

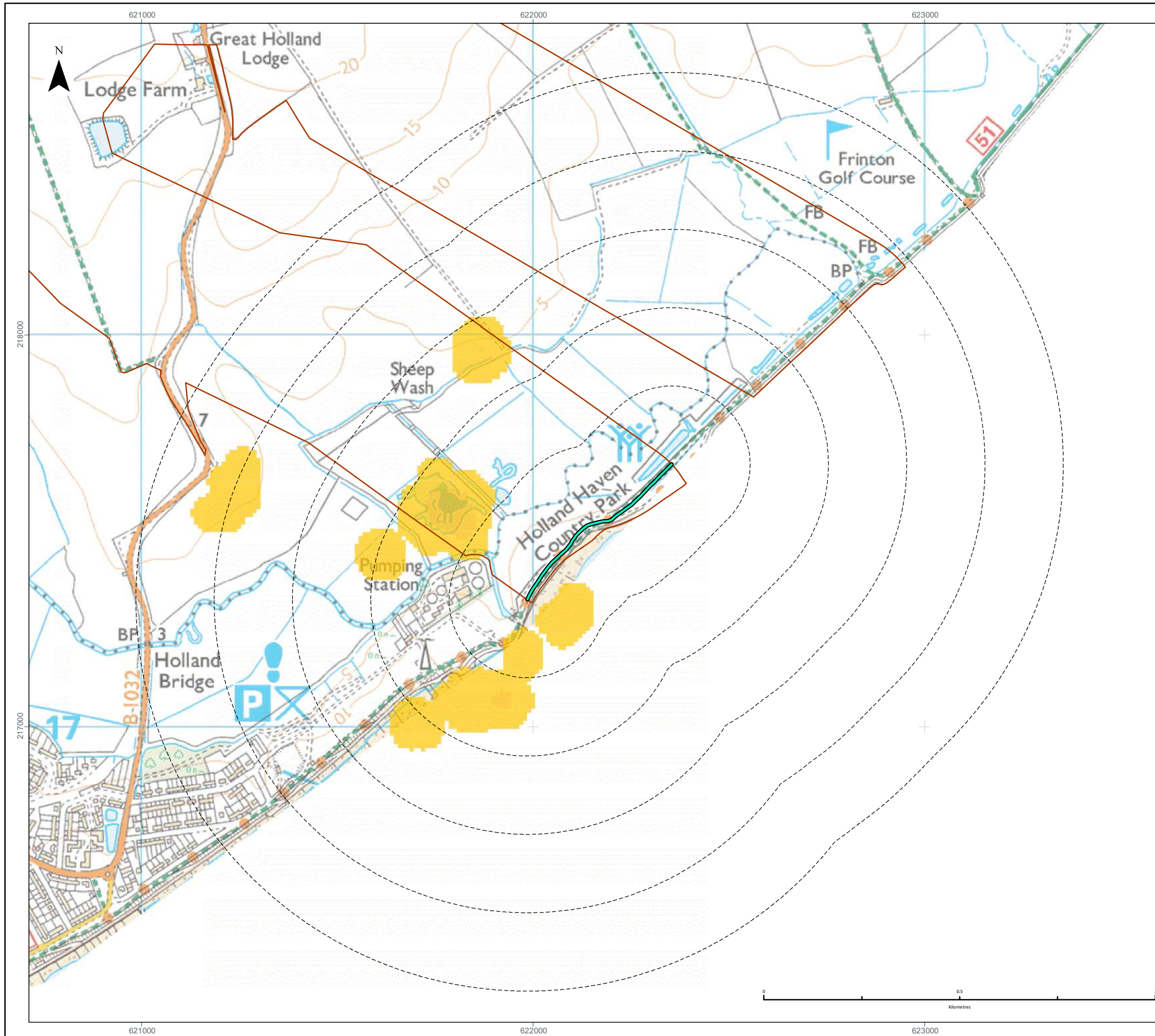
DRAWING TITLE:
 Brent Goose Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.1
 Page 1 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Canada goose Distribution
 (Records/50m²; Total = 160;
 Highest Density for Species = 0.89)

Highest Density For Survey (38.62)
 Lowest Density For Survey (<math><1</math>)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

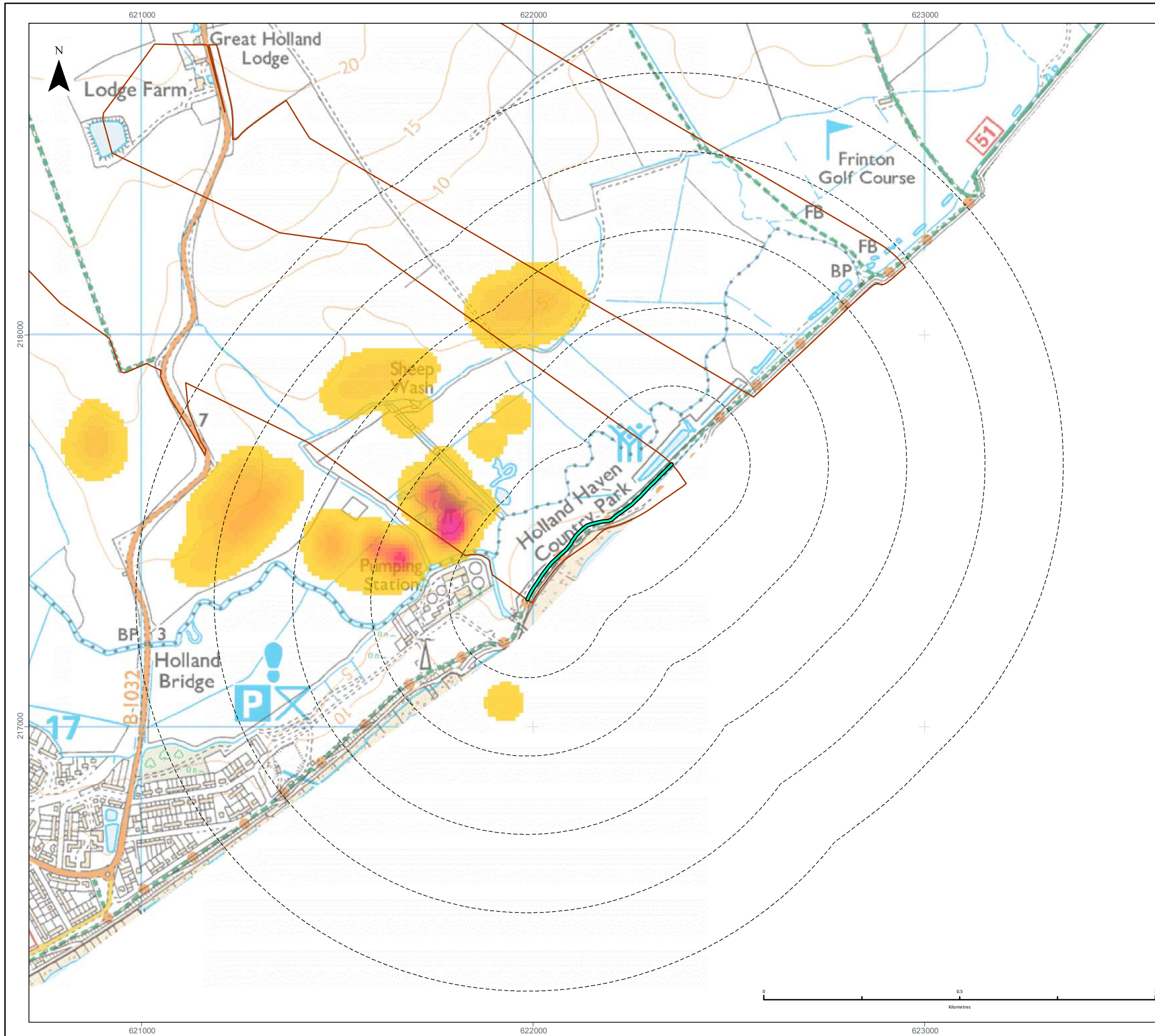
DRAWING TITLE:
 Canada goose Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.2
 Page 2 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Greylag Goose Distribution
 (Records/50m²; Total = 4082;
 Highest Density for Species = 22.34)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

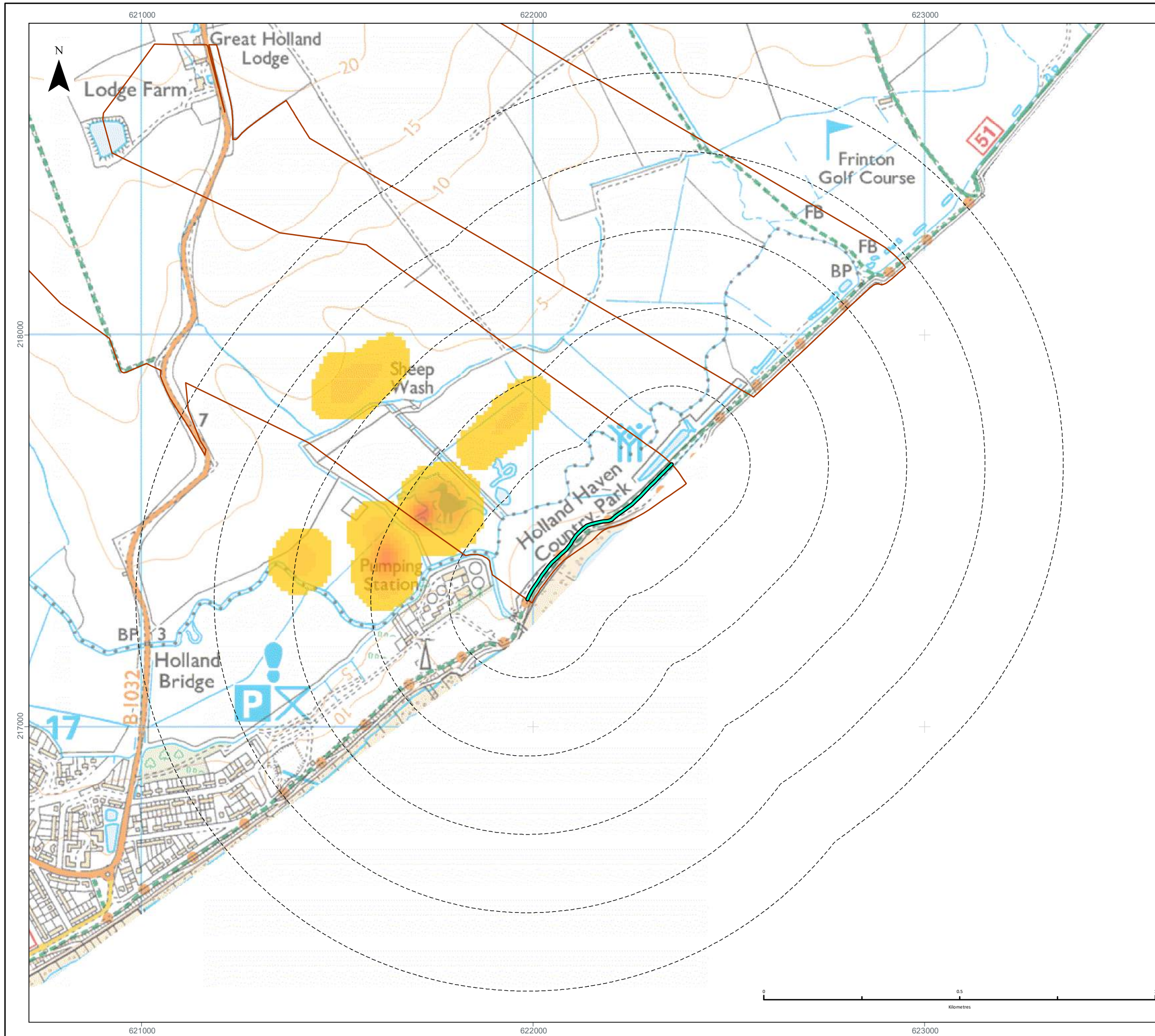
DRAWING TITLE:
 Greylag Goose Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.3
 Page 3 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

White Fronted Goose Distribution
 (Records/50m²; Total = 1057;
 Highest Density for Species = 8.15)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

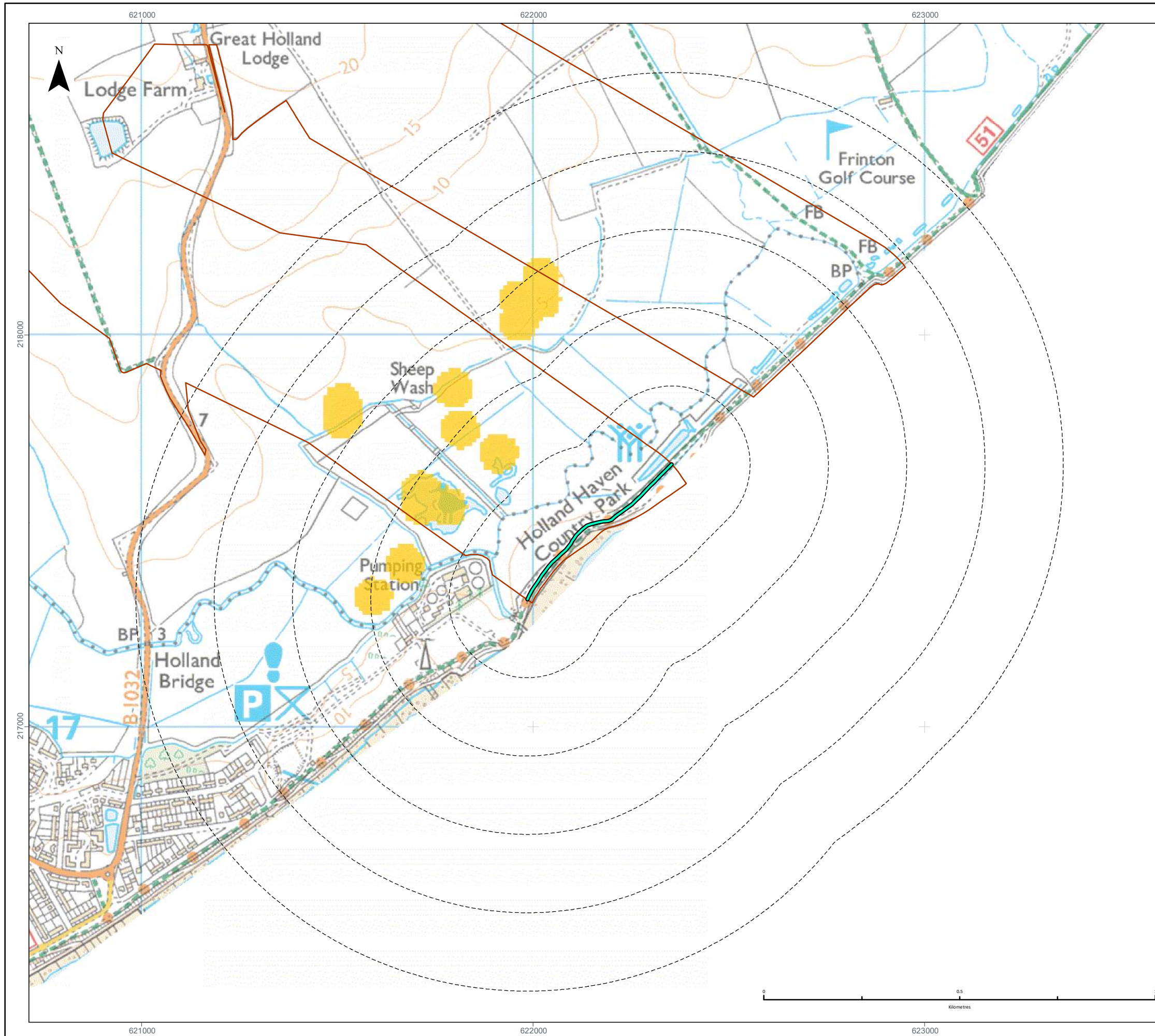
DRAWING TITLE:
 White Fronted Goose Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.4
 Page 4 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Mute Swan Distribution
 (Records/50m²; Total = 16;
 Highest Density for Species = 0.11)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

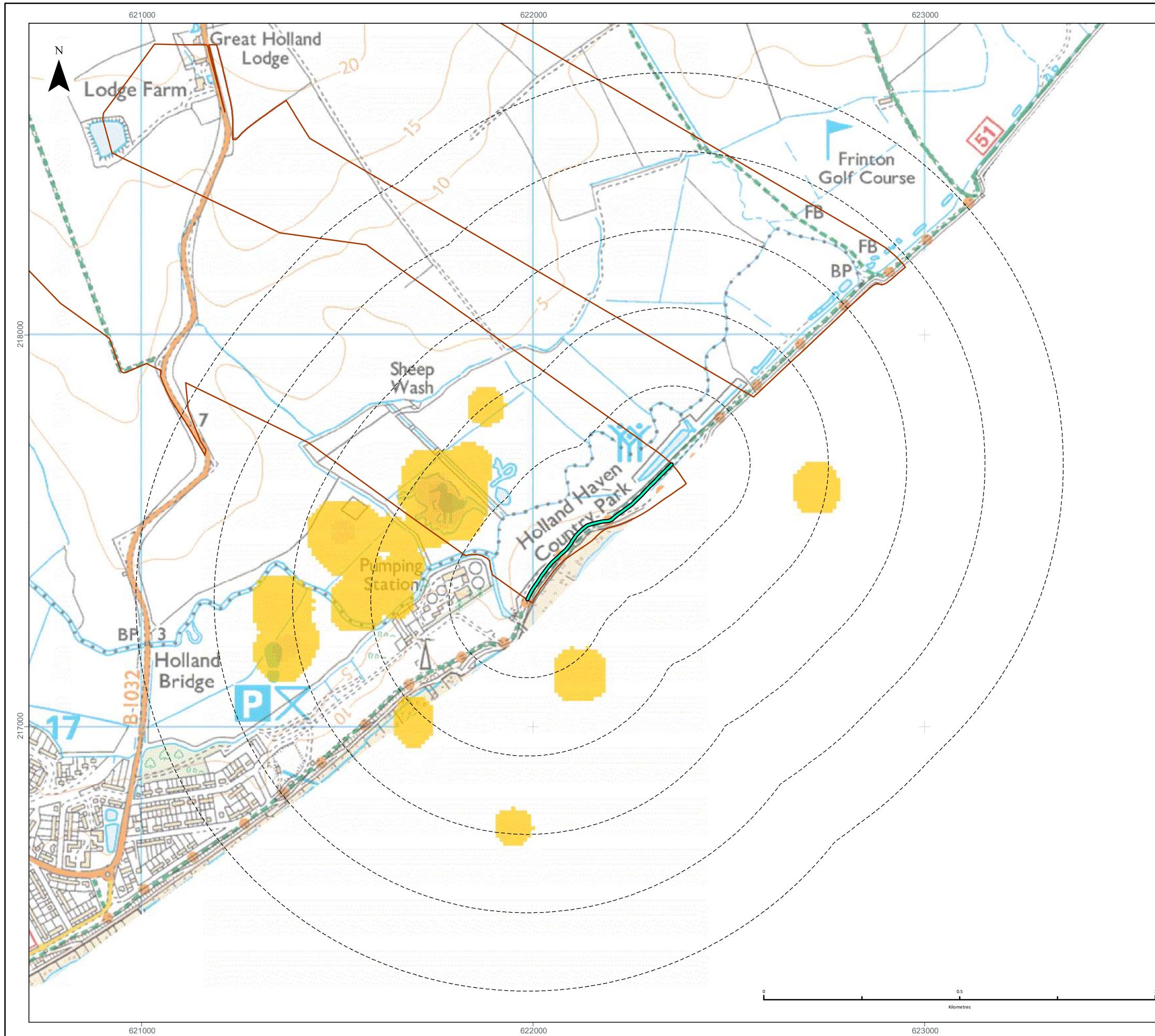
DRAWING TITLE:
 Mute Swan Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.5
 Page 5 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Shelduck Distribution
 (Records/50m²; Total = 237;
 Highest Density for Species = 1.72)

Highest Density For Survey (38.62)

Lowest Density For Survey (<math><1</math>)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

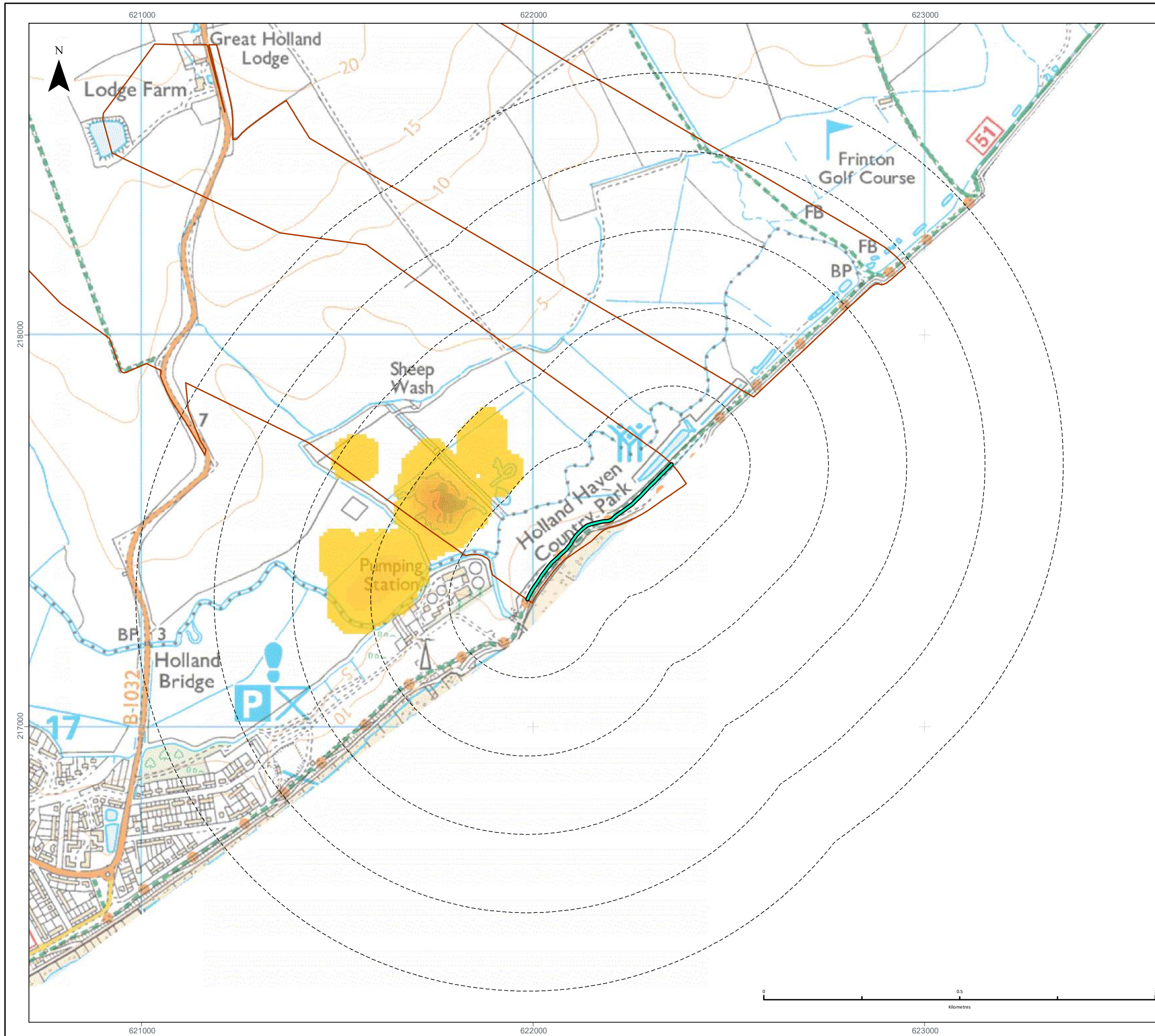
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 Shelduck Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.6
 Page 6 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Shoveler Distribution
 (Records/50m²; Total = 539;
 Highest Density for Species = 4.95)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

DRAWING TITLE:
 Shoveler Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.7
 Page 7 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Gadwall Distribution
 (Records/50m²; Total = 54;
 Highest Density for Species = 0.75)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

DRAWING TITLE:
 Gadwall Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.8
 Page 8 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Wigeon Distribution
 (Records/50m²; Total = 2982;
 Highest Density for Species = 15.84)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

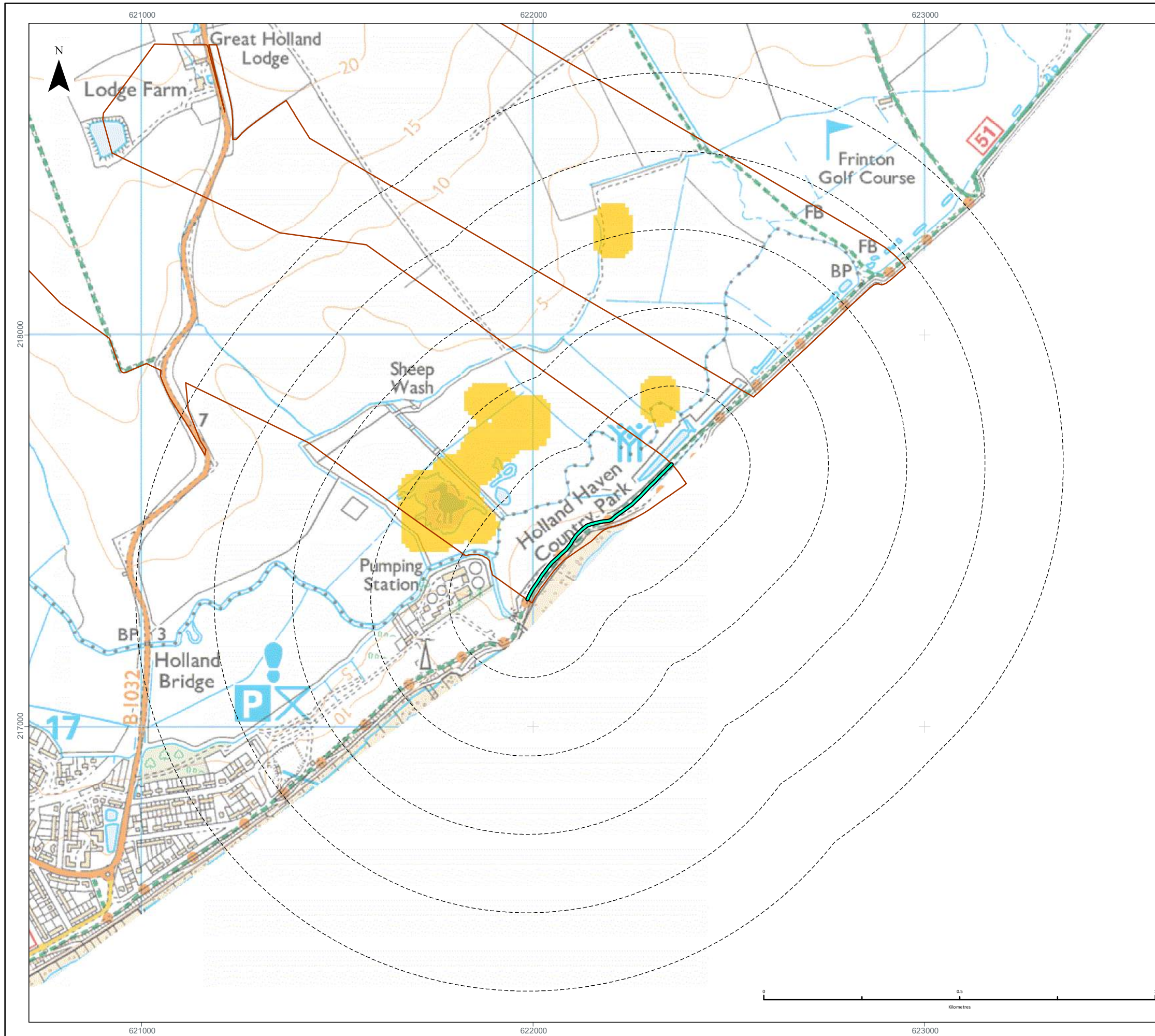
DRAWING TITLE:
 Wigeon Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.9
 Page 9 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Mallard Distribution
 (Records/50m²; Total = 96;
 Highest Density for Species = 0.95)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

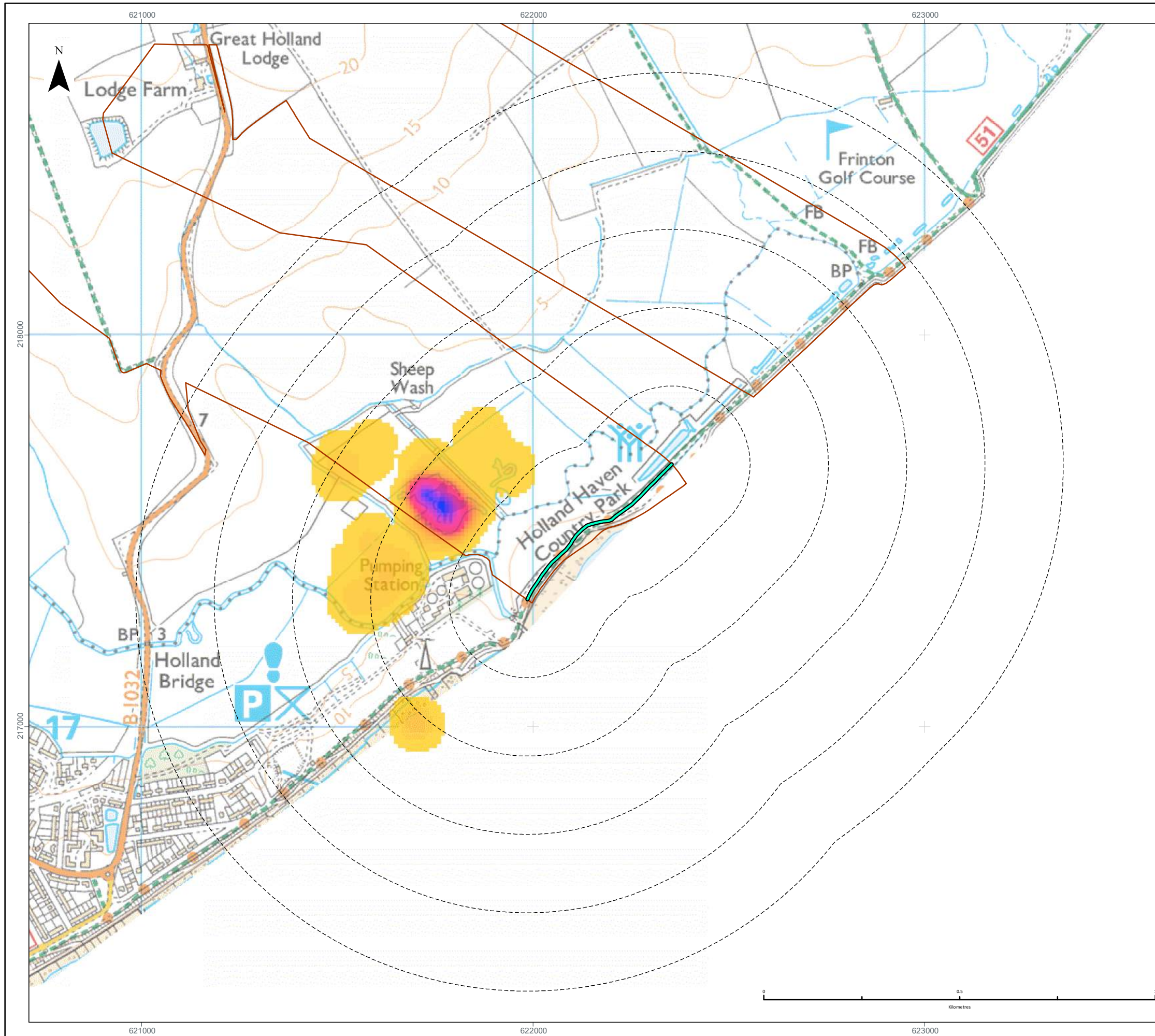
DRAWING TITLE:
 Mallard Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.10
 Page 10 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Teal Distribution
(Records/50m²; Total = 4961; Highest Density for Species = 38.62)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

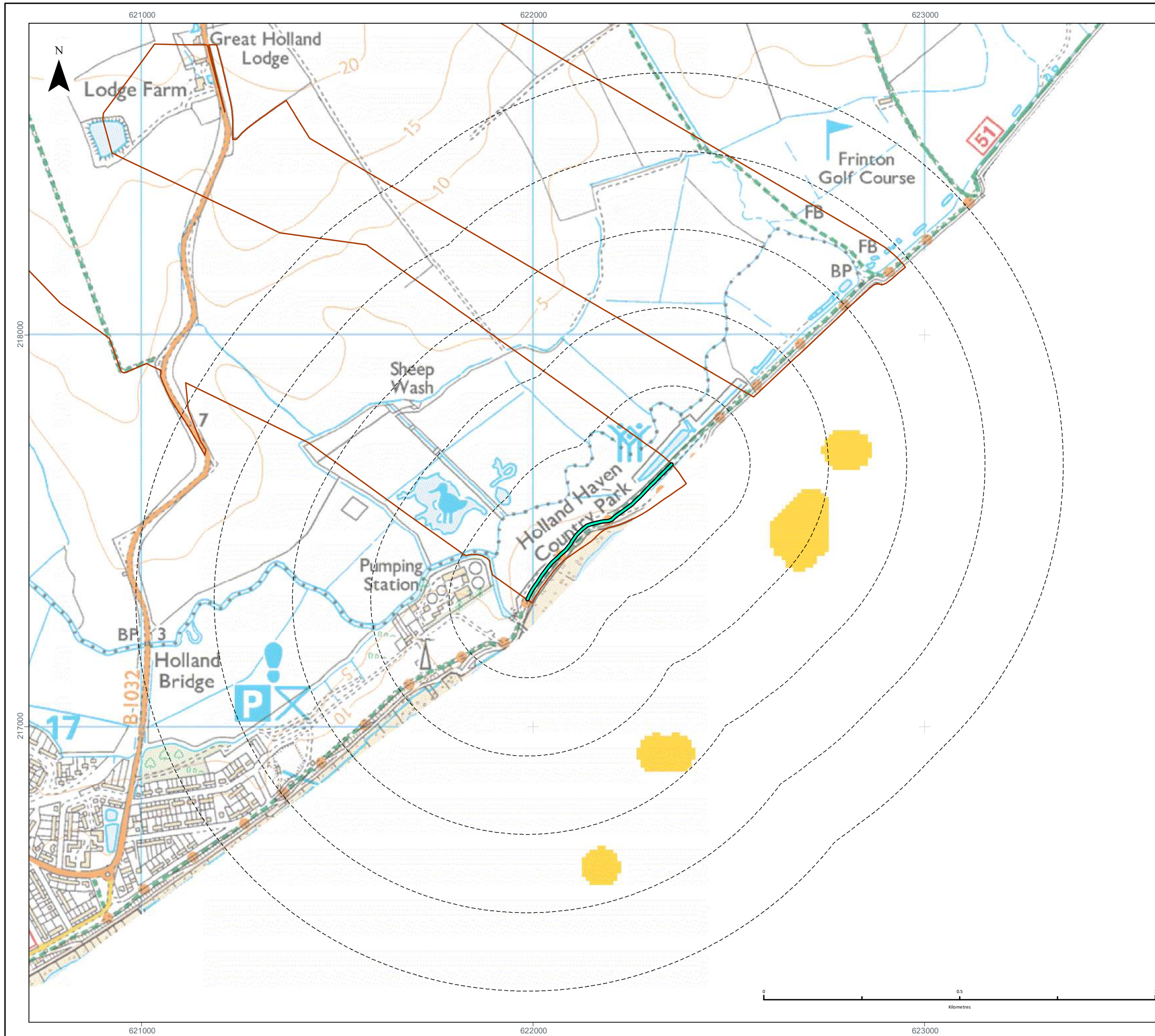
DRAWING TITLE:
 Teal Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.11
 Page 11 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Common Scoter Distribution
 (Records/50m²; Total = 15;
 Highest Density for Species = 0.13)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

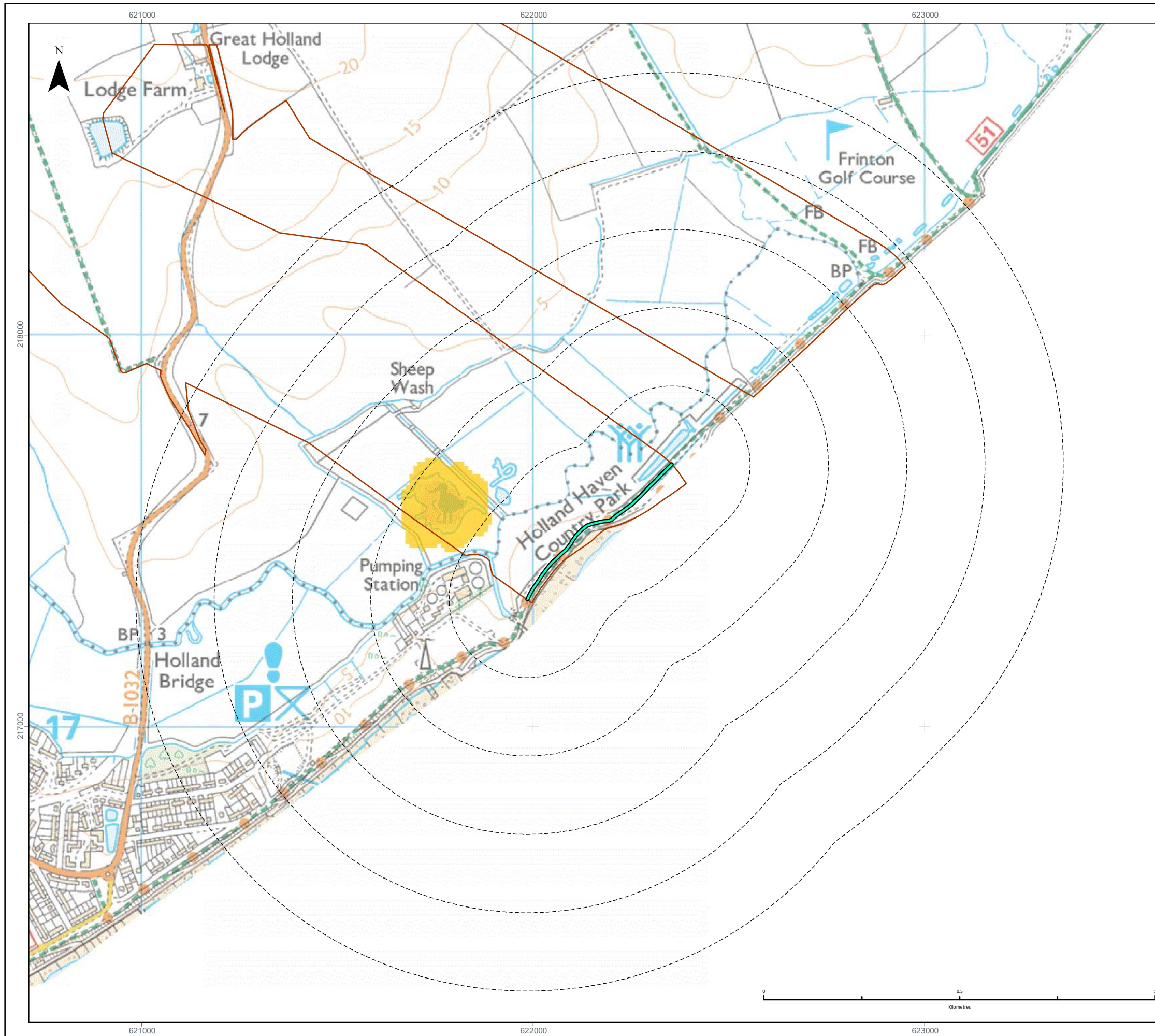
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 Common Scoter Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
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2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.12
 Page 12 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Moorhen Distribution
 (Records/50m²; Total = 71;
 Highest Density for Species = 0.76)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

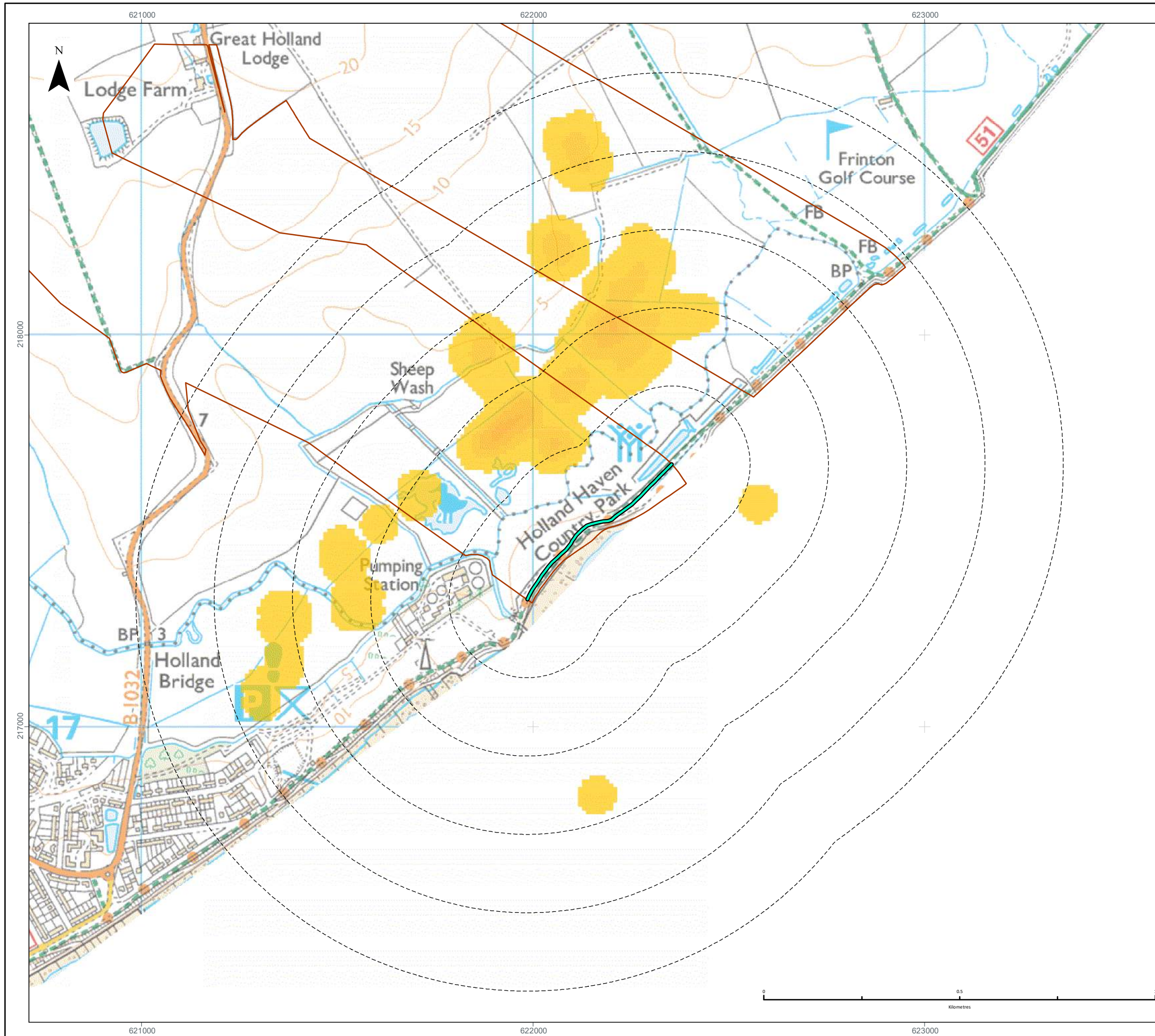
DRAWING TITLE:
 Moorhen Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
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2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.13
 Page 13 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Curlew Distribution
 (Records/50m²; Total = 775;
 Highest Density for Species = 2.50)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

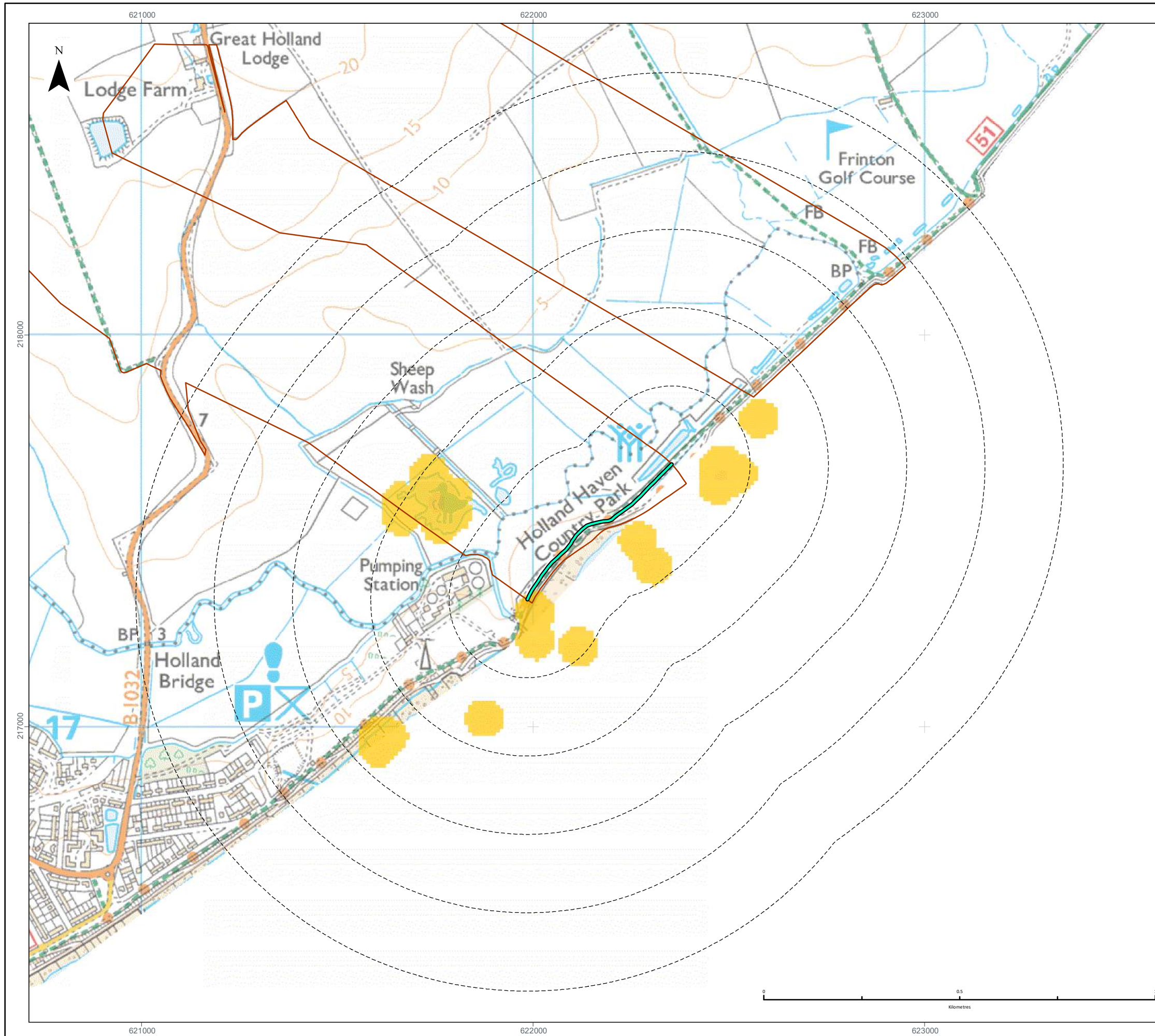
DRAWING TITLE:
 Curlew Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.14
 Page 14 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Oystercatcher Distribution
 (Records/50m²; Total = 46;
 Highest Density for Species = 0.40)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

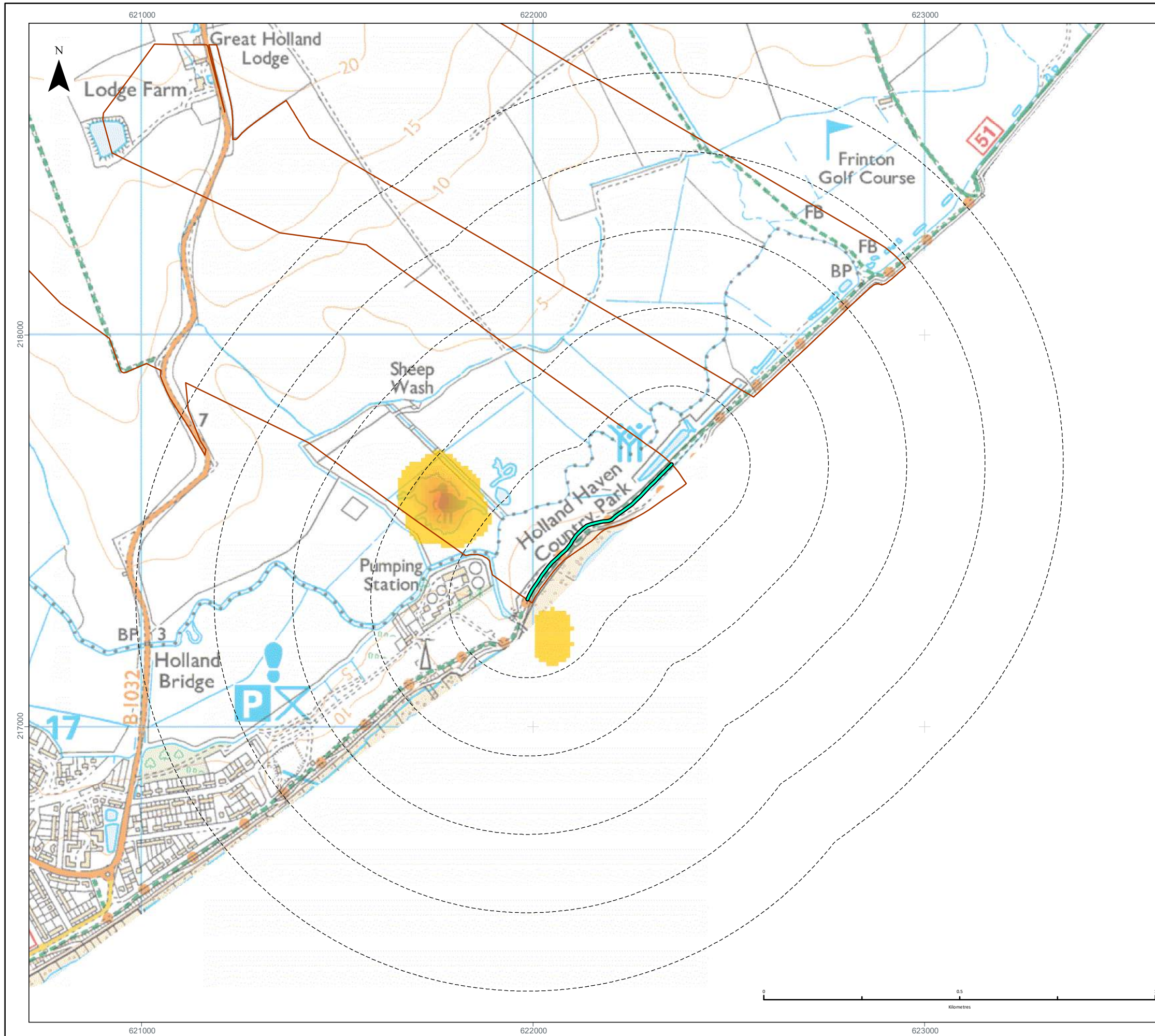
DRAWING TITLE:
 Oystercatcher Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.15
 Page 15 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Avocet Distribution
 (Records/50m²; Total = 459;
 Highest Density for Species = 7.07)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

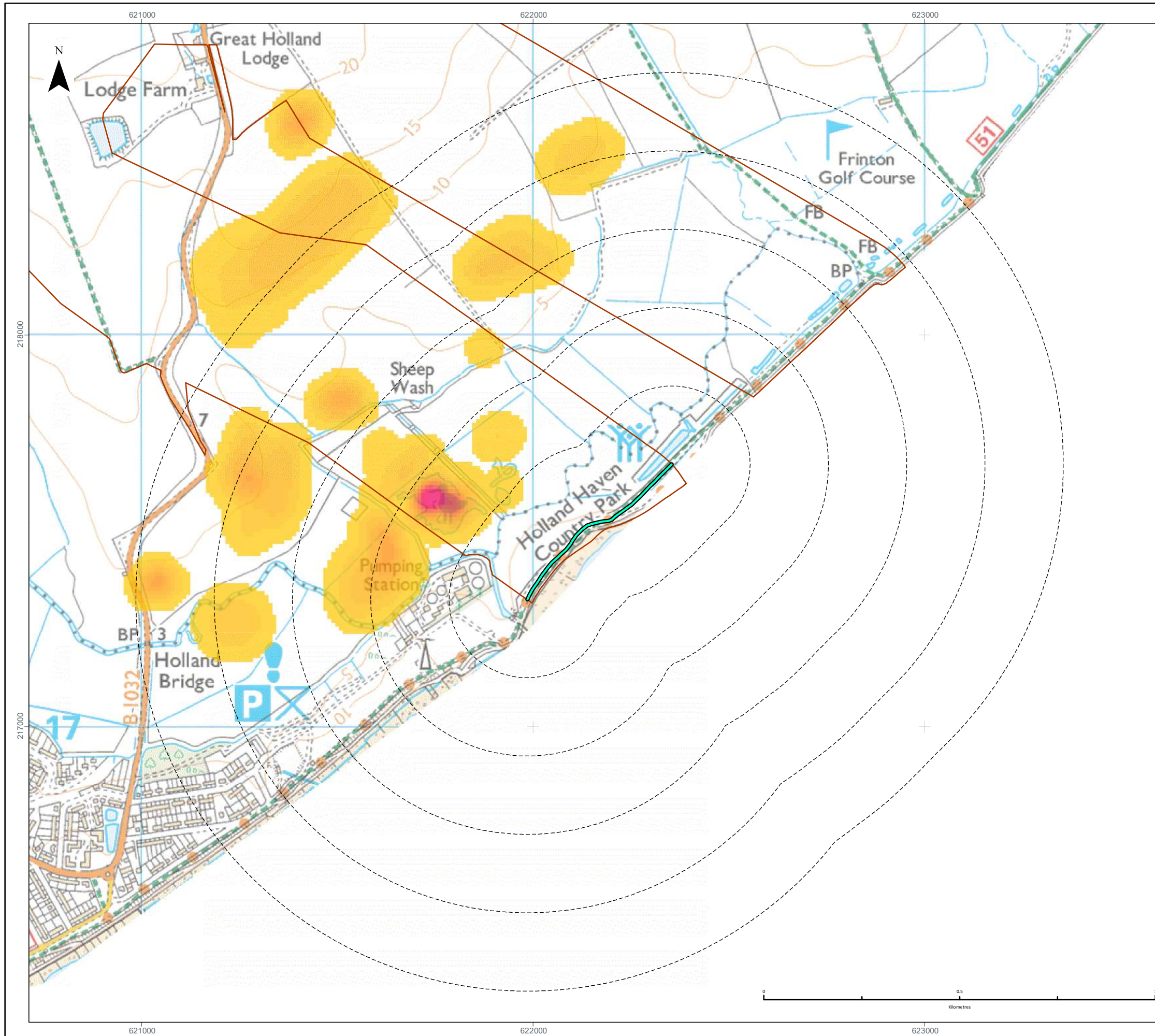
DRAWING TITLE:
 Avocet Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.16
 Page 16 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Lapwing Distribution
 (Records/50m²; Total = 4512;
 Highest Density for Species = 19.05)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

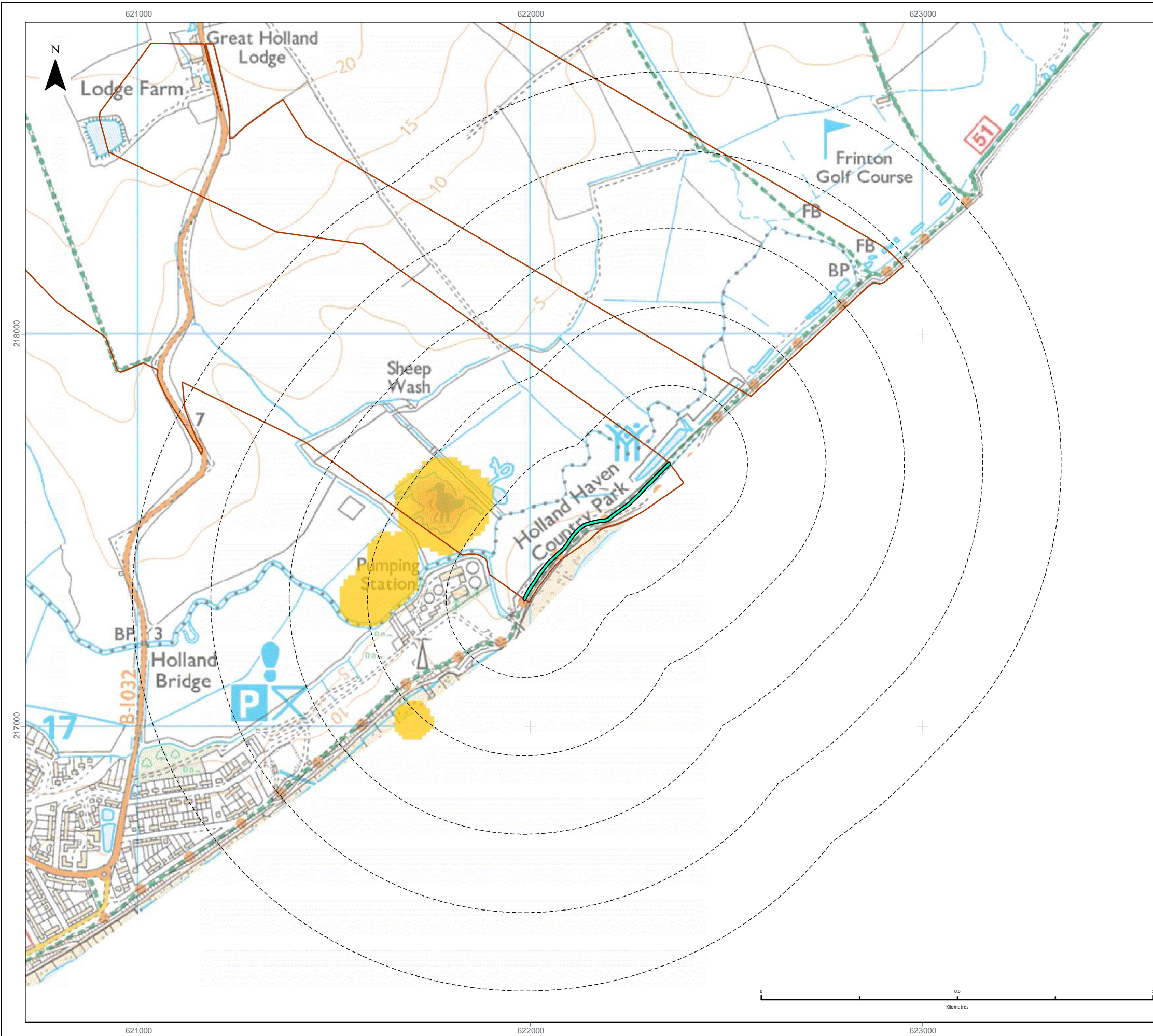
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 Lapwing Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
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2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.17
 Page 17 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid

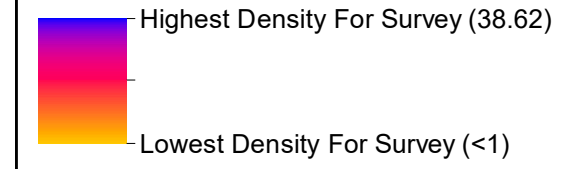




LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Black-Tailed Godwit Distribution
 (Records/50m²; Total = 276;
 Highest Density for Species = 3.01)



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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

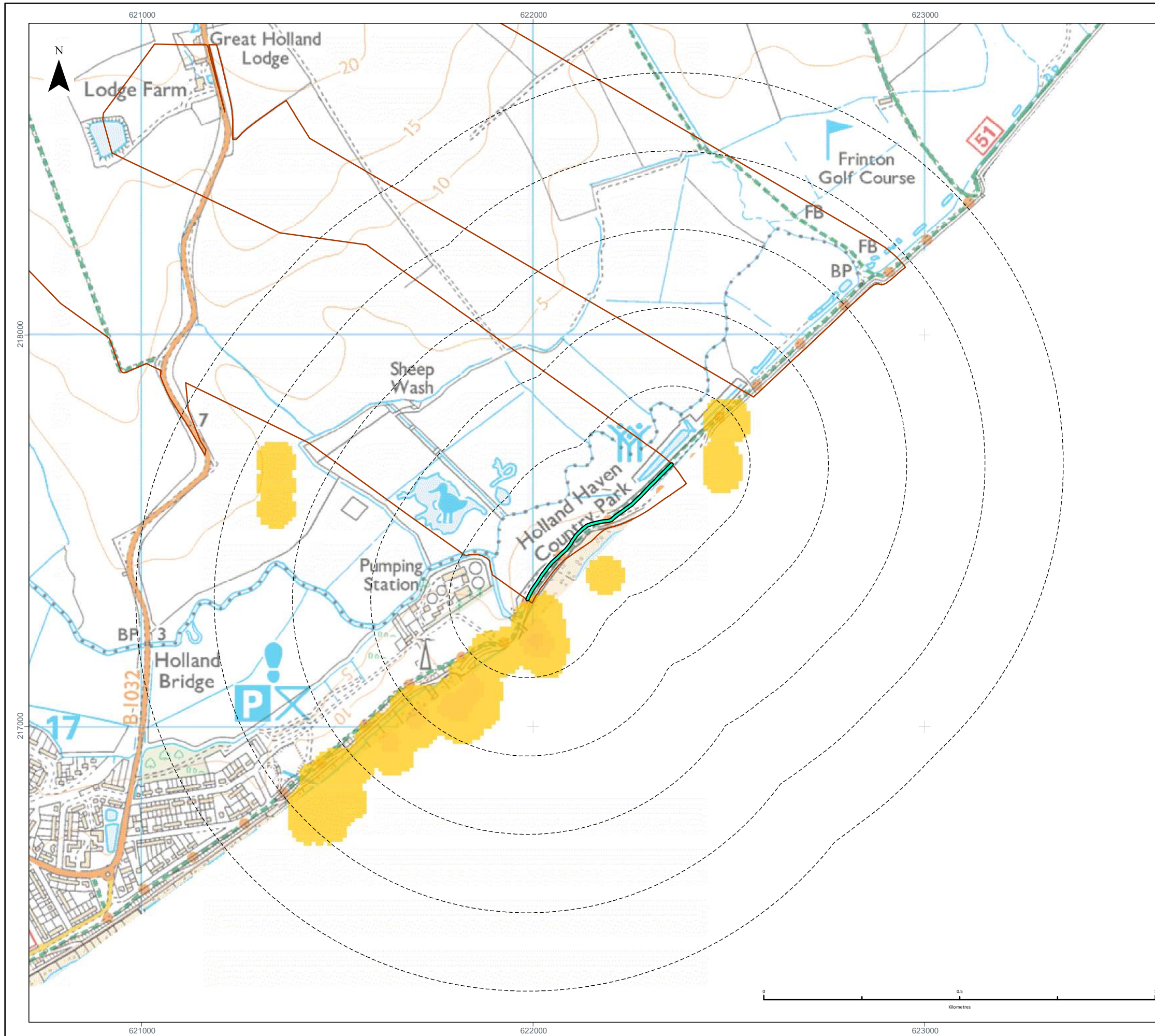
DRAWING TITLE:
 Black-Tailed Godwit Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.18
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SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Turnstone Distribution
 (Records/50m²; Total = 203;
 Highest Density for Species = 1.36)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

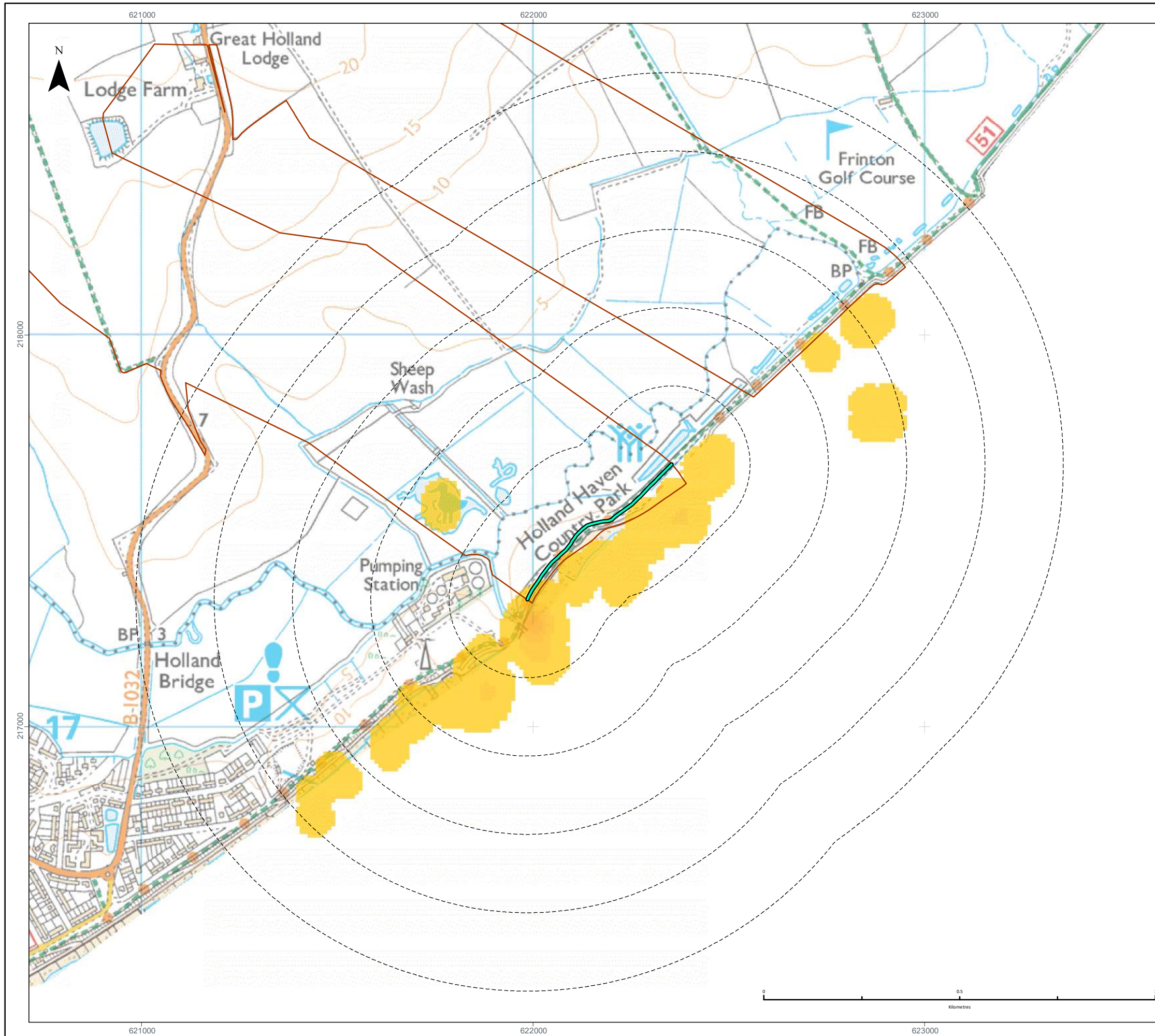
DRAWING TITLE:
 Turnstone Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.19
 Page 19 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Purple Sandpiper Distribution
 (Records/50m²; Total = 249;
 Highest Density for Species = 2.84)

Highest Density For Survey (38.62)
 Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

DRAWING TITLE:
 Purple Sandpiper Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.20
 Page 20 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Snipe Distribution
 (Records/50m²; Total = 24;
 Highest Density for Species = 0.45)

Highest Density For Survey (38.62)
 Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

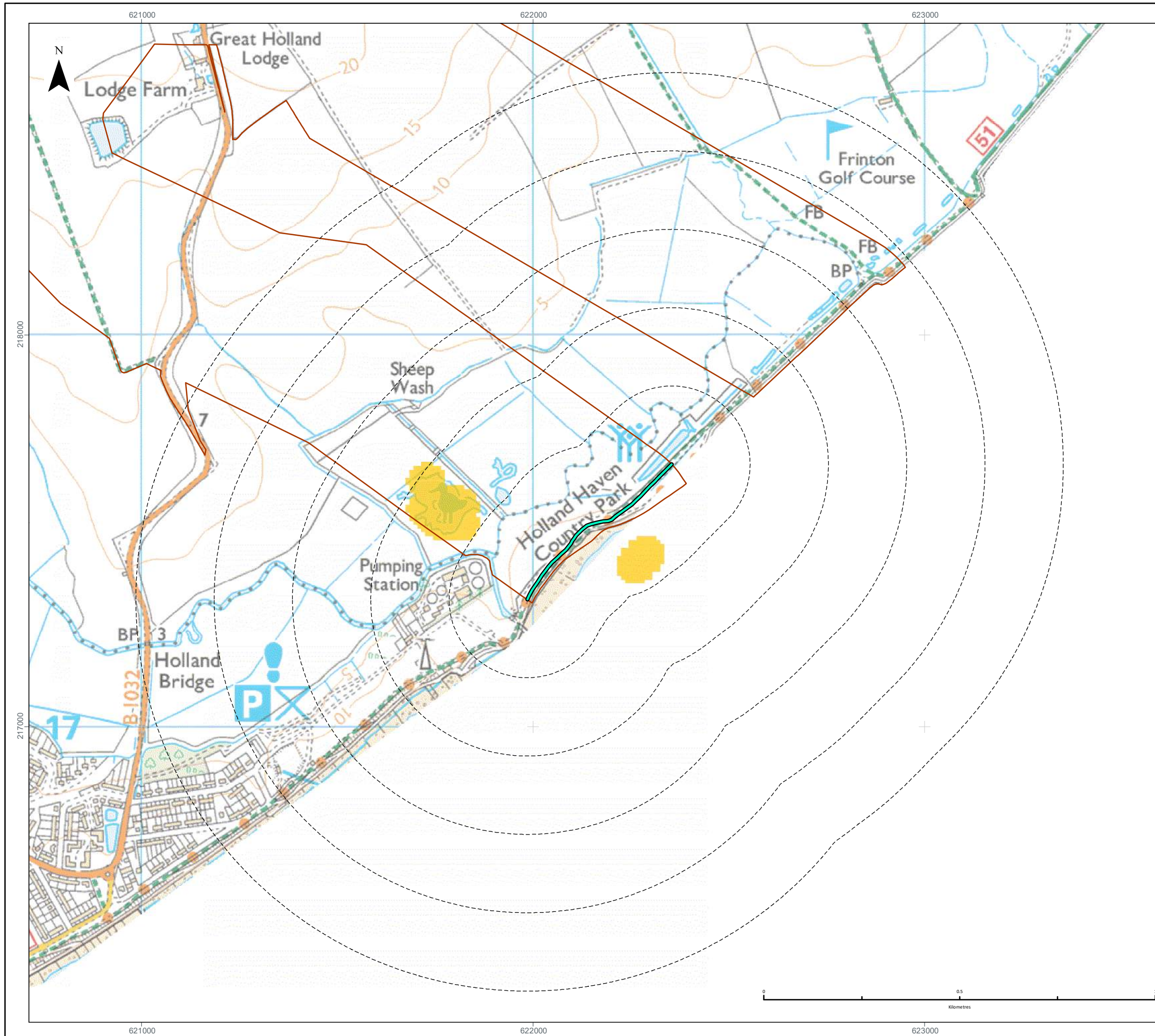
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 Snipe Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
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2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.21
 Page 21 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid

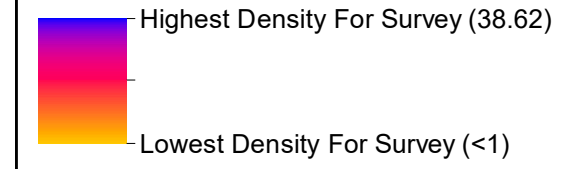




LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Redshank Distribution
 (Records/50m²; Total = 14;
 Highest Density for Species = 0.20)



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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

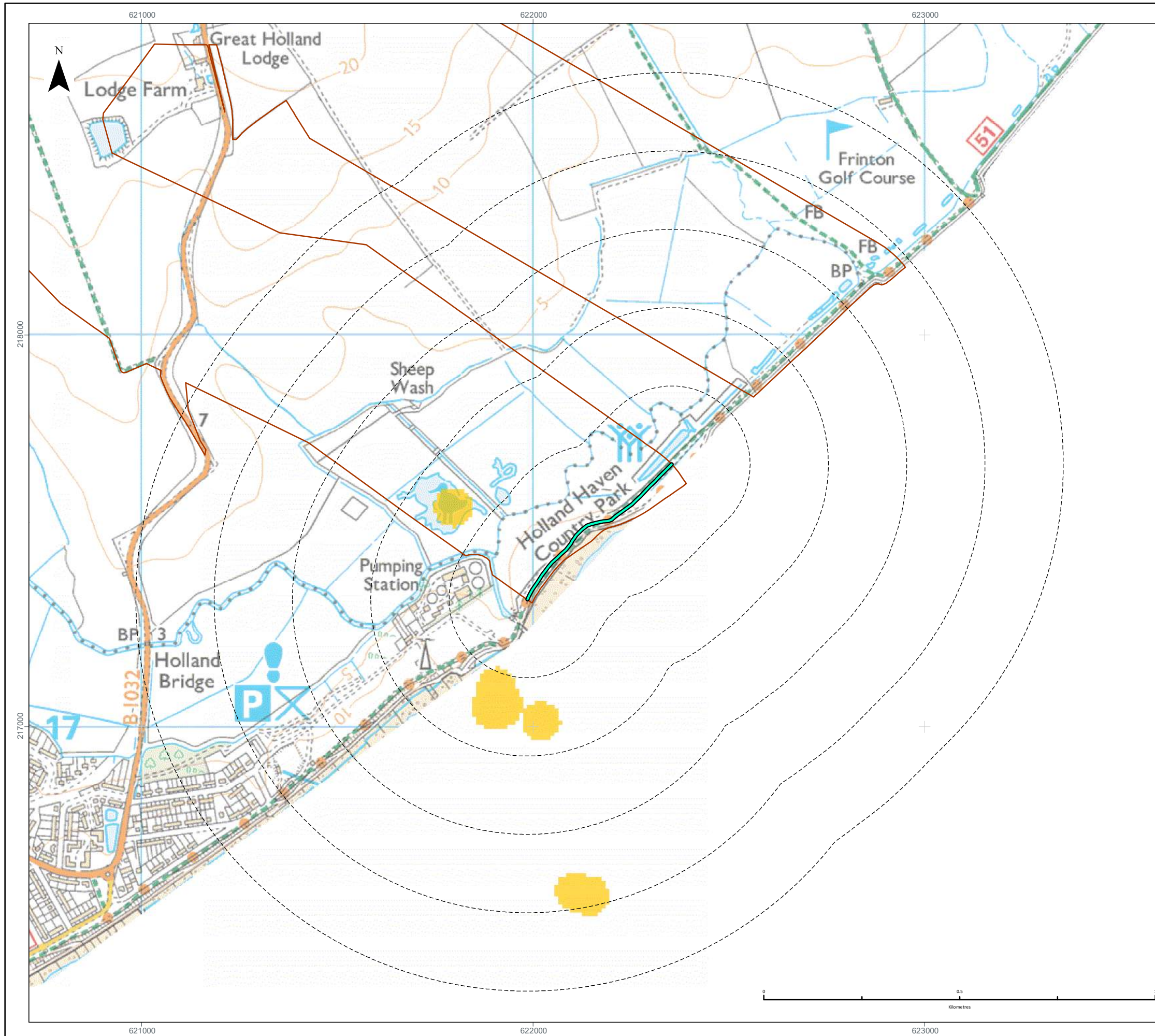
DRAWING TITLE:
 Redshank Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.22
 Page 22 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Mediterranean Gull Distribution
 (Records/50m²; Total = 10;
 Highest Density for Species = 0.17)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

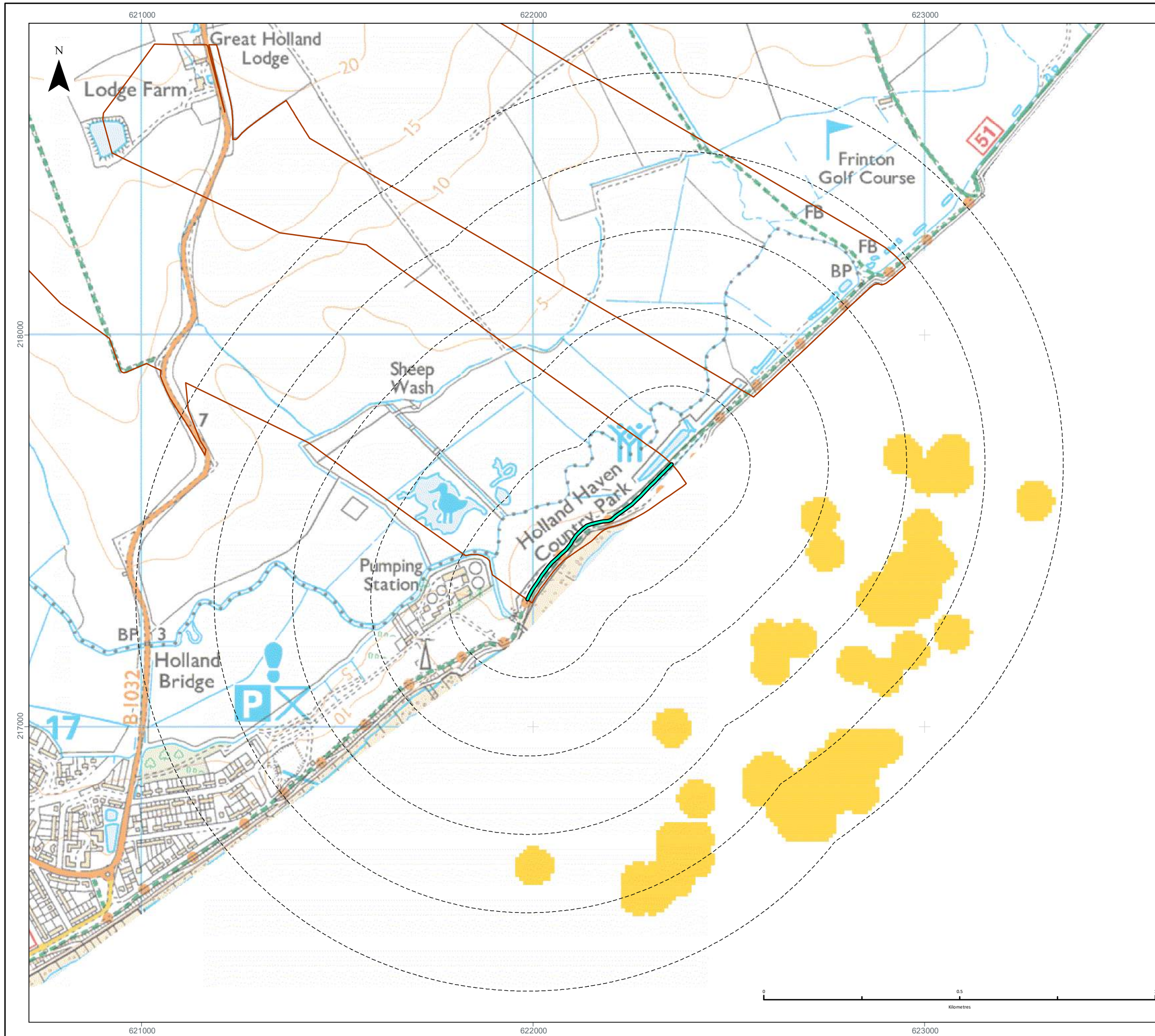
DRAWING TITLE:
 Mediterranean Gull Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.23
 Page 23 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Red-Throated Diver Distribution
 (Records/50m²; Total = 64;
 Highest Density for Species = 0.17)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

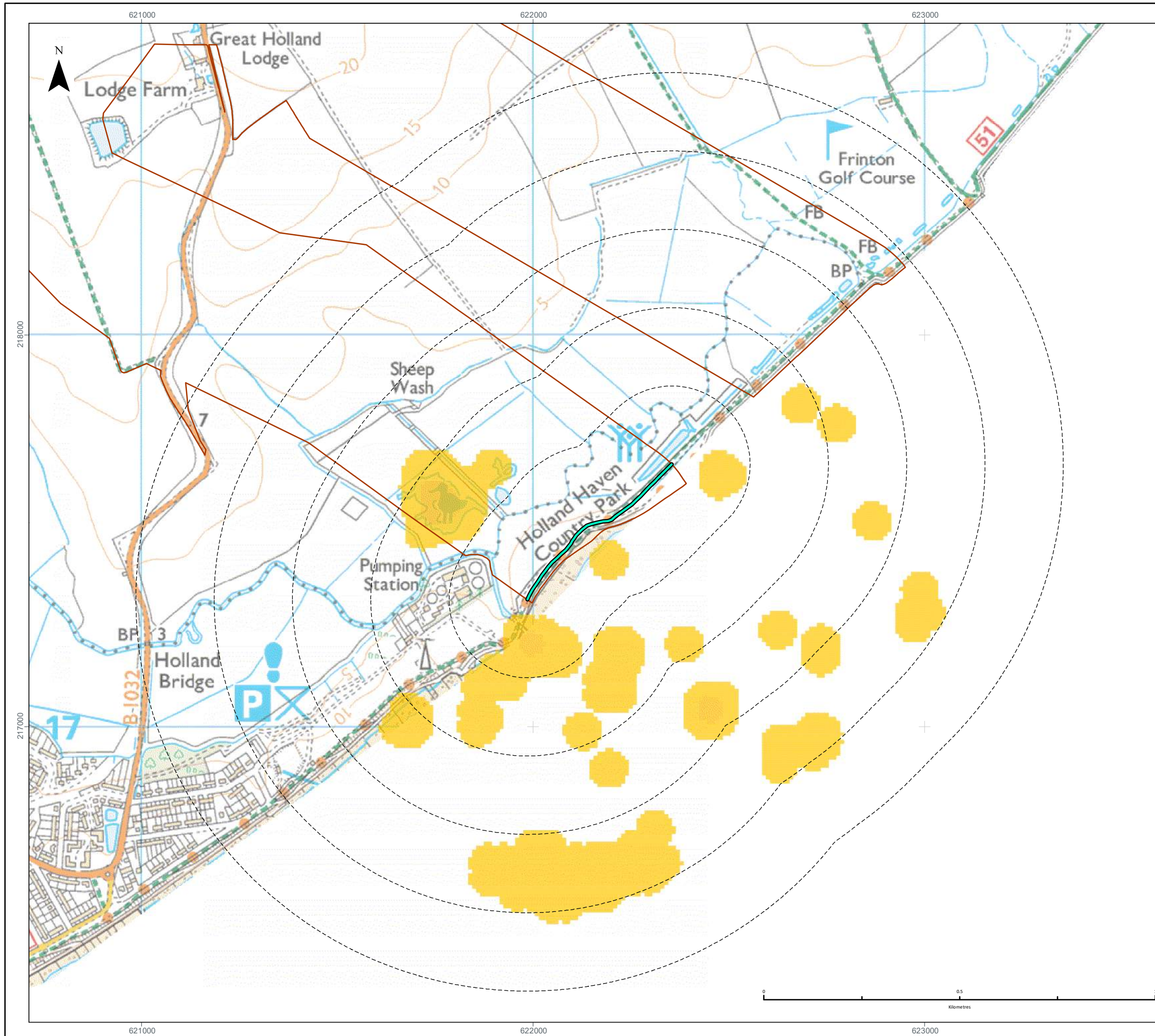
DRAWING TITLE:
 Red-Throated Diver Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.24
 Page 24 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid

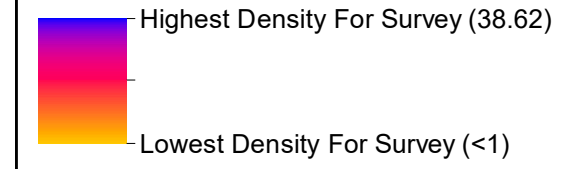




LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Cormorant Distribution
 (Records/50m²; Total = 225;
 Highest Density for Species = 0.78)



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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

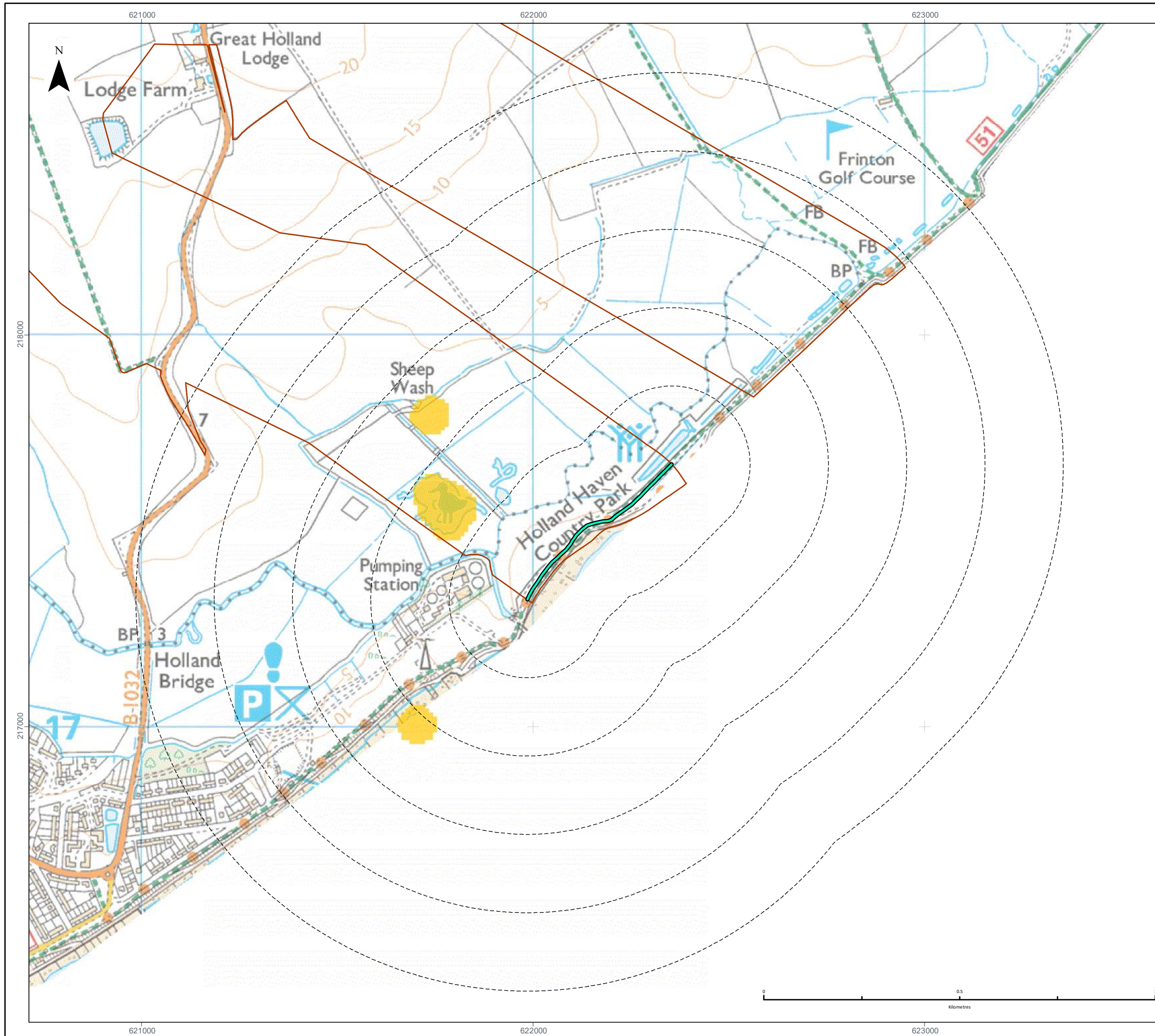
DRAWING TITLE:
 Cormorant Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.25
 Page 25 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Grey Heron Distribution
 (Records/50m²; Total = 11;
 Highest Density for Species = 0.16)

Highest Density For Survey (38.62)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

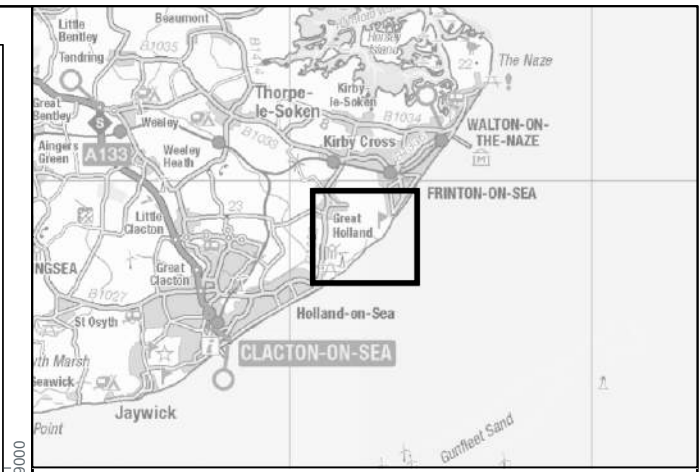
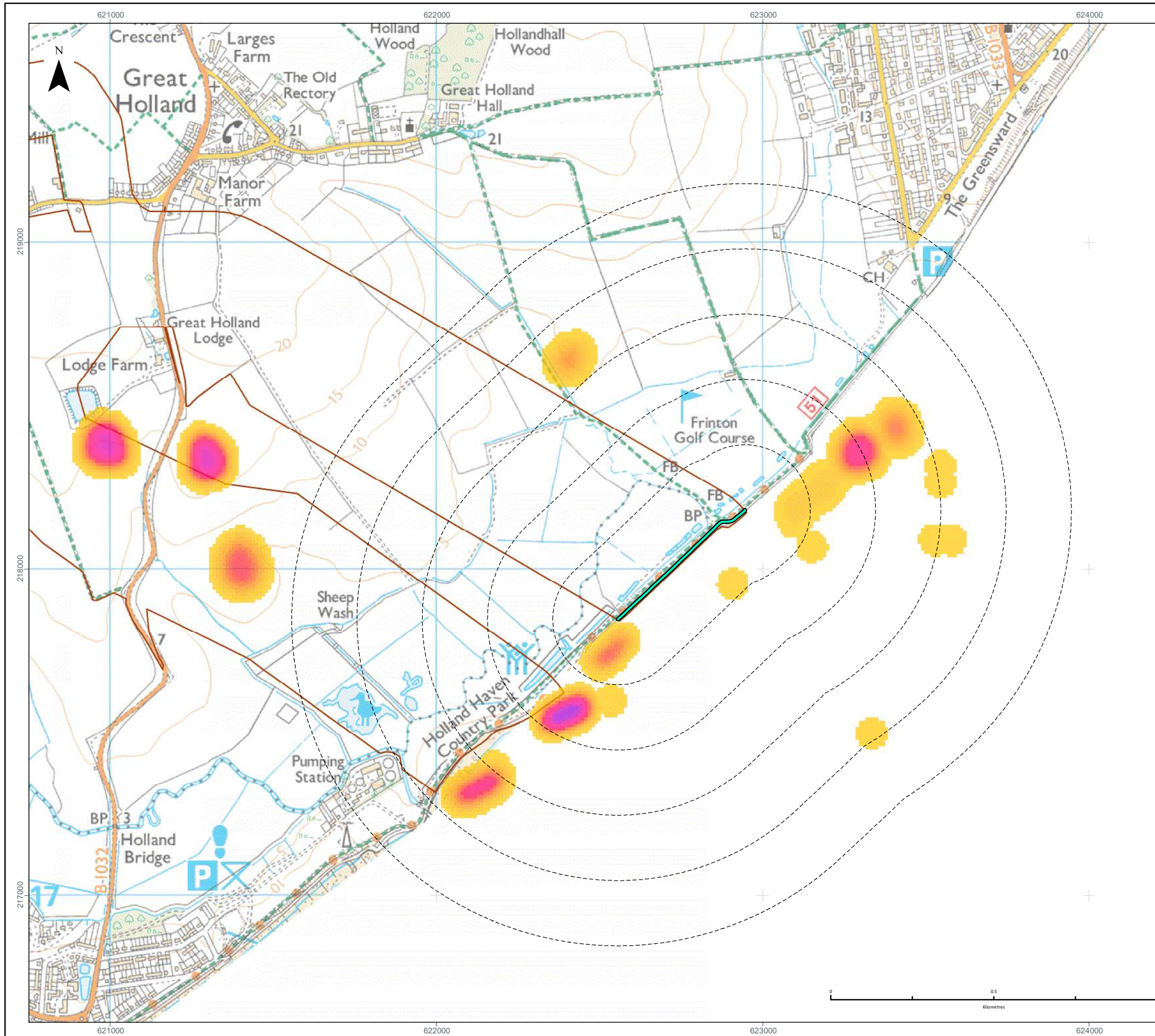
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 Grey Heron Distribution
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	28/07/2022	For Issue	JO	MR
2	04/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 3.26
 Page 26 of 26

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Brent Goose Distribution
 (Records/50m²; Total = 5359;
 Highest Density for Species = 14.65)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

DRAWING TITLE:
 Brent Goose Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.1
 Page 1 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Canada Goose Distribution
 (Records/50m²; Total = 27;
 Highest Density for Species = 0.20)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

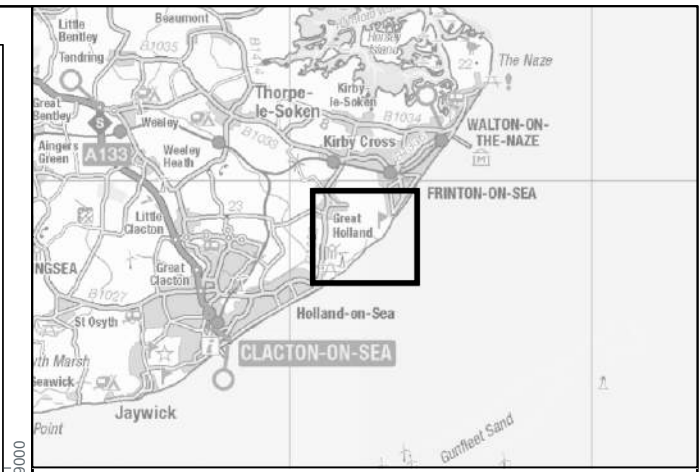
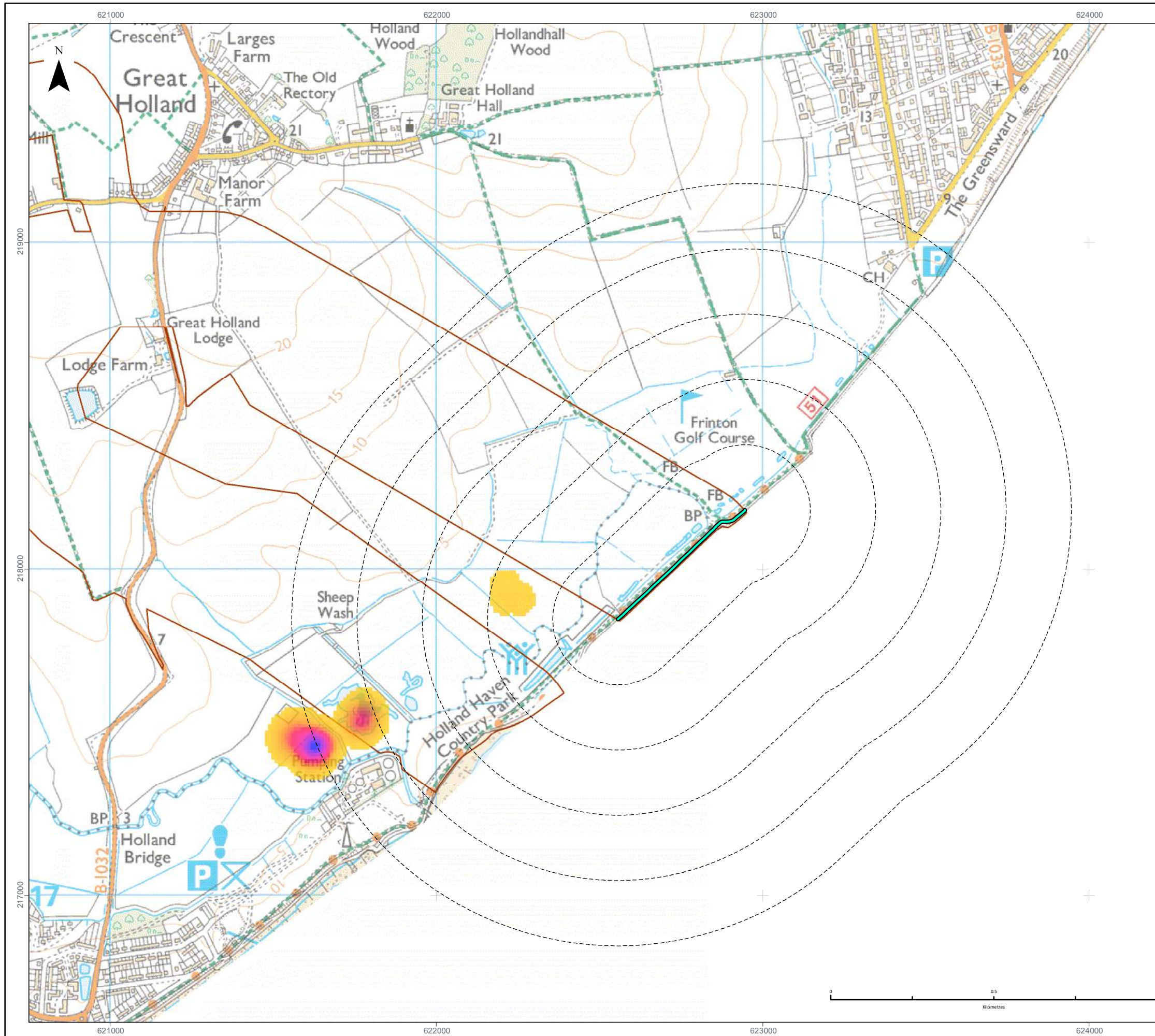
DRAWING TITLE:
 Canada Goose Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.2
 Page 2 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Greylag Goose Distribution
 (Records/50m²; Total = 1603;
 Highest Density for Species = 19.70)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

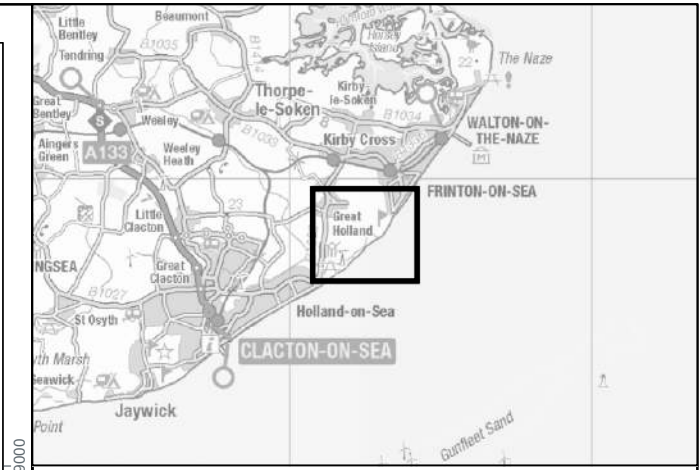
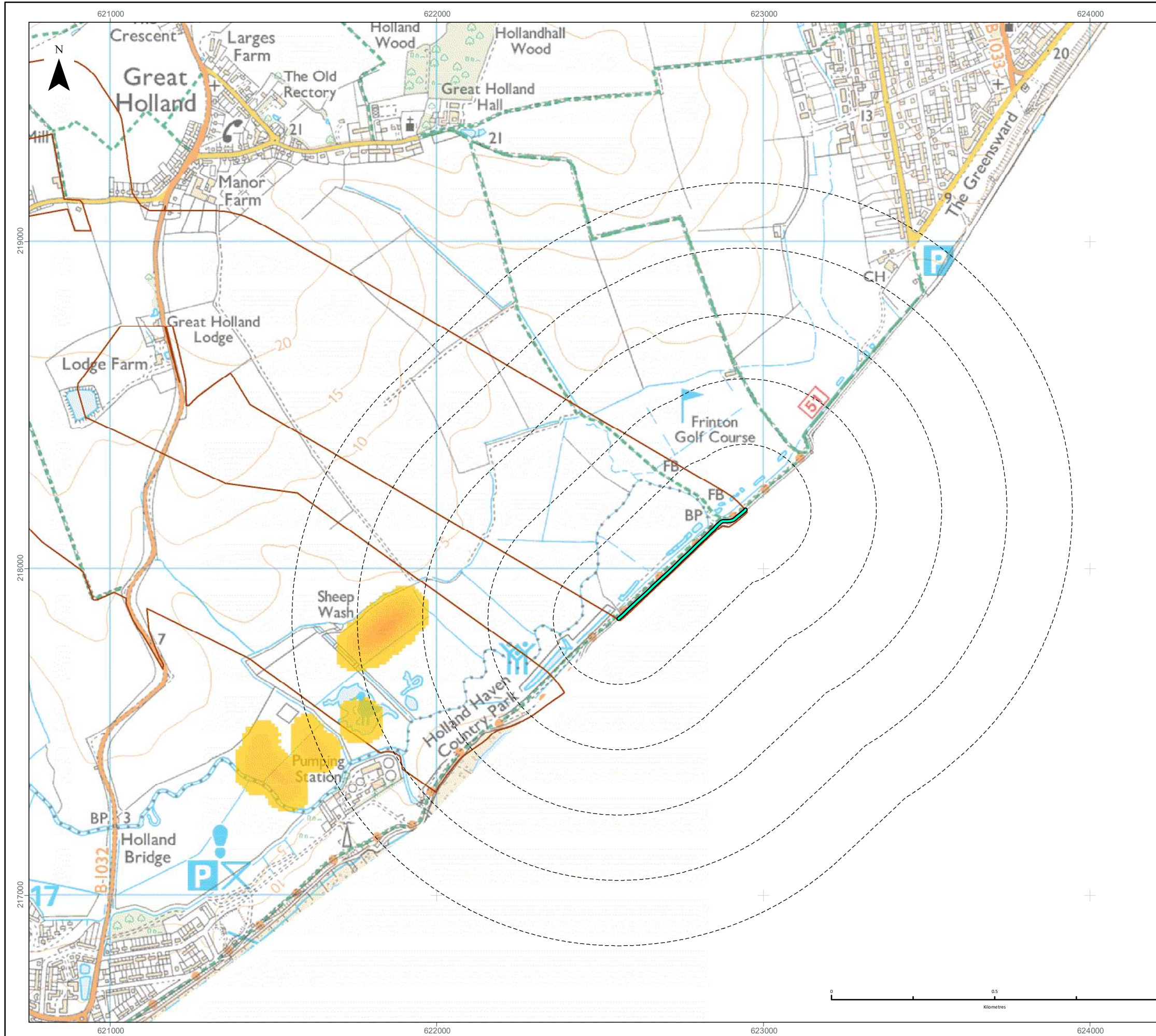
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 Greylag Goose Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.3
 Page 3 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

White Fronted Goose Distribution
 (Records/50m²; Total = 263;
 Highest Density for Species = 1.87)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

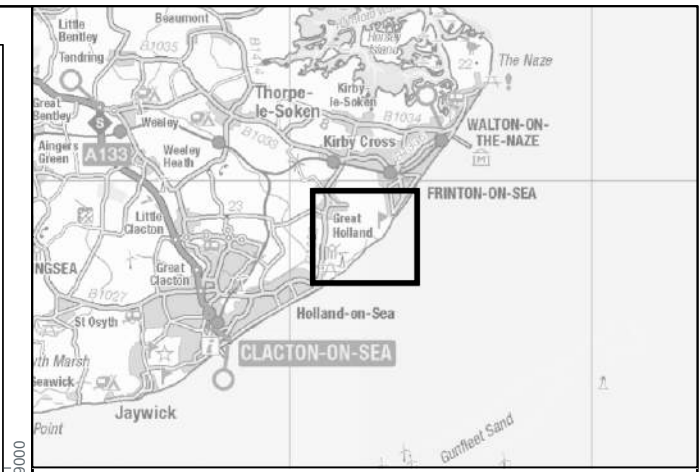
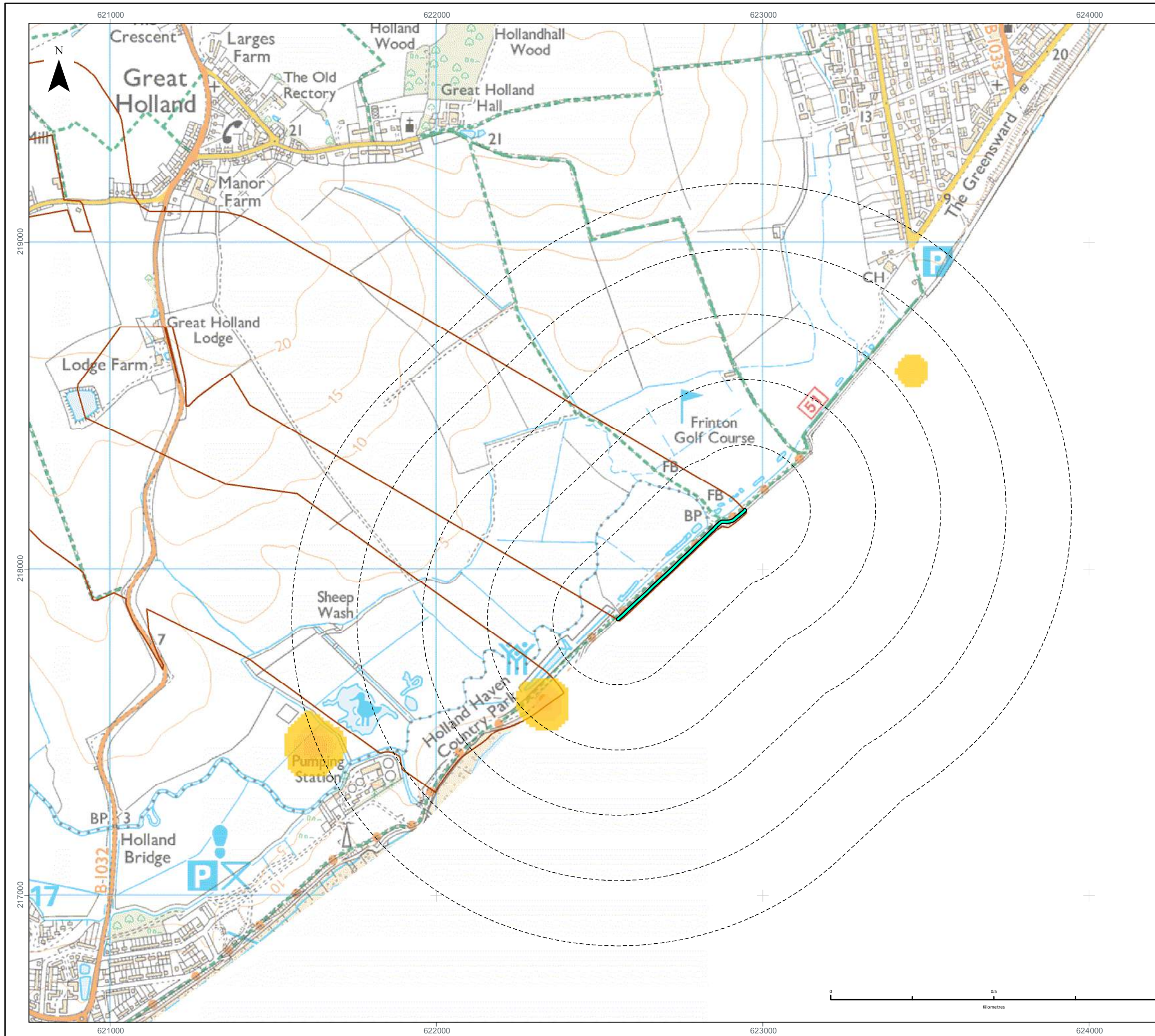
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 White Fronted Goose Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.4
 Page 4 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Shelduck Distribution
(Records/50m²; Total = 75; Highest Density for Species = 0.79)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

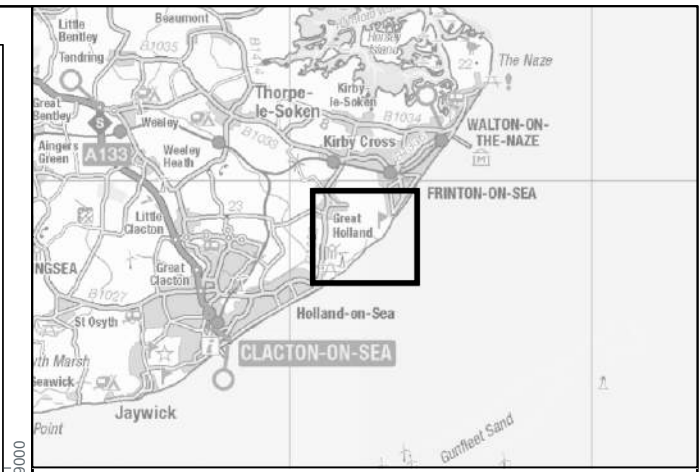
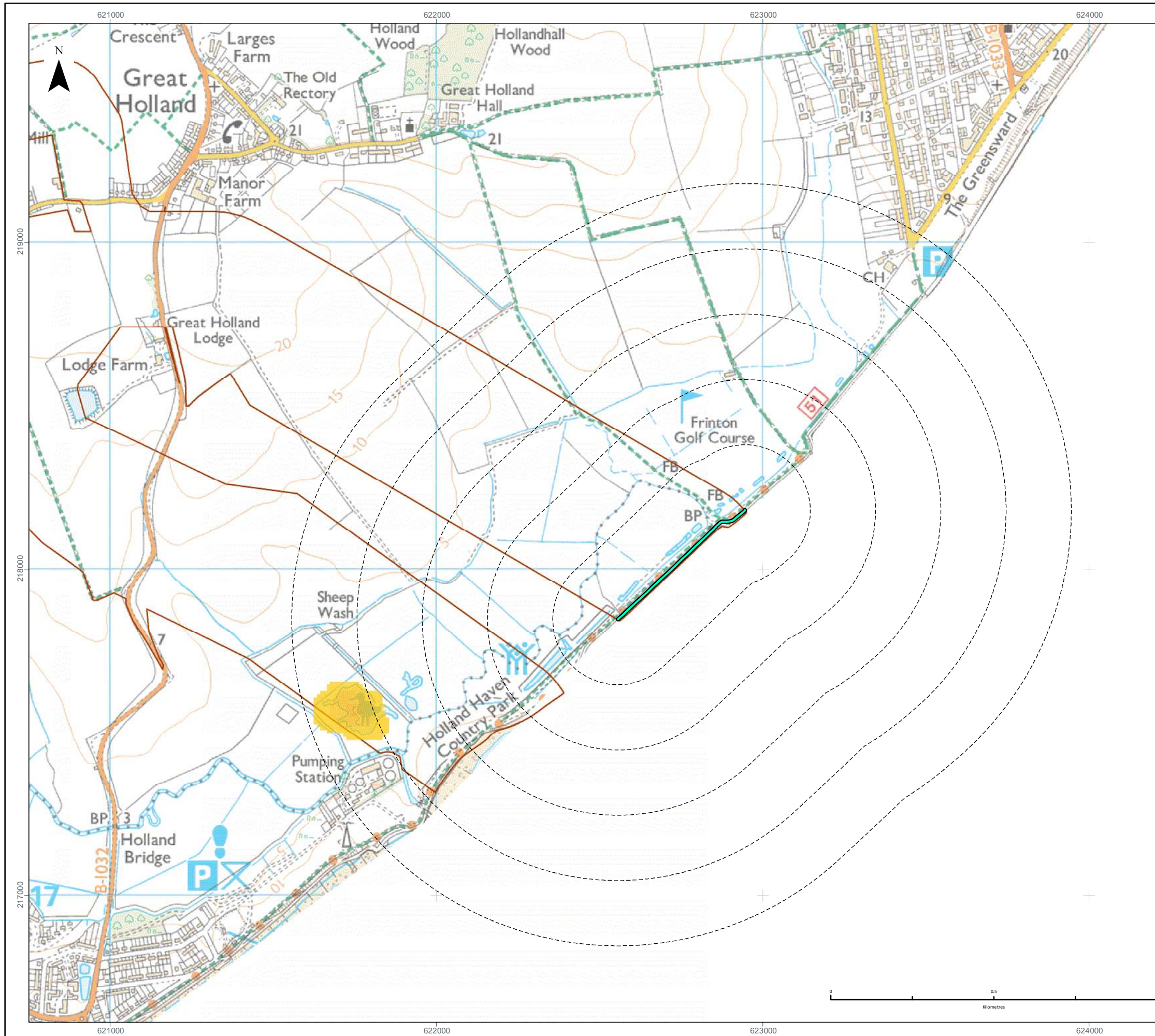
DRAWING TITLE:
 Shelduck Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.5
 Page 5 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Shoveler Distribution
 (Records/50m²; Total = 31;
 Highest Density for Species = 0.48)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

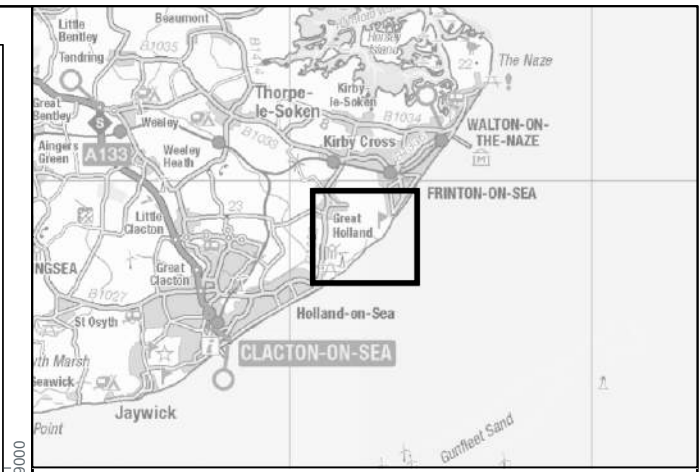
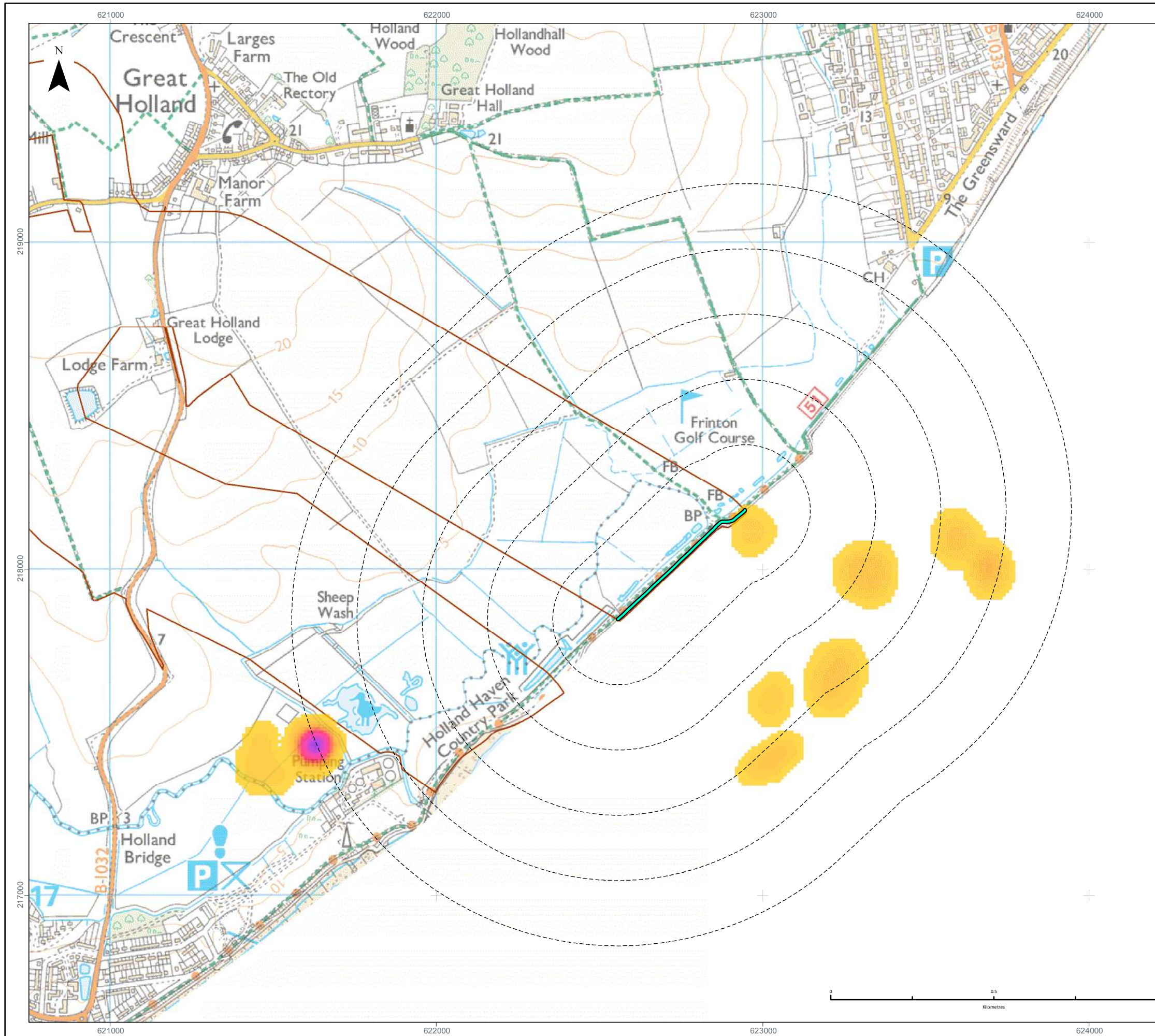
DRAWING TITLE:
 Shoveler Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.6
 Page 6 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Wigeon Distribution
 (Records/50m²; Total = 1177;
 Highest Density for Species = 16.04)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
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PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

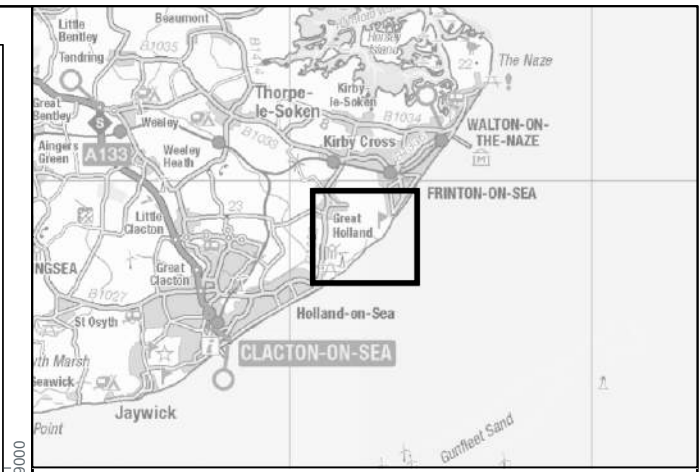
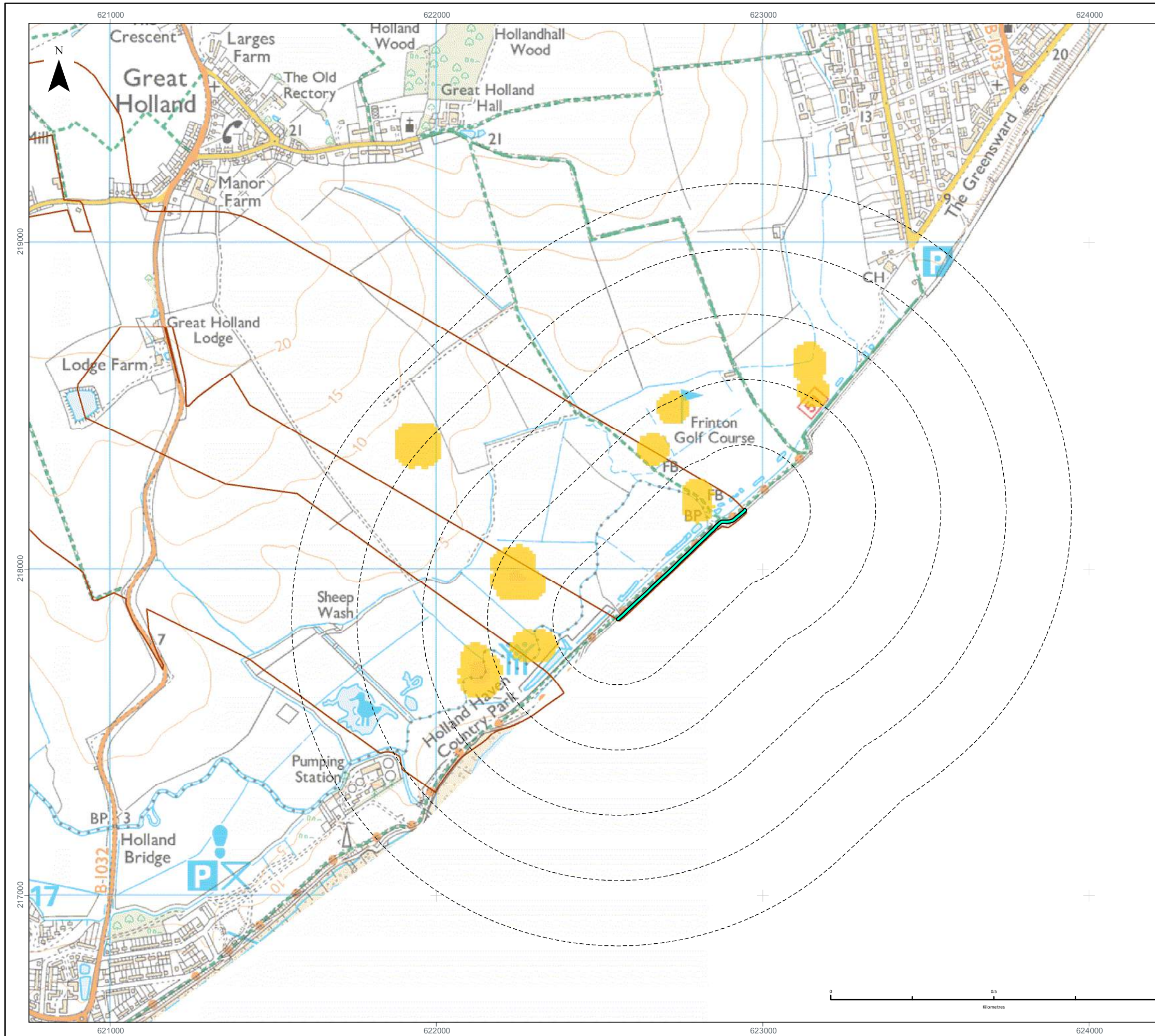
DRAWING TITLE:
 Wigeon Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.7
 Page 7 of 17

SCALE: 1:12,000 | PLOT SIZE: A3 | DATUM: ODN | COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Mallard Distribution
 (Records/50m²; Total = 27;
 Highest Density for Species = 0.15)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

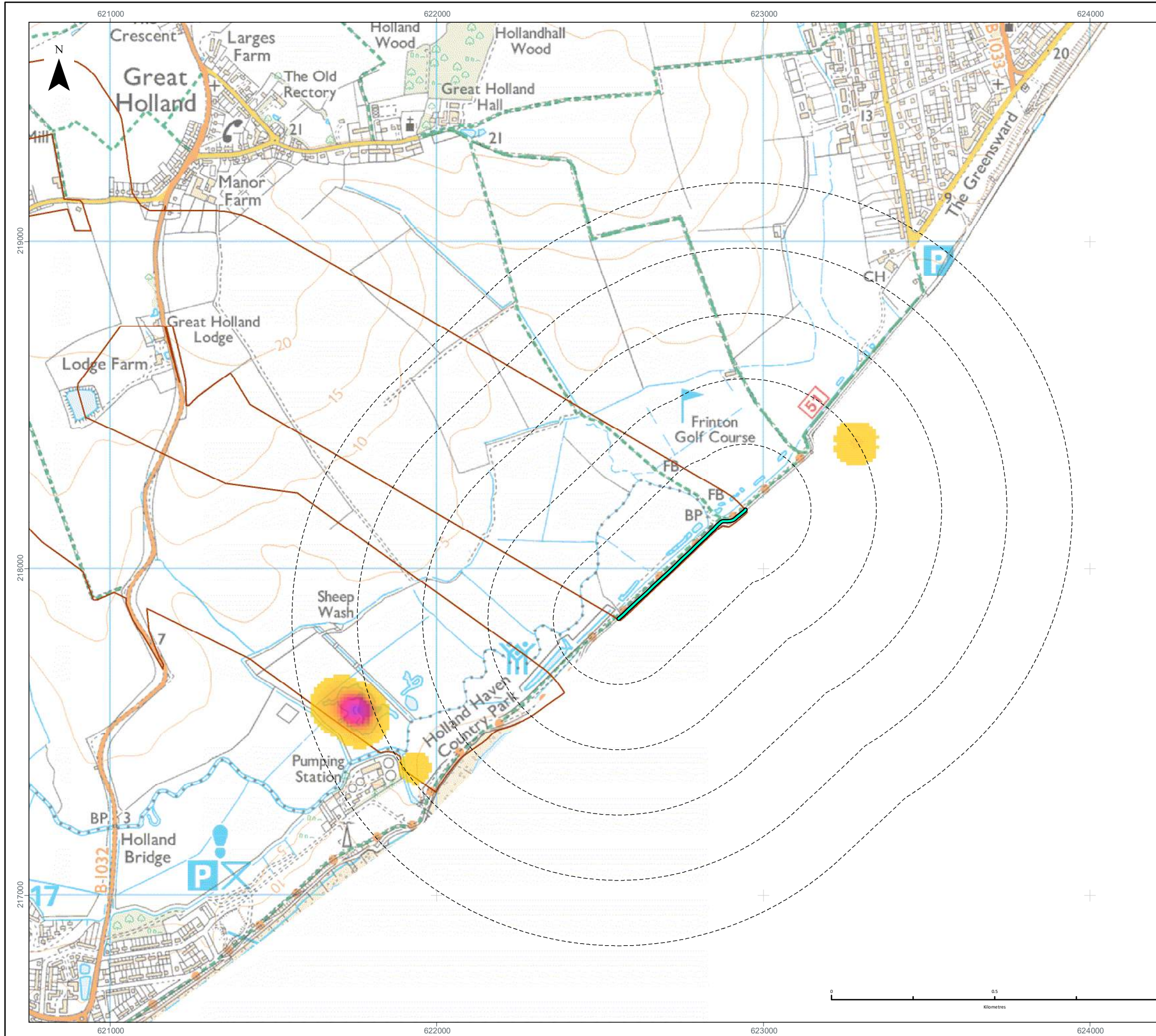
DRAWING TITLE:
 Mallard Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.8
 Page 8 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid



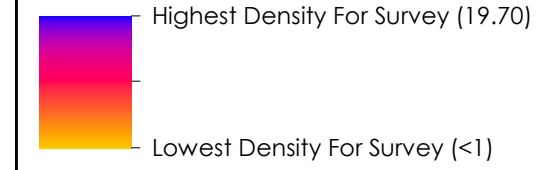


LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Teal Distribution

(Records/50m²; Total = 707;
Highest Density for Species = 11.99)



Data Source:
© Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
*FIVE ESTUARIES OFFSHORE WINDFARM:
WINTERING BIRD SURVEY (LANDFALL LOCATIONS)*

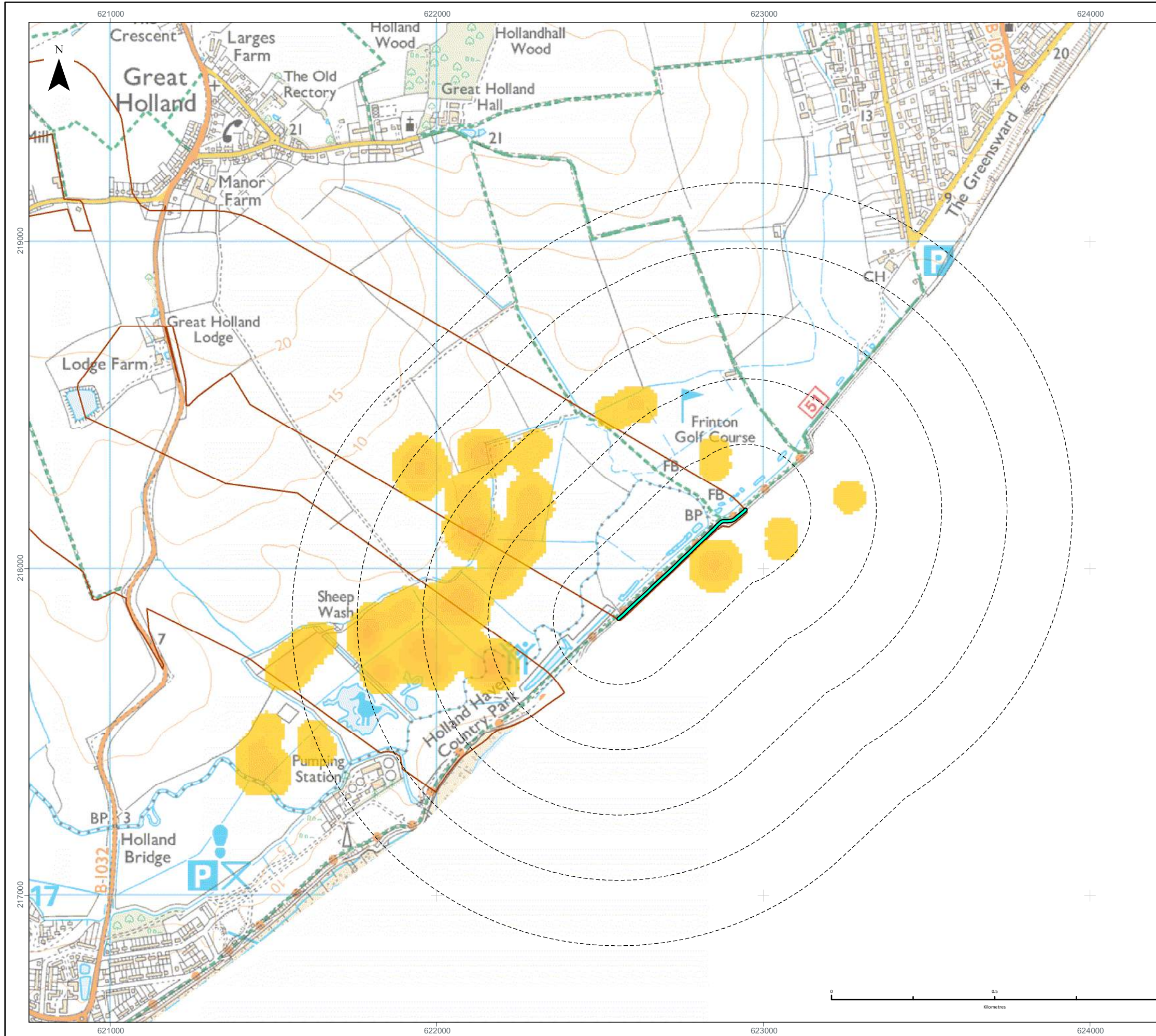
DRAWING TITLE:
**Teal Distribution
Survey Location 2**

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
4.9
Page 9 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Curlew Distribution
 (Records/50m²; Total = 554;
 Highest Density for Species = 1.30)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

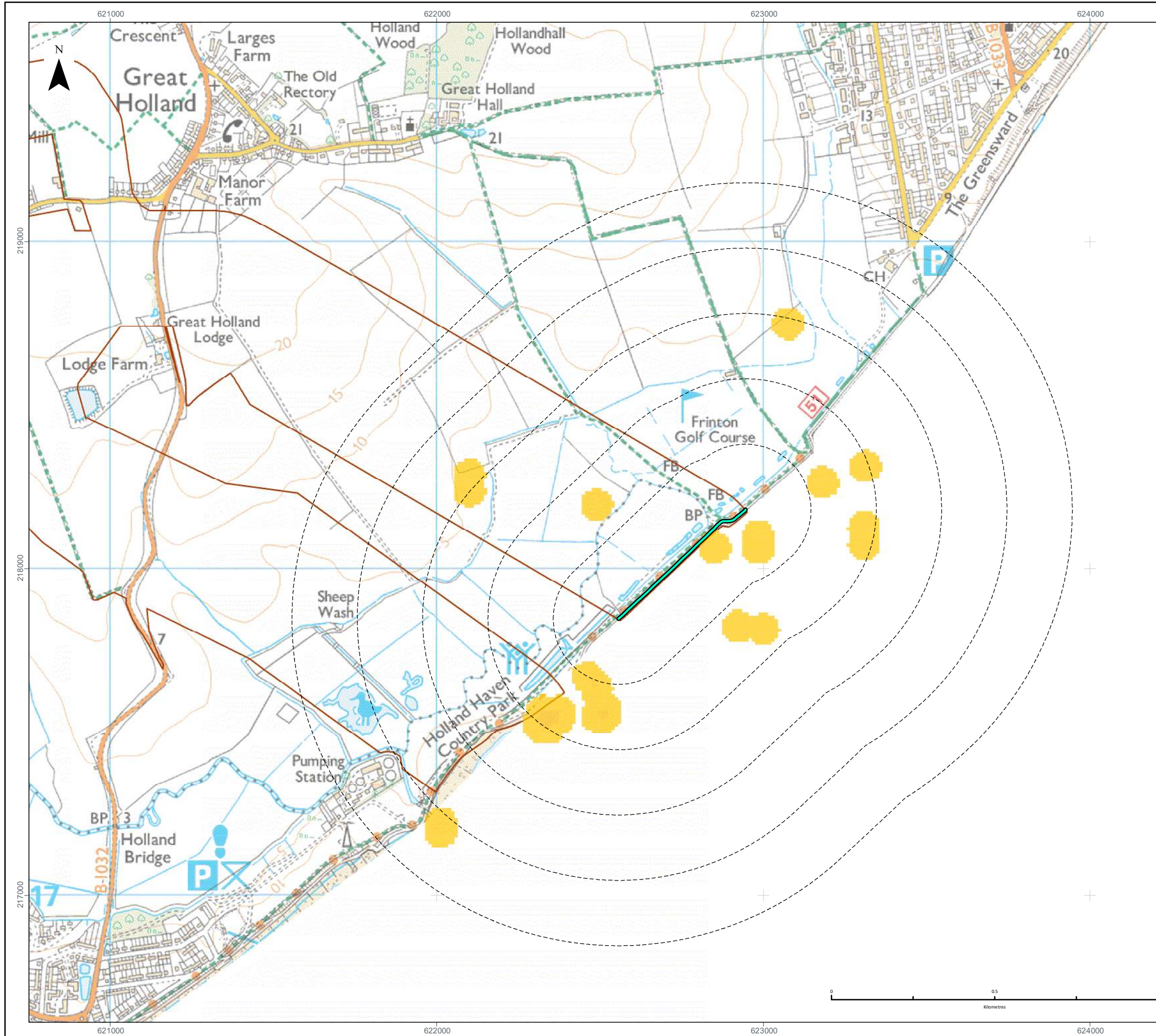
DRAWING TITLE:
 Curlew Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.10
 Page 10 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Oystercatcher Distribution
(Records/50m²; Total = 28; Highest Density for Species = 0.13)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

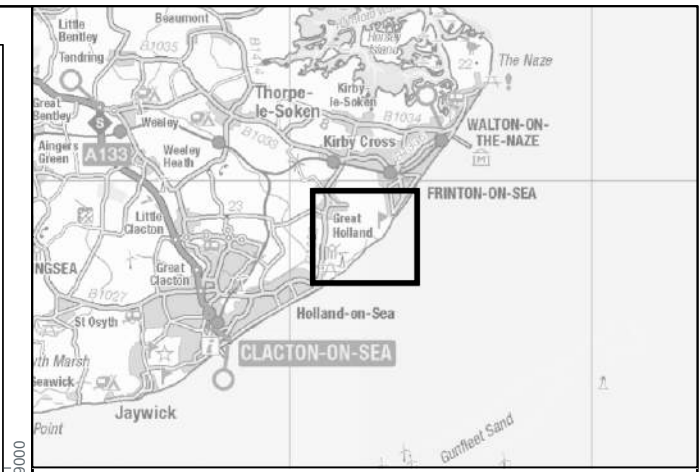
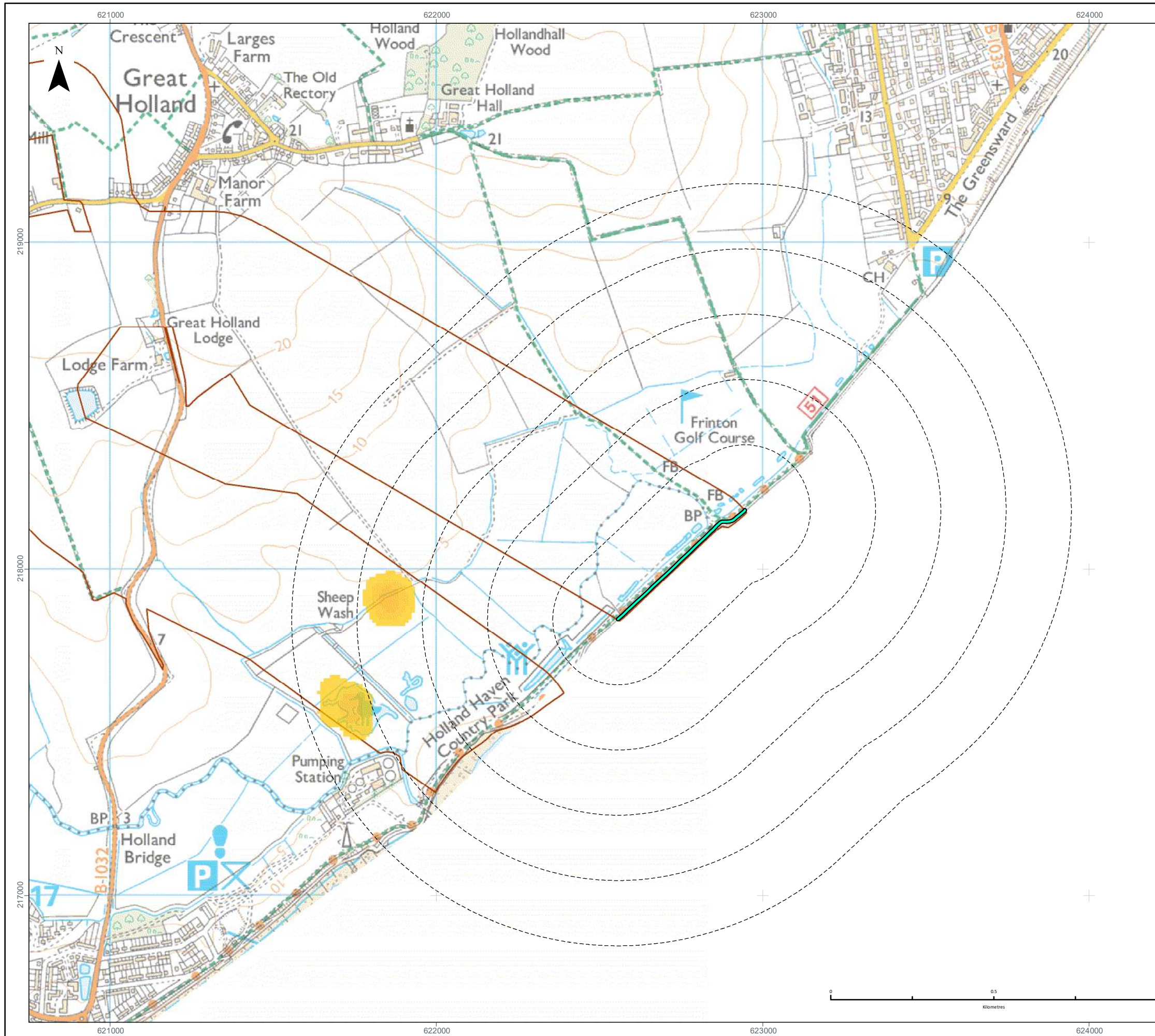
DRAWING TITLE:
 Oystercatcher Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.11
 Page 11 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Avocet Distribution
 (Records/50m²; Total = 52;
 Highest Density for Species = 0.81)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

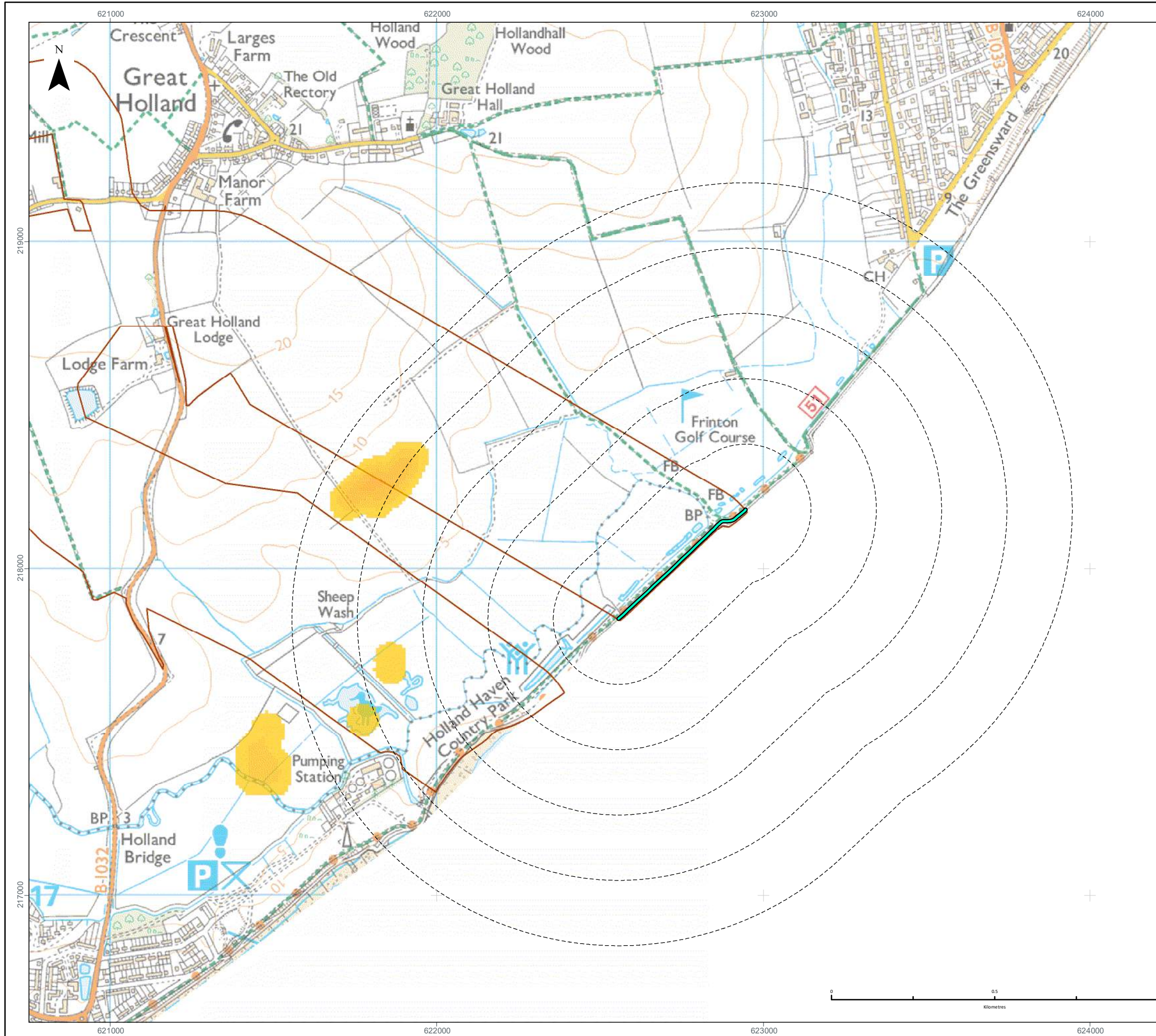
DRAWING TITLE:
 Avocet Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.12
 Page 12 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Lapwing Distribution
(Records/50m²; Total = 148; Highest Density for Species = 0.96)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

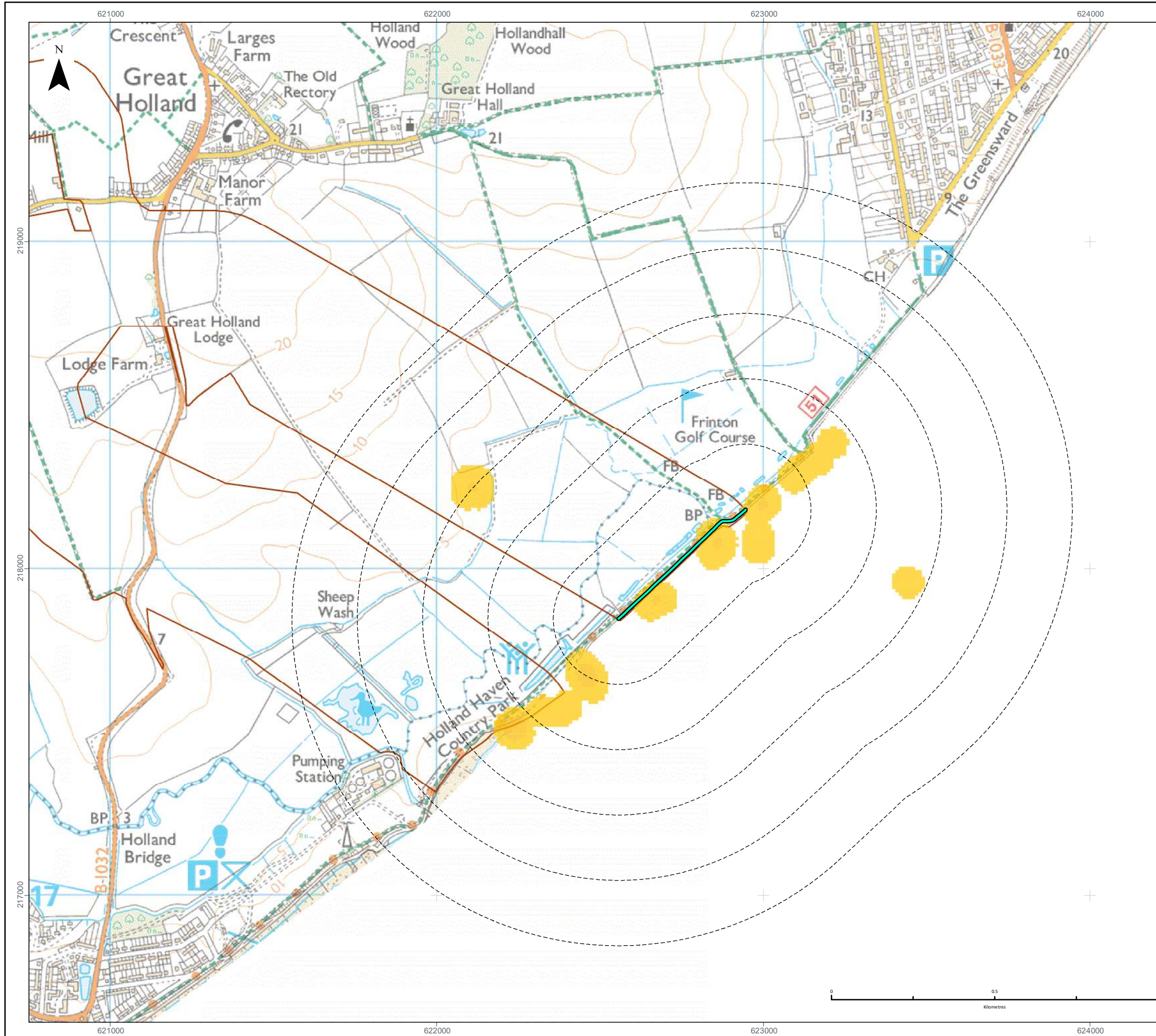
DRAWING TITLE:
 Lapwing Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.13
 Page 13 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid



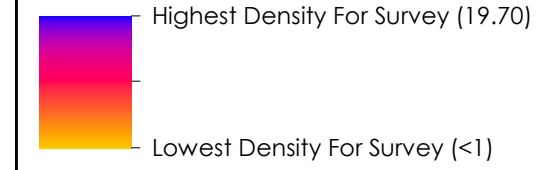


LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Turnstone Distribution

(Records/50m²; Total = 41;
Highest Density for Species = 0.32)



Data Source:
© Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
*FIVE ESTUARIES OFFSHORE WINDFARM:
WINTERING BIRD SURVEY (LANDFALL LOCATIONS)*

DRAWING TITLE:
**Turnstone Distribution
Survey Location 2**

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

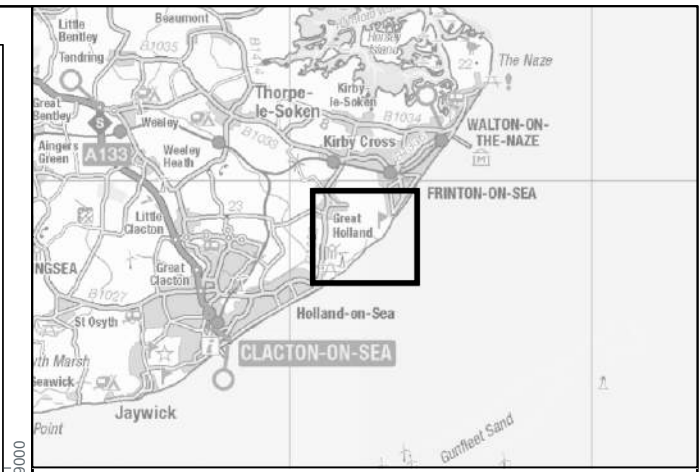
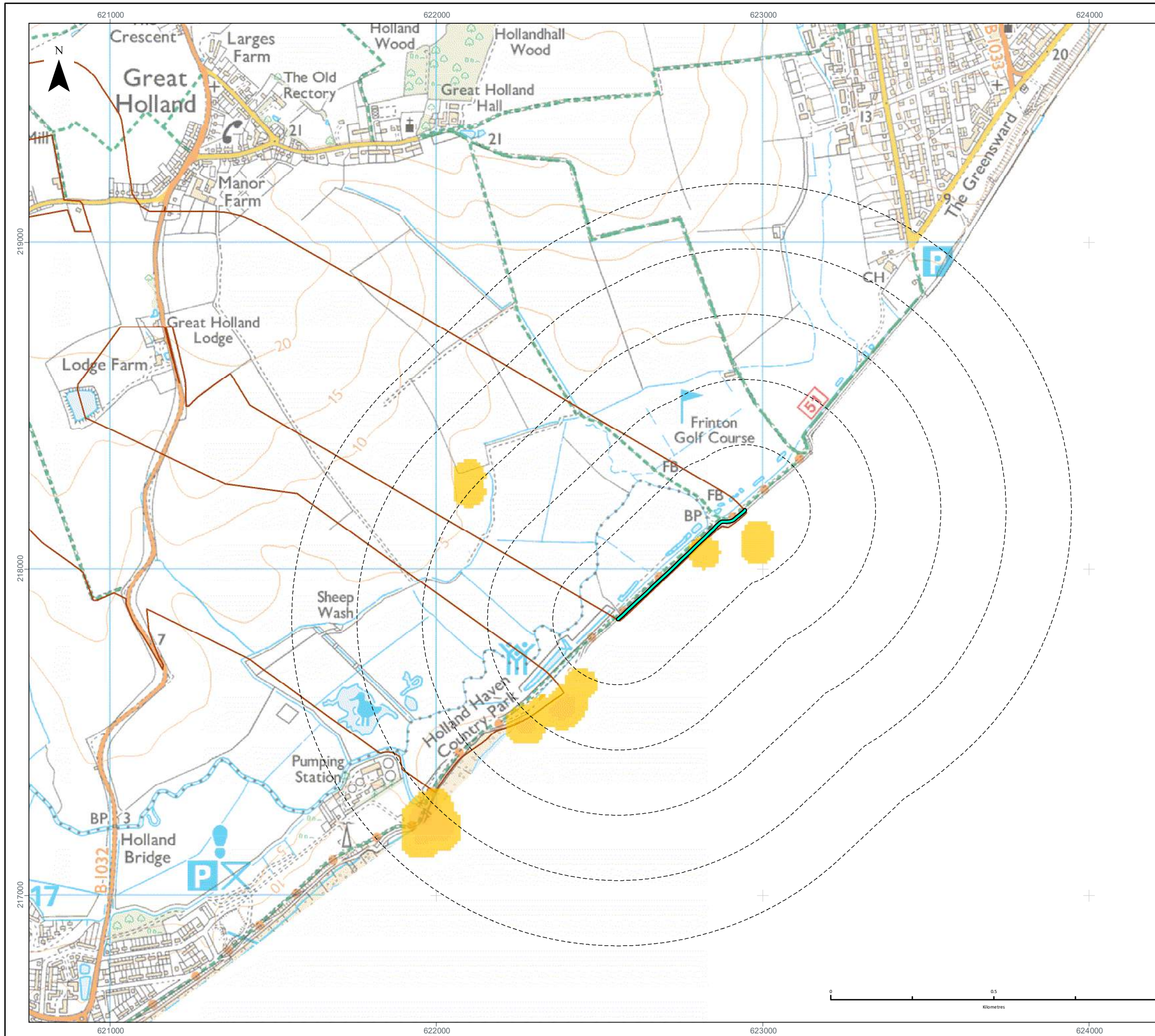
DRAWING NUMBER:

4.14

Page 14 of 17

SCALE: 1:12,000	PLOT SIZE: A3	DATUM: ODN	COORDINATE SYSTEM: British National Grid
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LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Purple Sandpiper Distribution
(Records/50m²; Total = 54;
Highest Density for Species = 0.50)

Highest Density For Survey (19.70)
 Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

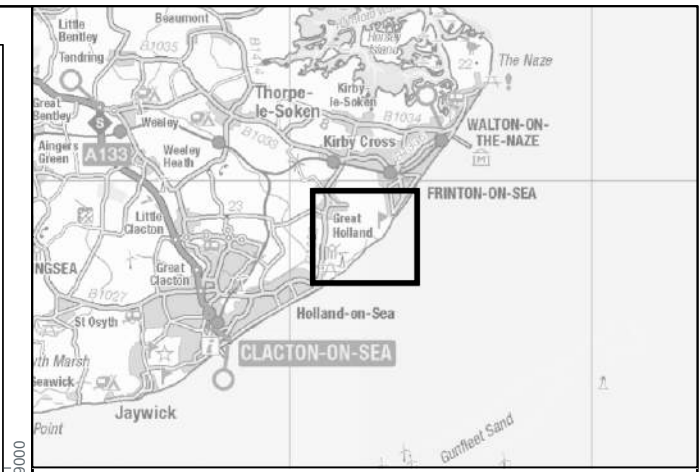
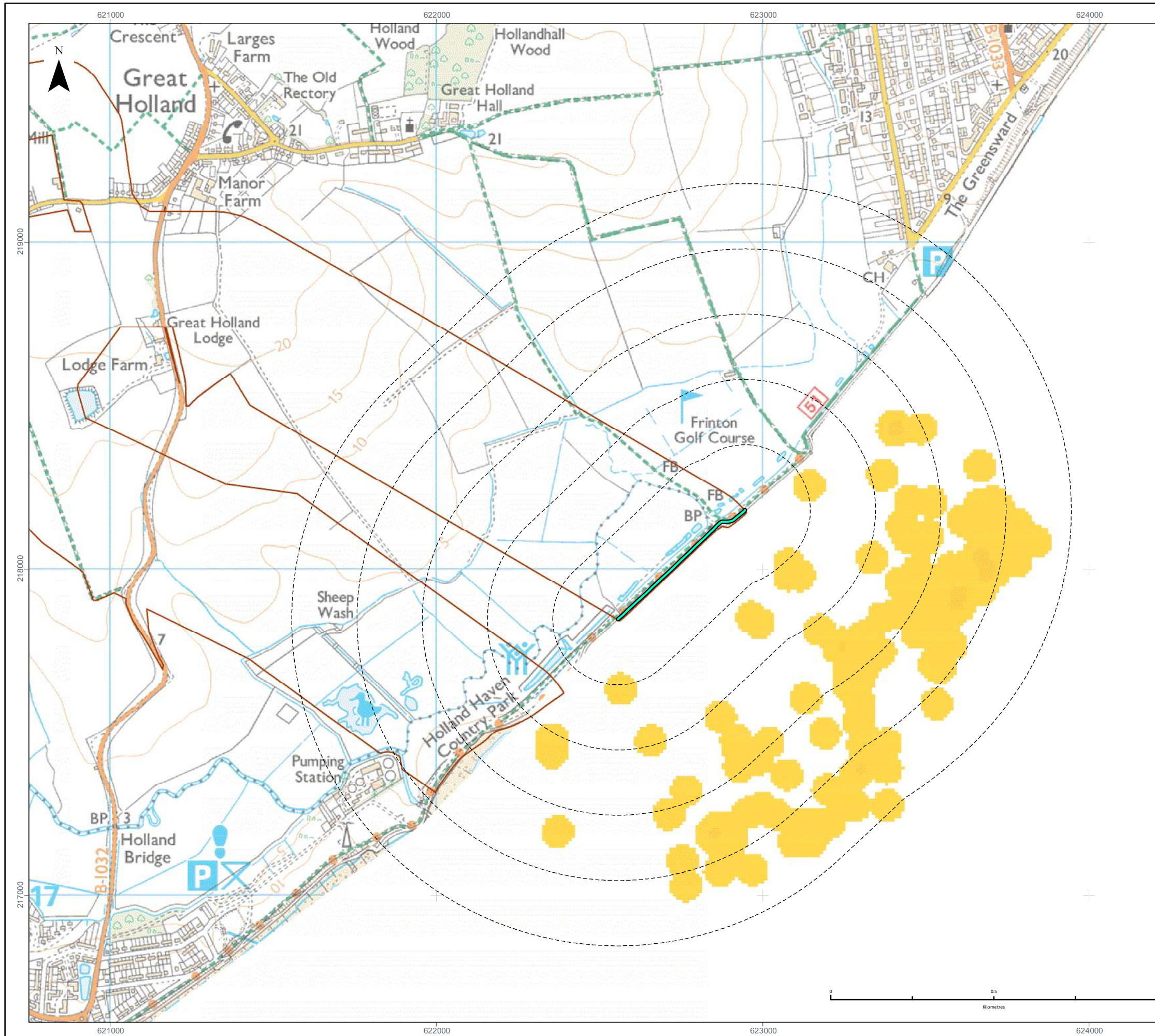
DRAWING TITLE:
 Purple Sandpiper Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.15
 Page 15 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Red-Throated Diver Distribution
 (Records/50m²; Total = 127;
 Highest Density for Species = 0.15)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

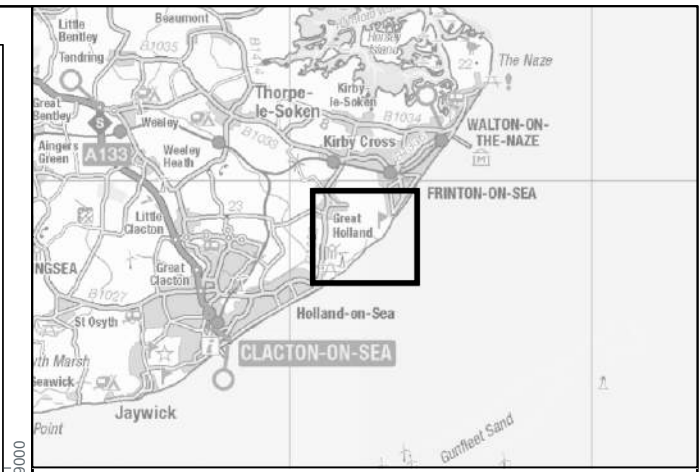
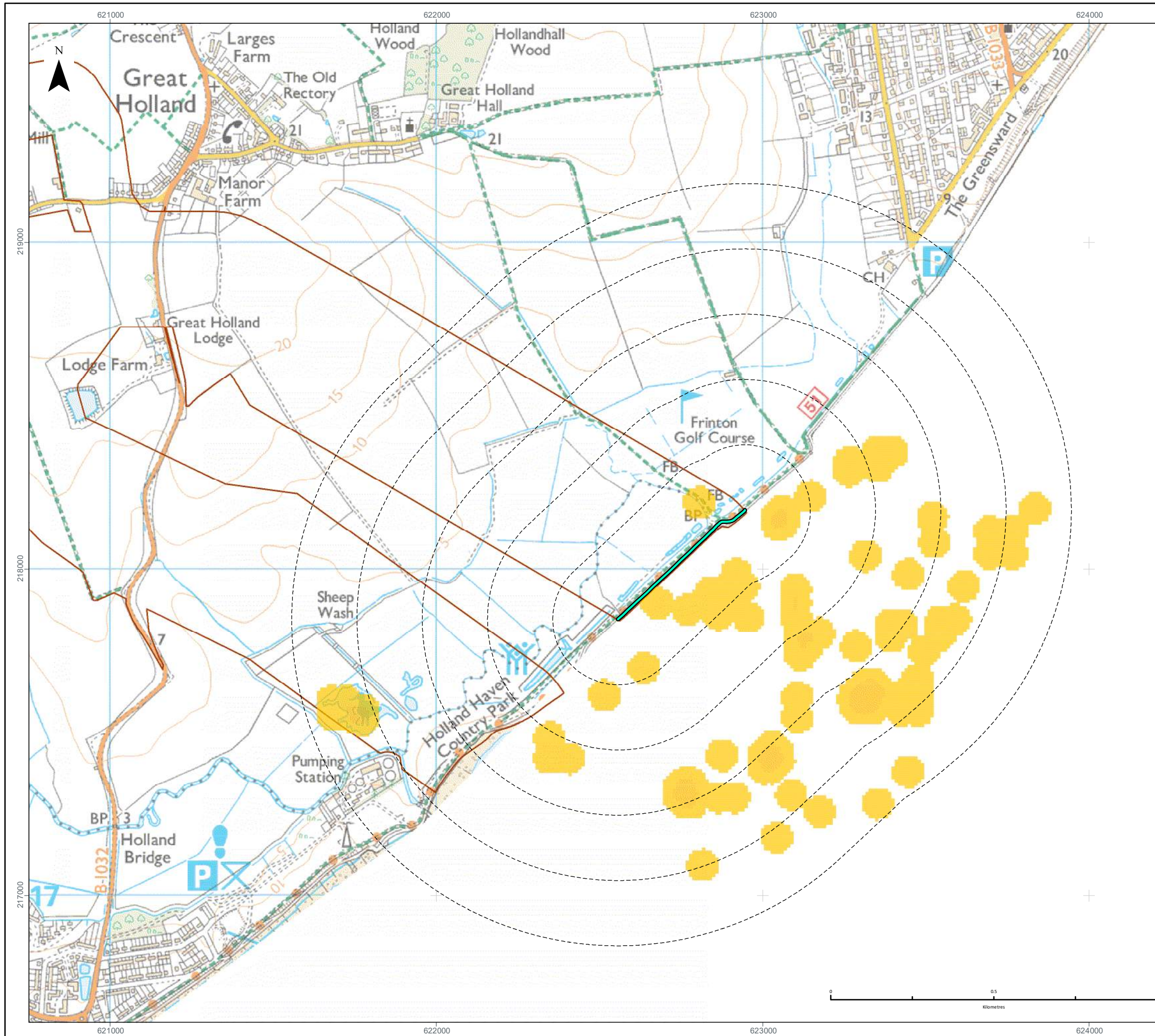
DRAWING TITLE:
 Red-Throated Diver Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.16
 Page 16 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Cormorant Distribution
 (Records/50m²; Total = 116;
 Highest Density for Species = 0.26)

Highest Density For Survey (19.70)

Lowest Density For Survey (<1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

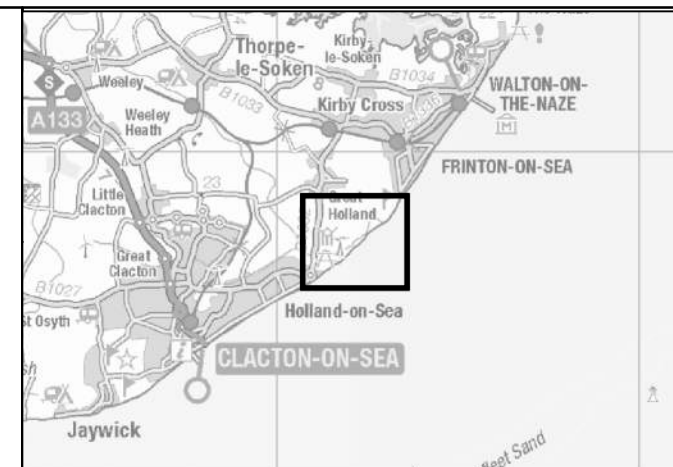
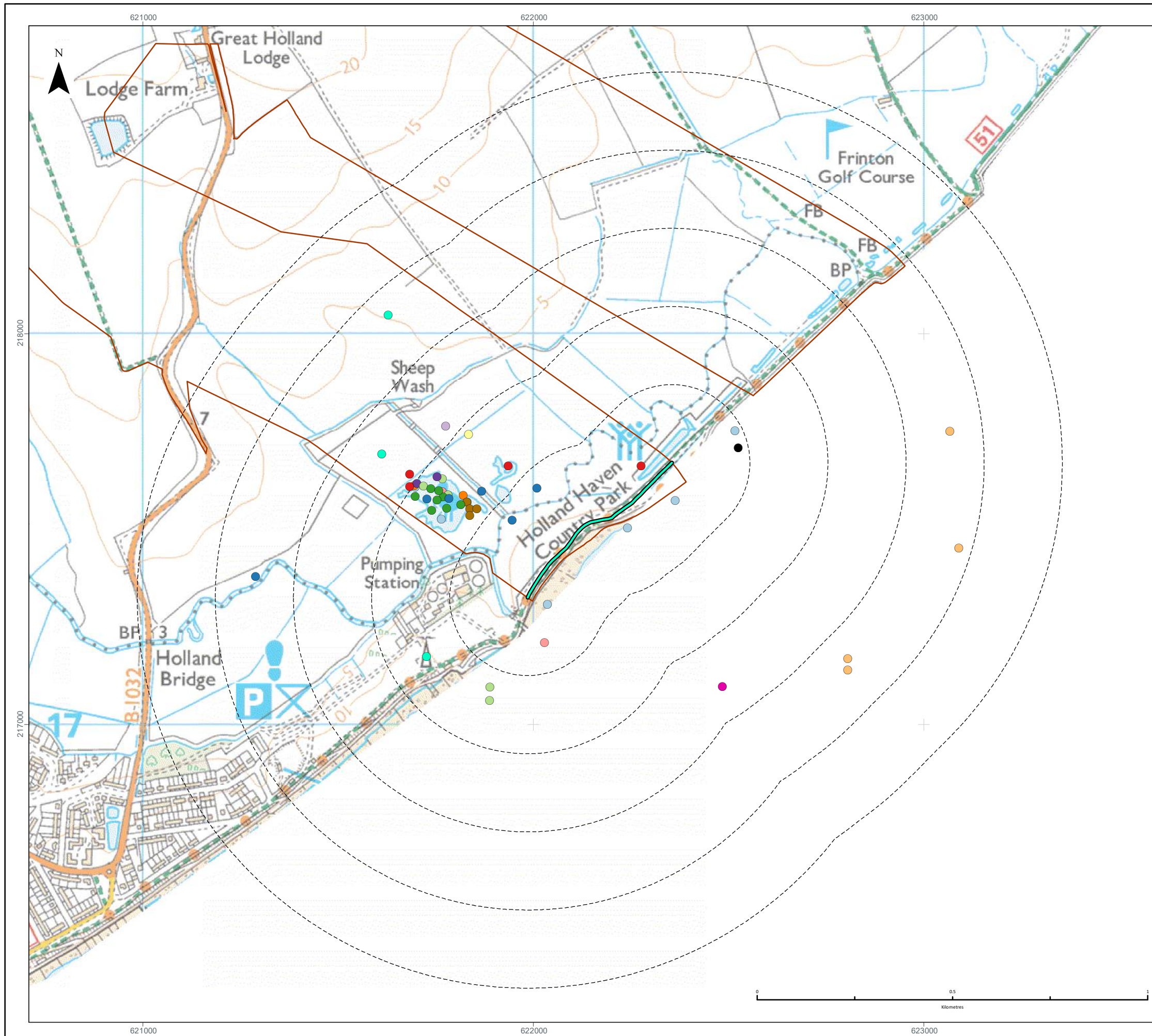
DRAWING TITLE:
 Cormorant Distribution
 Survey Location 2

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
 4.17
 Page 17 of 17

SCALE: 1:12,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





- LEGEND**
- Potential Landfall and Route Corridor
 - Survey Location
 - Survey Location 0 - 1 km Buffer (200 m Intervals)

- Species**
- Common Sandpiper (Total = 6)
 - Cetti's Warbler (Total = 6)
 - Dunlin (Total = 6)
 - Little Egret (Total = 8)
 - Great Black-Backed Gull (Total = 2)
 - Green Sandpiper (Total = 4)
 - Great Crested Grebe (Total = 4)
 - Golden Plover (Total = 2)
 - Hen Harrier (Total = 1)
 - Little Stint (Total = 1)
 - Merlin (Total = 1)
 - Peregrine (Total = 3)
 - Razorbill (Total = 1)
 - Ruff (Total = 4)
 - Sanderling (Total = 1)

Data Source:
 © Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
 FIVE ESTUARIES OFFSHORE WINDFARM:
 WINTERING BIRD SURVEY (LANDFALL LOCATIONS)

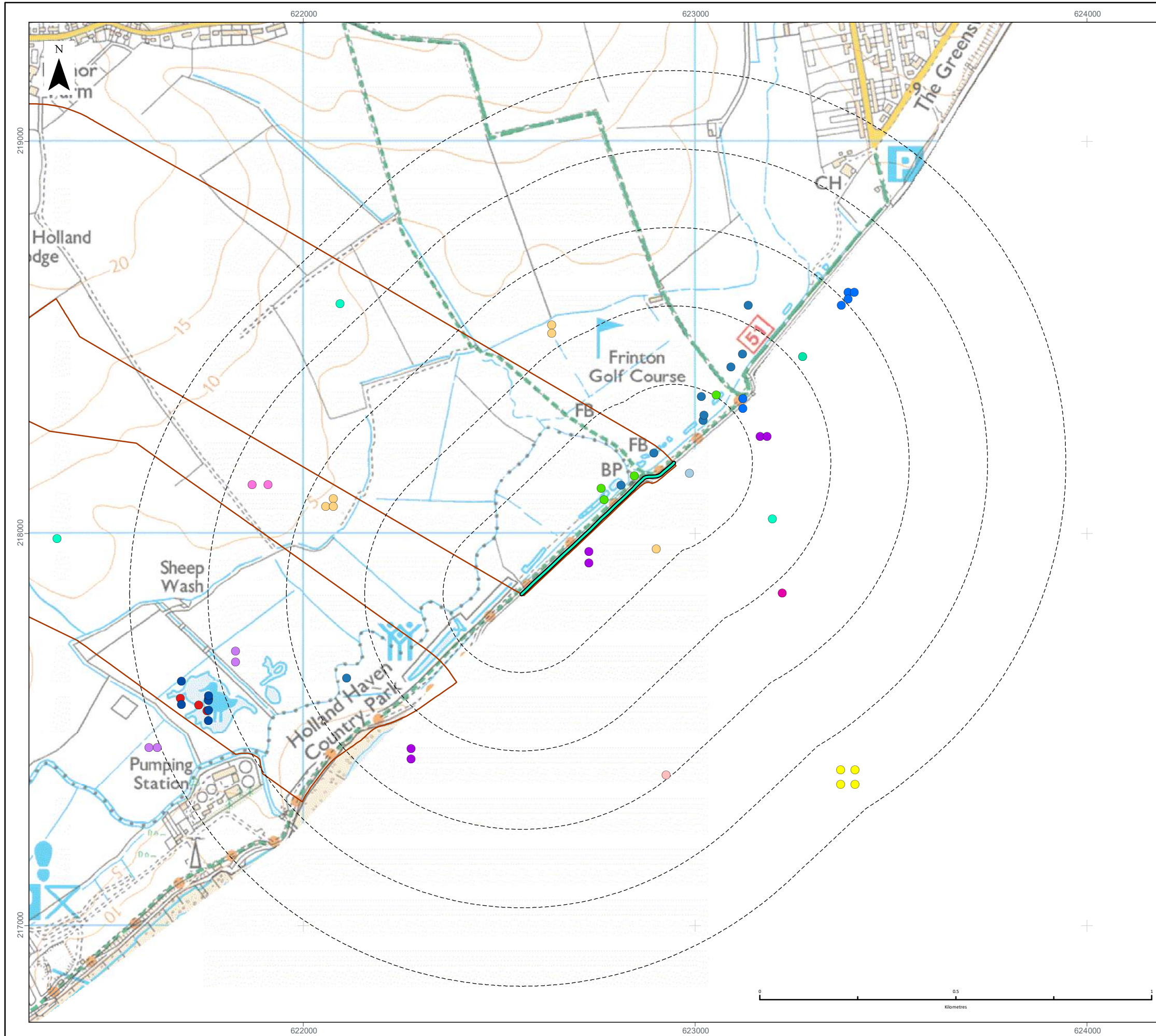
DRAWING TITLE:
 Waterbird Observations Below Ten Sightings
 and Schedule 1 Listed Species
 Survey Location 1

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
5

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid





LEGEND

- Potential Landfall and Route Corridor
- Survey Location
- Survey Location 0 - 1 km Buffer (200 m Intervals)

Species

- Black-Tailed Godwit (Total = 4)
- Common Sandpiper (Total = 1)
- Cetti's Warbler (Total = 9)
- Common Scoter (Total = 4)
- Dartford Warbler (Total = 4)
- Green Sandpiper (Total = 4)
- Guillemot (Total = 1)
- Moorhen (Total = 6)
- Mute Swan (Total = 2)
- Mediterranean Gull (Total = 6)
- Peregrine (Total = 3)
- Razorbill (Total = 1)
- Ringed Plover (Total = 1)
- Sanderling (Total = 6)
- Whimbrel (Total = 6)

Data Source:
© Crown copyright [and database rights] (2022) 0100031673 OS OpenData.

PROJECT TITLE:
*FIVE ESTUARIES OFFSHORE WINDFARM:
WINTERING BIRD SURVEY (LANDFALL LOCATIONS)*

DRAWING TITLE:
*Waterbird Observations Below Ten Sightings
and Schedule 1 Listed Species
Survey Location 2*

VER	DATE	REMARKS	Drawn	Checked
1	29/07/2022	For Issue	JO	MR
2	05/10/2022	Survey Location Symbology	JO	DW

DRAWING NUMBER:
6

SCALE: 1:10,000 PLOT SIZE: A3 DATUM: ODN COORDINATE SYSTEM: British National Grid



APPENDIX 2

Statutory Designated Site Citations

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type 1.2 Site code

1.3 Compilation date 1.4 Update

1.5 Relationship with other Natura 2000 sites

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

1.6 Respondent(s)

1.7 Site name

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199306
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	latitude
01 14 29 E	51 52 46 N

2.2 Site area (ha) 2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK54	Essex	100.00%

2.6 Biogeographic region

Alpine

Atlantic

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

Code	Species name	Population			Site assessment			
		Resident	Migratory		Population	Conservation	Isolation	Global
Breed	Winter	Stage						
A052	<i>Anas crecca</i>		3631 I		B		C	
A046a	<i>Branta bernicla bernicla</i>		6892 I		B		C	
A137	<i>Charadrius hiaticula</i>		520 I		C		C	
A156	<i>Limosa limosa islandica</i>		1121 I		A		C	
A141	<i>Pluvialis squatarola</i>		3251 I		B		C	
A132	<i>Recurvirostra avosetta</i>		317 I		A		B	
A195	<i>Sterna albifrons</i>	55 P			B		C	
A048	<i>Tadorna tadorna</i>		1629 I		B		C	
A162	<i>Tringa totanus</i>		1461 I		C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	70.0
Salt marshes. Salt pastures. Salt steppes	25.0
Coastal sand dunes. Sand beaches. Machair	1.0
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	1.0
Bogs. Marshes. Water fringed vegetation. Fens	2.0
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	1.0
Other arable land	
Broad-leaved deciduous woodland	
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Scree. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Alluvium, Clay, Mud, Neutral, Sand

Geomorphology & landscape:

Barrier beach, Coastal, Enclosed coast (including embayment), Estuary, Floodplain, Intertidal sediments (including sandflat/mudflat), Islands, Lagoon, Lowland, Open coast (including bay), Subtidal sediments (including sandbank/mudbank)

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

<i>Sterna albifrons</i> (Eastern Atlantic - breeding)	2.3% of the GB breeding population 4 year mean 1992-1995
Over winter the area regularly supports:	
<i>Recurvirostra avosetta</i> (Western Europe/Western Mediterranean - breeding)	25% of the GB population 5 year peak mean 1991/92-1995/96

ARTICLE 4.2 QUALIFICATION (79/409/EEC)	
Over winter the area regularly supports:	
<i>Anas crecca</i> (North-western Europe)	2.7% of the population in Great Britain 5 year peak mean 1991/92-1995/96
<i>Branta bernicla bernicla</i> (Western Siberia/Western Europe)	2.3% of the population 5 year peak mean 1991/92-1995/96
<i>Charadrius hiaticula</i> (Europe/Northern Africa - wintering)	1.1% of the population 5 year peak mean 1991/92-1995/96
<i>Limosa limosa islandica</i> (Iceland - breeding)	1.7% of the population 5 year peak mean 1991/92-1995/96
<i>Pluvialis squatarola</i> (Eastern Atlantic - wintering)	7.5% of the population in Great Britain 5 year peak mean 1991/92-1995/96
<i>Tadorna tadorna</i> (North-western Europe)	2.2% of the population in Great Britain 5 year peak mean 1991/92-1995/96
<i>Tringa totanus</i> (Eastern Atlantic - wintering)	0.8% of the population 5 year peak mean 1991/92-1995/96

4.3 Vulnerability

The main vulnerability is due to natural changes in sea level, leading to accelerated erosion of saltmarshes. The problem is being addressed in two ways; use of sand and gravels from dredging in Harwich harbour to reinforce existing beaches and protecting grazing marsh areas by reinforcing seawall toe with these materials in the most aggressive areas. The option of managed realignment may be considered in the future.

The nature of the site leads to potential water quality problems due to discharge from boats and from local sewage works as well as small industrial discharges. English Nature is addressing this problem with Water Quality Control officers of the Environment Agency (monitoring) and any authorised discharges will be reviewed under the provisions of the Habitat Regulations.

Although a secluded backwater the site attracts a large number of yachts and accompanying watersports. There is occasional disturbance to the site by water and jet skiers. This is controlled by a wardening scheme.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	64.8
UK04 (SSSI/ASSI)	100.0

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

FOR OFFICE USE ONLY.

DD MM YY

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Designation date

--	--	--	--	--	--

Site Reference Number

2. Date this sheet was completed/updated:

Designated: 08 June 1993

3. Country:

UK (England)

4. Name of the Ramsar site:

Hamford Water

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) **Describe briefly the type of boundary delineation applied:**

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 52 46 N 01 14 29 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Harwich

Hamford Water is a tidal inlet whose mouth is about 5 km south of Harwich, Essex.

Administrative region: Essex

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 2187.21

Min. -1

Max. 3

Mean 1

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud and sand flats, and saltmarsh supporting rare plants and internationally important species/populations of migratory waterfowl.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 6 – species/populations

occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

- Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa 1169 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)
- Common redshank , *Tringa totanus totanus*, 2099 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

- Dark-bellied brent goose, *Branta bernicla bernicla*, 3629 individuals, representing an average of 1.6% of the population (5 year peak mean 1998/9-2002/3)
- Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe 377 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in winter:

- Grey plover , *Pluvialis squatarola*, E Atlantic/W Africa -wintering 2749 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	neutral, shingle, sand, mud, clay, alluvium, sedimentary
Geomorphology and landscape	lowland, coastal, floodplain, barrier beach, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), open coast (including bay), enclosed coast (including embayment), estuary, islands, lagoon, pools
Nutrient status	eutrophic
pH	strongly alkaline
Salinity	brackish / mixosaline, fresh
Soil	mainly organic
Water permanence	usually permanent

Summary of main climatic features	<p>Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5</p>
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General description of the Physical Features:

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud- and sand-flats, and saltmarsh.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Hamford Water is a large, shallow estuarine basin comprising tidal creeks and islands, intertidal mud- and sand-flats, and saltmarsh.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces, Sediment trapping, Recharge and discharge of groundwater, Maintenance of water quality (removal of nutrients)

19. Wetland types:

Human-made wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	69.5
H	Salt marshes	25
E	Sand / shingle shores (including dune systems)	2
9	Canals and drainage channels	1
5	Salt pans, salines	0.5
Tp	Freshwater marshes / pools: permanent	0.5
O	Freshwater lakes: permanent	0.5
K	Coastal fresh lagoons	0.5
J	Coastal brackish / saline lagoons	0.5

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The main habitat types of this site are, intertidal mud and sand flats; and saltmarsh.

The main vegetation types of this site consist of pioneer saltmarsh communities; *Salicornia sp.*, *Suaeda maritima* and *Spartina maritima*. Mature saltmarsh communities; *Limonium binervosum* and *Atriplex portulacoides*, *Puccinellia sp.* and eelgrass *Zostera sp.* beds

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.**Higher Plants.**

Peucedanum officinale (nationally rare RDB Lower risk – near threatened)

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds**Species currently occurring at levels of national importance:****Species regularly supported during the breeding season:**

Mediterranean gull , <i>Larus melanocephalus</i> , Europe	3 apparently occupied nests, representing an average of 2.7% of the GB population (Seabird 2000 Census)
Black-headed gull , <i>Larus ridibundus</i> , N & C Europe	11000 apparently occupied nests, representing an average of 8.5% of the GB population (Seabird 2000 Census)
Little tern , <i>Sterna albifrons albifrons</i> , W Europe	113 apparently occupied nests, representing an average of 5.8% of the GB population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Ruff , <i>Philomachus pugnax</i> , Europe/W Africa	28 individuals, representing an average of 4% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	3 individuals, representing an average of 2.2% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , <i>Tringa nebularia</i> , Europe/W Africa	76 individuals, representing an average of 12.7% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Common shelduck , <i>Tadorna tadorna</i> , NW Europe	1738 individuals, representing an average of 2.2% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian teal , <i>Anas crecca</i> , NW Europe	2684 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , <i>Recurvirostra avosetta</i> , Europe/Northwest Africa	388 individuals, representing an average of 11.4% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , <i>Pluvialis apricaria</i> <i>apricaria</i> , P. a. altifrons Iceland & Faroes/E Atlantic	3021 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9-2002/3)
Red knot , <i>Calidris canutus islandica</i> , W & Southern Africa (wintering)	3956 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

None reported

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Fisheries production
- Non-consumptive recreation
- Scientific research
- Sport fishing
- Sport hunting
- Tourism
- Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	+
Private	+	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism		+
Recreation	+	
Current scientific research		+
Fishing: commercial	+	
Fishing: recreational/sport		+
Marine/saltwater aquaculture		+
Gathering of shellfish		+

Bait collection		+
Livestock watering hole/pond		+
Grazing (unspecified)		+
Rough or shifting grazing		+
Permanent pastoral agriculture		+
Hay meadows		+
Hunting: recreational/sport	+	
Industry		+
Sewage treatment/disposal		+
Harbour/port		+
Flood control	+	
Military activities		+

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2		+		+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
 Erosion - There is a programme of recharge of dredged material from off-site that has alleviated some of the habitat loss on site. The Essex Coast and Estuaries Coastal Habitat Management Plan (CHaMP) (Anon. 2002) covers the site and it is expected to inform the shoreline management plan as well as local plan policies.
 The possibility of managed realignment schemes to address erosion impacts may be considered.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	

National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

There are also other bird counts and research on oysters.

Environment.

Hydrological monitoring.

Sedimentation monitoring.

Saltmarsh erosion.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Boat trips are available around the site.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

Yachting, walking, wildfowling and sport fishing occur on the site.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,

European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

- Anon. (2002) *Essex Coast and Estuaries Coastal Habitat Management Plan: Executive summary*. English Nature, Peterborough (Living with the Sea LIFE Project). www.english-nature.org.uk/livingwiththesea/champs/pdf/ESSEX.FINALEXEC.SUMMARY.pdf
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- Buck, AL (ed.) (1993) *An inventory of UK estuaries. Volume 5. Eastern England*. Joint Nature Conservation Committee, Peterborough
- Burd, F (1989) *The saltmarsh survey of Great Britain. An inventory of British saltmarshes*. Nature Conservancy Council, Peterborough (Research & Survey in Nature Conservation, No. 17)
- Covey, R (1998) Chapter 6. Eastern England (Bridlington to Folkestone) (MNCR Sector 6). In: *Benthic marine ecosystems of Great Britain and the north-east Atlantic*, ed. by K. Hiscock, 179-198. Joint Nature Conservation Committee, Peterborough. (Coasts and Seas of the United Kingdom. MNCR series)
- Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge
- Davidson, NC, Laffoley, D d'A, Doody, JP, Way, LS, Gordon, J, Key, R, Pienkowski, MW, Mitchell, R & Duff, KL (1991) *Nature conservation and estuaries in Great Britain*. Nature Conservancy Council, Peterborough
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- Hill, TO, Emblow, CS & Northen, KO (1996) *Marine Nature Conservation Review Sector 6. Inlets in eastern England: area summaries*. Joint Nature Conservation Committee, Peterborough (Coasts and seas of the United Kingdom. MNCR series)
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- Musgrove, AJ, Pollitt, MS, Hall, C, Hearn, RD, Holloway, SJ, Marshall, PE, Robinson, JA & Cranswick, PA (2001) *The Wetland Bird Survey 1999–2000: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge. www.wwt.org.uk/publications/default.asp?PubID=14
- Pritchard, DE, Housden, SD, Mudge, GP, Galbraith, CA & Pienkowski, MW (eds.) (1992) *Important Bird Areas in the United Kingdom including the Channel Islands and the Isle of Man*. Royal Society for the Protection of Birds, Sandy
- Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain*. Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)
- Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds.) (2001) *The UK SPA network: its scope and content*. Joint Nature Conservation Committee, Peterborough (3 vols.) www.jncc.gov.uk/UKSPA/default.htm

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EC Directive 79/409 on the Conservation of Wild Birds Special Protection Area (SPA)

Name: Stour and Orwell Estuaries

Unitary Authority/County: Essex, Suffolk.

Site description: The Stour and Orwell estuaries straddle the eastern part of the Essex/Suffolk border in eastern England. The SPA is coincident with Cattawade Marshes Site of Special Scientific Interest (SSSI), Orwell Estuary SSSI and Stour Estuary SSSI. The estuaries include extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The mud-flats hold *Enteromorpha*, *Zostera* and *Salicornia* spp. The site also includes areas of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell and at Cattawade Marshes at the head of the Stour. Trimley Marshes on the north side of the Orwell includes several shallow freshwater pools, as well as areas of grazing marsh, and is managed as a nature reserve by the Suffolk Wildlife Trust. In summer, the site supports important numbers of breeding avocet *Recurvirostra avosetta*, while in winter it holds major concentrations of waterbirds, especially geese, ducks and waders. The geese also feed, and some waders roost, in surrounding areas of agricultural land outside the SPA. The site has close ecological links with the Hamford Water and Mid-Essex Coast SPAs, lying to the south on the same coast.

Size of SPA: The SPA covers an area of 3,676.92 ha.

Qualifying species:

The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex 1 species	Count and season	Period	% of GB population
Avocet <i>Recurvirostra avosetta</i>	21 pairs - breeding	5 year peak mean 1996 – 2000	3.6%

The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Migratory species	Count and season	Period	% of subspecies/population
Redshank <i>Tringa totanus</i>	2,588 individuals – autumn passage	5 year peak mean 1995/96 – 1999/2000	2.0% <i>britannica</i>
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	2,627 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.2% <i>bernicla</i> , Western Siberia (breeding)
Pintail <i>Anas acuta</i>	741 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.2% Northwestern Europe (non-breeding)
Grey plover <i>Pluvialis squatarola</i>	3,261 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.3% Eastern Atlantic (non- breeding)
Knot <i>Calidris canutus</i> <i>islandica</i>	5,970 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.3% <i>islandica</i>
Dunlin <i>Calidris alpina alpina</i>	19,114 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	1.4% <i>alpina</i> , Western Europe (non-breeding)
Black-tailed godwit <i>Limosa limosa islandica</i>	2,559 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	7.3% <i>islandica</i>
Redshank <i>Tringa totanus</i>	3,687 individuals - wintering	5 year peak mean 1995/96 – 1999/2000	2.8% <i>britannica</i>

Bird counts from: Wetland Bird Survey (WeBS) database.

Assemblage qualification:

The site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds (waterbirds as defined by the Ramsar Convention) in any season:

In the non-breeding season, the area regularly supports 63,017 individual waterbirds (5 year peak mean 1993/94 - 1997/98), including great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, dark-bellied brent goose *Branta bernicla bernicla*, shelduck *Tadorna tadorna*, wigeon *Anas penelope*, gadwall *Anas strepera*, pintail *Anas acuta*, goldeneye *Bucephala clangula*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, lapwing *Vanellus vanellus*, knot *Calidris canutus islandica*, dunlin *Calidris alpina alpina*, black-tailed godwit *Limosa limosa islandica*, curlew *Numenius arquata*, redshank *Tringa totanus* and turnstone *Arenaria interpres*.

Non-qualifying species of interest: The SPA/Ramsar site as a whole, including the proposed extensions, is used by non-breeding marsh harrier *Circus aeruginosus*, hen harrier *Circus cyaneus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, short-eared owl *Asio flammeus* and kingfisher *Alcedo atthis* (all species listed in Annex I of the EC Birds Directive) in numbers of less than European importance (less than 1% GB population). It also supports breeding common tern *Sterna hirundo*, little tern *Sterna albifrons* and kingfisher (all listed in Annex I) in numbers of less than European importance.

Status of SPA:

- 1) Stour and Orwell Estuaries was classified as a Special Protection Area on 13 July 1994.
- 2) Extensions to the Stour and Orwell Estuaries SPA were classified on 19 May 2005.

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

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DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 13 July 1994

3. Country:

UK (England)

4. Name of the Ramsar site:

Stour and Orwell Estuaries

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

051 57 16 N 001 09 38 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Felixstowe

The Stour Estuary forms the south-eastern part of Essex/Suffolk boundary.

The Orwell Estuary is a relatively long and narrow estuary with extensive mudflats and some saltmarsh, running from Ipswich in the north, southwards towards Felixstowe.

Administrative region: Essex; Suffolk

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 3676.92

Min.	-1
Max.	3
Mean	0

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Stour and Orwell Estuaries is a wetland of international importance, comprising extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. It provides habitats for an important assemblage of wetland birds in the non-breeding season and supports internationally important numbers of wintering and passage wildfowl and waders. The site also holds several nationally scarce plants and British Red Data Book invertebrates.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 2

Contains seven nationally scarce plants: stiff saltmarsh-grass *Puccinellia rupestris*; small cord-grass *Spartina maritima*; perennial glasswort *Sarcocornia perennis*; lax-flowered sea lavender *Limonium humile*; and the eelgrasses *Zostera angustifolia*, *Z. marina* and *Z. noltei*.

Contains five British Red Data Book invertebrates: the muscid fly *Phaonia fusca*; the horsefly *Haematopota grandis*; two spiders, *Arctosa fulvolineata* and *Baryphema duffeyi*; and the Endangered swollen spire snail *Mercuria confusa*.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

63017 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

Common redshank , *Tringa totanus totanus*, 2588 individuals, representing an average of 2% of the population (5-year peak mean 1995/96-1999/2000)

Species with peak counts in winter:

Dark-bellied brent goose, *Branta bernicla bernicla*, 2627 individuals, representing an average of 1.2% of the population (5-year peak mean 1995/96-1999/2000)

Northern pintail , *Anas acuta*, NW Europe 741 individuals, representing an average of 1.2% of the population (5-year peak mean 1995/96-1999/2000)

Grey plover , *Pluvialis squatarola*, E Atlantic/W Africa -wintering 3261 individuals, representing an average of 1.3% of the population (5-year peak mean 1995/96-1999/2000)

Red knot , *Calidris canutus islandica*, W & Southern Africa (wintering) 5970 individuals, representing an average of 1.3% of the population (5-year peak mean 1995/96-1999/2000)

Dunlin , *Calidris alpina alpina*, W Siberia/W Europe 19114 individuals, representing an average of 1.4% of the population (5-year peak mean 1995/96-1999/2000)

Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe 2559 individuals, representing an average of 7.3% of the population (5-year peak mean 1995/96-1999/2000)

Common redshank , *Tringa totanus totanus*, 3687 individuals, representing an average of 2.8% of the population (5-year peak mean 1995/96-1999/2000)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

Details of bird species occurring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	shingle, sand, mud
Geomorphology and landscape	lowland, coastal, valley, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), estuary
Nutrient status	
pH	
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

The Stour and Orwell estuaries include extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes an area of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The Stour and Orwell estuaries include extensive mudflats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The site also includes an area of low-lying grazing marsh at Shotley Marshes on the south side of the Orwell.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Sediment trapping

19. Wetland types:

Inland wetland, Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	44.2

H	Salt marshes	35
F	Estuarine waters	19.8
4	Seasonally flooded agricultural land	0.7
E	Sand / shingle shores (including dune systems)	0.3

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Orwell is a relatively long and narrow estuary with extensive mudflats bordering the channel that support large patches of eelgrass *Zostera* sp. The saltmarsh tends to be sandy and fairly calcareous with a wide range of communities. There are small areas of vegetated shingle on the foreshore of the lower reaches. Grazing marshes adjoin the estuary at Shotley. The Stour estuary is a relatively simply structured estuary with a sandy outer area and a muddier inner section. The mud is rich in invertebrates and there are areas of higher saltmarsh. The shoreline vegetation varies from oak-dominated wooded cliffs, through scrub-covered banks to coarse grasses over seawalls, with reed-filled borrow dykes behind.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Puccinellia rupestris (nationally scarce); *Spartina maritima* (nationally scarce); *Sarcocornia perennis* (nationally scarce); *Limonium humile* (nationally scarce); *Zostera angustifolia* (nationally scarce); *Zostera marina* (nationally scarce); *Zostera noltei* (nationally scarce).

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Pied avocet , *Recurvirostra avosetta*, W Europe 21 pairs, representing an average of 2.8% of the GB population (5-year peak mean 1996-2000)

Species with peak counts in spring/autumn:

Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa 638 individuals, representing an average of 2.1% of the GB population (5-year peak mean 1995/96-1999/2000)

Species with peak counts in winter:

Great crested grebe , *Podiceps cristatus cristatus*, NW Europe 245 individuals, representing an average of 1.5% of the GB population (5-year peak mean 1995/96-1999/2000)

Great cormorant , *Phalacrocorax carbo carbo*, NW Europe 232 individuals, representing an average of 1% of the GB population (5-year peak mean 1995/96-1999/2000)

Common shelduck , <i>Tadorna tadorna</i> , NW Europe	2955 individuals, representing an average of 3.8% of the GB population (5-year peak mean 1995/96-1999/2000)
Eurasian curlew , <i>Numenius arquata arquata</i> , N. a. <i>arquata</i> Europe (breeding)	1824 individuals, representing an average of 1.2% of the GB population (5-year peak mean 1995/96-1999/2000)
Ruddy turnstone , <i>Arenaria interpres interpres</i> , NE Canada, Greenland/W Europe & NW Africa	690 individuals, representing an average of 1.4% of the GB population (5-year peak mean 1995/96-1999/2000)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Phaonia fusca; *Haematopota grandis* (Meigen) (RDB3); *Arctosa fulvolineata* (RDB3); *Baryphyma duffeyi* (RDB3); *Mercuria (=Pseudamnicola) confusa* (RDB1).

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Archaeological/historical site
- Livestock grazing
- Non-consumptive recreation
- Sport hunting
- Tourism
- Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	
Local authority, municipality etc.	+	

National/Crown Estate	+	
Private	+	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	+
Recreation	+	+
Cutting of vegetation (small-scale/subsistence)	+	
Bait collection	+	
Permanent arable agriculture		+
Grazing (unspecified)	+	
Hunting: recreational/sport	+	
Sewage treatment/disposal	+	
Harbour/port	+	
Flood control	+	
Transport route	+	+
Urban development		+
Non-urbanised settlements	+	+

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2	Natural coastal processes exacerbated by fixed sea defences, port development and maintenance dredging.	+		+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
 Erosion - Erosion is being tackled through sediment replacement for additional erosion that can be attributed to port development and maintenance dredging. A realignment site has been created on-site to make up for the loss of habitat due to capital dredging. General background erosion has not been tackled although a Flood Management Strategy for the site is being produced.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Area of Outstanding National Beauty (AONB)	+	+

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

High tide bird counts.

Environment, Flora and Fauna.

Vegetation, bird and invertebrate surveys/monitoring carried out on NGO reserves.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None reported

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

A popular area for tourists as it is within an AONB. There are more visitors in the summer. However it is well used throughout the year by walkers, bird watches and for sailing.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House,
Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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EC Directive 79/409 on the conservation of wild birds: Special Protection Area

Mid-Essex Coast

Colne Estuary

The Mid-Essex Coast comprises an extensive complex of estuaries and intertidal sand and silt flats, including several islands, shingle and shell beaches and extensive areas of saltmarsh. The proposed Special Protection Area follows the boundaries of five SSSIs: the Colne Estuary, the Blackwater Estuary, Dengie, River Crouch Marshes and Foulness.

The Colne Estuary qualifies under Article 4.1 of the Birds Directive by supporting nationally important breeding populations of an Annex 1 species: the average peak count of little tern *Sterna albifrons* over the period 1987-1991 was 73 pairs (3% of British breeding population). The Colne Estuary is one of several sites within the proposed SPA where these birds breed.

The Colne Estuary also qualifies under Article 4.1 by regularly supporting a nationally important wintering population of an Annex 1 species, the hen harrier *Circus cyaneus*. During the period 1987/88 to 1991/92 a mean of 19 birds (2% of the British total) occurred in the Mid-Essex Coast area. The Colne Estuary is one of a number of sites used in the area.

The Colne Estuary qualifies under Article 4.2 by supporting, in summer, nationally important populations of two regularly occurring migratory species. Between 1987 and 1991 an average peak mean of 15 pairs (7% of British breeding population) of pochard *Aythya ferina* and 135 pairs (1% of British) of ringed plover *Charadrius hiaticula* bred in the proposed SPA.

The Colne Estuary also qualifies under Article 4.2 as a wetland of international importance by regularly supporting, in winter, over 20,000 waterfowl. In the five year period 1987/88 to 1991/92 the average peak count was 30,687 birds, comprising 8,675 wildfowl and 22,012 waders. It regularly supports, in winter, internationally important numbers of the following two species of migratory waterfowl (average peak counts for the period 1987/88 to 1991/92): 5,315 dark-bellied brent geese *Branta bernicla bernicla* (3.1 % of the total world population, 5.9% of the British wintering population) and 1,252 redshank *Tringa totanus* (1.1% of the East Atlantic Flyway (EAF) population, 1.6% of British).

The Colne Estuary also supports nationally important wintering populations of a further 10 species: 243 cormorant *Phalacrocorax carbo* (1.2% of British), 354 mute swan *Cygnus olor* (1.9% of British), 1,237 shelduck *Tadorna tadorna* 1.6% of British), 262 Goldeneye *Bucephala clangula* (1.7% of British), 355 ringed plover *Charadrius hiaticula* (1.5% of British), 1,168 grey plover *Pluvialis squatarola* (5.5% of British), 219 sanderling *Calidris alba* (1.5% of British), 11,272 dunlin *Calidris alpina* (2.6% of British), 606 black-tailed godwit *Limosa limosa* (12.7% of British) and 938 curlew *Numenius arquata* (1% of British).

During severe winter weather the Mid-Essex Coast (including the Colne Estuary) can assume even greater national and international importance as wildfowl and waders from many other areas arrive, attracted by the relatively mild climate and the abundant food resources available in this Special Protection Area.

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the compiler of this form:

Joint Nature Conservation Committee

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DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 28 July 1994

3. Country:

UK (England)

4. Name of the Ramsar site:

Colne Estuary (Mid-Essex Coast Phase 2)

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 48 57 N 00 57 36 E

9. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Colchester

The Colne Estuary lies about 3 km south-east of Colchester on the north Essex coast.

Administrative region: Essex

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 2701.43

Min.	-1
Max.	4
Mean	1

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Colne Estuary is a comparatively short and branching estuary, with five tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants.

13. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 3, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site is important due to the extent and diversity of saltmarsh present. This site, and the four other sites in the Mid-Essex Coast complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.

Ramsar criterion 2

The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species.

Ramsar criterion 3

This site supports a full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

32041 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Dark-bellied brent goose, <i>Branta bernicla bernicla</i> ,	3165 individuals, representing an average of 1.4% of the population (5 year peak mean 1998/9-2002/3)
Common redshank , <i>Tringa totanus totanus</i> ,	1624 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in winter:

Black-tailed godwit , <i>Limosa limosa islandica</i> , Iceland/W Europe	402 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)
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Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

See Sections 21/22 for details of noteworthy species

Details of bird species occurring at levels of National importance are given in Section 22

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	neutral, shingle, sand, mud, clay, alluvium, sedimentary, pebble
Geomorphology and landscape	lowland, island, coastal, valley, shingle bar, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), open coast (including bay), estuary, islands, lagoon, cliffs
Nutrient status	eutrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

The Colne Estuary is a comparatively short and branching estuary, with five tidal arms that flow into the main channel of the River Colne. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern English estuaries.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The catchment area of the River Colne is approximately 250 km² to the tidal limit. Being a long and narrow catchment it has few tributaries, with most contributions being from field drains or minor watercourses. The Colne Estuary is a comparatively short and branching estuary, with five tidal arms that flow into the main channel of the River Colne. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern English estuaries.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Shoreline stabilisation and dissipation of erosive forces

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	30
H	Salt marshes	25
Tp	Freshwater marshes / pools: permanent	20
F	Estuarine waters	19

E	Sand / shingle shores (including dune systems)	3
J	Coastal brackish / saline lagoons	2
B	Marine beds (e.g. sea grass beds)	1

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The Colne Estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. The fauna is dominated by *Hydrobia ulvae* with *Macoma balthica*, *Scrobicularia plana*, *Hediste diversicolor*, and *Nephtys hombergii*. Towards the mouth of the estuary the substratum becomes more sandy; *Zostera noltei* and *Zostera marina* have been recorded at Sandy Point.

Saltmarsh has colonised a large proportion of the estuary at Geedon Saltings, Colne Point and the Strood. The majority of this is high-level marsh dominated by saltmarsh grass *Puccinellia maritima*, sea purslane *Atriplex portulacoides* and annual seablite *Suaeda maritima* while the creek edges and disused oyster pits have been colonised by glasswort *Salicornia* spp, sea aster *Aster tripolium*, and cord grass *Spartina* spp. There are extensive saltpans on Geedon Saltings and Colne Point where there is a shorter sward of saltmarsh grass, thrift *Armeria maritima* and common sea-lavender *Limonium vulgare*. Nationally uncommon species such as golden samphire *Inula crithmoides* and shrubby sea blite *Suaeda vera* occur frequently in the upper marsh and at the foot of the sea-walls. Shrubby sea blite is particularly extensive at Colne Point where there is a transition from saltmarsh to sand dune and shingle. This transition habitat is also important for the nationally uncommon rock sea-lavender *Limonium binervosum* and is one of the few East Anglian sites for sea heath *Frankenia laevis*.

Ecosystem services

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

Bupleurum tenuissimum (nationally scarce), *Carex divisa* (nationally scarce), *Frankenia laevis* (nationally scarce), *Hordeum marinum* (nationally scarce), *Inula crithmoides* (nationally scarce), *Limonium binervosum* (RDB Lower risk – near threatened), *Sarcocornia perennis* (nationally scarce), *Salicornia pusilla* (nationally scarce), *Spartina maritima* (nationally scarce), *Suaeda vera* (nationally scarce), *Zostera marina* (nationally scarce), *Zostera noltei* (nationally scarce).

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Birds

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Mediterranean gull , <i>Larus melanocephalus</i> , Europe	2 apparently occupied nests, representing an average of 1.8% of the GB population (Seabird 2000 Census)
Black-headed gull , <i>Larus ridibundus</i> , N & C Europe	2300 apparently occupied nests, representing an average of 1.7% of the GB population (Seabird 2000 Census)
Little tern , <i>Sterna albifrons albifrons</i> , W Europe	20 apparently occupied nests, representing an average of 1% of the GB population (Seabird 2000 Census)
Species with peak counts in spring/autumn:	
Ringed plover , <i>Charadrius hiaticula</i> , Europe/Northwest Africa	361 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	3 individuals, representing an average of 2.2% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Little egret , <i>Egretta garzetta</i> , West Mediterranean	20 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9-2002/3)
Common shelduck , <i>Tadorna tadorna</i> , NW Europe	840 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Hen harrier, <i>Circus cyaneus</i> , Europe	<19 individuals, representing an average of 2.5% of the GB population (5 year mean 1987-1991)
Water rail , <i>Rallus aquaticus</i> , Europe	5 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , <i>Recurvirostra avosetta</i> , Europe/Northwest Africa	376 individuals, representing an average of 11% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , <i>Pluvialis apricaria</i> <i>apricaria</i> , P. a. altifrons Iceland & Faroes/E Atlantic	3665 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Grey plover , <i>Pluvialis squatarola</i> , E Atlantic/W Africa -wintering	1124 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9-2002/3)
Dunlin , <i>Calidris alpina alpina</i> , W Siberia/W Europe	7939 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Dyschirius extensus (RDB3), *Coleophora fuscicornis* (potential RDB1), *Ethmia terminella* (potential RDB2), *Lestes dryas* (RDB2), *Polistichus connexus* (RDB3), *Aethes margarotana* (RDB2), *Cnaemidophorus rhododactyla* (potential RDB2), *Coleophora wockeella* (potential RDB2), *Neofriseria singula* (potential RDB2), *Aedes flavescens* (RDB2), *Erioptera bivittata* (RDB2), *Stratiomys longicornis* (RDB2), *Hybomitra expollicata* (RDB3), *Heliophanus auratus* (RDB2), *Trichoncus hackmani* (RDB2), *Trichoptera cito* (RDB2), *Baris scolopacea* (RDB3), *Graptodytes bilineatus* (RDB3), *Philonthus punctus* (RDB3), *Eupithecia extensaria* (RDB3), *Idaea ochrata* (RDB3), *Malacosoma castrensis* (RDB3), *Ancylis upupana* (potential RDB3), *Eucosma catoptyrana* (pRDB3), *Eucosma maritima*, *Nyctegretis lineana* (potential RDB3), *Platyptilia calodactyla* (potential RDB3), *Platytes alpinella* (potential RDB3), *Stigmella samiatella* (potential RDB3), *Yponomeuta rorrella* (potential RDB3), *Campsicnemus magius* (RDB3), *Haematopota bigoti* (RDB3), *Hybomitra ciureai* (RDB3), *Limonia danica* (RDB2), *Myrmica specioles* (RDB3), *Arctosa fulvolineata* (RDB3), *Euophrys browningo* (rare and endemic to Great Britain. A UKBAP species) and *Haplodrassus minor* (RDB3).

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Aquatic vegetation (e.g. reeds, willows, seaweed)
- Archaeological/historical site
- Environmental education/ interpretation
- Fisheries production
- Livestock grazing
- Non-consumptive recreation
- Scientific research
- Sport fishing
- Sport hunting
- Tourism
- Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

Ownership category	On-site	Off-site
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Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	+
National/Crown Estate	+	+
Private	+	+
Other	+	+

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Collection of non-timber natural products: commercial	+	
Collection of non-timber natural products: subsistence	+	
Cutting of vegetation (small-scale/subsistence)	+	
Fishing: commercial	+	+
Fishing: recreational/sport	+	
Freshwater aquaculture	+	
Bait collection	+	
Permanent arable agriculture		+
Livestock watering hole/pond	+	
Permanent pastoral agriculture	+	
Hunting: recreational/sport	+	
Industry	+	
Sewage treatment/disposal		+
Harbour/port	+	
Flood control	+	
Irrigation (incl. agricultural water supply)		+
Urban development	+	
Military activities	+	+

26. Factors (past, present or potential) adversely affecting the site’s ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2		+		+
Pollution – agricultural fertilisers	2	Run off from adjacent agricultural land		+	
Pollution – pesticides/agricultural runoff	2	Run off from adjacent agricultural land		+	

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
 Erosion - The Essex Coast and Estuaries Coastal Habitat Management Plan (CHaMP) (Anon. 2002) covers the site and it is expected to inform the shoreline management plan as well as local plan policies.

It is proposed at strategic level to consider opportunities for managed realignment.

Pollution – agricultural fertilisers - The Water Framework Directive and new Agri-Environment Schemes are expected to address this factor.

Pollution – pesticides/agricultural runoff - The Water Framework Directive and new Agri-Environment Schemes are expected to address this factor.

Is the site subject to adverse ecological change? YES

27. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	+
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	

Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Environmentally Sensitive Area (ESA)	+	+
Special Area of Conservation (SAC)	+	
Management plan in preparation	+	

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

29. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Environment.

Foreshore monitoring by EA.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Essex Wildlife Trust have an education officer based near the site. The Colne Estuary Project has been established.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

Holiday camps: March to October (some all year).

Dog walking: all year - no facilities.

Bird watching - all year - there are nature reserves and hides.

Sailing: predominantly summer - there are marinas and moorings for boats.

Jet-skiing: summer only - there is a licensed area and access to open water provided at West Mersea.

Water-skiing: predominantly summer - there is a licensed area.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,

European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • email: ramsar@ramsar.org

County: Essex

Site name: Holland Haven Marshes

District: Tendring

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: Tendring District Council

National grid reference: TM 211 170

Area: 208.83 ha 516.02ac

Ordnance survey sheet: 1:50,000: 169

1:10,000: TM11 NE, TM 21 NW

Date notified (Under 1949 Act):

Date of last revision:

Date notified (under 1981 Act): 1 October 1992 Date of last revision:

Other information: This is a new site. Part of the site is a Country Park, owned and managed by Tendring District Council.

Description and reasons for notification:

Holland Haven Marshes in an area of reclaimed estuarine saltmarsh and freshwater marsh situated between Holland-on-Sea and Frinton-on-Sea. The site is bisected by Holland Brook and its tributaries, from which an extensive ditch system radiates. The ditch network represents an outstanding example of a freshwater to brackish water transition intimated by the aquatic plant communities, which include a number of nationally and locally scarce species. The adjoining grasslands are of botanical importance in their own right as well as acting as a buffer zone to the ditch system. Further interest is provided by the aquatic and terrestrial invertebrates and the birds which frequent the area, especially in winter.

The salt-water influence is much in evidence downstream of Holland Bridge within the dykes of the coastal grazing marsh. The dominant emergent plants are Sea Club-rush *Scirpus maritimus* and Common Reed *Phragmites australis* while Parsley Water-dropwort *Oenanthe lachenalii* and Grey Club-rush *Schoenoplectus lacustris* ssp. *tabernaemontani*, both scarce in Essex, are locally frequent. Two nationally scarce plants are found in these mesohaline (moderately brackish) ditches: Brackish Water-crowfoot *Ranunculus baudotii* and Divided Sedge *Carex divisa*.

To the west of Holland Bridge the saline influence is less marked and the system is essentially freshwater or oligohaline (slightly brackish). Reed Canary-grass *Phalaris arundinacea*, Branched Bur-reed *Sparganium erectum* and Greater Reedmace *Typha latifolia* are the dominant emergent species, with Common Spike-rush *Eleocharis palustris*, Celery-leaved Buttercup *Ranunculus sceleratus*, Marsh Bedstraw *Galium palustre* and Water Pepper *Polygonum hydropiper* in the shallow water margins. Tubular Water-dropwort *Oenanthe fistulosa* and Slender Spike-rush *Eleocharis uniglumis*, both rare in Essex, are also present. Rigid Hornwort *Ceratophyllum demersum* is widespread in these ditches, while the presence of the nationally uncommon Soft Hornwort *Ceratophyllum submersum*, at one location, is indicative of a brackish influence. Other fully aquatic plants include the invasive alien Water Fern *Azolla filiculoides*, Various-leaved Water Starwort *Callitriche platycarpa*, and Fat

Duckweed *Lemna gibba* and Greater Duckweed *Lemna polyrhiza*, both of which are scarce in Essex.

The grassland through which the ditch system runs comprises coastal and freshwater grazing marsh and an area of amenity grassland on Frinton golf course. It is generally dominated by grasses such as Creeping Bent *Agrostis stolonifera*, Crested Dog's-tail *Cynosurus cristatus*, Red Fescue *Festuca rubra*, Perennial Rye-grass *Lolium perenne* and Meadow Barley *Hordeum secalinum*, with Marsh Foxtail *Alopecurus geniculatus* in seasonally flooded depressions on the grazing land. Typically maritime species are distributed throughout the coastal marshland including Sea Couch *Elymus pycnanthus*, Strawberry Clover *Trifolium fragiferum* and Spiny Rest-harrow *Ononis spinosa*. Immediately behind the sea wall, where the land is subject to salt spray, a saltmarsh vegetation has developed with Sea milkwort *Glaux maritima*, Sea Hard-grass *Parapholis strigosa*, Greater Sea-spurrey *Spergularia media*, Saltmarsh Rush *Juncus gerardii*, and two nationally uncommon species, Sea Barley *Hordeum marinum* and Borrer's Saltmarsh Grass *Puccinellia fasciculata*. Growing in tracks where seepage of sea water occurs and Reflexed Saltmarsh Grass *Puccinellia distans* and the nationally scarce Curved Hard-grass *Parapholis incurva*.

Through under-recorded, there are indications that the aquatic invertebrate fauna reflect the diversity of water conditions. A specialist brackish water species, a Red Data Book soldier fly *Stratiomys singularior*, has been recorded, and molluscs are abundant. The nationally notable Ruddy Darter dragonfly *Sympetrum sanguineum* and *Stenopelmus rufinasus*, a beetle associated with Water Fern, have also been found. Terrestrial invertebrates include a dense population of Roesel's Bush-cricket *Metrioptera roeselii*, which is also nationally notable, and a bumble bee *Bombus muscorum* which is rare in Essex. The Brown Argus butterfly *Aricia agestis* has been recorded in recent years from adjacent areas, and it is possible that this county rarity persists in small numbers on the site.

Additional interest is provided by the birds which use the area. Hen Harrier and Short-eared Owl hunt over the marshes in winter, whilst the flooded low ways attract waders and wildfowl. These may include Wigeon (typically 1000, max 6500), Teal (several hundred), Pintail (max 35), Shoveler (max 20), Pochard (max 10), Ruff (max 90) and Snipe. A count of 900 Snipe in March 1988 represents a record number of this species in Essex. Several hundred Brent Geese graze the marshes in winter, and there are regular wintering flocks of Twite (max 160) and Lapland Bunting (max 70). The concrete wall immediately adjacent to the sea wall is the major area in Essex for wintering Purple Sandpipers, with 10 to 15 birds in most years. In summer, the marsh supports a typical range of breeding birds, including Skylark, Meadow Pipit and Yellow Wagtail, with Reed Warblers in the dykes and Ringed Plover behind the sea wall. During the spring and autumn migration, Spotted Redshank, Black-tailed Godwit, Whimbrel, Green and Common Sandpipers are seen regularly on passage.

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