4.60 BELFAST LOUGH

LTC site code:	BB
Centre grid:	J3982
JNCC estuarine review site:	159
Habitat zonation:	447 ha intertidal, 1704 ha subtidal, 0 ha nontidal
Statutory status:	Belfast Lough SPA (UK9020101), Belfast Lough Ramsar (7UK123) [Also Outer Ards proposed SPA (UK9020271), Outer Ards Peninsula proposed Ramsar]
Winter waterbird interest:	Great Crested Grebe, Cormorant, Light-bellied Brent Goose, Shelduck, Mallard, Scaup, Eider, Goldeneye, Red-breasted Merganser, Oystercatcher, Ringed Plover, Golden Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Waterbird assemblage

SITE DESCRIPTION

Belfast Lough is a large sea lough in the north-east of Ireland, with the city of Belfast at its head. The area surveyed comprises the coast from Carrickfergus on the north shore around to the eastern end of Bangor on the south shore. The outer parts of the lough's shore are generally rocky with some sandy bays, but more extensive areas of intertidal mud are located toward Belfast. Industrial land-claim has, however, reduced the area of the mudflats over the last 150 years, and Belfast has become the main port in Northern Ireland for heavy cargo. More recently, some of the area, including the RSPB Belfast Harbour reserve, has been given a degree of protection, but there is a continuing threat to the remaining intertidal mudflats from potential future harbour expansion. The wash from the shipping activities, including high-speed passenger ferries, may also cause increased erosion of intertidal habitats. Additionally, a proposed new water-taxi service which would operate outside the main shipping lanes could cause increased disturbance. There has been a loss of disturbance-free high-tide roosts within the inner lough, along with problems of refuse disposal and pollution, as would be expected at a highly urbanised and industrialised site. Recreational activities only occur over relatively small, localised parts of the lough. However, extensive areas of Belfast Lough are licensed for shellfish aquaculture, the impact of which is currently unclear (I. Enlander pers. comm.).

COVERAGE AND INTERPRETATION

Belfast Lough is one of the more frequently surveyed sites at low tide, with counts being returned each winter from 1994–95 to 1998–99 (and subsequently). Local circumstances, however,

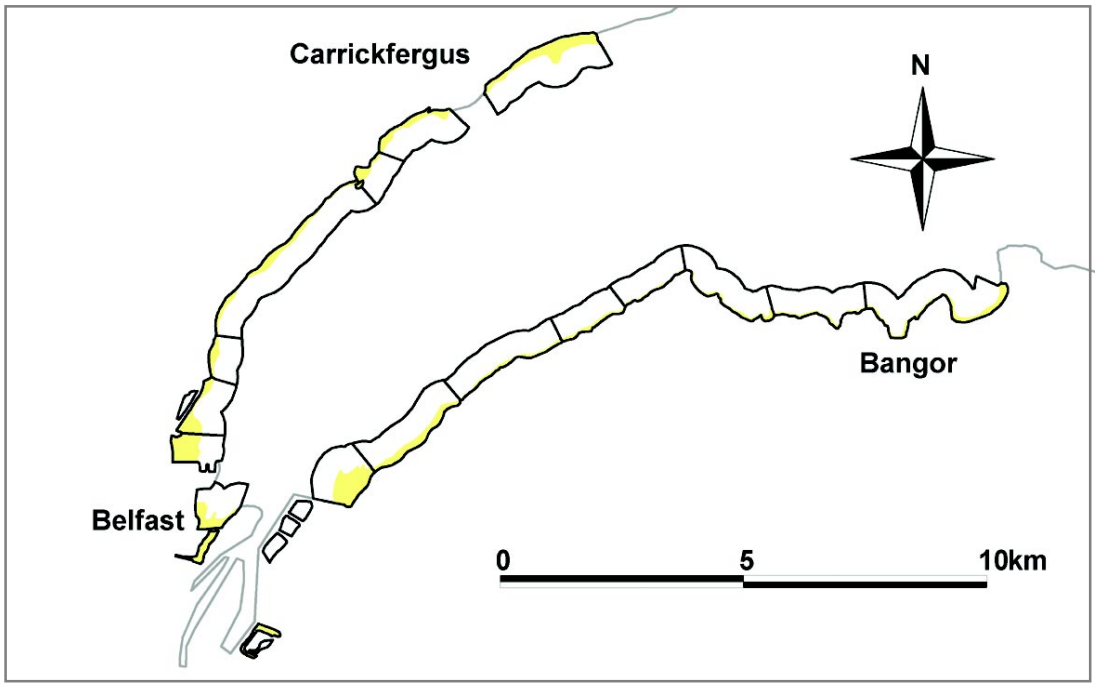


Figure 4.60.1: **LTC sections at Belfast Lough, winters 1995–96 to 1998–99**

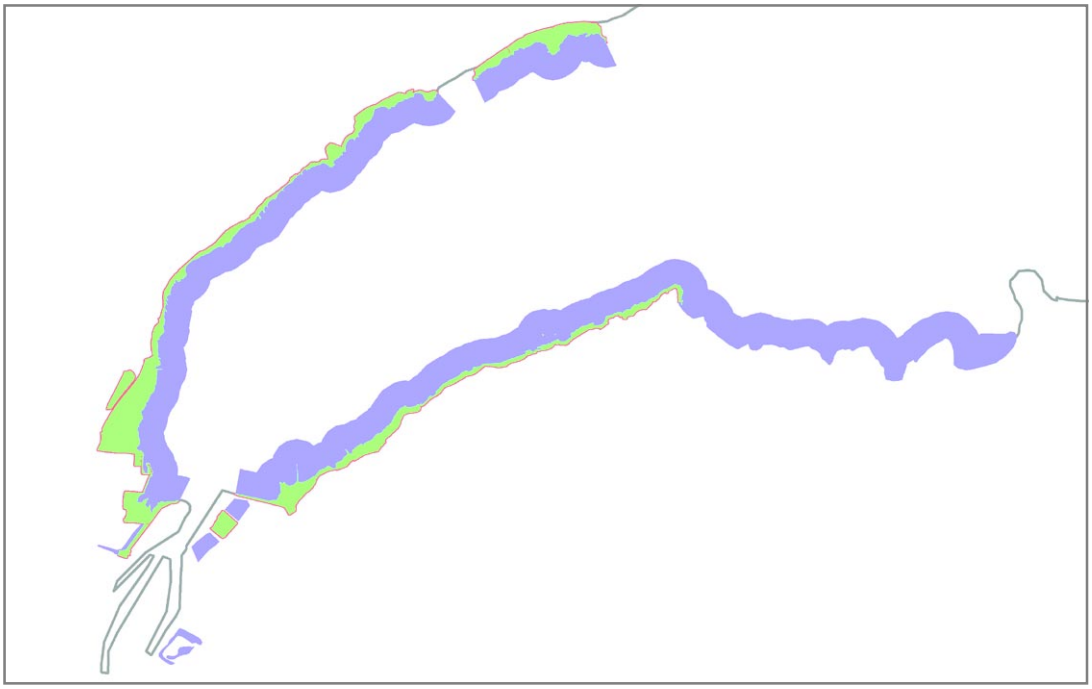


Figure 4.60.2: LTC and SPA boundaries, with overlap, at Belfast Lough

have unfortunately not made it possible for four counts per winter to be carried out; instead, counts have been restricted to two or three months per winter. Figure 4.60.1 shows the positions of the 23 sections counted for the survey. The same count sections have been used throughout, although the survey was confined to the inner lough during the winter of 1994–95.

The Belfast Lough SPA covers much the same area as the LTC site on the north shore, but on the south only extends a short way past Grey Point (Figure 4.60.2). However, the outer part of the south shore is proposed for inclusion within a proposed Outer Ards SPA. Two of the harbour pools, plus Victoria Park, are also outside the SPA. The boundaries of the existing Ramsar site are entirely coincident with those of the SPA.

Movements of birds from Belfast Lough to other sites are not known to occur on a daily basis, although at the outer extremes of the site similar rocky habitat continues on both north and south shores and local movements seem likely. Great Crested Grebes are known to move between the site and Lough Neagh, but on a seasonal rather than a daily basis. Many of the offshore species, however, will be variably detectable depending upon the conditions. At high tide, some species move inland (often several kilometres) onto agricultural land and recreational playing fields, mostly Oystercatchers, Curlews and, more recently, Black-tailed Godwits (I. Enlander pers. comm.).

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1996–97 are presented for all of the 20 species of principal interest listed above. For clarity, smaller dots are used to display the distributions of many of these species. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.60.3).

The totals maps show that for many species, the inner parts of the lough (especially the western shore) support the highest overall bird densities, including the largest concentrations of Great Crested Grebes, Shelducks, Scaup, Goldeneyes, Oystercatchers, Knot, Dunlin, Black-tailed Godwits, Bar-tailed Godwits, Curlews and Redshanks. Some species were almost entirely confined to this area (*e.g.* Black-tailed Godwit), whilst others occurred elsewhere at lower densities. A different group of species (Eider, Ringed Plover and Turnstone) occurred in higher densities on the outer parts of the site. Red-breasted Mergansers and Cormorants were found widely throughout the site. Small numbers of Light-bellied Brent Geese occurred to the north of Green Island. The RSPB Belfast Harbour reserve is an important area for Lapwings, Mallards and other dabbling ducks. Despite being outside the SPA boundary, Victoria Park also supported notable concentrations of several species, including estuarine birds such as Dunlin, Oystercatcher and Redshank, small numbers of Golden Plovers and more typical parkland species like Mallard.

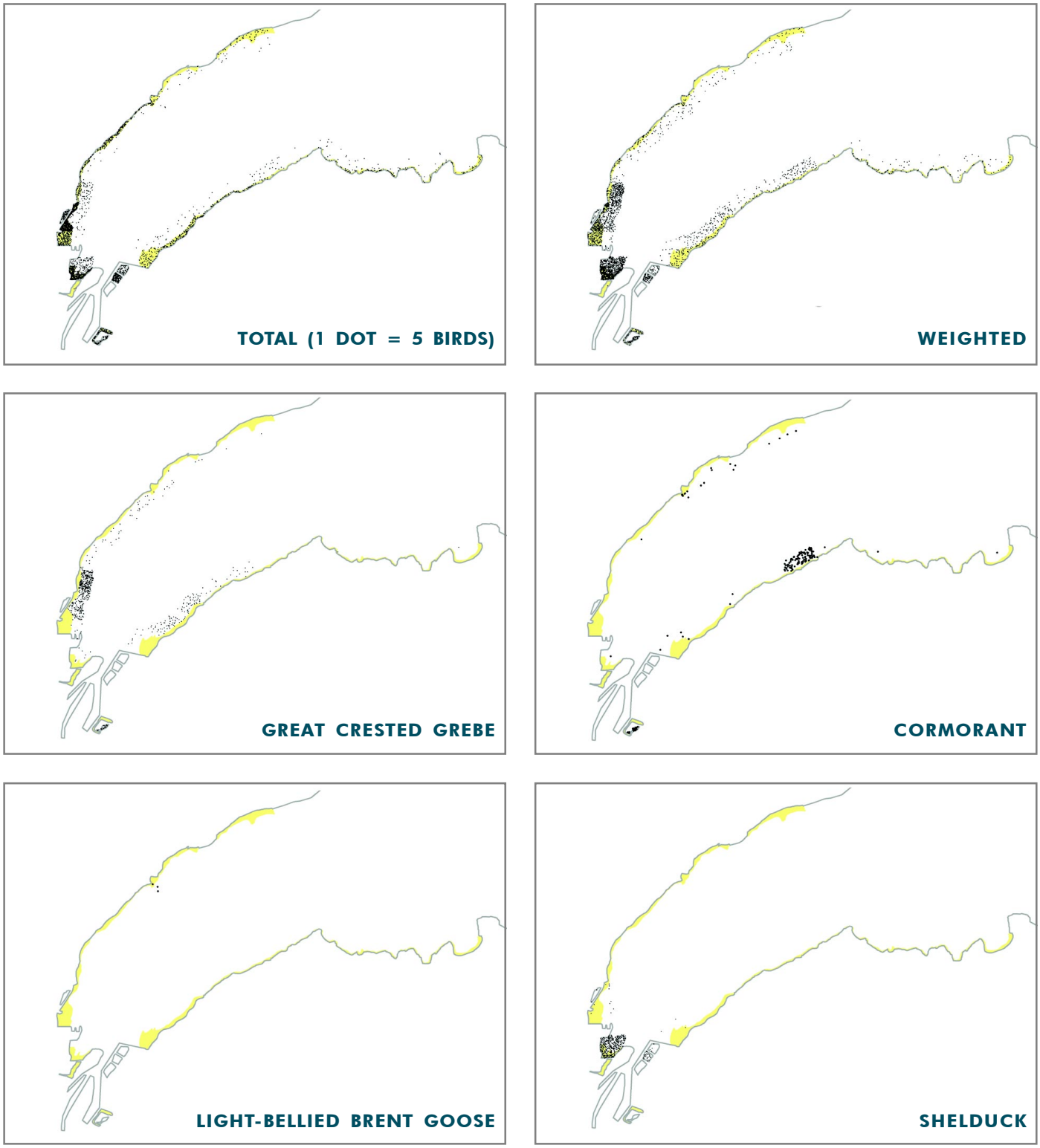


Figure 4.60.3 (i): **Low tide waterbird distributions recorded at Belfast Lough, winter 1996–97**

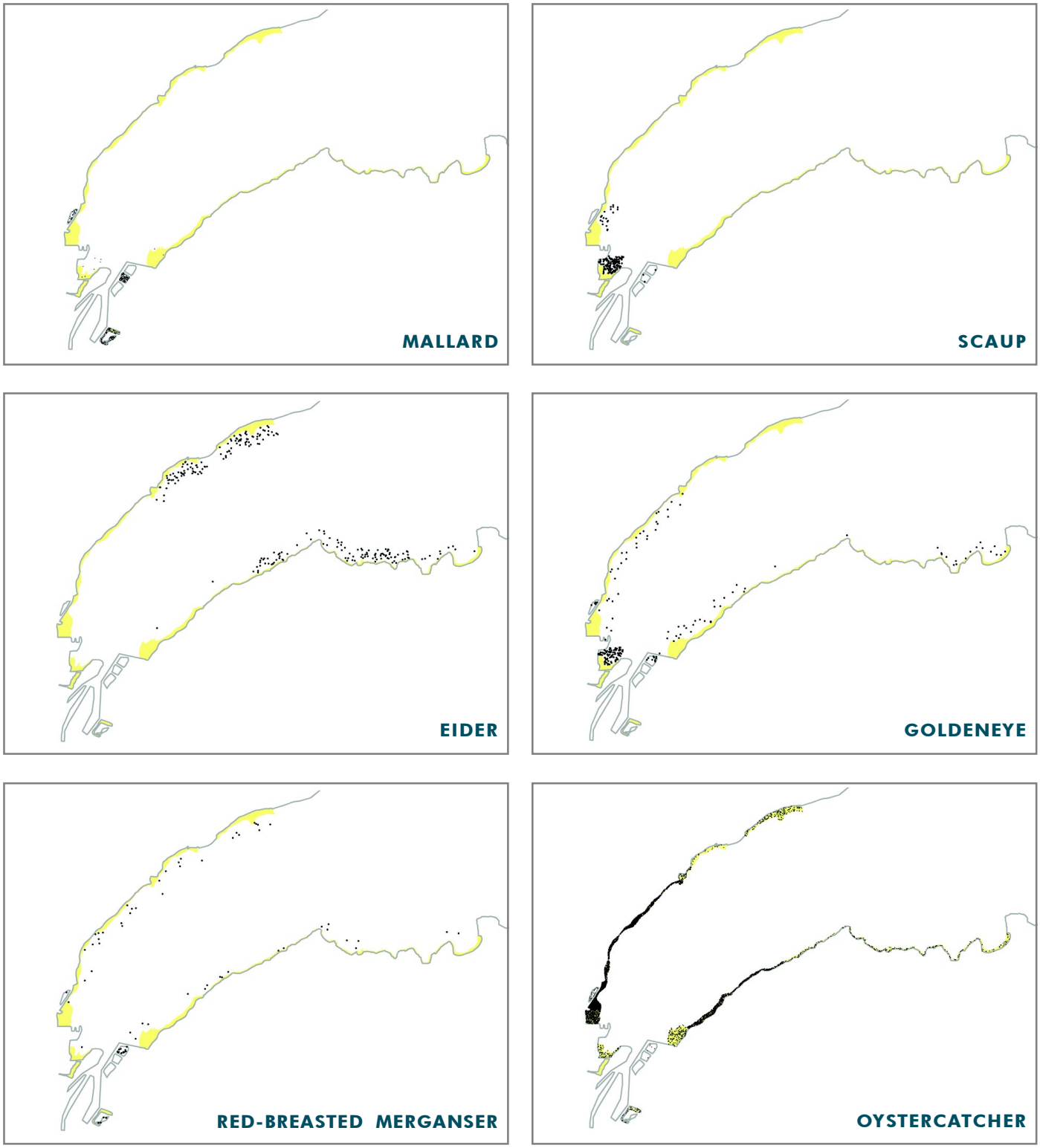


Figure 4.60.3 (ii): **Low tide waterbird distributions recorded at Belfast Lough, winter 1996–97**

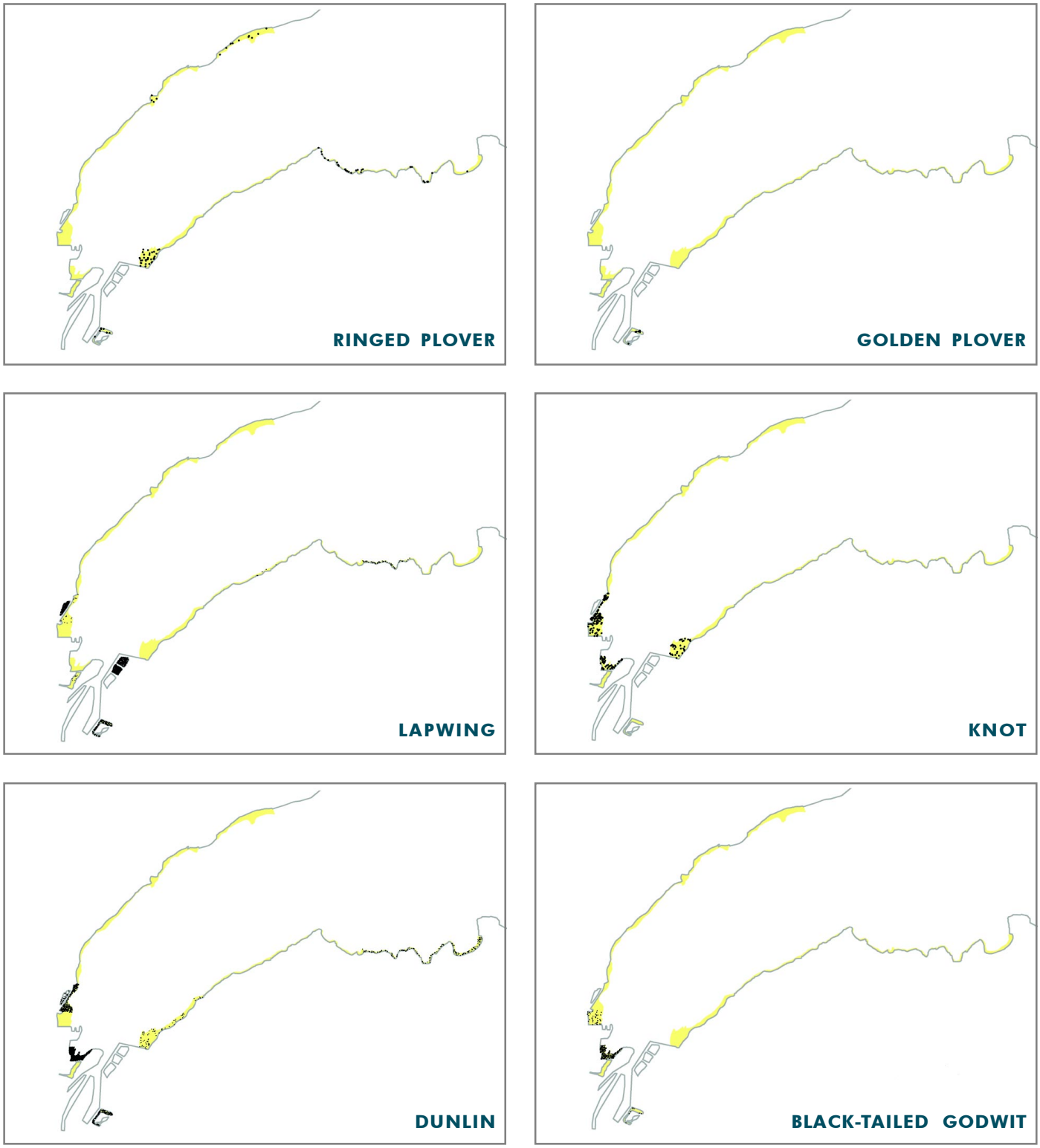


Figure 4.60.3 (iii): **Low tide waterbird distributions recorded at Belfast Lough, winter 1996–97**

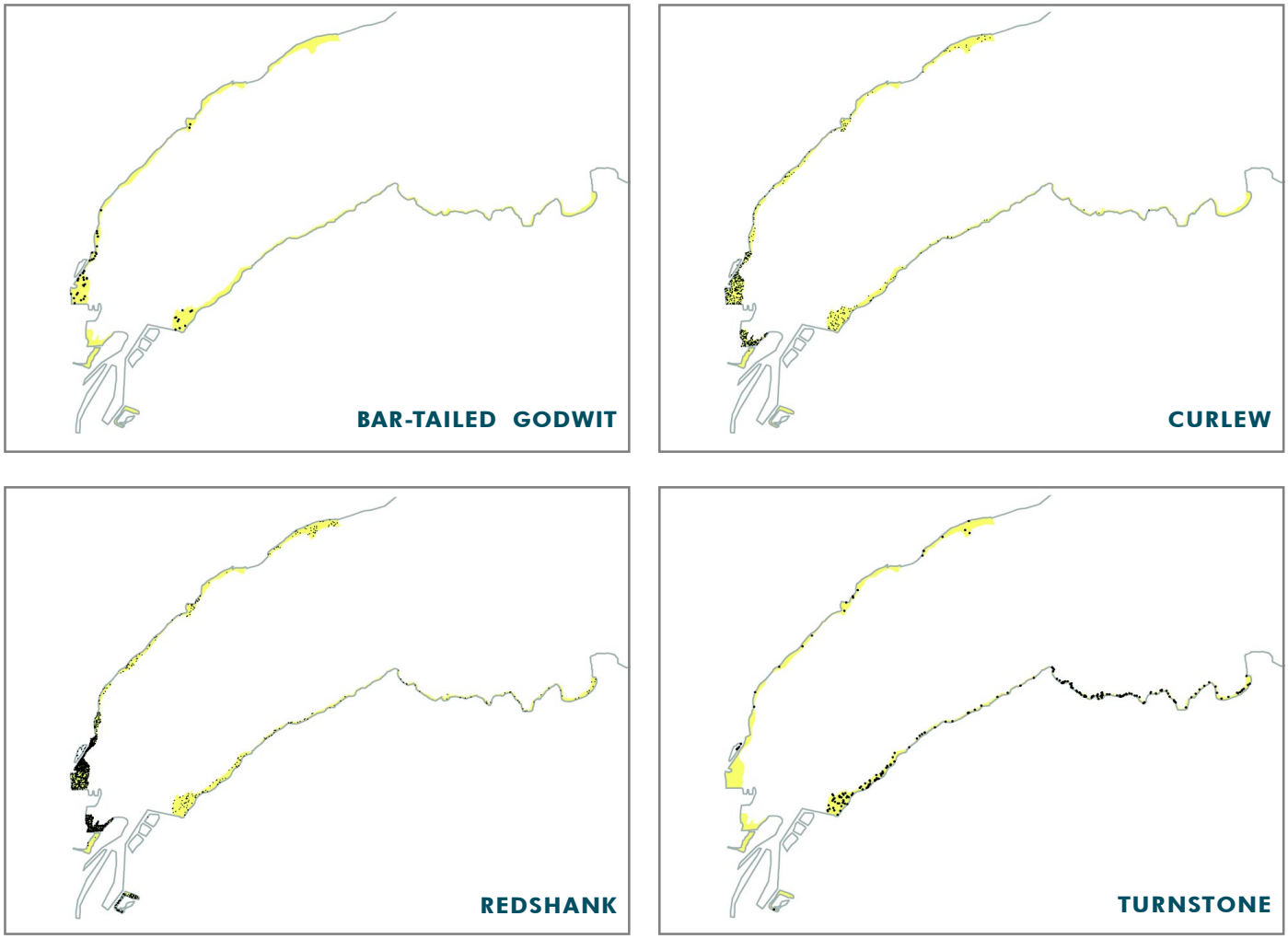


Figure 4.60.3 (iv): **Low tide waterbird distributions recorded at Belfast Lough, winter 1996–97**

4.61 STRANGFORD LOUGH

LTC site code:	BS
Centre grid:	J5660
JNCC estuarine review site:	160
Habitat zonation:	4030 ha intertidal, 5080 ha subtidal, 0 ha nontidal
Statutory status:	Strangford Lough SPA (UK9020111), Strangford Lough Ramsar (7UK120)
Winter waterbird interest:	Little Grebe, Great Crested Grebe, Cormorant, Mute Swan, Greylag Goose, Light-bellied Brent Goose, Shelduck, Wigeon, Gadwall, Teal, Mallard, Pintail, Shoveler, Eider, Goldeneye, Red-breasted Merganser, Coot, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Waterbird assemblage

SITE DESCRIPTION

Strangford Lough is a large, almost land-locked sea lough situated to the south-east of Belfast in Northern Ireland. It encompasses extensive tidal flats at the northern end, smaller bays and creeks throughout and numerous small drumlin islands, particularly along the western shore. The principal conservation issues concern large-scale recreational use, human population growth around the lough, increased eutrophication of the water, dredging for shellfish and increased intensification of agriculture. A recent proposal for a tidal barrage at the mouth of the lough was rejected. Much of the lough is managed by the National Trust, which also manages the wildfowling activity around the lough.

COVERAGE AND INTERPRETATION

Strangford Lough has been counted for the scheme during every month of every winter since its inception in 1992–93, although data for the 1998–99 winter were not available for incorporation into this account. Figure 4.61.1 shows the positions of the 118 sections counted for the survey during the 1997–98 survey. Over the years, a number of modifications have been made to the count sections used, further details of which can be obtained from the National Organiser.

Figure 4.61.2 shows the overlap between the SPA boundary and the area counted for the LTCs. Strangford Lough SPA is unusual in that the area below mean low water is included within the SPA

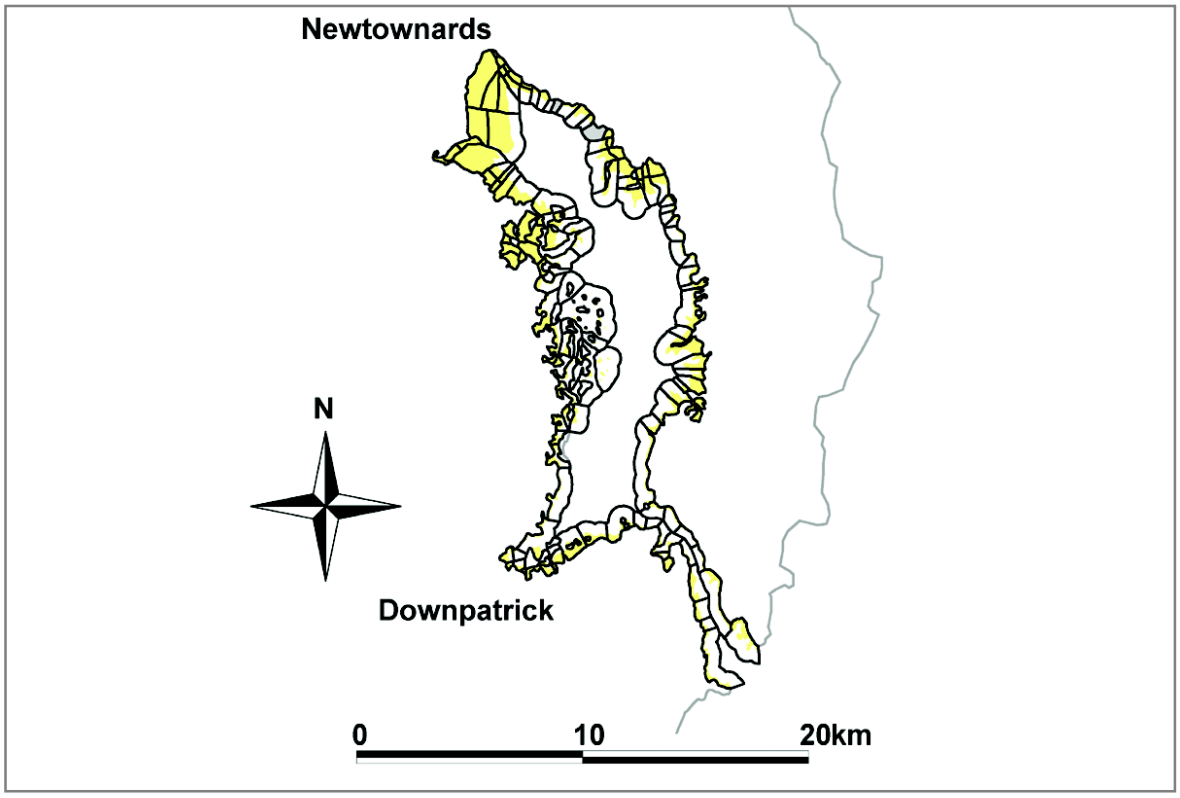


Figure 4.61.1: **WeBS LTC sections at Strangford Lough, winter 1997–98**

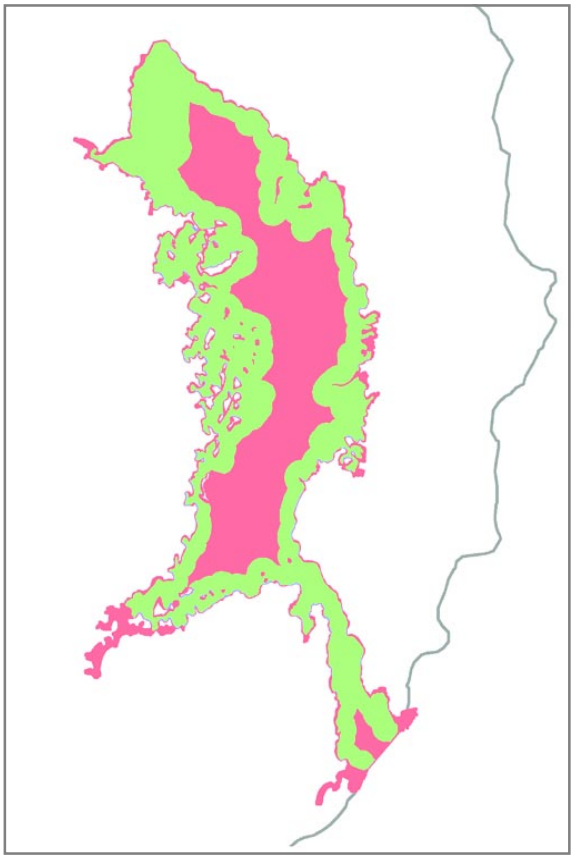


Figure 4.61.2: LTC and SPA boundaries, with overlap, at Strangford Lough

boundary. Thus, much of the inner lough is within the SPA but not surveyed by the LTCs. Otherwise, some small areas, particularly around the mouth of the lough and around Quoile and Ringmore Hill in the south-west of the site, are within the SPA boundary but were not surveyed for the LTCs. The boundaries of the Ramsar site are entirely coincident with those of the SPA.

Strangford Lough is a large and relatively isolated site and it is likely that most of the wintering waterbird populations using the lough are self-contained. However, some interchange with nearby non-estuarine coasts, including the Outer Ards WeBS site, at the mouth of the site is likely. Certain species, such as the grassland plovers, will also make use of nearby terrestrial or freshwater habitats.

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1997–98 are presented for 27 of the 29 species of principal interest listed above. For clarity, smaller dots are used to display the distributions of several of these species. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.61.3). Of the remaining species, Coots have not been recorded during LTCs at the site and presumably occur on nearby non-tidal wetlands. No Greylag Geese were recorded by the scheme during the 1997–98 winter, although the species was noted in each of the five previous winters.

The totals map shows that most of the high density areas are at the northern end of the site, with birds distributed more patchily elsewhere. The weighted totals map also emphasises the northern lough, from Mahee Island around to Greyabbey Bay. The northern flats were key areas for many of the waders, notably Oystercatchers, Golden Plovers, Grey Plovers, Knot and the two godwits (although finer-scale differences in distribution were apparent for these two species), as well as Shelduck and Pintail. Light-bellied Brent Geese were also found in their highest density in the north of the lough, although they disperse southwards as the winter progresses, both within the lough and within Ireland as a whole. Ringed Plovers were mostly found at Greyabbey and in the outer channel connecting the lough to the sea; the latter area was also a key area for Cormorants and Turnstones, as well as many of the Teal. Teal and Wigeon were found in localised areas around much of the lough, especially the islands along the middle of the west shore. The mid-west shore held most of the Mallards also, with Shovelers mostly at Mahee Island and Gadwall at Castleward Bay. Redshanks and Curlews were rather evenly distributed around the whole site, whereas Lapwings and Dunlin, although widespread, were more clumped and displayed gaps in their distributions. Little Grebes, Great Crested Grebes, Eiders and Red-breasted Mergansers were widespread in small numbers, with Goldeneyes somewhat more localised around Ardmillan/Mahee Island on the west shore and near Ardkeen on the east shore. Most Mute Swans were found in the north of the lough, with notable concentrations off Mount Stewart.

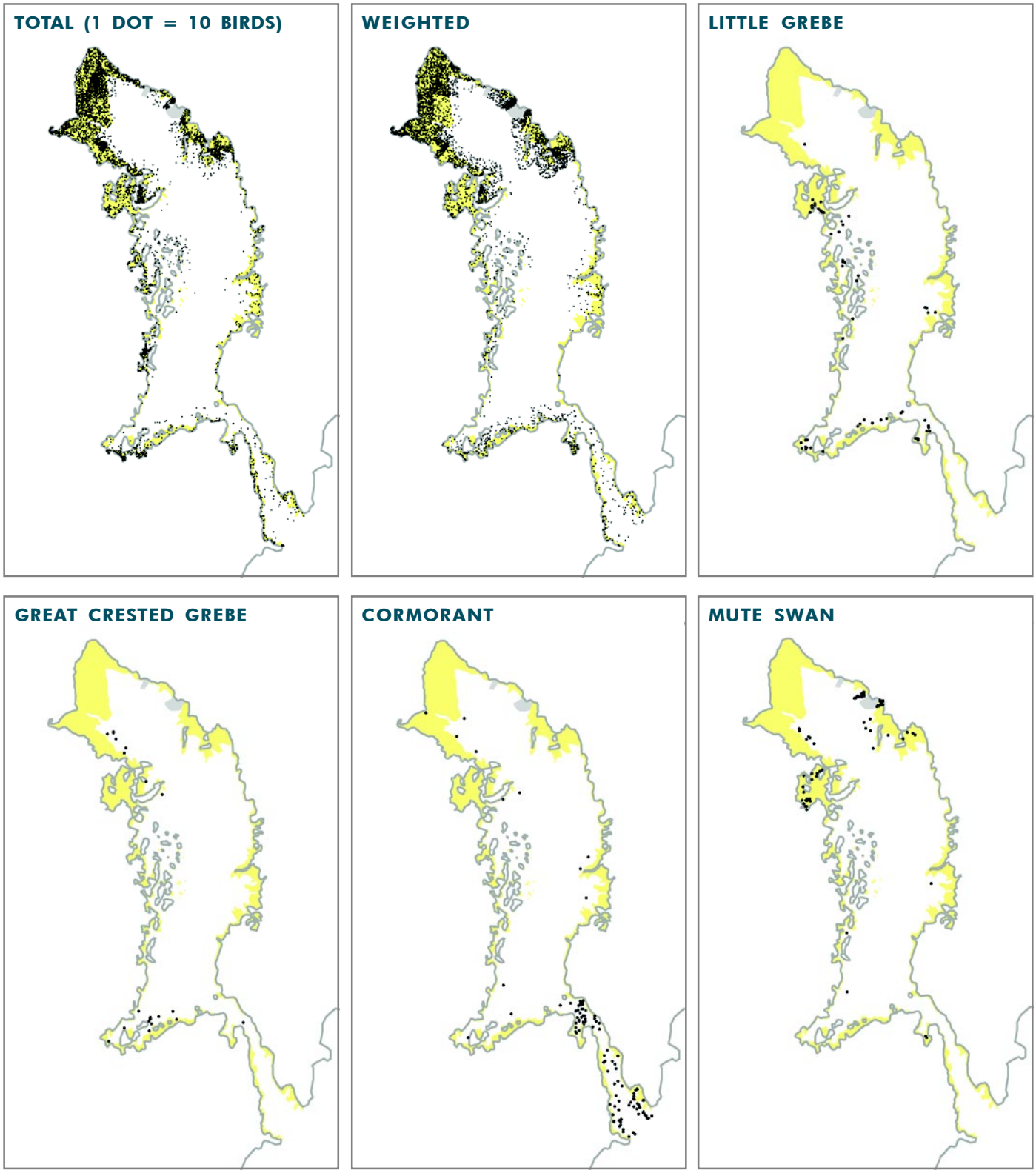


Figure 4.61.3 (i): **Low tide waterbird distributions recorded at Strangford Lough, winter 1997–98**

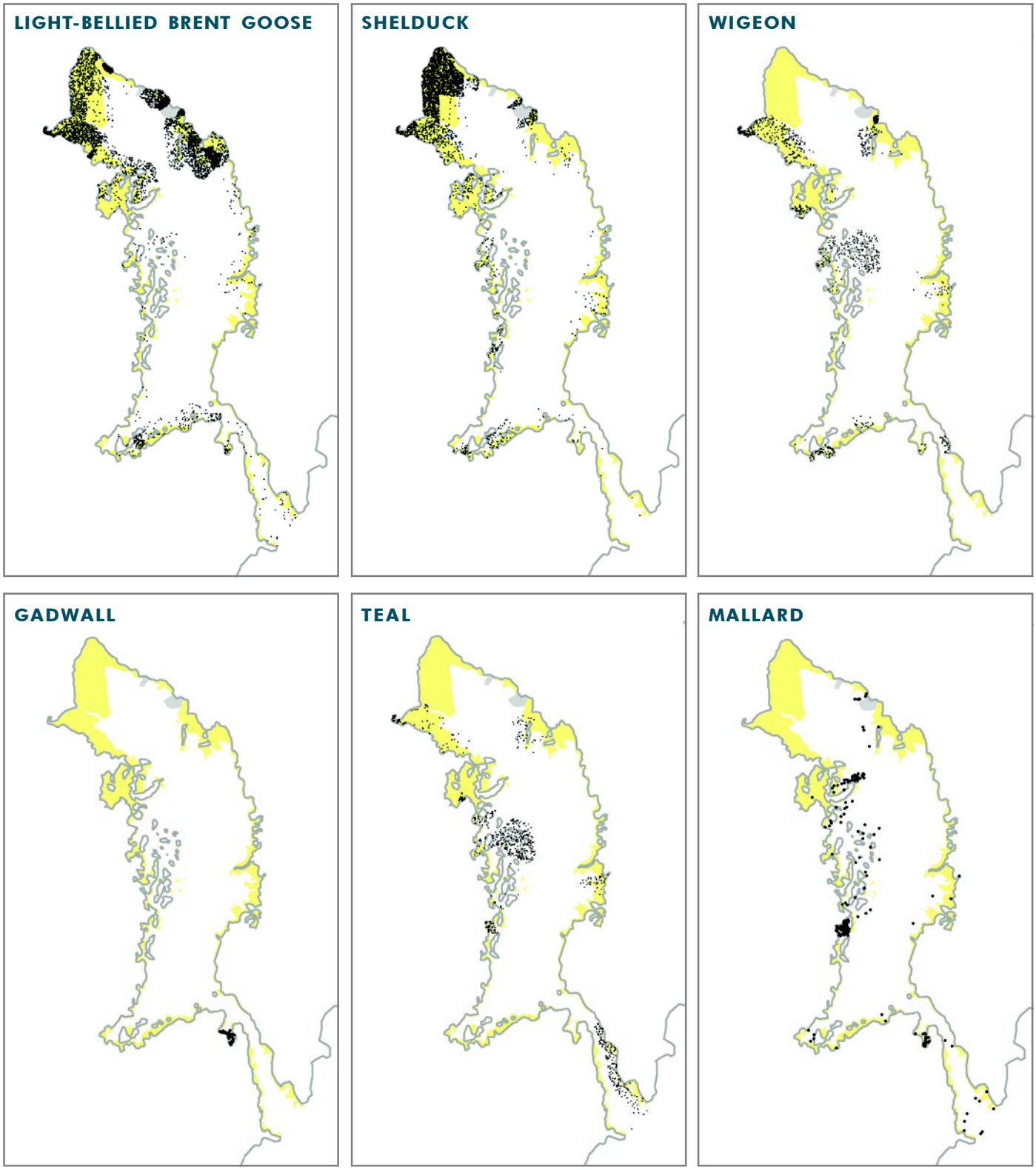


Figure 4.61.3 (ii): **Low tide waterbird distributions recorded at Strangford Lough, winter 1997–98**

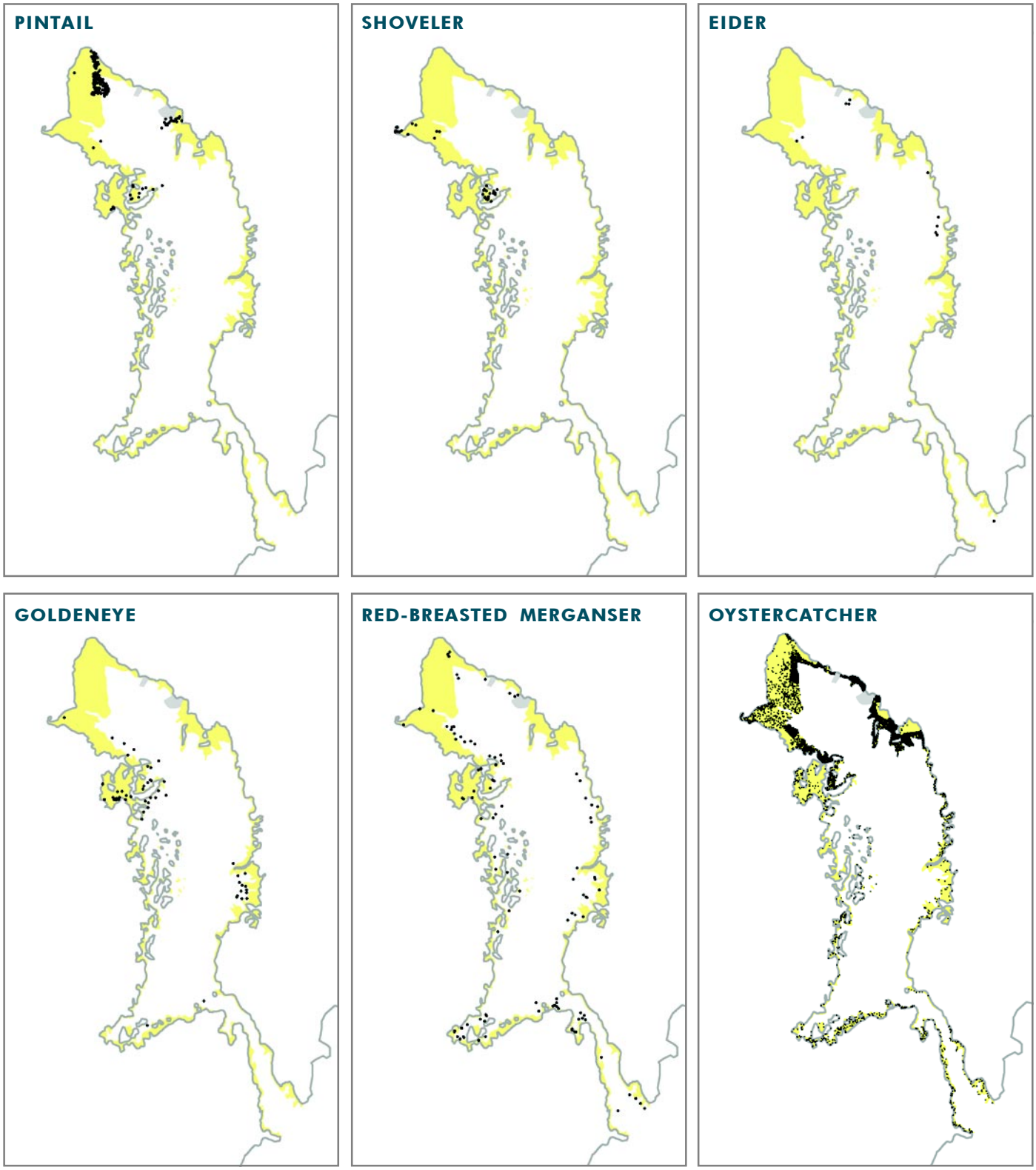


Figure 4.61.3 (iii): **Low tide waterbird distributions recorded at Strangford Lough, winter 1997–98**

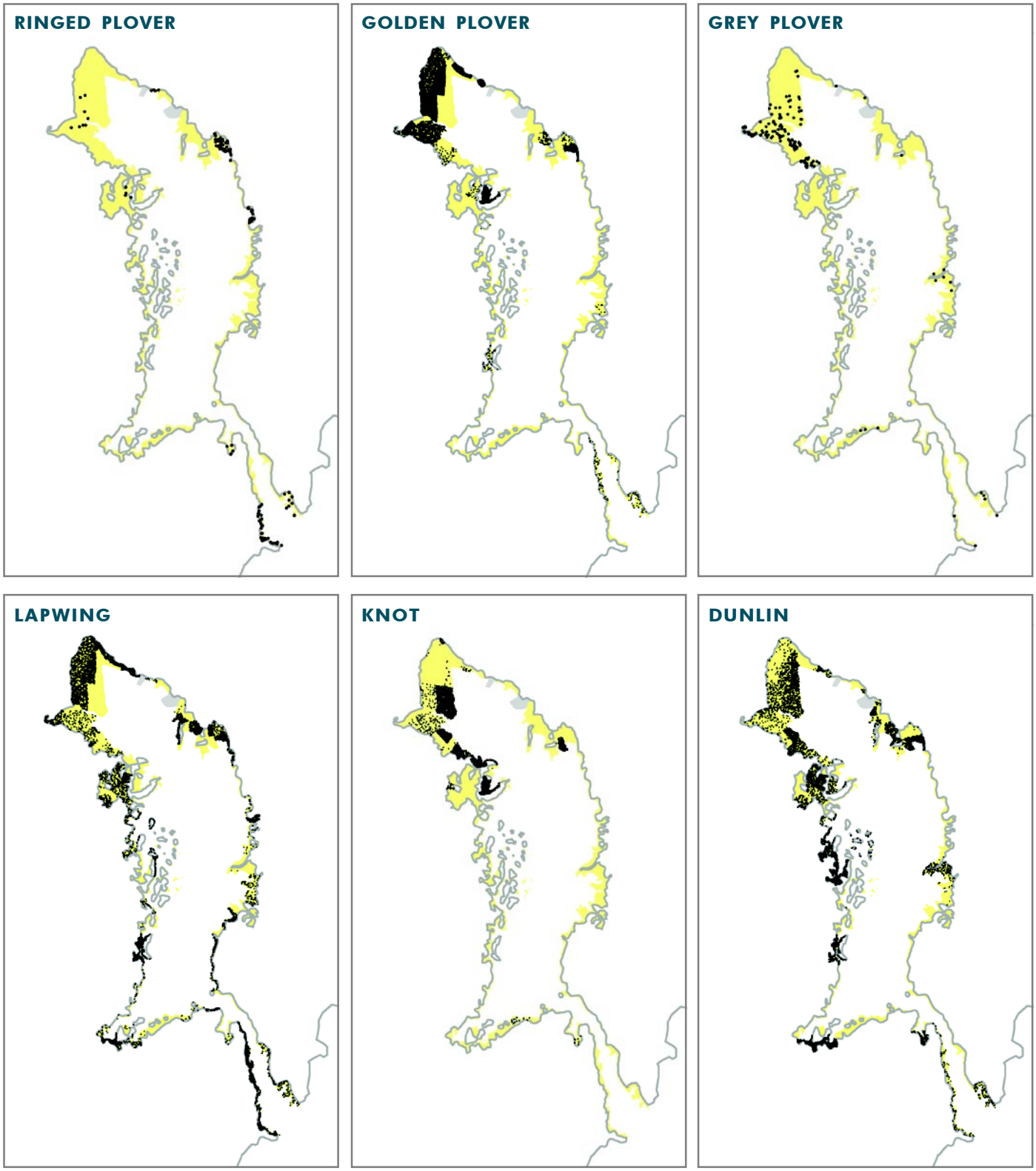
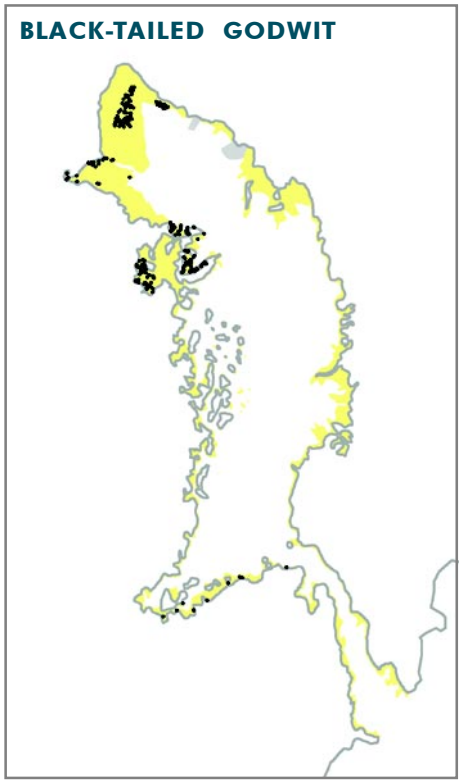
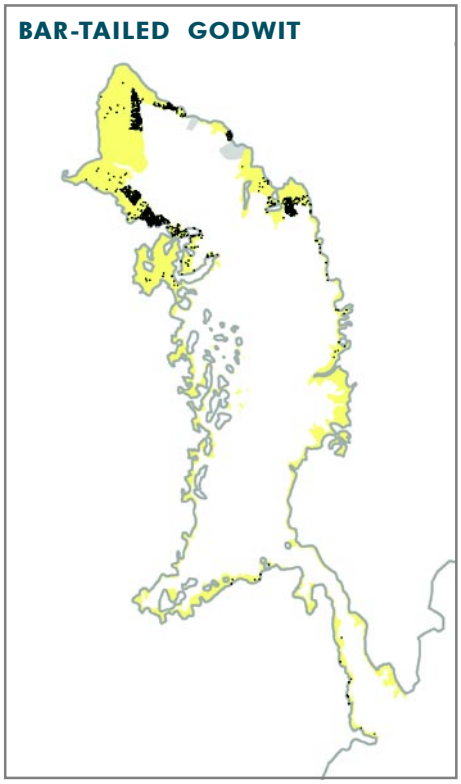
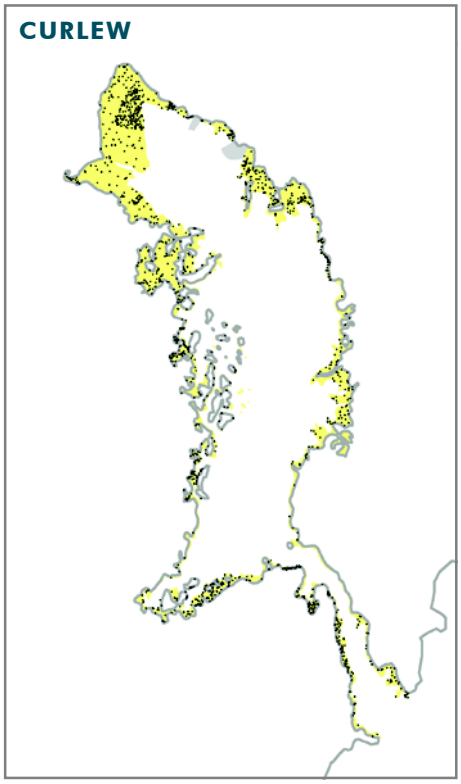


Figure 4.61.3 (iv): **Low tide waterbird distributions recorded at Strangford Lough, winter 1997–98**







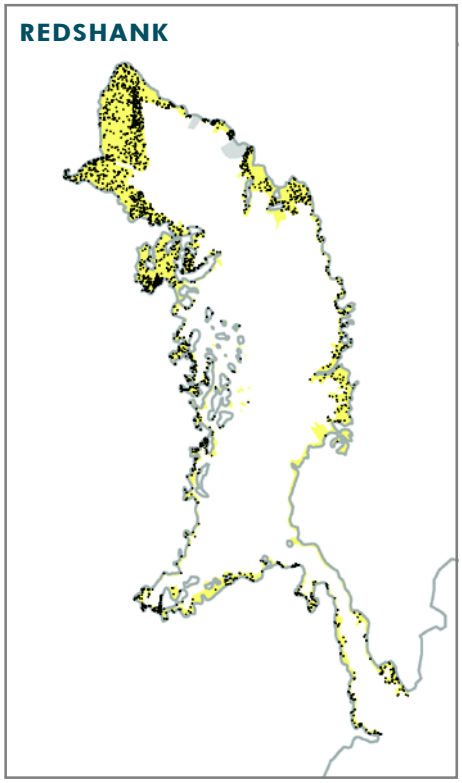


Figure 4.61.3 (v): **Low tide waterbird distributions recorded at Strangford Lough, winter 1997–98**

4.62 DUNDRUM BAY

LTC site code:	DU
Centre grid:	J4137
JNCC estuarine review site:	162
Habitat zonation:	393 ha intertidal, 68 ha subtidal, 3 ha nontidal
Statutory status:	Murlough ASSI
Winter waterbird interest:	Mute Swan, Shelduck, Common Scoter, Oystercatcher, Knot, Dunlin, Redshank

SITE DESCRIPTION

This small muddy estuary is at the confluence of the Blackstaff and Carrigs Rivers, which empty into the sea through a narrow channel between extensive sand dune systems and into a wide sandy bay. The estuary is surrounded largely by farmland but there are some small areas of saltmarsh at the northern and southern ends of the site. There is virtually no industrial development around Dundrum Bay, but there are problems with waste disposal around the site. Disturbance occurs as a result of recreational activities such as watersports and shooting. The development of aquaculture is also an issue of conservation concern at the site (C. Mellon pers. comm.).

COVERAGE AND INTERPRETATION

Dundrum Bay was covered for the scheme during the winter of 1996–97, counts being carried out during all four months. Figure 4.62.1 shows the positions of the five sections counted for the survey. The sandy outer bay was mostly not covered for this survey.

Dundrum Bay is not part of a designated SPA but does form a part of the Murlough ASSI. As Figure 4.62.2 shows, however, the ASSI also includes more of the outer beach as well as the important dune systems. Care should be taken in the interpretation of counts for Dundrum, as to whether they refer to the inner bay and/or outer bay.

Dundrum Bay is a relatively isolated site and movements between here and other estuarine sites are unlikely to occur on a daily basis. However, movement from the counted LTC site to and from the adjacent open coast seems likely.

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1996–97 are presented for five of the seven species

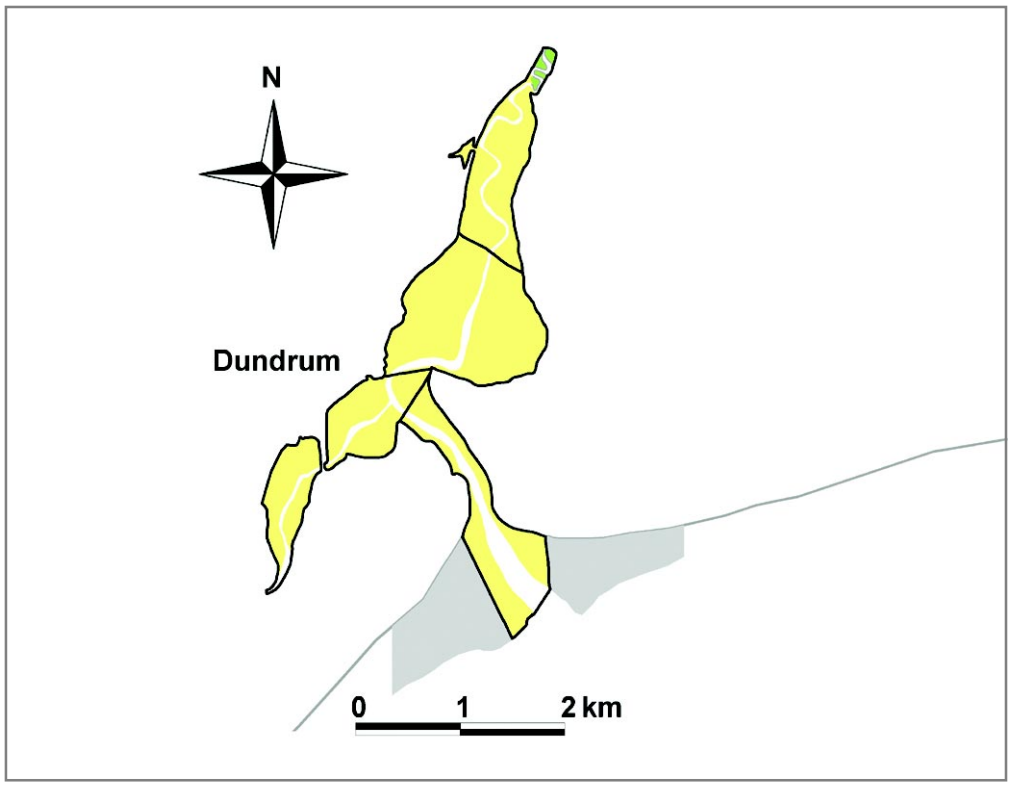


Figure 4.62.1: LTC sections at Dundrum Bay, winter 1996–97

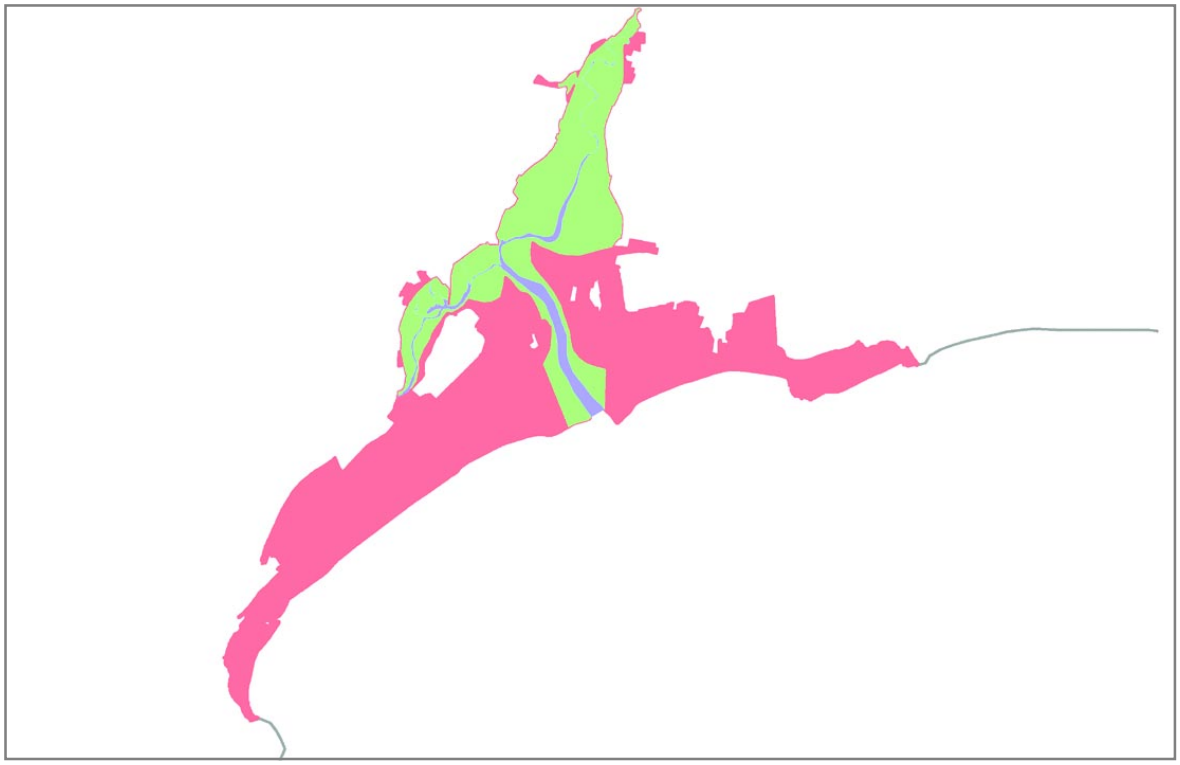


Figure 4.62.2: **LTC and ASSI boundaries, with overlap, at Dundrum Bay.**

of principal interest listed above. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.62.3). Of the remaining species, only a single Knot and no Common Scoter were recorded; these two species make greater use of the outer bay.

The totals map, supported by the weighted totals map, suggests a fairly even density of waterbirds around the site, but with the south-west corner holding the highest overall bird density. Oystercatchers and Dunlin were numerous on the widest part of the bay, east of Dundrum village, with Dunlin also in relatively high densities in the south-west corner. Mute Swans were mostly found at the south-west of the site, in contrast to Shelducks which were mostly at the north-eastern end. Redshanks were evenly distributed around the inner bay. Amongst other species, Light-bellied Brent Geese were most common in the central parts of the bay but Curlews were at a lower density here than at the north-east or south-west ends. Although the outlet channel to the outer bay was counted, only Oystercatchers were at all numerous along it.

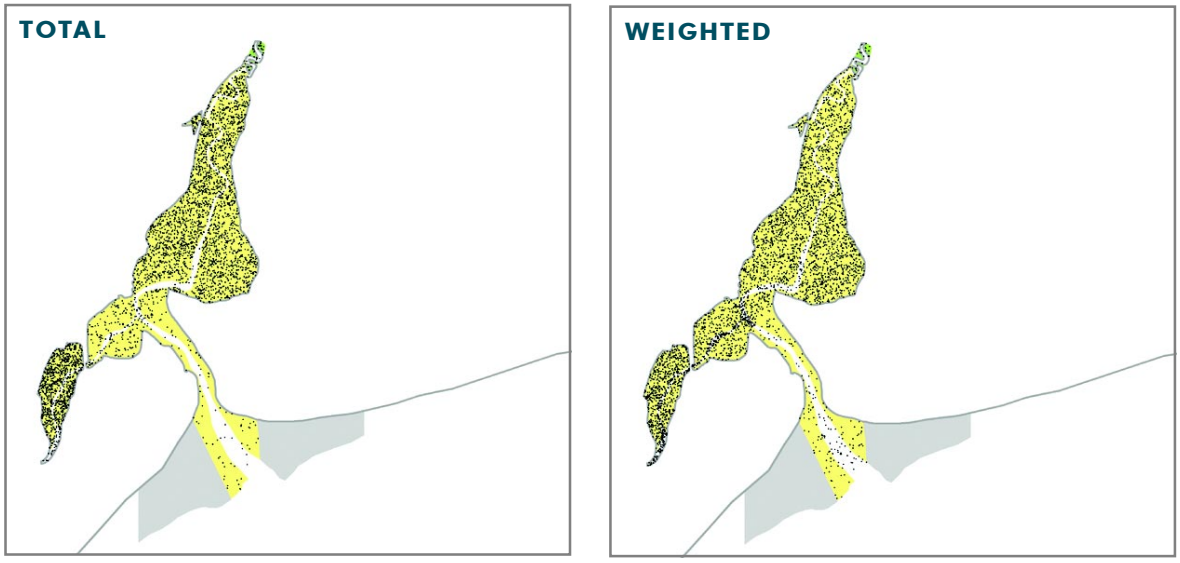


Figure 4.62.3 (i): **Low tide waterbird distributions recorded at Dundrum Bay, winter 1996–97**

Figure 4.62.3 (ii): **Low tide waterbird distributions recorded at Dundrum Bay, winter 1996–97**

5 Species Accounts

Andy Musgrove

INTRODUCTION

The following section provides a species-by-species summary of the information collected by the WeBS Low Tide Counts. The amount of information presented for each species varies. Full-page accounts are presented for 29 of the most common estuarine waterbird species. A further 32 species, generally less common or less dependent upon estuaries, are treated in reduced accounts. Amongst these reduced accounts are those for the gulls; although a very important component of estuarine waterbird assemblages, monitoring of gulls has been optional to date for WeBS volunteers (as discussed in Methods). A further 47 species (mostly rare species and escapes from captivity) are summarised in Table 5.1. It should be noted that the division of the recorded species into these three groups is based on a subjective assessment and has no wider relevance outside this publication.

Raptors and passerines are omitted from the species accounts. The presence or absence of raptors was recorded by counters in an analogous fashion to human activities and therefore these species are discussed in the Coverage section. In general, passerines were not recorded by the LTCs. However, during the counts of the North Norfolk Coast during the 1997–98 winter, a systematic study was made of the occurrence of selected passerines across the whole site; a brief summary of the results is given in the site account for the North Norfolk Coast.

OUTLINE OF THE FULL SPECIES ACCOUNTS

UK Status

A brief description is given of the status of the species within the UK, its distribution, habitat preferences, movements and food.

LTC Status

The proportions of sites, sections and visits on which each species was recorded is set out and any inherent patterns are discussed, along with the proportion of birds noted as feeding or roosting. The distribution maps for each site are considered and any underlying patterns in distribution are discussed in the light of known biological factors.

A map is presented depicting the mean site densities recorded at each site. The mean site density is defined as 'the sum of the mean counts for each section divided by the total area of suitable habitat surveyed'. The suitable habitat is determined in the same way as for the plotting of distribution maps, *i.e.* Dunlin on intertidal habitats, Goldeneye on water, etc. (as discussed in Methods). The mean site densities at each site are depicted using a series of four red dots of increasing diameter, the larger dots representing the higher densities. For further details on the actual values of the mean site densities, the National Organiser should be consulted. Additional blue dots (of a single size) are also placed on the maps to show any estuaries not covered by the LTCs during the period under review but which supported a five-year peak mean in excess of the 1% national importance threshold during the period 1994–95 to 1998–99 (as listed in Pollitt *et al.* 2000). This is to ensure that readers recall that further important sites may exist, notably the Wash and Morecambe Bay for many species. The between-site pattern depicted by the map is discussed. In some cases, the term 'Greater Thames' is used whilst discussing large-scale patterns; within the context of this book this is taken to mean all estuaries from the Deben in Suffolk to the Swale in Kent inclusive.

Any notably high site densities and site totals are mentioned. It should always be noted, however, that the methodology of the LTCs does not require counts to be made synchronously

across a site and so the potential for double-counting is greater than for the Core Counts, where a greater effort is made to achieve a level of synchronicity. The distribution of section densities is also given in broad terms, by presenting the 95th and 99th percentile values of section density as a broad example of what might be considered to be a high sectional density.

SPA network

The coverage of the UK SPA network achieved by the LTCs for the selected species is given. Additional sites for which recorded site totals of a species at low tide were in excess of the national 1% threshold value are highlighted. However, additional data would be required for most sites to assess whether numbers at a site regularly exceed national or international 1% thresholds and therefore merit further consideration of suitability for designation as an SPA. Furthermore, in most cases the LTC data in isolation are not suitable for assessing sites for designation. This is largely because the degree of synchronicity in site counting is less for some sites than is the case with Core Counts (see Methods).

REDUCED SPECIES ACCOUNTS

These cover many of the same aspects as listed above for the full accounts, but no map is presented and discussion of distribution is limited by the smaller dataset for each species.

TABULATED SPECIES

For each additional species, the number of sites and the number of visits for which the species was recorded is listed in Table 5.1, along with a very brief synopsis of its status.

Table 5.1: Summary information for additional species recorded by the WeBS Low Tide Counts: 1992–93 to 1998–99

Species	No of records	No of sites	Notes
Black-throated Diver *Gavia arctica*	6	3	Localised open-coast species
Red-necked Grebe *Podiceps grisegena*	9	7	Scarce in winter, notably at Firth of Forth
Black-necked Grebe *Podiceps nigricollis*	6	5	Scarce in winter, notably at several south coast estuaries
Fulmar *Fulmarus glacialis*	2	2	Numerous coastal breeder but winters out to sea
Bittern *Botaurus stellaris*	1	1	Scarce and elusive non-estuarine species
Great White Egret *Ardea alba*	3	1	Vagrant
Spoonbill *Platalea leucordia*	7	4	Several individuals winter on traditional southern estuaries
Greater Flamingo *Phoenicopterus ruber*	2	2	Presumed escape
Black Swan *Cygnus atratus*	1	1	Escape
Bean Goose *Anser fabalis*	2	2	Localised non-estuarine species
White-fronted Goose *Anser albifrons*	17	8	Non-estuarine species, although several key areas adjacent to estuaries, especially Severn and Swale
Bar-headed Goose *Anser indicus*	1	1	Escape
Snow Goose *Anser caerulescens*	3	2	Escape
Ross's Goose *Anser rossii*	3	1	Escape
Emperor Goose *Anser canagicus*	4	2	Escape
Barnacle Goose *Branta leucopsis*	15	7	Svalbard population winters on Solway but other records mostly attributable to naturalised populations
Black Brant *Branta bernicla nigricans*	3	2	Vagrant
Egyptian Goose *Alopochen aegyptiacus*	2	2	Naturalised in East Anglia, others may be more recent escapes
Ruddy Shelduck *Tadorna ferruginea*	4	4	Escape
Muscovy Duck *Cairina moschata*	1	1	Escape
Mandarin *Aix galericulata*	4	2	Naturalised in several areas but also frequent escape from captivity
American Wigeon *Anas americana*	2	2	Vagrant
Yellow-billed Duck *Anas undulata*	1	1	Escape
Red-crested Pochard *Netta rufina*	1	1	Escape, naturalised or wild immigrant from continent
Pochard x Tufted Duck *Aythya hybrid*	1	1	*Aythya* hybrids are not infrequent
Surf Scoter *Melanitta perspicillata*	4	1	Vagrant
Smew *Mergellus albellus*	23	12	Localised non-estuarine species
Ruddy Duck *Oxyura jamaicensis*	6	3	Naturalised non-estuarine species
Water Rail *Rallus aquaticus*	32	10	Widespread but elusive species, mostly non-estuarine
Black-winged Stilt *Himantopus himantopus*	2	1	Long-staying individual of debated origin
Little Stint *Calidris minuta*	13	9	Widespread in autumn with few remaining to overwinter
Curlew Sandpiper *Calidris ferruginea*	3	3	Widespread in autumn but very few overwinter
Jack Snipe *Lymnocryptes minimus*	27	12	Widespread but elusive species, mostly non-estuarine
Woodcock *Scolopax rusticola*	5	5	Common but principally terrestrial
Green Sandpiper *Tringa ochropus*	15	11	Widespread but mostly non-estuarine
Mediterranean Gull *Larus melanocephalus*	28	10	Widespread in small numbers
Little Gull *Larus minutus*	2	2	Scarce in winter except at a few traditional sites
Ring-billed Gull *Larus delawarensis*	6	2	Scarce in winter, mostly in the west
Yellow-legged Gull *Larus michahellis*	12	2	Widespread in small numbers, not exclusively coastal. Of debated taxonomic position
Iceland Gull *Larus glaucoides*	4	3	Scarce in winter, mostly in the north
Glaucous Gull *Larus hyperboreus*	7	3	Scarce in winter, mostly in the north
Kittiwake *Rissa tridactyla*	11	5	Winters out to sea
Sandwich Tern *Sterna sandvicensis*	3	2	Long-distance migrant, scarce in winter
Common Tern *Sterna hirundo*	1	1	Long-distance migrant, very scarce in winter
Guillemot *Uria aalge*	28	3	Winters out to sea
Razorbill *Alca torda*	9	4	Winters out to sea
Black Guillemot *Cepphus grylle*	21	1	Widespread open coast species in the north-west
Kingfisher *Alcedo atthis*	37	12	Widespread in small numbers, not confined to coast

LITTLE GREBE

TACHYBAPTUS RUFICOLLIS

The Little Grebe is a fairly common and widespread species that occurs in wetland habitats across much of the UK during the winter, although the species is scarce in upland areas and along the open coast (Lack 1986). Most birds are thought to be resident or locally dispersive, but some interchange with the continent does occur (Wernham *et al.* 2002). Little Grebes feed mostly by diving from the surface to catch insect larvae, molluscs, crustaceans, amphibian and small fish (Snow and Perrins 1998).

Little Grebes were recorded at 46 of the 62 sites under review. The species was localised within each site, however, being noted on only 14% of count sections and on only 8% of visits. The proportion of Little Grebes recorded as feeding at low tide was 99%, a similarly high figure to other grebes, divers and sea-ducks. An examination of the LTC distribution maps for Little Grebe shows that, in general, the species was mostly found in the more sheltered, inner parts of estuaries, either along the higher reaches of a main river channel or along narrow side channels, in small bays or on adjacent nontidal pools. Some of the sites from which Little Grebes were unrecorded at low tide, notably the Thames Estuary, are known to support the species (from WeBS Core Counts); the discrepancies are explained largely by differing site definitions (*i.e.* the birds occurring on nontidal habitat adjacent to the estuary which was counted for Core Counts but not for the LTCs).

Figure 5.1 shows the relative site densities at the review sites around the UK, suggesting that densities tended to be higher in southern England, notably around the Solent and in Cornwall. The sites supporting the highest densities were all relatively small. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.10 birds per hectare, with 1% of sections supporting densities in excess of 0.63 birds per hectare. At most sites during the period under review, monthly site totals of fewer than 30 Little Grebes were recorded.

A total of ten SPAs in the UK are designated for their value to wintering Little Grebes, of which seven overlap with the LTC sites within this review (the others being the Wash and two inland sites) (Stroud *et al.* 2001). Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the Deben Estuary and North Norfolk Coast.

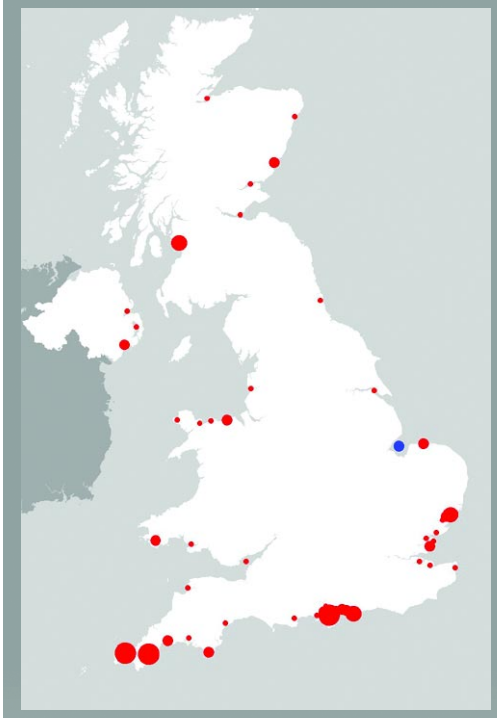


Figure 5.1: **Mean site densities of Little Grebe**

GREAT CRESTED GREBE

PODICEPS CRISTATUS

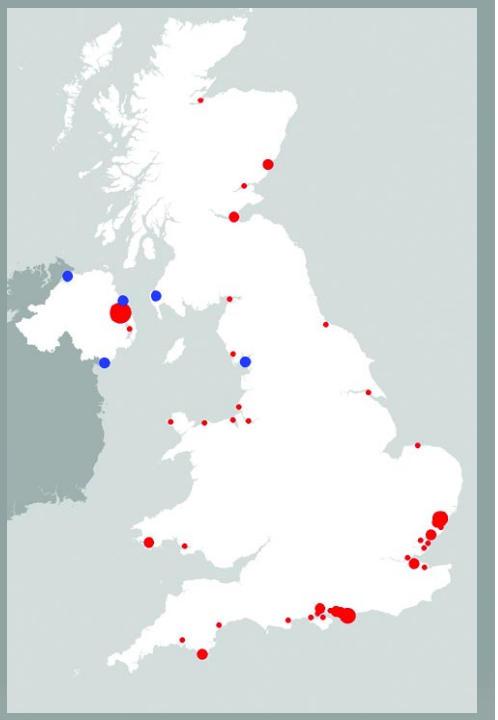


Figure 5.2: **Mean site densities of Great Crested Grebe**

Great Crested Grebes are widespread in lowland wetland habitats across the UK throughout the year, with inland still waters favoured in the summer but a degree of dispersal outside the breeding season, partly to form congregations on larger inland waterbodies but also to coastal habitats (Gibbons *et al.* 1993, Lack 1986). Some interchange with the continent has been demonstrated by ring-recoveries but data are sparse and the extent of this is unclear (Wernham *et al* 2002). Additionally, it appears that much migration occurs at night, hence most movement goes unobserved. Great Crested Grebes feed mainly on fish, although other foods such as aquatic invertebrates will be taken. Prey is taken following a surface dive followed by underwater pursuit (Snow and Perrins 1998).

Great Crested Grebes were recorded at 41 of the 62 sites under review. The species was relatively localised within each site, however, being noted on 17% of count sections and on only 8% of visits. The proportion of Great Crested Grebes recorded as feeding at low tide was 95%, a similarly high figure to other grebes, divers and sea-ducks. An examination of the LTC distribution maps for Great Crested Grebe shows little in the way of general distributional patterns. At most sites, the species was scarce and scattered. At sites where birds were more numerous, they were often quite widespread (such as on the Stour Estuary), but often certain areas held locally higher densities, such as the inner half of the west shore of Belfast Lough, or the inner parts of the Firth of Forth. Some of the sites where Great Crested Grebes were not recorded at low tide were of note, either given their size (*e.g.* Severn Estuary, Ribble Estuary) or given that they would have been expected to do so from an examination of WeBS Core Counts (*e.g.* Lavan Sands, Pegwell Bay). In some cases at least, the discrepancies may be explained largely by counters concentrating on intertidal habitats and not attempting (or being unable) to count distant offshore birds.

Figure 5.2 shows the relative site densities at the review sites around the UK. Belfast Lough is highlighted, with most other higher densities occurring in the south, especially around the Solent and Greater Thames. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.07 birds per hectare, with 1% of sections supporting densities in excess of 0.37 birds per hectare. The highest counts by far were made at Belfast Lough, where the peak was a synchronous count of 1,662 in November 1997. Few other site counts in excess of 100 birds were recorded.

A total of 17 SPAs in the UK are designated for their value to wintering Great Crested Grebes, of which 11 overlap with the LTC sites within this review (the others being Morecambe Bay, Lough Foyle and four inland sites) (Stroud *et al.* 2001). At no additional sites did low tide site totals exceed the 1% national threshold value.

CORMORANT
PHALACROCORAX CARBO

Outside the breeding season, Cormorants are widespread in coastal and inland lowland wetlands throughout the UK, although the distribution is much more localised around breeding colonies in the summer (Lack 1986, Gibbons *et al.* 1993). The Cormorants wintering in the UK are a mixture of dispersing resident breeders (the first-years dispersing further than the adults) and immigrant birds from the near-continent, the latter largely of the race *sinensis* (Wernham *et al.* 2002). Cormorants feed almost exclusively on fish, caught following a surface dive and underwater pursuit; the prey is usually brought to the surface before being consumed (Snow and Perrins 1998).

The LTCs confirmed that Cormorants are very widespread on estuaries in winter, the species being recorded at 60 of the 62 sites under review. Also, the species was relatively widespread within each site, being noted on 49% of count sections and on 23% of visits. The proportion of visits on which the species was recorded changed significantly (χ^2_3=26.55, P<0.001) over the course of the winter, declining from 25% in November and December to 21% by February. The proportion of Cormorants recorded as feeding at low tide was 44%, a relatively low figure compared to superficially similar species such as Great Crested Grebe or Red-breasted Merganser, for example. This may be due to differences in feeding biology but could equally be due to the very obvious appearance of a roosting Cormorant, which is unlikely to be overlooked or recorded as feeding. Examination of the LTC distribution maps for Cormorant shows that the species was widespread and fairly evenly scattered at most sites. At a few sites, birds were more localised, sometimes around the mouth (*e.g.* Strangford Lough, Conwy Estuary) or sometimes in more inner parts of a site (*e.g.* Moray Firth). The only two sites where Cormorants were not recorded during the period under review were the Adur Estuary and Lindisfarne; both of these sites were only partially covered by the scheme and it is likely that the species did indeed occur on all sites.

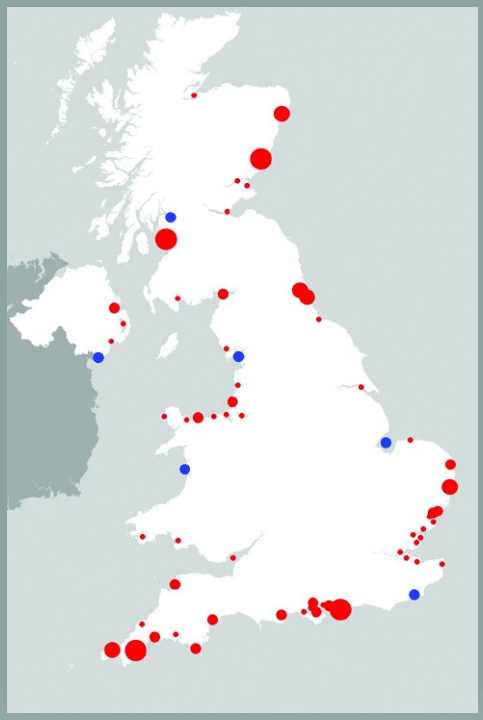


Figure 5.3: **Mean site densities of Cormorant**

Figure 5.3 shows the relative site densities at the review sites around the UK. Several of the sites supporting the highest densities were in the north, whilst there was a cluster of low densities around the Irish Sea and along the Bristol Channel. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.27 birds per hectare, with 1% of sections supporting densities in excess of 1.38 birds per hectare.

A total of 32 SPAs in the UK are designated for their value to wintering Cormorants, of which 23 overlap with the LTC sites within this review (the others being Morecambe Bay, Lough Foyle, the Wash and six inland sites) (Stroud *et al.* 2001). Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the Thames Estuary and Conwy Estuary.

LITTLE EGRET
EGRETTA GARZETTA

Figure 5.4: **Mean site densities of Little Egret**

The Little Egret is now a relatively common sight on estuaries in southern England and Wales. Numbers tend to peak in late summer and decline through the winter, and are at their lowest ebb in late spring and early summer. Only a very small proportion of the population occurs away from estuaries. The species is a recent colonist in the UK, following a range expansion northwards along the French Atlantic coast (Dubois *et al.* 2000). An influx of about 50 birds in autumn 1989 has been followed by ever increasing autumn influxes, with at least 1,650 present in autumn 1999. Winter numbers have also increased dramatically, from practically nil during the 1980s to about 900 in January 2000 (Musgrove 2002). Although numbers are also increasing rapidly in the Republic of Ireland, records from Northern Ireland are still sparse (Smiddy and O'Sullivan 1998, *Wildfowl & Wader Counts*). Most UK Little Egrets are derived by post-breeding dispersal from north-west France but locally bred birds are contributing an increasing proportion of the total (Combridge and Parr 1992, Lock and Cook 1998). Little Egrets feed mostly on small fish but also take a wide variety of other prey items such as amphibians and insects (Snow and Perrins 1998).

Wintering Little Egrets were recorded at 23 of the 62 sites under review, with the species being noted on 12% of count sections and on 5% of visits, the latter figure declining throughout the winter in line with the seasonal pattern described above (χ^2_3=11.51, P<0.01). The proportion of Little Egrets recorded as feeding at low tide was 95%, compared to only 68% for Grey Heron. This difference could have been due to a greater propensity of Grey Heron towards nocturnal foraging (Voisin 1991). Examination of the LTC distribution maps for Little Egret reveals no particular preference for inner or outer parts of sites. Most of the sites at which Little Egrets were not recorded during the period under review were outside its core southern range. However, a few estuaries within this range also lacked records, notably the Camel Estuary and Swale Estuary. Due to the massive range expansion during the course of the review period, occurrence and numbers depended greatly on which winter a site was covered by the scheme; these two sites were both covered in 1992–93 only.

Figure 5.4 shows the south-westerly distribution during the period under review, the highest densities being found around the Solent and in southern Devon and Cornwall. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.02 birds per hectare, with 1% of sections supporting densities in excess of 0.09 birds per hectare. Counts of 30 or more birds were made at Langstone Harbour, Chichester Harbour and the Fowey Estuary.

Only three SPAs in the UK have been designated for their value to wintering Little Egrets: Chichester and Langstone Harbours, Poole Harbour and Tamar Estuaries Complex (Stroud *et al.* 2001). At no additional sites did site totals exceed the 1% national threshold value.

GREY HERON
ARDEA CINEREA

Grey Herons are common and widespread in winter in wetland habitats throughout the UK, both inland and on the coast, although seldom numerous at any one site (Lack 1986). Most UK Grey Herons are resident but there is some dispersal from upland areas in the summer to the lowlands and the coast in winter. Prolonged cold periods can make feeding difficult and can trigger further movements. The resident breeding population is also supplemented in the winter by an unknown number of immigrants from northern Europe, especially Norway, Sweden, Denmark and the Netherlands (Wernham *et al.* 2002). Grey Herons feed mostly on fish, but will also take other prey such as amphibians, reptiles and small mammals (Snow and Perrins 1998).

Grey Herons were recorded at 61 of the 62 sites under review (only missed from Lavan Sands), with the species being noted on 38% of count sections and on 16% of visits. The proportion of visits on which Grey Herons were recorded dropped markedly and steadily over the course of the winter: the species was recorded on 20% of November visits, but this declined to just 10% of February visits (χ^2_3=154.56, P<0.001). This may be partly explained by winter mortality and partly by dispersal back to breeding colonies, as the species breeds early in the year. The proportion of Grey Herons recorded as feeding at low tide was 68%. This is a relatively low figure, especially in relation to Little Egret, and may be partly explained by the fact that Grey Herons feed at night more often (Voisin 1991). Examination of the LTC distribution maps for Grey Heron shows that the species was usually quite dispersed within an estuary. The widest intertidal flats were less frequently occupied, however, with narrower estuarine areas and saltmarshes occupied in preference.

Figure 5.5: **Mean site densities of Grey Heron**

Figure 5.5 shows the very widespread distribution of the species, with little suggestion of broad-scale geographical differences in estuarine densities. The highest recorded mean site densities were from the Wear and Irvine–Garnock Estuaries, both small sites. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.06 birds per hectare, with 1% of sections supporting densities in excess of 0.25 birds per hectare. The majority of site counts of over 50 Grey Herons during the scheme were made at the large site of Strangford Lough.

No SPAs in the UK have been designated for their value to wintering Grey Herons, given that the species is mostly non-migratory in the UK (Stroud *et al.* 2001). The population is very dispersed across the country, mostly inland, and numbers are never particularly high on any one site. No 1% threshold level has been set to date, due to the uncertainty in the winter population estimate, but in any case, no LTC sites reached the value of 300 that would be inferred from the rough Winter Atlas estimate. However, a (non-synchronous) count of 108 Grey Herons from Strangford Lough just exceeds 1% of the all-Ireland estimate.

MUTE SWAN

CYGNUS OLOR

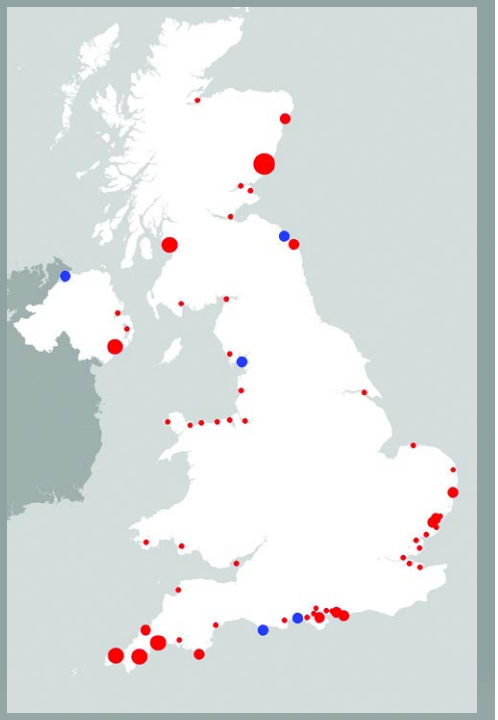


Figure 5.6: **Mean site densities of Mute Swan**

Mute Swans are a familiar sight on wetlands throughout the UK in the winter, mostly on lowland freshwater habitats although birds do also occur on estuaries (Lack 1986, Gibbons *et al.* 1993). Mute Swans in the UK are largely resident, making mostly local movements except during summer moult migrations to traditional sites. However, longer-distance movements can occur in severe winters, with some UK-bred birds moving to the south coast and across to France and other birds arriving from the near continent. Elsewhere in Europe, Mute Swans exhibit more clearly defined migratory behaviour (Wernham *et al.* 2002). Mute Swans feed mainly on aquatic vegetation, often taken by up-ending in water up to a metre deep, although the species will also graze on land (Snow and Perrins 1998).

Mute Swans were recorded at 55 of the 62 sites under review, with the species being noted on 23% of count sections and on 10% of visits. The proportion of Mute Swans recorded as feeding at low tide was 73%. Examination of the LTC distribution maps for Mute Swan shows that the species was usually fairly localised within an estuary, with the major concentrations occurring around towns (*e.g.* Bideford, Southampton, Ipswich, etc.) or on adjacent freshwater habitats (such as the Emsworth and Langstone Mill Ponds by Chichester Harbour). Other concentrations were recorded in the vicinity of grain-unloading docks, as on the Humber Estuary, where there is an abundance of food. In more natural locations, fewer birds were found on the wider intertidal flats and most birds occurred on the inner estuaries.

Figure 5.6 shows the widespread distribution of the species, with little suggestion of broad-scale geographical differences in estuarine densities. The highest site density was recorded at Montrose Basin. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.29 birds per hectare, with 1% of sections supporting densities in excess of 2.75 birds per hectare. The highest site counts were made at the Humber Estuary, with a synchronous count of 311 in December 1998.

No SPAs in the UK have been designated for their value to wintering Mute Swans, given that the species is essentially non-migratory (Stroud *et al.* 2001). However, site totals exceeding the 1% national threshold values were recorded at Belfast Lough, Strangford Lough, Dundrum Bay and the Humber Estuary.

DARK-BELLIED BRENT GOOSE

BRANTA BERNICLA BERNICLA

Dark-bellied Brent Geese are the most numerous of the three subspecies of Brent Goose occurring in the UK (Kershaw and Cranswick 2003). Most birds arrive in October and remain until May when they depart to breeding grounds in the Russian Arctic. In the UK, the geese are almost entirely confined to estuaries and surrounding grassland habitats to the south-east of a line from the Humber Estuary to the Burry Inlet (Lack 1986, *Wildfowl & Wader Counts*). In the spring and autumn, many use the Wadden Sea as a staging ground, but in mid-winter most of the population is found in Britain and on the Atlantic coast of France (Ebbinge *et al.* 1999). Dark-bellied Brent Geese traditionally feed on intertidal habitats and saltmarshes by grazing, pulling up underwater plants and by eating drifting eel-grass and green algae (Snow & Perrins 1998). However, they have increasingly been making use of coastal grasslands (including amenity grassland such as playing fields) and arable crops (Vickery *et al.* 1995).

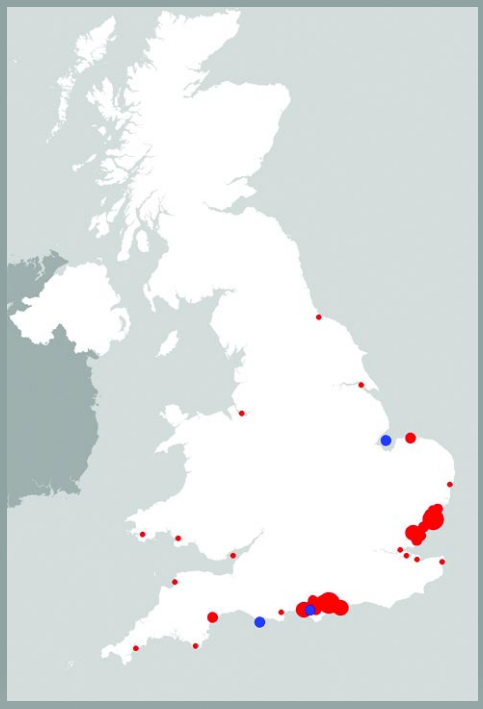


Figure 5.7: **Mean site densities of Dark-bellied Brent Goose**

Dark-bellied Brent Geese were recorded at 33 of the 62 sites under review. However, the geese were noted from 27% of count sections and on 19% of visits and were thus rather widespread in those areas where they occurred. The proportion of birds recorded as feeding at low tide was 79%. Examination of the LTC distribution maps for Dark-bellied Brent Geese shows that within the core range of the species (*i.e.* from the Solent to the Wash) the geese were very widespread within almost all sites, although local concentrations did occur, especially on nontidal grassland (such as at Farlington Marshes in Langstone Harbour, at Pagham Harbour and the Beaulieu Estuary). On the North Norfolk Coast, most geese occurred on saltmarsh with relatively few on intertidal habitats. Towards the periphery of the range, the birds became more localised within each site (*e.g.* at the Humber Estuary, Burry Inlet and Exe Estuary). Of the sites from which Dark-bellied Brent Geese were not recorded, most were outwith the core south-eastern range. Within the core range, the only major site from which the species was not recorded was Breydon Water.

Figure 5.7 shows the distribution of the birds clearly, with the major concentrations around the Solent and the Greater Thames. At a sectional level, 5% of all sections surveyed supported densities in excess of 2.15 birds per hectare, with 1% of sections supporting densities in excess of 6.49 birds per hectare. Counts exceeding the current 1% threshold value were recorded at 20 sites, although most of the counts in excess of the international 1% threshold value of 3,000 were from just four sites: Blackwater Estuary, Chichester Harbour, Langstone Harbour and North Norfolk Coast.

A total of 19 SPAs have been designated for their value to wintering Dark-bellied Brent Geese (Stroud *et al.* 2001). All of these SPAs overlap with the LTC sites with the exception of the Wash and Chesil Beach & the Fleet. In addition to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at Pagham Harbour.

LIGHT-BELLIED BRENT GOOSE

BRANTA BERNICLA HROTA

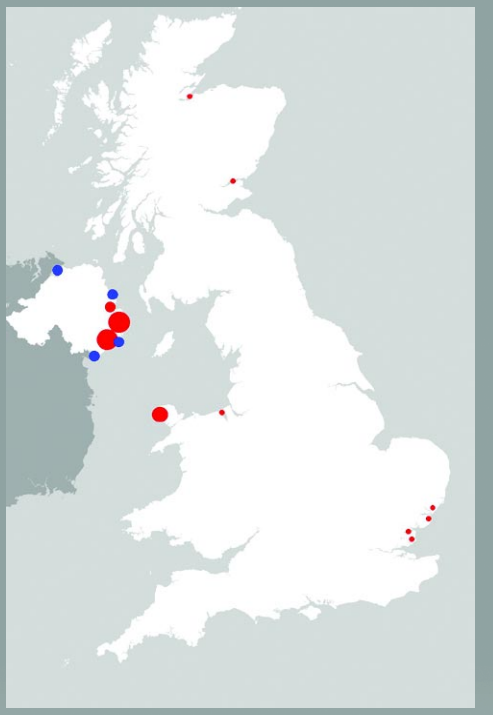


Figure 5.8: **Mean site densities of Light-bellied Brent Goose**

Light-bellied Brent Geese occur in the UK in two separate populations. The more numerous of these breeds in the eastern Canadian Arctic and winters almost exclusively in Ireland (Merne *et al.* 1999), whereas another population breeds on Svalbard and winters around the North Sea (Clausen *et al.* 1999). Within the UK, the latter population only occurs with regularity at Lindisfarne. Light-bellied Brent Geese at other east coast sites also derive from this population. The following discussion mostly refers to the Canadian/Irish population. Light-bellied Brent Geese arrive in Northern Ireland in September and October, with most birds making first for Lough Foyle or Strangford Lough. The latter site regularly supports over 75% of the entire flyway population of about 20,000 birds. Numbers peak in the province in October and November and then decline over the winter as the population redistributes, mostly into the Republic of Ireland with small numbers making it to western Britain and France (O'Briain and Healy 1991, *Wildfowl & Wader Counts*). Most birds leave in March. Many birds stage in spring and autumn in Iceland on route to and from the breeding grounds (Gardarsson and Gudmundsson 1997). On arrival at Strangford Lough, the geese feed initially on *Zostera*, but as the winter progresses other foodsources are increasingly utilised, including agricultural land (Andrews *et al.* 1996).

Light-bellied Brent Geese were recorded at 11 of the 62 sites under review, with records from 8% of count sections and on 10% of visits. The proportion of visits on which the geese were recorded rose significantly (χ^2_3=19.45, P<0.001) over the course of the winter, averaging 8% in November compared to 11% in February, as birds disperse within Strangford Lough as the winter progresses. The proportion of birds recorded as feeding at low tide was 94%, perhaps suggesting a higher reliance on intertidal habitats than Dark-bellied Brent Geese. Five of the sites apparently involved the Canadian flyway (Inland Sea, Dee Estuary and three in Northern Ireland) and the other six involved small numbers of birds (up to three birds per site) of the Svalbard population, along the east coast from the Moray Firth to the Crouch-Roach Estuary. Of the sites not recording Light-bellied Brent Geese, the key absence was the lack of records from Lindisfarne. This site was only partially covered by the LTCs in 1992–93, when the geese obviously made use of the uncounted main part of the site but were unrecorded at the adjacent surveyed Budle Bay. Examination of the LTC distribution maps for Light-bellied Brent Geese reveals little in underlying principles given the concentration at Strangford Lough. At those sites where birds occurred, they tended to be widespread.

The Republic of Ireland should be remembered when considering Figure 5.8; key sites in the Republic are distributed around the whole coast, with Dublin Bay the most important single site. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.09 birds per hectare, with 1% of sections supporting densities in excess of 1.29 birds per hectare. Strangford Lough totals tended to be highest in November, although the numbers by then were much lower than typical peak counts earlier in the autumn when birds first arrive.

Seven SPAs have been designated for their value to wintering Light-bellied Brent Geese, six in Northern Ireland plus Lindisfarne (Stroud *et al.* 2001). Although it is not designated an SPA, site totals exceeding the 1% national threshold value were recorded at Dundrum Bay.

SHELDUCK
TADORNA TADORNA

Shelducks are familiar estuarine birds throughout the UK. The vast majority of the population winters on intertidal habitats, with only small numbers at inland sites (Lack 1986). Movements of Shelducks are complex. Most adults make a post-breeding moult migration to Helgoland Bight in northwest Germany, although some moult in smaller flocks on certain UK estuaries such as at Bridgwater Bay on the Severn Estuary. Juveniles stay around their natal areas until the autumn when they disperse, mostly moving south. At the same time, the birds moulting in Germany start to return, although the movement is staggered and many birds continue to move into the UK, especially the south-east, over the course of the winter (Wernham *et al.* 2002). Shelducks feed mostly on intertidal molluscs and crustaceans, obtained by wading in shallow water or on wet mud (Snow and Perrins 1998).

Shelducks were recorded at 60 of the 62 sites under review, with the species being noted on 66% of count sections and on 44% of visits, making Shelduck the most widespread wildfowl species in UK intertidal habitats. The movement of Shelducks back from the continent into the UK over the course of the winter was apparent from the proportion of visits on which the species was recorded each month, increasing steadily from 35% in November to 52% in February (χ^2_3=216.08, P<0.001). The proportion of Shelducks recorded as feeding at low tide was 85%, much higher than the dabbling ducks and more in line with the estuarine waders. Examination of the LTC distribution maps for Shelduck shows that at many sites the species was widespread and fairly evenly distributed (*e.g.* Chichester Harbour, Langstone Harbour, Blackwater Estuary, Colne Estuary, Deben Estuary, etc.). However, at other sites, the birds were more localised, numbers being concentrated on inner parts of sites with fewer in the outer estuary. This was presumably linked to the occurrence of sand and mud, with extensive sandflats (such as found at the Alt Estuary, Ribble Estuary, Duddon Estuary, Conwy Estuary, Swale Estuary, *etc.*) unsuitable. Only at two sites, the relatively small and incompletely surveyed Adur and Tyne Estuaries, was the species not recorded.

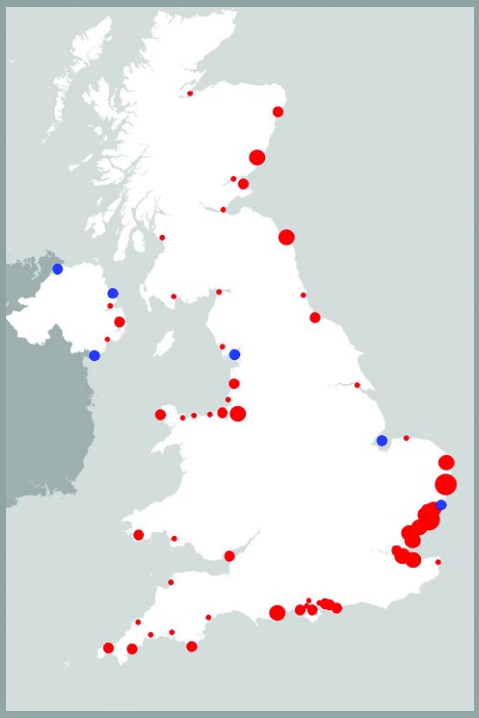


Figure 5.9: **Mean site densities of Shelduck**

Figure 5.9 shows that Shelducks were clearly widespread but that site densities were higher on the east coast than in the west. This is due to the generally muddier nature of east coast estuaries and to the closer proximity to the moulting site on the near continent. At a sectional level, 5% of all sections surveyed supported densities in excess of 1.48 birds per hectare, with 1% of sections supporting densities in excess of 3.71 birds per hectare. Despite high densities in the east, many of the highest site totals of Shelducks were recorded in the west, notably the Dee, Mersey and Severn Estuaries and Strangford Lough.

A total of 32 SPAs in the UK have been designated for their value to wintering Shelducks (Stroud *et al.* 2001). Of these, five were not surveyed by the LTCs during the period under review: Alde-Ore Estuary, Lough Foyle, Lough Neagh & Lough Beg, Morecambe Bay and the Wash. Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the Deben Estuary, Blyth Estuary (Suffolk), Crouch-Roach Estuary and Dundrum Bay.

WIGEON

ANAS PENELOPE

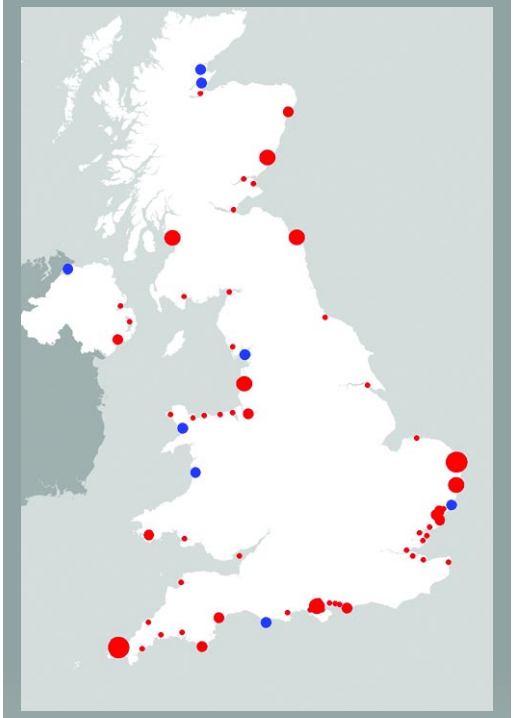


Figure 5.10: **Mean site densities of Wigeon**

Although scarce as a breeding species, the Wigeon is now thought to be the most numerous species of wildfowl found in the UK in winter, following an increase in its numbers coupled with a concurrent decline in the Mallard population (Kershaw and Cranswick 2003). Although many of the largest flocks occur on estuaries, Wigeon are also found widely inland, with some sites also holding large flocks (Lack 1986, *Wildfowl & Wader Counts*). Wigeon wintering in the UK originate from Fennoscandia, Russia and, to a lesser extent, Iceland (Wernham *et al.* 2002). Most birds arrive in the UK in October and November and leave again from late March to early April. However, there is also known to be a high degree of turnover and some redistribution throughout the winter. Wigeon feed mostly on vegetable matter, obtained both from the surface of the water and by grazing on land (Snow and Perrins 1998).

Wigeon were recorded at 58 of the 62 sites under review, with the species being noted on 42% of count sections and on 22% of visits. The four sites at which Wigeon were unrecorded included the three small (and partially covered) estuaries of the Adur, Wear and Tyne, and the larger Alt Estuary. The lack of any Wigeon at the Alt was linked to the open, sandy habitat present but was notable given the huge numbers on the adjacent sites of the Ribble, Dee and Mersey Estuaries. There was no appreciable difference between months in the proportion of visits on which the species was recorded. The proportion of Wigeon recorded as feeding at low tide was 42%, much lower than the majority of estuarine waders but very similar to Teal and Pintail. Wigeon feed on vegetable material either by grazing (including at night) or by picking at floating vegetation as the tide rises and falls and hence there can be less of a reliance on the low tide period for feeding. Examination of the LTC distribution maps for Wigeon fails to reveal any clear patterns. At some sites, birds were widespread and evenly distributed (*e.g.* Stour Estuary), whereas at others, birds were more localised, although potentially still as abundant (*e.g.* Humber Estuary). Distribution therefore appears to have been influenced by highly local factors.

Figure 5.10 shows the widespread distribution of the species on UK estuaries, with little geographical difference in site densities apparent. At a sectional level, 5% of all sections surveyed supported densities in excess of 2.96 birds per hectare, with 1% of sections supporting densities in excess of 9.20 birds per hectare. The only counts made at low tide that were in excess of the current international 1% threshold value of 12,500 were from the Ribble Estuary.

A total of 38 SPAs in the UK have been designated for their value to wintering Wigeon (Stroud *et al.* 2001). Of these, 16 were not surveyed by the LTCs during the period under review, including six estuaries: Alde-Ore Estuary, Cromarty Firth, Dornoch Firth and Loch Fleet, Lough Foyle, Morecambe Bay and the Wash. Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the Burry Inlet and Cleddau Estuary.

Several thousand pairs of Teal breed in the UK but, whilst these are thought to mostly remain during the winter, they are heavily outnumbered by immigrants from further north (Gibbons *et al.* 1993, Kershaw and Cranswick 2003). Although many coastal sites are of great importance, this is also a widespread species inland during the winter, both in large flocks and scattered more widely at low density (Lack 1986). Most of the Teal wintering in the UK breed from Iceland across to northwest Siberia. Both the autumn arrival and spring departure tend to be quite protracted. Teal are known to be highly responsive to local conditions, and cold weather in particular can cause rapid redistribution of birds, especially south into France and Iberia (Wernham *et al.* 2002). Teal are omnivorous, but feed mostly on seeds during the winter, filtering through mud with their bills; most feeding takes place at night (Snow and Perrins 1998).

Teal were recorded at 58 of the 62 sites under review, with the species being noted on 35% of count sections and on 18% of visits. The four sites at which the species was unrecorded were the Alt Estuary, Camel Estuary, Pegwell Bay and Ythan Estuary. There was no difference between months in the proportion of visits on which the species was recorded. The proportion of Teal recorded as feeding at low tide was 39%, much lower than the majority of estuarine waders but very similar to Wigeon and Pintail. Examining the LTC distribution maps for Teal shows a general preference for sheltered creeks and channels, including along larger river channels such as the Ribble Estuary, with fewer on open sandy coastlines. Saltmarshes (notably on the Dee Estuary and the North Norfolk Coast) and adjacent freshwater wetlands (such as Trimley Marshes on the Orwell Estuary) were also occupied by higher densities of the species.

Figure 5.11 shows the widespread distribution of the species on UK estuaries, with little geographical difference in site densities apparent. At a sectional level, 5% of all sections surveyed supported densities in excess of 1.55 birds per hectare, with 1% of sections supporting densities in excess of 5.88 birds per hectare. The highest site totals were consistently recorded at the Mersey Estuary, although counts in excess of the current international 1% threshold value of 4,000 were also recorded at the Dee Estuary.

A total of 30 SPAs in the UK have been designated for their value to wintering Teal (Stroud *et al.* 2001). Of these, 16 were not surveyed by the LTCs during the period under review, including four estuaries: Alde-Ore Estuary, Dornoch Firth and Loch Fleet, Lough Foyle and Morecambe Bay. Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at Pagham Harbour.

TEAL
ANAS CRECCA

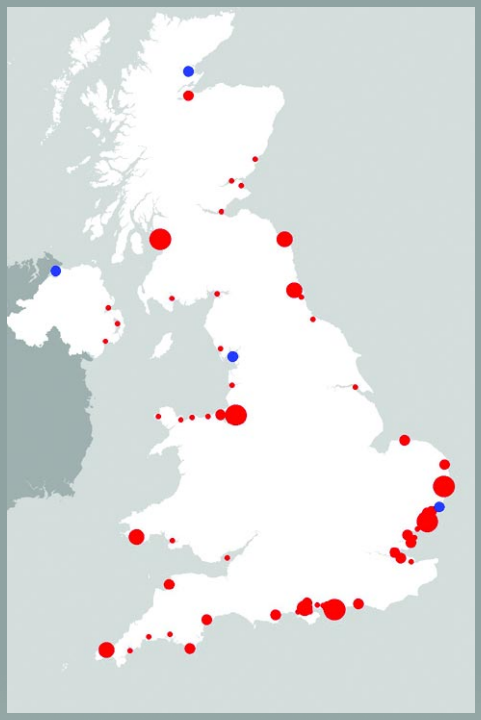


Figure 5.11: **Mean site densities of Teal**

MALLARD

ANAS PLATYRHYNCHOS

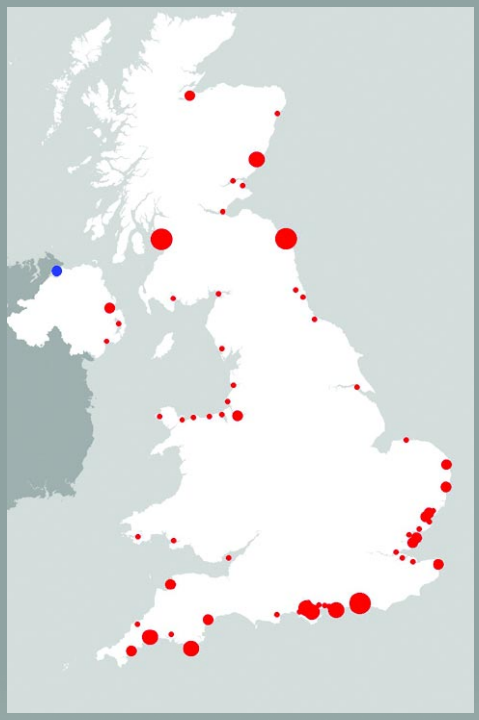


Figure 5.12: **Mean site densities of Mallard**

The Mallard is the most widespread and familiar species of wildfowl in the UK, occurring in almost every conceivable wetland habitat. The wintering population is derived from both resident birds, which tend to be largely sedentary or locally dispersive, and immigrants from northern Europe (from Iceland to Russia) (Wernham *et al.* 2002). The picture is complicated by deliberate releases of large numbers of reared stock for shooting (Harradine 1985). Mallards are omnivorous and highly opportunistic feeders, both in the water and on land (Snow and Perrins 1998).

Mallards were recorded at 61 of the 62 sites under review, with the species being noted on 55% of count sections and on 29% of visits. The only site at which the species was unrecorded was the Hayle Estuary. There was no difference between months in the proportion of visits on which the species was recorded. The proportion of Mallards recorded as feeding at low tide was 56%, notably higher than the other dabbling ducks and perhaps influenced by the reliance of the species on feeding by man. Examining the LTC distribution maps for Mallard shows the species to be widespread at some sites but more localised at others. Many were found along river channels, as with the other dabbling ducks, but particularly high concentrations occurred around towns, car-parks and the like, where local birds gather to be fed.

Figure 5.12 shows the widespread distribution of the species on UK estuaries, with little geographical difference in site densities apparent, although lower densities were found at most sites around the Irish Sea and along the east coast from Norfolk north to the Tyne Estuary. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.96 birds per hectare, with 1% of sections supporting densities in excess of 3.14 birds per hectare.

A total of 14 SPAs in the UK have been designated for their value to wintering Mallards (Stroud *et al.* 2001). Of these, seven were not surveyed by the LTCs during the period under review, including three estuaries: Lough Foyle, Morecambe Bay and the Wash. At no additional sites did site totals exceed the 1% national threshold value.

The Pintail is fairly widespread but local in the UK in winter, with the majority of birds found on a small number of key sites, mostly estuaries (Lack 1986). Most UK wintering birds originate from Russia, as well as from the Baltic States, Fennoscandia and Iceland (Wernham *et al.* 2002). Pintail feed on a wide variety of both plant and animal material, mostly obtained from underwater mud by up-ending, although the species will also feed on land (Snow and Perrins 1998).

Pintail were recorded by the LTCs from 40 of the 62 sites under review, although the degree of localisation within each site was striking, with records from only 16% of count sections and only 7% of visits. There was little difference between months in the proportion of visits on which the species was recorded, although the proportion was slightly lower in November (χ^2_3=8.35, P<0.05). The proportion of Pintail recorded as feeding at low tide was 40%, a relatively low value but very similar to that for Wigeon and Teal. These species find more suitable feeding conditions on a rising or falling tide and/or at night. An examination of the LTC distribution maps for Pintail reinforces the fact that this was usually either a scarce species or, when more numerous, highly localised within a site. Pintail generally preferred inner, more sheltered parts of estuaries, often where there are saltmarshes or adjacent grazing marshes. Birds often loaf at low tide along main river channels, such as in the inner Dee Estuary, at Pagham Harbour and at Wigtown Bay.

Figure 5.13 shows the relative site densities at the review sites around the UK, showing a wide scatter of higher density sites, although higher densities were present at several East Anglian sites. The low densities of birds in Northern Ireland were notable, given the prominence of some other sites on the eastern side of the Irish Sea. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.20 birds per hectare, with 1% of sections supporting densities in excess of 1.00 birds per hectare. Counts in excess of the 1% international threshold of 600 birds were recorded at eight sites, the highest totals being recorded at the Dee Estuary, Duddon Estuary and Burry Inlet.

A total of 25 SPAs in the UK are designated for wintering Pintail, of which 17 overlap to some extent with the LTC sites within this review (Stroud *et al.* 2001). Of the remaining eight sites, three are estuarine (the Wash, Morecambe Bay and Cromarty Firth) and five are inland. At no additional sites did site totals exceed the 1% national threshold value.

PINTAIL
ANAS ACUTA

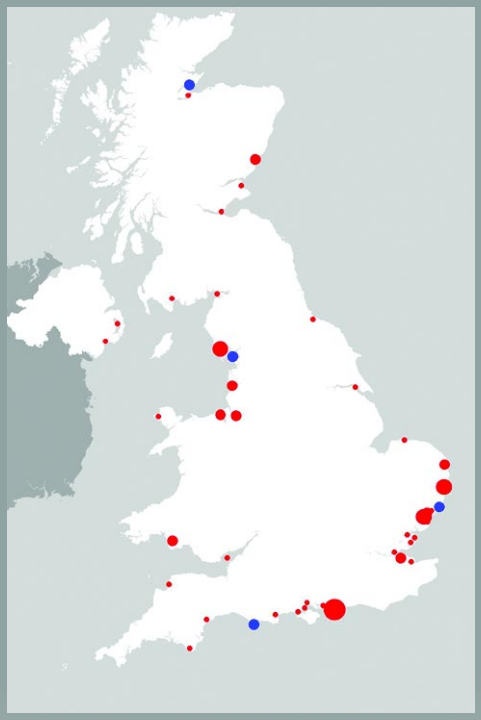


Figure 5.13: Mean site densities of Pintail

EIDER

SOMATERIA MOLLISSIMA

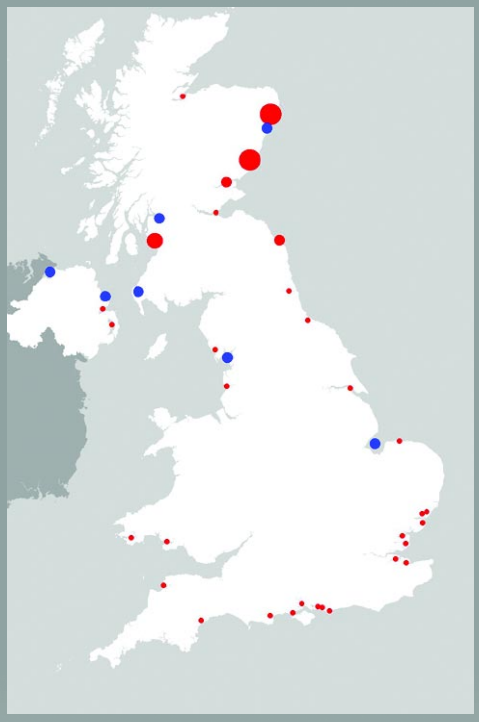


Figure 5.14: **Mean site densities of Eider**

The Eider is the most numerous sea-duck in UK waters and is often found close inshore. Like most sea-ducks, it has a predominantly northern distribution in the UK with Scotland accounting for the majority of the birds. Except for Northumberland, Northern Ireland and Walney Island in Cumbria, birds are found widely but relatively sparsely around the rest of the coast. Eiders frequent both estuaries and more open coast, although they seldom stray inland (Lack 1986). The majority of our wintering birds also breed here. Some are sedentary, whilst others move to favoured sites in the winter, notably at the mouth of the Firth of Tay. Only relatively small numbers are thought to arrive from the larger Fennoscandian and Russian population that winters mostly in the Baltic Sea and northern Wadden Sea (Wernham *et al.* 2002). Eiders feed mostly upon molluscs, as well as crustaceans and echinoderms, generally obtained by surface-diving (Snow and Perrins 1998).

Eiders were recorded at 32 of the 62 sites under review, with the species being noted on 11% of count sections and on 4% of visits. There was no difference between months in the proportion of visits on which the species was recorded. The proportion of Eiders recorded as feeding at low tide was 42%, a value more similar to the dabbling ducks than to most sea-ducks and seemingly contrary to the statement in Lack (1986) that 'In estuaries Eiders feed at low tide and roost over the high tide period.' However, the feeding *vs* roosting figures were heavily biased by the single flock at the mouth of the Firth of Tay that made up a large proportion of the total birds recorded by the scheme. Of the sites where Eiders were not recorded by the scheme, most were in the south, but the list also included more northerly sites such as the Solway Firth (inner estuary only), Wigtown Bay and Eden Estuary. Examining the LTC distribution maps for Eider, there was clearly a preference for outer parts of estuaries. At the Ythan Estuary, Irvine–Garnock Estuary and Montrose Basin, each of which has a constricted exit to the sea, Eiders were found on lower stretches of the main river channels, whilst at Belfast Lough and the Firth of Tay, with wide mouths, birds congregated around the outer reaches of both shores. Birds were more generally distributed around the Firth of Forth, which is rather non-estuarine in character for much of its length. In the south, the smaller numbers of birds tended to be found mostly around the mouths of sites also.

Figure 5.14 shows the northerly distribution of this species, with a scattering of lower densities elsewhere around the coast; the highest mean site densities were recorded at Montrose Basin and the Ythan Estuary. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.13 birds per hectare, with 1% of sections supporting densities in excess of 3.83 birds per hectare. The highest actual counts made at low tide were from the Firth of Tay.

A total of eight SPAs in the UK have been designated for their value to wintering Eiders (Stroud *et al.* 2001). Of these, neither Morecambe Bay nor Lough Foyle was surveyed by the LTCs during the period under review. At no additional sites did site totals exceed the 1% national threshold value.

GOLDENEYE

BUCEPHALA CLANGULA

The Goldeneye is a scarce breeding species in the UK but is much more widespread during the winter across much of the UK, both on the coast and inland (Gibbons et al. 1993, Lack 1986). Most of our wintering birds breed in Fennoscandia and Russia, although the small number of British breeders is also thought to remain throughout the winter. Birds make a post-breeding movement to parts of the Baltic Sea and then later travel to their wintering grounds, mostly from November onwards. Return migration occurs from February onwards, although birds often remain relatively late into the spring (Wernham *et al.* 2002). Goldeneyes feed on molluscs, crustaceans and insect larvae, obtained by surface-diving in water of depths of up to four metres (Snow and Perrins 1998).

Goldeneyes were recorded at 47 of the 62 sites under review, with the species being noted on 28% of count sections and on 12% of visits. There was a relatively late arrival, with the species recorded on only 8% of visits in November compared to 13–14% during the rest of the winter (χ^2_3=65.05, P<0.001). The proportion of Goldeneyes recorded as feeding at low tide was 95%, which is comparable to most other diving ducks and similar species. There was no clear pattern to the 15 sites where Goldeneyes were not recorded. Examining the LTC distribution maps for Goldeneye, a variety of patterns were observed. At many sites, Goldeneyes were few in number but where they were more numerous, the species was generally distributed quite widely around a site. At some sites, most were found along the upper reaches of channels (*e.g.* Stour and Orwell Estuaries) whilst the lower reaches were more densely occupied elsewhere. In a few cases, large concentrations occurred in very restricted areas, notably on the Humber Estuary and Moray Firth. Such concentrations were related to the habit of the species to gather at sewers and food processing plants, where the birds often feed on waste grain. Such concentrations were transitionary, depending upon the provision of the food source; concentrations which used to be observed around Edinburgh on the Firth of Forth no longer occur following improved sewage treatment systems.

Figure 5.15 shows the widespread distribution of this species on UK estuaries, with a tendency for the highest densities to be in the north and low densities in Wales and the south-west. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.29 birds per hectare, with 1% of sections supporting densities in excess of 1.22 birds per hectare. Actual counts made at low tide that exceeded the current 1% British or Irish national threshold values were recorded at seven sites, the highest site total being recorded at the Moray Firth.

A total of 15 SPAs in the UK have been designated for their value to wintering Goldeneyes (Stroud *et al.* 2001). Of these, five are not covered at all by the LTCs, those being Morecambe Bay and four inland sites. Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the North Norfolk Coast.

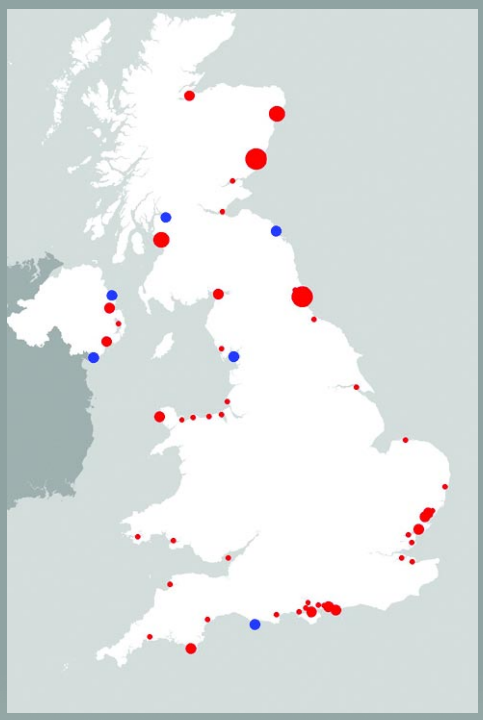


Figure 5.15: **Mean site densities of Goldeneye**

RED-BREASTED MERGANSER

MERGUS SERRATOR

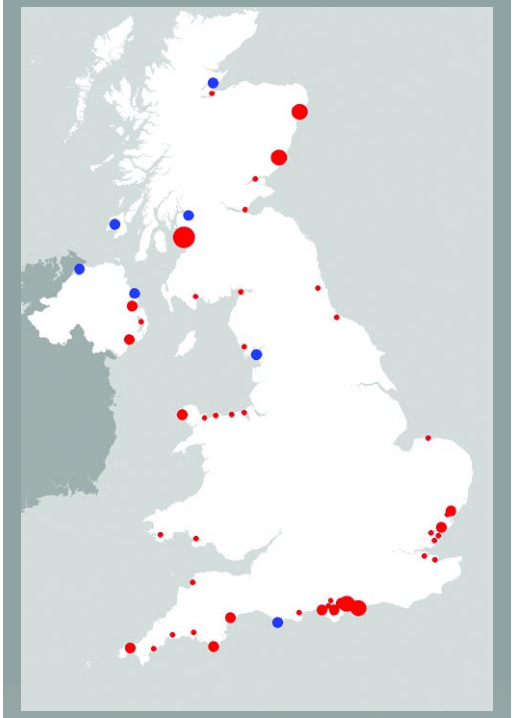


Figure 5.16: **Mean site densities of Red-breasted Merganser**

Red-breasted Mergansers breed locally in much of north-western Britain, especially in coastal areas (Gibbons *et al.* 1993). The winter distribution is much wider, with birds found around all coasts (both estuarine and open) but seldom inland (Lack 1986). The wintering population is made up of UK breeders, which are largely sedentary and disperse to coasts near to their breeding locations, plus immigrants which appear to be mostly Icelandic in the north but may be more from north-east and central Europe along the south and east coasts of England. Some UK birds congregate at moulting sites in August but immigrants are not thought to appear until October and peak in December (Wernham *et al.* 2002). Red-breasted Mergansers feed on fish, obtained by foraging from the surface with head submerged and subsequent diving (Snow and Perrins 1998).

Red-breasted Mergansers were recorded at 46 of the 62 sites under review, with the species being noted on 33% of count sections and on 14% of visits; the latter figure did not vary significantly during the course of the winter. The proportion of Red-breasted Mergansers recorded as feeding at low tide was 91%, which was similar to most other diving ducks. There was no clear pattern to the sites not recording Red-breasted Mergansers, although the species was notable by its absence from a number of the largest sites (Severn, Thames, Humber, Ribble and Mersey Estuaries). From looking at the LTC distribution maps for Red-breasted Merganser it can be seen that the species occurred in a highly dispersed and evenly distributed pattern on most sites. However, at a few sites the species showed a preference for the mouth of the estuary. Concentrations of Red-breasted Mergansers were unusual, however, with sectional counts in excess of 100 birds noted only on the Moray Firth and Firth of Forth.

Figure 5.16 shows that the species was widespread on UK estuaries, but only in low densities along much of the English east coast, around the Bristol Channel and around most of the Irish Sea. The Solent and south-west England, along with several Scottish sites, held higher densities. At a sectional level, 5% of all sections surveyed supported densities in excess of 0.27 birds per hectare, with 1% of sections supporting densities in excess of 1.48 birds per hectare. Actual counts made at low tide that exceeded the current 1% British or Irish national threshold values were recorded at ten sites, the highest site total being from the Firth of Forth.

A total of 15 SPAs in the UK have been designated for their value to wintering Red-breasted Mergansers (Stroud *et al.* 2001). Of these, three have not been covered at all by the LTCs during the period under review, those being Cromarty Firth, Morecambe Bay and Lough Foyle. Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at the North Norfolk Coast and Irvine–Garnock Estuary.

OYSTERCATCHER
HAEMATOPUS OSTRALEGUS

The Oystercatcher is one of the most familiar waders frequenting UK shores, as well as one of the most common and widespread. Virtually all UK Oystercatchers winter on the coast, with about 78% found on estuaries (Rehfisch *et al.* 2003). The species breeds widely in coastal regions of the UK, as well as inland in the north (Gibbons *et al.* 1993). These birds tend to remain in the country in the winter and are joined by birds from as far as Iceland and Russia, different regions of the UK receiving immigrants from broadly different breeding areas (Wernham *et al.* 2002). On estuaries, Oystercatchers feed mostly on bivalve molluscs, especially cockles, mussels and Baltic tellin, whilst inland earthworms are favoured (Snow and Perrins 1998).

Oystercatchers were recorded at 61 of the 62 sites under review (the exception being the small, partially-covered Wear Estuary), with the species being noted on 80% of count sections and on 66% of visits. This level of ubiquity at the section and visit level was exceeded only by Curlew and Redshank. There was no appreciable difference between months in the proportion of visits on which the species was recorded. The proportion recorded as feeding at low tide was 90%, a little lower than some other intertidal feeders. Oystercatchers were found to be widespread on most sites. At many sites, higher densities were clearly present towards the mouth of the estuary, such as at the Humber Estuary. At other sites, such as the Medway Estuary, a more even distribution was noted. At a few sites inner estuary densities were the highest, probably due to local conditions leading to more extensive areas of intertidal habitat here (*e.g.* Strangford Lough, Orwell Estuary). The most striking concentration of Oystercatchers, however, occurred in Belfast Lough where the relatively narrow flats, especially on the west shore south of Green Island, supported extremely high densities of birds.

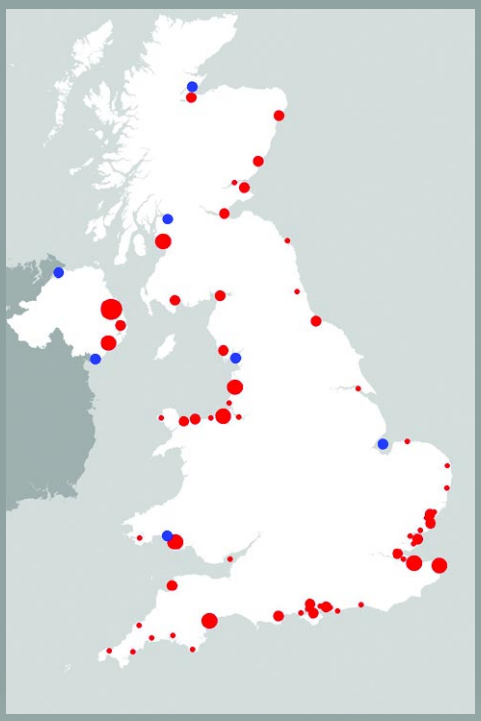


Figure 5.17: **Mean site densities of Oystercatcher**

Figure 5.17 well depicts the widespread distribution of the species, with little broad-scale difference in site densities apparent, although the relative importance of the Northern Ireland estuaries and the relatively low densities along much of the English east coast can be seen. The highest mean site density by far was recorded at Belfast Lough. At a sectional level, 5% of all sections surveyed supported densities in excess of 5.34 birds per hectare, with 1% of sections supporting densities in excess of 14.80 birds per hectare.

A total of 30 SPAs in the UK have been designated for their value to wintering Oystercatchers (Stroud *et al.* 2001). Of these, six were not surveyed by the LTCs during the period under review, all of which were estuarine in character: Cromarty Firth, Dornoch Firth and Loch Fleet, Lough Foyle, Morecambe Bay, the Wash and Gibraltar Point (although it is likely that the latter two SPAs involve, in part, the same birds). Additional to the sites overlapping SPAs, site totals exceeding the 1% national threshold value were recorded at Dundrum Bay.