

WeBS Low Tide Counts

AIMS

Estuarine sites in the UK provide the most important habitat for non-breeding waterbirds, acting as wintering grounds for many migrants but also as stopover feeding locations for other waterbirds passing along the East Atlantic Flyway. Core Counts on estuaries tend to quantify birds present at high tide roosts. Although important, knowledge of roost sites provides only part of the picture, and does not elucidate the use that waterbirds make of a site for feeding.

The WeBS Low Tide Counts scheme has flourished since its inception in the winter of 1992/93, with most of the major estuaries covered. The scheme aims principally to monitor, assess and regularly update information on the relative importance of inter-tidal feeding areas of UK estuaries for wintering waterbirds and thus to complement the information gathered by WeBS Core Counts.

The data gathered contribute greatly to the conservation of waterbirds by providing supporting information for the establishment and management of UK Ramsar sites and Special Protection Areas (SPAs), other site designations and whole estuary conservation plans. In addition, WeBS Low Tide Counts enhance our knowledge of the low water distribution of waterbirds and provide data that highlight regional variations in habitat use, whilst also informing protection of the important foraging areas identified. WeBS Low Tide Counts provide valuable information needed to gauge the potential effects on waterbirds of a variety of human activities which affect the extent or value of inter-tidal habitats, such as proposals for dock developments, recreational activities, tidal power barrages, marinas and housing schemes. Designing mitigation or compensation for such activities can be assisted using data collected under the scheme. Furthermore, the effects on bird distributions of climate change and sea level rise can be assessed.

METHODS

The scheme provides information on the numbers of waterbirds feeding on subdivisions of the inter-tidal habitat within estuaries. Given the extra work that Low Tide Counts entail, often by the same counters that carry out the Core Counts, WeBS aims to cover most individual estuaries about once every six years, although on some sites more frequent counts are made. Co-ordinated counts of waterbirds are made by volunteers each month between November and February on pre-established subdivisions of the inter-tidal habitat in the period two hours either side of low tide.

DATA PRESENTATION

Tabulated Statistics

Tables 8 and 9 present three statistics for 18 of the more numerous waterbird species present on 21 estuaries covered during the 2010/11 winter: the peak number of a species over the whole site counted in any one month (with checks for count synchronicity made from assessing proximity of count dates and consultation with Local Organisers); an estimate of the mean number present over the winter for the whole site (obtained by summing the mean counts of each species for each count section) and the mean density over the site (in birds per hectare), which is the mean number divided by the total area surveyed (in hectares). The area value used for these calculations is the sum of the inter-tidal and non-tidal components of each count section but omits the sub-tidal areas (*i.e.* those parts of the count section which are under water on a mean low tide).

Dot Density Maps

WeBS Low Tide Count data are presented as dot density maps, with subdivision of count sections into basic habitat elements. The reason for such a subdivision is to ensure species are plotted on appropriate habitat areas and to improve the accuracy of density estimates. Each section for which a count has

been made is divided into a maximum of three different habitat components:

Inter-tidal: Areas that lie between mean high water and mean low water.

Sub-tidal: Areas that lie below mean low water. In more 'open-coast'-type situations, a sub-tidal zone reaching 500 m out from the inter-tidal sections has been created arbitrarily, indicating the approximate extent of visibility offshore from land-based counts.

Non-tidal: Areas that lie above mean high water (usually saltmarsh although some grazing marshes are also covered).

The mean count for the sector is then divided amongst a varying number of the different components, dependent on the usual habitat preferences of the species involved. For example, Dunlin dots are plotted exclusively on inter-tidal sections whereas Wigeon dots are spread across inter-tidal, sub-tidal and non-tidal areas (in proportion to the relative areas of these three components).

Currently, throughout all WeBS Low Tide Count analyses, mean low tide and mean high tide are taken from the most recent Ordnance Survey 1:25000 maps (in Scotland, the lines on the OS maps are mean low water springs and mean high water springs instead). It is recognised, unfortunately, that these maps represent the current real shape of the mudflats, water channels and saltmarshes to varying degrees of accuracy. However, in the interests of uniformity across the UK, the Ordnance Survey outlines are adhered to throughout the analyses.

The maps display the average number of birds in each count section as dots spread randomly across habitat components of count sections, thus providing an indication of both numbers and density. It is important to note that individual dots do not represent the precise position of individual birds; dots have been assigned to habitat components proportionally and are then randomly placed within those areas. No information about the distribution of birds at a finer scale than the count sector level should be inferred from the dot density maps. For all maps in the present report, one dot is equivalent to one bird, except where stated. The size of

individual dots has no relevance other than for clarity.

As most estuaries have now been covered more than once at low tide, density maps show the relative distributions of species in the winter of 2010/11 compared to an earlier winter of survey. It is hoped that comparative dot density distributions will lead to an easier and fuller appreciation of low tide estuarine waterbird distribution, and changes therein. The following colour conventions apply to density maps: red dots = 2010/11 winter; blue dots = earlier winter; pale blue = water; yellow = inter-tidal habitat (e.g. mudflat, sandflat); pale green = non-tidal habitat (e.g. saltmarsh, reedbed); grey = not covered in one survey winter. More detailed information concerning analysis and presentation of WeBS Low Tide Counts can be obtained from the Low Tide Counts National Organiser, or from *Estuarine Waterbirds at Low Tide* (Musgrove *et al.* 2003)

ESTUARY ACCOUNTS

The main estuaries counted at low tide in the winter of 2010/11 are discussed. WeBS Low Tide Counts were carried out on 21 different sites, with estuary accounts encompassing 4 of these. To allow space in this report for these sites which have not been counted for many years, dot density distribution maps for all sites included in the 2010/11 Low Tide Counts are available on our website at www.bto.org/webs/low-tide-results or from the WeBS office. Other counts, usually on limited numbers of sectors or only in one month, were made in the winter of 2010/11 on Adur Estuary, Langstone Harbour, Loch Indaal, Fal Complex and Moray Firth. For all other sites, data were collected during the period November to February. Assessment of national and international importance is based on five- year peak mean counts from the main species accounts in this volume of *Waterbirds in the UK*. Fig. 66 shows the location of sites covered in 2010/11, and a site description is presented for each estuary. Distribution maps are presented for selected species; where possible, for species present in national or internationally important numbers, or which are known to be undergoing site-level changes. General bird distribution is described for winter 2010/11.



Figure 66. Map showing estuaries covered at low tide in the winter of 2010/11.
 1: Loch Fleet; 2: Moray Firth; 3: Breydon Water; 4: Alde Estuary; 5: Orwell Estuary; 6: Stour Estuary; 7: Crouch-Roach Estuary; 8: Adur Estuary; 9 Chichester Harbour; 10: Langstone Harbour; 11: Beaulieu Estuary; 12: Northwest Solent; 13: Fal Complex; 14: Hayle Estuary; 15: Burry Inlet; 16: Carmarthen Bay; 17: Traeth Lafan; 18: Solway Estuary; 19: Loch Indaal; 20: Belfast Lough; 21: Strangford Lough.

Table 8. Sites covered by Low Tide Counts in 2010/11 and important bird numbers held. Numbers in parentheses refer to the location in Figure 66. For species codes see Table 7.

	<i>International Importance</i>	<i>National Importance</i>
Adur Estuary (8)	None	None
Alde Estuary (4)	AV, BW, RK	DN, PT, SU, SV, T., WN
Belfast Lough (20)	BW	SU, SV, SP, E., GN, RM, RH, BV, GG, OC, RP, PS, RK, TT
Beaulieu Estuary (11)	None	DB, GV
Bembridge Harbour	None	None
Breydon Water (3)	PG, WN, SV, AV, GP, L., BW, CN	BS, EW, T., PT, RU, RK
Burry Inlet (15)	PT, OC	SV, DN, CU, GK, KN, BW
Carmarthen Bay (16)	CX, SS, OC	GP, BW, GK, KN, RM
Chichester Harbour (9)	DB, DN, BW	BA, CU, GV, RK, SS, SU
Crouch-Roach Est. (7)	DB, BW	DN, GP, GV, L., RP, SU, SV
Fal Complex (13)	None	QN
Hayle Estuary (14)	None	None
Langstone Harbour (10)	DB	RM, GV, DN, BW
Loch Fleet (1)	JI	None
Loch Indaal (19)	None	QN, SZ, SP
Northwest Solent (12)	None	DB, PT, GV, BW
Orwell Estuary (5)	BW	DB, GA, AV, KN, BW, RK
Solway Estuary (18)	YS, KN, OC, PG, PT, SP, RK, RP	WS, BA, CU, DN, GP, SS, SU, T.
Stour Estuary (6)	MS, BW, KN	DB, SU, PT, AV, GV, DN, RU, RK, RM, TT
Strangford Lough (21)	MS, WS, QN, SU, KN, GV, L., RK	T., RM, BV, GG, CO, RP, GP, GV, WN, MA, PT, SV, E., GN, DN, CU, GK, BW, BA
Treath Lafan (17)	None	CU, OC, QN, RK, RM

Table 9. Peak, mean counts and mean density (birds per ha) of 18 species across 21 estuaries covered by WeBS Low Tide Counts in 2010/11. "+" indicates densities of <0.01 birds per ha.

Species	Adur Estuary			Alde Complex			Beaulieu Estuary		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	0	0	0	479	215	0.05	660	481	0.83
Shelduck	1	0	+	906	723	0.17	116	68	0.12
Wigeon	0	0	0	6,374	5,243	1.23	984	776	1.34
Teal	238	103	1.37	3,391	3,201	0.75	877	643	1.11
Mallard	4	2	0.03	744	523	0.12	186	150	0.26
Pintail	0	0	0	142	149	0.04	34	10	0.02
Oystercatcher	2	2	0.03	214	93	0.02	63	52	0.09
Ringed Plover	61	23	0.31	222	77	0.02	11	7	0.01
Golden Plover	1	0	+	1,054	448	0.11	0	0	0
Grey Plover	12	7	0.09	64	65	0.02	66	34	0.06
Lapwing	352	165	2.2	3,490	3,197	0.75	605	328	0.57
Knot	0	0	0	72	48	0.01	336	128	0.22
Dunlin	238	183	2.44	2,185	2,640	0.62	347	183	0.32
Black-tailed Godwit	0	0	0	1,305	852	0.2	170	90	0.16
Bar-tailed Godwit	0	0	0	27	8	+	18	10	0.02
Curlew	0	0	0	922	909	0.21	213	186	0.32
Redshank	38	32	0.43	2,022	2,139	0.5	43	29	0.05
Turnstone	15	7	0.09	30	35	0.01	29	21	0.04

Table 9. cont.

Species	Belfast Lough			Bembridge Harbour			Breydon Water		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	88	62	0.14	370	223	1.59	0	0	0
Shelduck	206	165	0.36	25	16	0.11	54	26	0.06
Wigeon	147	119	0.26	1	0	+	29,370	12,112	30.13
Teal	704	532	1.17	193	84	0.6	884	489	1.22
Mallard	297	237	0.52	51	28	0.2	203	142	0.35
Pintail	0	0	0	0	0	0	86	33	0.08
Oystercatcher	3,374	2,929	6.42	25	21	0.15	34	10	0.02
Ringed Plover	160	132	0.29	12	5	0.04	24	12	0.03
Golden Plover	0	0	0	2	1	0.01	9,490	6,461	16.07
Grey Plover	2	0	+	21	9	0.06	37	19	0.05
Lapwing	510	366	0.8	182	55	0.39	16,955	7,384	18.37
Knot	134	65	0.14	0	0	0	100	58	0.14
Dunlin	1,344	1,007	2.21	93	54	0.39	5,407	3,675	9.14
Black-tailed Godwit	481	326	0.71	35	29	0.21	1,140	776	1.93
Bar-tailed Godwit	95	89	0.2	4	2	0.01	15	5	0.01
Curlew	280	185	0.41	17	15	0.11	672	299	0.74
Redshank	1,016	826	1.81	26	21	0.15	1,194	750	1.87
Turnstone	375	329	0.72	1	0	+	3	1	+

Species	Burry Inlet			Carmarthen Bay			Chichester Harbour		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	747	633	0.11	15	13	0.01	7,184	6,865	2.73
Shelduck	712	466	0.08	138	99	0.06	1,015	716	0.28
Wigeon	480	186	0.03	172	88	0.05	2,404	1,690	0.67
Teal	245	105	0.02	490	329	0.18	931	698	0.28
Mallard	15	7	+	0	119	0.07	351	310	0.12
Pintail	973	793	0.14	148	119	0.07	306	144	0.06
Oystercatcher	9,966	7,297	1.32	10,613	9,330	5.21	977	959	0.38
Ringed Plover	0	0	0	15	8	+	146	83	0.03
Golden Plover	112	37	0.01	0	0	0	967	538	0.21
Grey Plover	345	189	0.03	2	1	+	645	461	0.18
Lapwing	2,488	1,347	0.24	284	237	0.13	1,512	1,021	0.41
Knot	1,100	813	0.15	2,500	1,596	0.89	8,197	3,584	1.42
Dunlin	3,310	1,787	0.32	2,081	1,448	0.81	30,075	16,522	6.56
Black-tailed Godwit	703	474	0.09	96	68	0.04	572	347	0.14
Bar-tailed Godwit	25	8	+	20	14	0.01	1,628	987	0.39
Curlew	1,052	572	0.1	118	117	0.07	465	473	0.19
Redshank	451	390	0.07	281	213	0.12	687	589	0.23
Turnstone	0	0	0	42	15	0.01	102	87	0.03

Species	Crouch-Roach Estuary			Fal Complex			Hayle Estuary		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	4,368	2,685	1.56	0	0	0	0	0	0
Shelduck	2,115	1,438	0.83	0	0	0	49	36	0.34
Wigeon	5,932	3,168	1.84	3	1	0.05	1,675	790	7.52
Teal	4,403	3,029	1.76	0	0	0	1,423	735	7
Mallard	287	220	0.13	26	13	0.43	0	0	0
Pintail	356	133	0.08	0	0	0	0	0	0
Oystercatcher	468	268	0.16	4	2	0.08	20	17	0.16
Ringed Plover	126	72	0.04	0	0	0	17	9	0.09
Golden Plover	4,018	1,638	0.95	0	0	0	0	0	0
Grey Plover	364	173	0.1	1	1	0.02	5	2	0.02
Lapwing	5,857	4,172	2.42	0	0	0	290	77	0.73
Knot	418	108	0.06	0	0	0	0	0	0
Dunlin	6,433	2,558	1.48	1	1	0.02	375	155	1.48
Black-tailed Godwit	774	455	0.26	0	0	0	2	0	+
Bar-tailed Godwit	8	4	+	1	1	0.02	12	8	0.08
Curlew	510	396	0.23	4	2	0.07	469	129	1.23
Redshank	2,780	2,563	1.49	12	6	0.26	41	17	0.16
Turnstone	43	25	0.01	4	2	0.08	8	2	0.02

Table 9. cont.

Species	Langstone Harbour			Loch Fleet			Loch Indaal		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	1,972	1,902	4.71	0	0	0	29	25	0.07
Shelduck	215	143	0.35	175	90	0.16	25	28	0.07
Wigeon	932	881	2.18	996	687	1.18	313	261	0.69
Teal	153	73	0.18	144	126	0.22	145	127	0.34
Mallard	23	13	0.03	323	205	0.35	159	151	0.4
Pintail	98	55	0.14	0	0	0	5	6	0.02
Oystercatcher	417	352	0.87	1,089	923	1.59	198	230	0.61
Ringed Plover	60	46	0.11	8	3	0.01	216	206	0.55
Golden Plover	1	0	+	0	0	0	583	311	0.82
Grey Plover	177	118	0.29	0	0	0	11	16	0.04
Lapwing	55	29	0.07	0	0	0	180	108	0.29
Knot	22	12	0.03	56	14	0.02	70	50	0.13
Dunlin	5,078	3,320	8.22	392	188	0.32	313	286	0.76
Black-tailed Godwit	77	47	0.12	0	0	0	0	0	0
Bar-tailed Godwit	61	25	0.06	131	41	0.07	89	114	0.3
Curlew	201	164	0.41	300	257	0.44	360	261	0.69
Redshank	132	123	0.3	378	239	0.41	19	18	0.05
Turnstone	40	29	0.07	0	0	0	52	45	0.12

Species	Northwest Solent			Orwell Estuary			Solway Firth		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	2,653	2,114	2.81	1,547	790	0.64	0	0	0
Shelduck	282	207	0.27	1,130	825	0.67	766	954	0.06
Wigeon	1,351	971	1.29	1,809	1,346	1.1	1,922	2,094	0.13
Teal	717	408	0.54	1,344	747	0.61	599	515	0.03
Mallard	39	21	0.03	373	267	0.22	702	772	0.05
Pintail	180	68	0.09	202	175	0.14	3,929	2,246	0.13
Oystercatcher	104	93	0.12	1,743	1,506	1.23	15,306	19,902	1.19
Ringed Plover	73	29	0.04	152	72	0.06	103	111	0.01
Golden Plover	62	22	0.03	792	213	0.17	3,313	1,489	0.09
Grey Plover	194	142	0.19	451	259	0.21	370	237	0.01
Lapwing	67	39	0.05	1,200	813	0.66	1,603	1,571	0.09
Knot	171	99	0.13	2,771	1,120	0.91	2,685	2,398	0.14
Dunlin	3,980	3,313	4.4	4,292	2,512	2.05	7,307	10,464	0.63
Black-tailed Godwit	446	329	0.44	546	378	0.31	5	2	+
Bar-tailed Godwit	27	17	0.02	45	15	0.01	907	1,160	0.07
Curlew	156	121	0.16	584	542	0.44	2,830	3,355	0.2
Redshank	121	83	0.11	1,594	1,415	1.15	1,625	1,355	0.08
Turnstone	99	79	0.1	126	90	0.07	81	66	+

Species	Stour Estuary			Strangford Lough			Traeth Lafan		
	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.	Peak No.	Mean No.	Mean Dns.
Brent Goose	1,851	1,474	0.91	2,522	2,072	0.57	24	18	0.01
Shelduck	1,776	1,560	0.96	3,101	2,322	0.64	556	306	0.09
Wigeon	3,524	2,355	1.45	1,049	637	0.17	420	287	0.09
Teal	1,224	893	0.55	2,104	1,484	0.41	51	23	0.01
Mallard	269	214	0.13	326	296	0.08	284	217	0.07
Pintail	290	245	0.15	218	92	0.03	157	127	0.04
Oystercatcher	1,190	1,058	0.65	5,420	4,475	1.23	5,212	4,627	1.44
Ringed Plover	135	102	0.06	137	110	0.03	55	30	0.01
Golden Plover	493	172	0.11	1,819	1,321	0.36	0	0	0
Grey Plover	978	862	0.53	40	21	0.01	2	0	+
Lapwing	1,875	1,043	0.64	3,068	1,876	0.51	180	45	0.01
Knot	10,735	6,047	3.72	2,807	1,401	0.38	152	53	0.02
Dunlin	16,180	13,312	8.18	4,384	3,114	0.85	2,573	734	0.23
Black-tailed Godwit	1,644	857	0.53	313	238	0.07	0	0	0
Bar-tailed Godwit	144	121	0.07	737	588	0.16	43	11	+
Curlew	977	884	0.54	1,129	1,045	0.29	952	708	0.22
Redshank	1,755	1,435	0.88	2,018	1,900	0.52	714	599	0.19
Turnstone	538	462	0.28	144	126	0.03	115	58	0.02

ALDE COMPLEX

Site description

The Alde Complex is separated from the sea by the large shingle spit of Orfordness, and the estuary is comprised of three rivers – the Alde, Butley and Ore. The spit has been extending southwards since 1530, with the consequent effect of pushing the mouth of the River Ore progressively further to the southwest. Havergate Island lies at the confluence of the Rivers Ore and Butley, and supports the largest breeding colony of Avocets in Britain. The River Alde is relatively wide and shallow with mudflats in the upper reaches and saltmarsh including some *Spartina* exposed at low tide along both banks. The Butley River has extensive areas of mudflat, grading into saltmarsh and reedbed along its length. The River Ore has very little mudflat and is largely entrained by seawalls.

Industrial operations are virtually absent and water quality is excellent, however, a wide range of recreational activities takes place. Sailing occurs throughout (with moorings at Aldeburgh and Orford) and windsurfing, canoeing and water-skiing are permitted in the lower zones. Leisure use of the beach occurs around the mouth and wildfowling takes place over parts of the Alde, Butley and Orfordness. Other activities include oyster cultivation, fish trawling, eel netting, reed cutting and bait digging.

General bird distribution 2010/11

Area covered 5,807 ha; Mean total birds 23,502; Mean bird density 4.05 birds per ha.

The Alde Estuary supports high numbers of many waterbirds, with 57 species recorded during Low Tide Counts. These included two Spoonbills and one Bittern. Wigeon and Teal were the most numerous wildfowl species present, and were both found throughout the site with the Butley River, Havergate Island and the Snape Maltings used by marked concentrations. The extensive marshes on the site supported good numbers of other wildfowl, including three-figure counts of Shoveler, Gadwall, Pintail and Tufted Ducks, with Orfordness, Havergate Island, Oxley Marshes and Gedgrave Marshes being

especially favoured. Up to 550 European White-fronted Geese were present at Aldeburgh & Sudbourne Marshes. This is a species infrequently recorded during Low Tide WeBS counts (as are Tundra Bean Geese and Smew, which were also noted at Alde Complex in 2010/11). Despite the lack of wide mudflats, the site held four-figure counts of several wader species, including Avocet, Dunlin and Redshank, whilst the presence of up to 38 Spotted Redshank in November was noteworthy.

Comparative bird distribution (Fig. 67)

Pintail are found on the Alde Complex in nationally important numbers though numbers counted during Core counts have fallen in keeping with the national index. Numbers counted during Low Tide counts have also decreased, declining from a mean count of 434 birds (0.08 birds per ha) in 2001/02 to 141 (0.02 birds per ha) in 2010/11. Havergate Island, the landward side of Orfordness and between Hazlewood Marshes and Snape Maltings were favoured by Pintail in both years. The Lantern Marshes and the seaward side of Orfordness were the main areas where birds were more apparent in 2001/02 than in 2010/11.

In keeping with the trends at many other east coast estuaries, numbers of Black-tailed Godwit on the Alde Complex have increased dramatically in the last ten years and the species is now present in internationally important numbers. Low Tide Counts reflect this increase, with the mean count in 2010/11 of 852 (0.20 birds per ha) significantly higher than the 39 (0.01 birds per ha) in 2001/02. The main concentrations of Black-tailed Godwits in 2010/11 were on the north side of the River Alde between Hazlewood Marshes and Snape Maltings, (where there was a mean count of 336 birds) and along the south side of Iken Marshes (where there was a mean count of 252 birds). The north end of the Butley River was the main area in 2001/02 and this area was also favoured in 2010/11 along with Sudbourne Marshes.

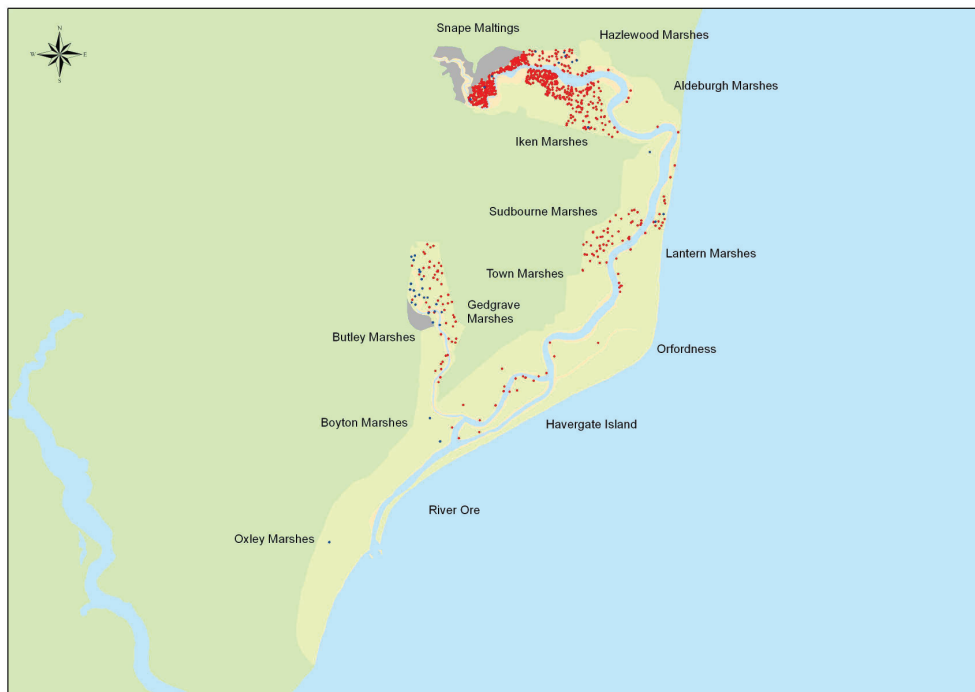
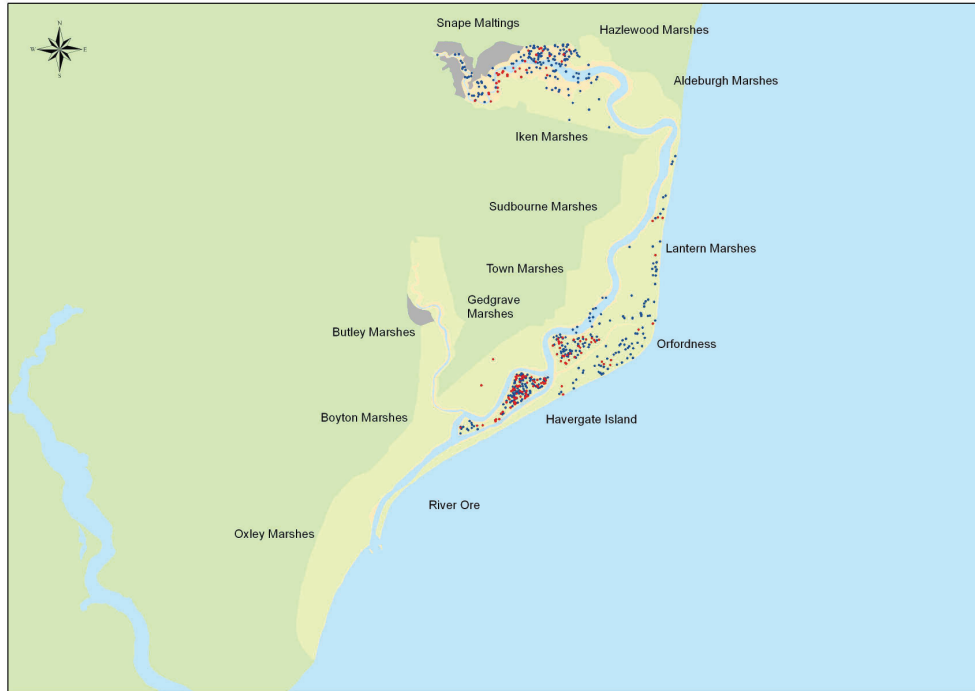


Figure 67. Low Tide distribution of Pintail (above) and Black-tailed Godwit (below) for the winters of 2001/02 (blue) and 2010/11 (red) on the Alde Complex. Yellow = intertidal; pale green = non-tidal; blue = subtidal. Grey areas were not counted in 2010/11.

CHICHESTER HARBOUR

Site description

Chichester Harbour is a large and complex estuary, situated between Chichester and Havant. It is connected to Langstone Harbour to the west by a channel along the north side of Hayling Island.

The Harbour is a land-locked area of deep salt-water channels; bounded by mud banks which are covered twice daily by tides flowing through the narrow entrance. There are sandbanks and shingle near the entrance and much of the shore at the high-tide mark is shingle. The river channels are muddy, whereas the intertidal areas south of Thorney Island are much sandier and support extensive areas of eelgrass and algae. Chichester Harbour is covered by international legislation, being designated as a Ramsar site and (combined with neighbouring Langstone Harbour) as an SPA. It also has national protection as a SSSI. The estuary is extremely popular with watersports enthusiasts, so although the majority of the shoreline is undeveloped with restricted access, the areas with public access tend to be heavily used.

General bird distribution 2010/11

Area covered 3,136 ha; Mean total birds 36,918; Mean bird density 11.8 birds per ha.

With 55 species recorded during the Low Tide Counts, Chichester Harbour held the highest number of the sites counted. Four-figure counts were recorded for Shelduck and Wigeon, whilst, Teal, Pintail Mallard, Tufted Duck and Red-breasted Mergansers were all recorded in three-figure numbers. The Great Deeps, traditionally a favoured area for many wildfowl, were not counted in 2010/11; this will have affected the overall totals of these species. Single Black Brant, Smew, Red-throated Diver, two Slavonian Grebes and 26 European White-fronted Geese were more unusual visitors to Chichester Harbour in 2010/11.

Dunlin was the most numerous wader, with a mean site count of nearly 16,500 birds. Knot, Bar-tailed Godwit and Lapwing were also present in four-figure numbers, with the extensive mudflats on the south side of

Thorney Island being favoured by these species. An additional eight species (Oystercatcher, Golden Plover, Grey Plover, Sanderling, Black-tailed Godwit, Curlew, Redshank and Turnstone) were recorded in three-figure numbers.

Comparative bird distribution (Fig. 68)

Dark-bellied Brent Geese are found in internationally important numbers in Chichester Harbour, it being the third most important site for the species. It was by far the most numerous wildfowl species present in 2010/11, with a peak count of over 7,100 birds. Despite the Great Deeps not having been counted in 2010/11, the mean density was still almost double that of 2001/02, being 6,753 birds (2.15 birds per ha) compared with 3,626 birds (1.17 birds per ha). Dark-bellied Brent Geese are found throughout the site, with the top end of Bosham Channel and around Thorney Island used by distinct concentrations in both years.

Although Knot numbers on the Chichester and Langstone Harbours SPA have been stable over the course of the last 25 years, in the last ten years they have seen a medium decline (<http://www.bto.org/webs/alerts/>). Low Tide Counts at Chichester Harbour do not reflect this decrease, however, with a mean site count of 3,569 (1.43 birds per ha) in 2010/11 compared to 580 (0.24 birds per ha) in 2001/02. The main concentration of Knots in 2010/11 was at the south end of Thorney Island where there was a mean count of 3,178 birds (7.93 birds per ha) compared with just 37 birds (0.09 birds per ha) in 2001/02. Another favoured area in 2010/11 was near Mengham on Hayling Island. In 2001/02, the main concentration was on the east side of Thorney Island with a mean of 264 birds (7.33 birds per ha), however despite the increased number of birds counted on the site in the recent winter this area was not widely used, with a mean of just eight birds (0.21 birds per ha).

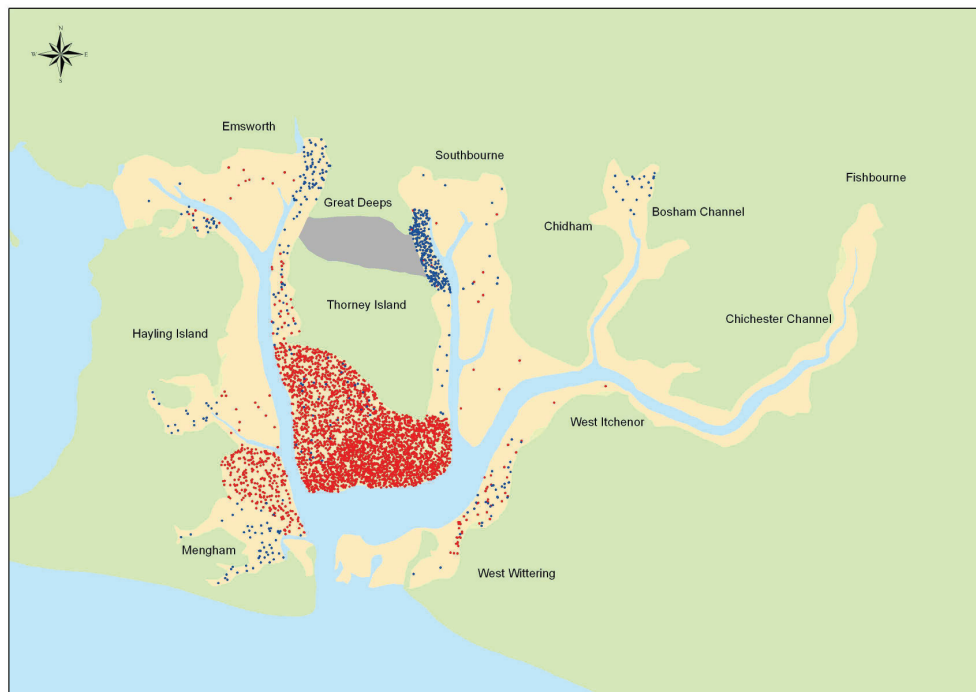
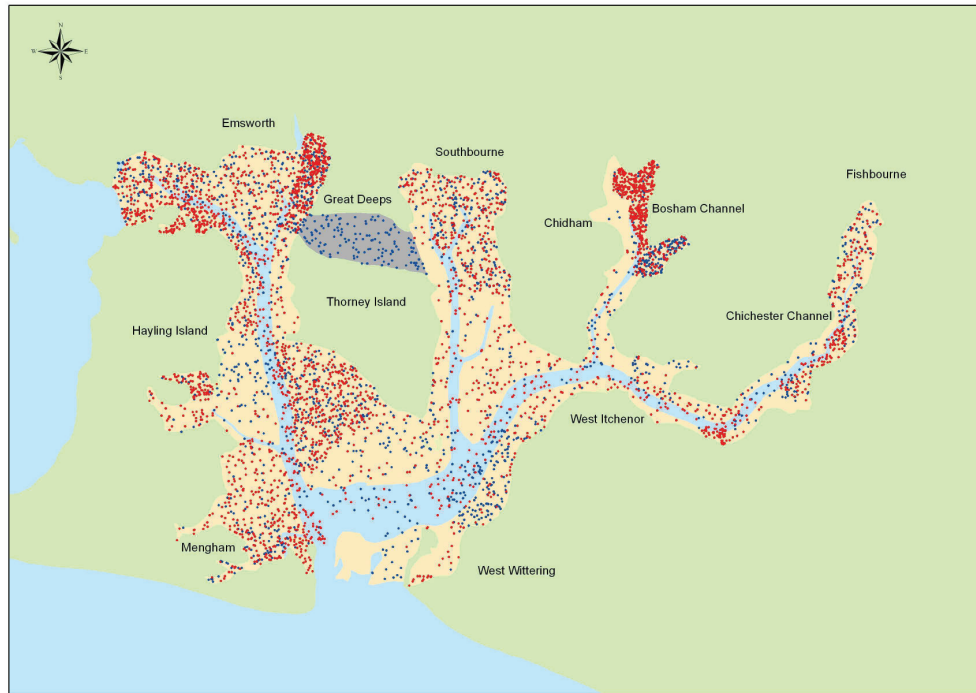


Figure 68. Low Tide distribution of Dark-bellied Brent Goose (above) and Knot (below) for the winters of 2001/02 (blue) and 20010/11 (red) at Chichester Harbour. Yellow = intertidal; pale green = non-tidal; blue = subtidal. Grey areas were not counted in 2010/11.

CROUCH-ROACH ESTUARY

Site description

The Crouch Estuary is traditionally considered together with its tributary, the Roach; the two converge on the coast of south Essex in eastern England. The River Crouch carves a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. Both rivers form dendritic creeks and low-lying riverine islands.

The surrounding habitat is almost exclusively lowland farmland and grazing marsh, with few urban developments. The intertidal zone along the rivers is 'squeezed' between the sea walls along both banks and the river channel, leaving a thin strip of tidal mud. The Crouch & Roach Estuary is an integral component of the phased Mid-Essex Coast SPA.

Threats to this SPA and environs are posed by disturbance caused by air activities, the development of a wharf, sea defences, homes and shops, car parks, marinas, holiday parks and an airport, and saltmarsh loss caused by sea-level rise. Seventy-five percent of the site is deemed by Natural England to be in unfavourable declining condition due mainly to saltmarsh erosion.

General bird distribution 2010/11

Area covered 2,896 ha; Mean total birds 23,913; Mean bird density 8.3 birds per ha.

With very little open mudflat habitat, numbers of wading birds are generally much lower on the Crouch-Roach than on other estuaries. Dunlin were the most abundant wader, present throughout the site and peaking at over 6,000 birds. Lapwing and Golden Plover were present in four-figure numbers, both favouring Bridgemarsh Island, Shelford Creek and the newly created managed realignment site on Wallasea Island. Redshank, typically, were numerous along the many creeks.

The narrow creeks also supported good numbers of Little Grebes with a peak count of 157 in December. Other wildfowl were present throughout the site, with Wigeon, Dark-bellied Brent Goose, Teal and Shelduck

being the most numerous. As with the waders, Bridgemarsh Island and Shelford Creek were favoured areas for many wildfowl species along with Clementsgreen Creek and the bottom end of Paglesham Reach.

Comparative bird distribution (Fig. 69)

Teal occur on the Crouch-Roach Estuary in large numbers, though just fall short of the national important threshold. Numbers here have risen steadily in the last few years and this increase has been reflected in the Low Tide Counts. The mean total for the site has gone up from 2,218 (0.72 birds per ha) in 2004/05 to 3,023 (1.04 birds per ha) in 2010/11. With its narrow creeks, the Crouch-Roach is ideal habitat for Teal. Present throughout much of the site, particular concentrations in both years were found at Clementsgreen Creek, along Paglesham Reach, Shelford Creek and at Great Wakering. The areas around Bridgemarsh Island and along Paglesham Creek were also favoured in 2010/11 which only held a few birds in 2004/05, whilst the managed realignment site on Wallasea Island held the highest densities with a mean density of 7.87 birds per ha, which may also account for the increase in the overall mean total.

The Crouch-Roach, along with many east coast sites has seen a steady rise in the number of wintering Avocets over the past decade. Even between the most recent sets of Low Tide counts, this increase is apparent, with the mean site total increasing from 251 (0.26 birds per ha) in 2004/05 to 328 (0.32 birds per ha) in 2010/11. In both years, the favoured areas were along Paglesham Reach and along the east side of Potton Island. In 2010/11, birds were also recorded along the seafront area of Burnham-on-Crouch, an area not used extensively in 2004/05.

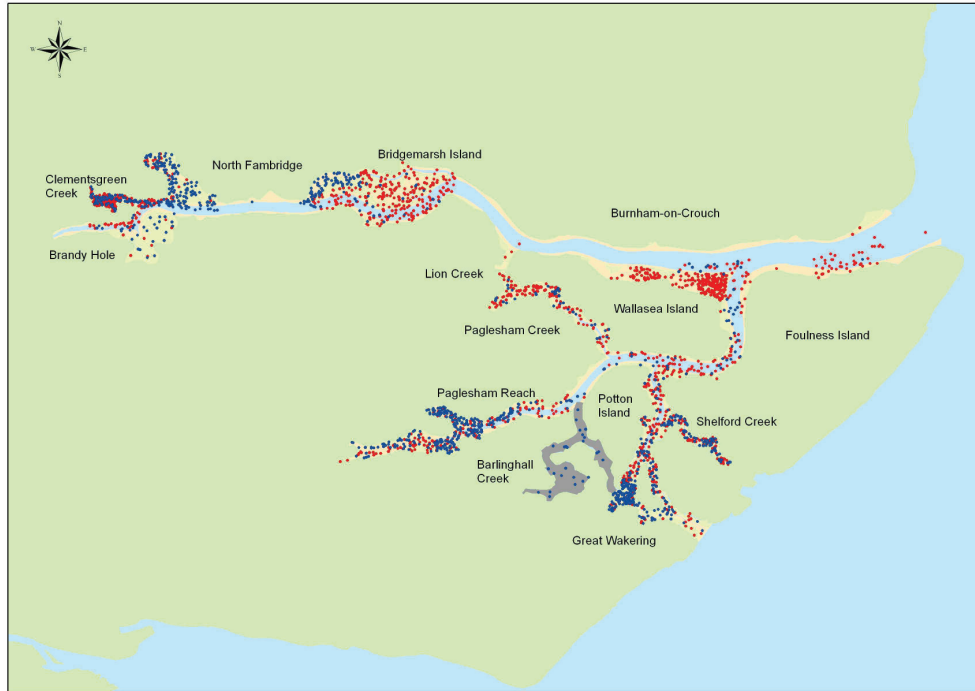


Figure 69. Low Tide distribution of Teal (above) and Avocet (below) for the winters of 2004/05 (blue) and 2010/11 (red) on Crouch-Roach Estuary. Yellow = intertidal; pale green = non-tidal; blue = subtidal. Grey areas were not counted in 2010/11.

TRAETH LAFAN (LAVAN SANDS)

Site description

Traeth Lafan is an extensive intertidal area situated at the northern end of the Menai Strait, between Bangor and Llanfairfechan. Three freshwater streams flow across the flats at low tide. There are a variety of habitats including both exposed and sheltered areas of sand, mudflats with an area of shingle, and mussel beds near Bangor. Some relatively small areas of saltmarsh have developed along the shore, particularly at the mouth of the Rhaeadrfawr and south-west of Llanfairfechan. The intertidal flats support an abundance of invertebrate fauna, which in turn attract large numbers of waterbirds. Industrial activity is limited, however, recreational and leisure use occurs. Boating, sailing and windsurfing take place in the channel, whilst walkers and dogs can cause disturbance to high tide roosts along the mainland coastline. Wildfowling, along with commercial and small-scale cockle gathering is another feature. Potential threats include oil pollution and the establishment of cord-grass in a small area of the site.

General bird distribution 2010/11

Area covered 4,654 ha; Mean total birds 7,939; Mean bird density 1.7 birds per ha.

With its large open mudflats, Traeth Lafan supports high numbers of many species. However, the mean totals were not as high as may have been expected owing to the fact that many birds shelter within inaccessible gullies at low tide, and so can only be seen when they are flushed (R. Pritchard pers. comm.). Only Oystercatcher and Dunlin were recorded in four figure numbers. Lapwing, Knot, Curlew, Redshank and Turnstone were all recorded in three figures with the Bangor Flats close to Bangor and opposite Beaumaris being the most favoured areas. Single Jack Snipe and Whimbrel represented more unusual records for the WeBS Low Tide count scheme. Whilst many waders typically favoured the open flats, many of the wildfowl species were much closer to shore on the Bangor Flats, at Abergwyngregyn and Llanfairfechan. Wigeon was the most numerous duck, peaking at 420 birds, whilst

Mallard and Pintail were also recorded in three figure counts. Little Egret numbers peaked at 22 birds in November, with birds present on the Bangor Flats and along the Menai Straits towards the Menai Bridge.

Comparative bird distribution (Fig. 70)

Numbers of Shelduck in Britain have shown a steady decline in the last ten years, as the population may have experienced a slight eastward shift across the North Sea into The Netherlands (Holt *et al.* 2011). Low Tide Counts at Traeth Lafan during this period have also mirrored this, with the mean site count of 439 (0.09 birds per ha) falling to 305 (0.07 birds per ha) in 2010/11. The favoured area for Shelduck within Traeth Lafan is on the sheltered Bangor Flats around Bangor. In 2010/11, fewer birds were seen on the more open flats towards Abergwyngregyn than in 2002/03, possibly in response to a colder winter. Birds were also present along the Anglesey coast between Beaumaris and Fryars Road. Oystercatchers are present at Traeth Lafan in nationally important numbers, with a five-year mean of 6,606 birds based on Core counts (p. 102 this report). Numbers of Oystercatchers have increased over the past 25 years and are stable during the last ten years (see <http://www.bto.org/webs/alerts/>). Low Tide Counts have shown a slight decline between 2002/03 and 2010/11, falling from a mean site count of 5,609 (1.74 birds per ha) to 4,626 (1.43 birds per ha). In both years, Oystercatchers were found in high densities off Llanfairfechan, though in 2002/03 the mean density here was 3.73 birds per ha (mean count of 932 birds) compared with 2.26 birds per ha (mean count of 566 birds) in 2010/11. In 2002/03, the other favoured area was north of Aber Ogwen, but in 2010/11 the main concentration was further to the west on Bangor Flats and on the Anglesey coast south of Beaumaris. Dutchman Bank was also used much more extensively by Oystercatchers in 2010/11 than in 2002/03.

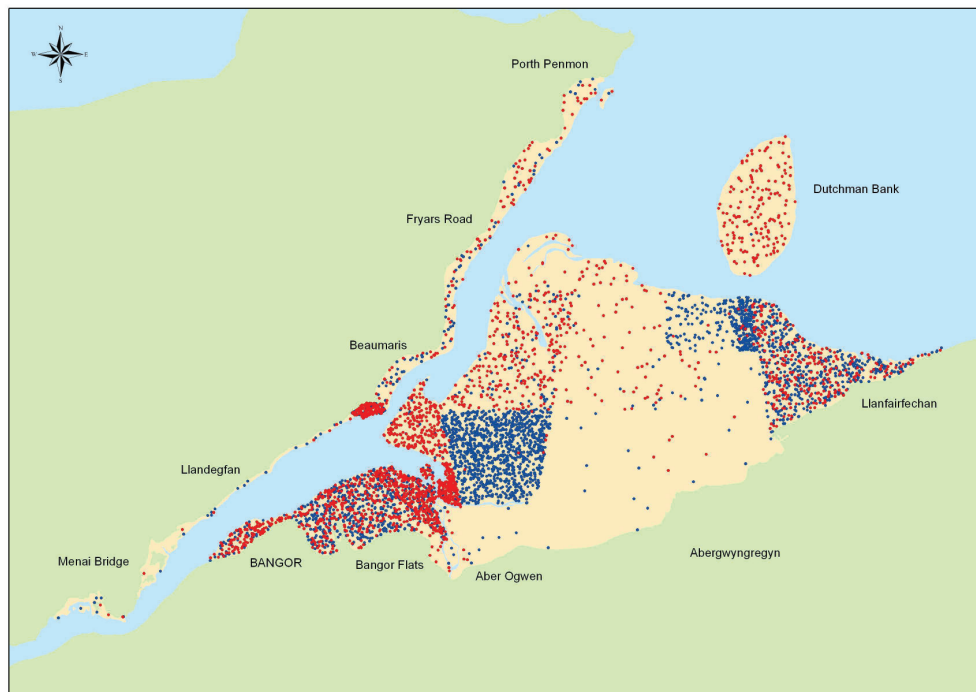
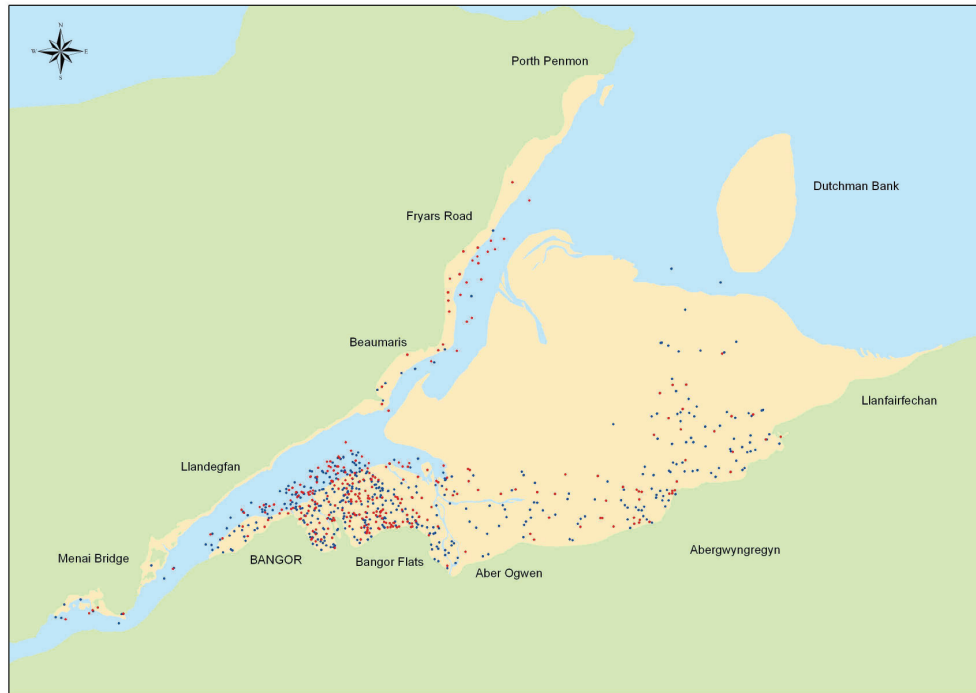


Figure 70. Low Tide distribution of Shelduck (above) and Oystercatcher (1 dot = 2 birds) (below) for the winters of 2002/03 (blue) and 2010/11 (red) at Traeth Lafan. Yellow = intertidal; blue = subtidal.

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Robert Gillmor