LINDISFARNE

Site description

Lindisfarne forms one of the largest intertidal areas in northeast England. This site, as one of only two barrier beach systems within the UK, has an unusual structure. The majority of the site is sandy, although there are increasing amounts of silt in parts of Budle Bay and Fenham Flats. Several freshwater creeks traverse the flats at low tide. Saltmarsh exists between Goswick and Fenham, especially around the causeway to Holy Island, and along the southwestern shore of Budle Bay. Extensive sand dunes occur on several parts of the site, with dune slacks, dune heath and dune pasture also represented. The eastern shoreline of Holy Island is mainly rocky, with a few patches of shingle. There is a small harbour on Holy Island but no other industry is present. Recreational activities are generally water-based and occur mainly in Budle Bay, though beach recreation is widespread over the entire area, as are walking and birdwatching. Some grazing and hand gathering of mussels occurs, as does wildfowling, but this is strictly licensed. Wildlife conservation is in force, with the area protected by SPA and Ramsar status, and in 1997 a waterbird refuge was set up on the southern Fenham Flats.

General bird distribution 2005/06

Area covered 2,950 ha; Mean total birds 19,596; Mean bird density 6.6 birds per ha.

Counts were made in November and January only, but counters at this site still managed to record a great diversity of species, 52 different species representing the second widest array of species across sites covered this winter. Amongst the scarcer species recorded were Black-throated and Great Northern Diver, Red-necked and Slavonian Grebe, Goosander and Scaup.

Most of Lindisfarne supports some birds at low tide, but the most important areas of the site continue to be the intertidal areas between Beal Point and Ross Point (incorporating Fenham Flats and extending offshore to Holy Island), and Budle Bay. Lindisfarne is an important site for internationally important numbers of both Barnacle and Light-bellied Brent Geese from the Svalbard populations, and also Icelandic breeding Pink-footed Geese. Fenham Flats and Budle Bay were areas especially notable for dense concentrations of Knot, Dunlin Golden Plover and Lapwing. Redshank and Oystercatchers also favoured these areas but were also concentrated around Holy Island, whilst other waders were widely present in varying densities around the site.

Comparative bird distribution

The distributions of Light-bellied Brent Goose and Grey Plover are discussed here.

As previously stated, Lindisfarne holds internationally important numbers of Light-bellied Brent Geese, and is by far the most important site in England for this population. Numbers present here are dependent on weather conditions in the other key wintering area in northern Denmark and so are subject to fluctuation between years. Numbers of Light-bellied Brent Geese present between 2001-02 and 2005-06 have, however, decreased markedly (Figure 65.), though of course this may be due to favourable weather conditions in Denmark. It is notable, however, that the distribution of birds in the two winters has apparently changed. Although the Fenham Flats area is still the favoured low water location, in 2005/06 there were also concentrations of birds further offshore to the south of Holy Island, as well as north of Beal Point.

Lindisfarne SPA includes Grey Plover as a interest feature due to international importance, yet Core Counts indicate a series of declines, sufficient to trigger Medium Alerts over a sustained period (Maclean & Austin 2006). The low tide distribution of the species has similarly changed, with an average 220 fewer individuals in 2005/06 than 2001/02 (Figure 65.). Despite differences in the timing of site coverage, it seems as though there has been a large decline in mean density on Fenham Flats. This has been only partially compensated by a more widespread distribution towards Holy Island, whilst within Budle Bay, mean Grey Plover density has altered little.

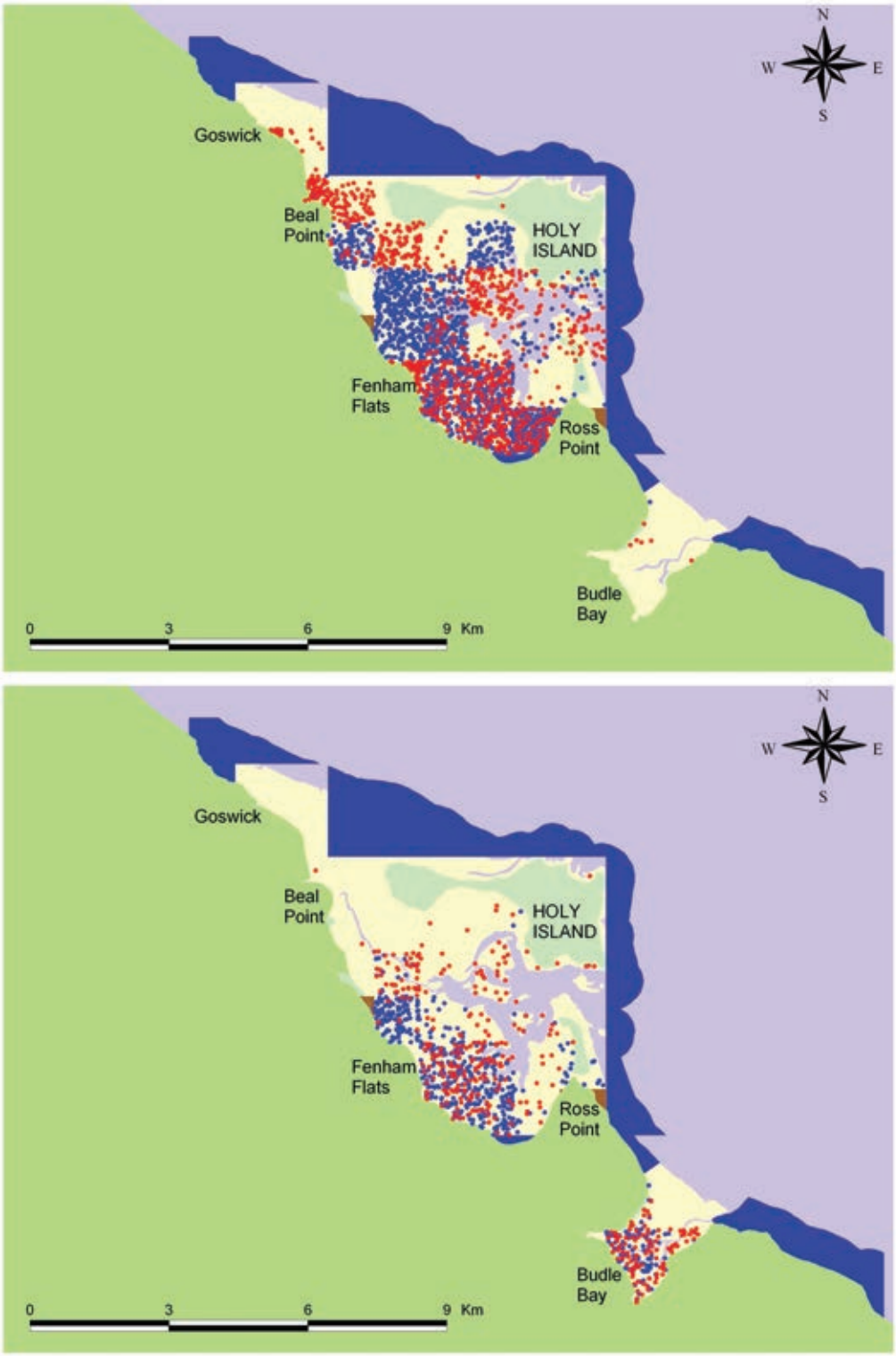

Figure 65. Low tide distribution of Light-bellied Brent Goose (above: 1 dot = 2 birds) and Grey Plover (below) at Lindisfarne for the winters of 2001/02 (blue dots) and 2005/06 (red). Yellow = intertidal; pale blue = subtidal; pale green = nontidal. Brown areas not covered in later winter; dark blue areas not covered in either winter.

MERSEY ESTUARY

Site description

Located on the Irish Sea coast of northwest England, the Mersey is a large, sheltered estuary which comprises large areas of saltmarsh and extensive intertidal sand- and mud-flats, along with limited areas of brackish marsh, reclaimed marshland, rocky shoreline and boulder clay cliffs. The Mersey has the second highest tidal range in the UK, which has created deep channels and sandbanks throughout the estuary. Since an improvement in water quality, the importance of the Mersey Estuary as both a wintering and staging post for large numbers of wildfowl and wading birds has been underlined by protective legislation, being designated as a SSSI and, as recently as 1995, as a Ramsar site and a SPA. Large conurbations on both banks dominate the site, with Liverpool and Widnes to the north and Birkenhead, Runcorn and Ellesmere Port to the south. Major industry is also a feature of the estuary with adjacent large docks and petrochemical plants; consequent pollution, plus habitat loss through expansion, are the primary concern.

General bird distribution 2005/06

Area covered 3,402 ha; Mean total birds 42,798; Mean bird density 12.6 birds / ha

Many of the marshes and sandbanks around the perimeter of the Mersey Estuary offer suitable habitat for some species at low water. Many abundant species including Shelduck, Pintail, Teal, Wigeon, Golden Plover, Lapwing, Curlew and Redshank are found throughout the site at varying density, though most species have discrete areas of highest concentration. Both Stanlow Banks and Ince Banks support many wildfowl species, such as Teal and Wigeon, plus high densities of Dunlin and Redshank. Many waders including large numbers of Lapwing and Golden Plover favour the large expanse of intertidal habitat around Weston Point in the east. Other areas of high bird density include Rock Park and at the estuary mouth at Wallasey.

Comparative bird distribution

When the Mersey was last covered at low tide for WeBS, in 1996/97, numbers of Wigeon were sufficient to exceed the national importance threshold, but this was no longer the case in 2005/06. The High Alert identified for the species at the site (Maclean *et al.* 2005) indicates a decline that may involve site factors, because the species is increasing at a national level. It is immediately evident that there has been a retraction of the species from areas in which it was previously densely distributed (Figure 66.). In both winters, Wigeon were most abundant along the south bank of the river, though densities in the earlier winter were far greater than in 2005/06. Most of the sectors counted between Eastham and Runcorn held Wigeon in high densities in 1996/97, but by the later winter many of these sectors supported few, if any, birds. On one sector of the marshes at Ince Banks, Wigeon density has declined from over 22 birds per ha to a complete absence of the species. The peak count of the sector at Eastham in 1996/97 was recorded as 6,850, the highest across the site; by 2005/06 the figure was reduced to just 60. Pintail are also in decline on the Mersey, so it is possible that common factors are responsible. Some potential explanations include changes in wastewater treatment, accretion or erosion of salt marsh and sustained movements to other wetland sites. However, it should also be noted that parts of the site not covered by WeBS Low Tide Counts (Figure 66.) may have undergone changes that have not been recorded.

Mean winter Dunlin numbers have also decreased sharply on low tide counts between 1996/97 and 2005/06, and the distribution of birds on the estuary has changed in this time as well (Figure 66.). The most notable change in distribution is a decline in density on the intertidal area west of Ince Banks. Mean winter numbers here were some 20,000 less than in the earlier winter. Some birds were recorded in new low water locations at Eastham Locks and Rock Park, but many more were absent from flats both on the inner estuary and at the mouth. Core Count figures show Dunlin numbers fluctuating but increasing (Maclean & Austin 2006), so it is to be hoped that this low tide pattern is not a harbinger of new detrimental changes.

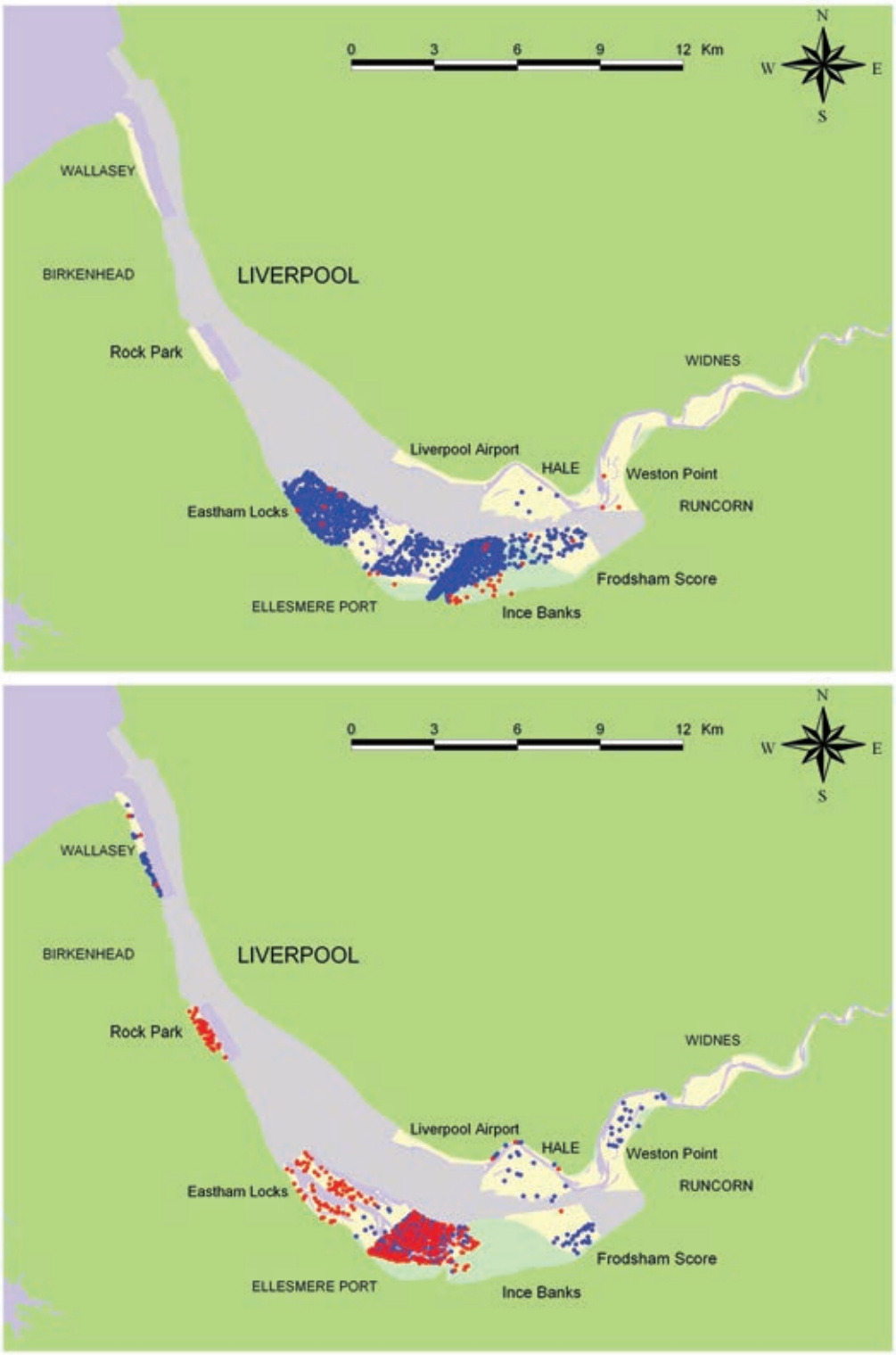

Figure 66. Low tide distribution of Wigeon (above: 1 dot = 5 birds) and Dunlin (below: 1 dot = 50 birds) at the Mersey Estuary for the winters of 1996/97 (blue dots) and 2005/06 (red). Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Grey areas not counted in either winter.

MONTROSE BASIN

Site description

Montrose Basin is an enclosed estuary of the South Esk, about 3 km across covering nearly 985 ha. The basin is separated from the sea by a broad spit on which the town of Montrose is situated; the river discharges to the sea through a narrow channel at the southern end of this spit. The intertidal flats range from sand to mud and shingle and there are also extensive mussel beds. Eelgrass and algae are also present and provide a food source for some of the wintering wildfowl. There are areas of saltmarsh on the inner edge of the basin and freshwater grazing fields nearby. Pressure from wildfowling used to be heavy on this site but has been restricted since 1981 when a local nature reserve was established; this has led to a dramatic rise in the numbers of waterfowl using the site, particularly Pink-footed and Greylag Geese.

General bird distribution 2005/06

Area covered 801 ha; Mean total birds 10,001; Mean bird density 12.5 birds per ha.

Montrose Basin is a very important site for many wildfowl species, many of which occur here in nationally important numbers. The most numerous species here are Wigeon and Eider, both of which occur in nationally important numbers with peak low tide counts of 4,849 and 2,833 respectively. Although perhaps not well reflected in low tide counts, Redshank are present in internationally important numbers as are Knot and Pink-footed Geese, though the latter species mainly uses the site for roosting and so may be absent or in lower numbers at other times. With most of the site consisting of intertidal areas, wading birds are distributed widely across the site, though Oystercatchers typically preferred the eastern side of the basin, whereas Redshank favoured the south western corner. Both Goosander and Red-breasted Merganser occurred here in nationally important numbers at the time of the last Low Tide Count in 1997/98, but this is no longer the case.

Comparative bird distribution

Of the species evaluated for WeBS Alerts at the Montrose Basin, none have declined sufficiently to trigger alerts (Maclean & Austin 2006). The distributions of two species of national importance at the site, undergoing different patterns of change, are investigated.

Between 1997/98 and 2005/06, the mean winter density of Wigeon at low water increased from 2.4 to 4.2 birds per ha. As is clear from Figure 67., this increase was brought about both by changes in bird density on sectors used in the earlier winter, as well as expansion into areas not previously holding Wigeon. Prominent amongst these were the area west of Rossie Mills toward The Lurgies, and bordering the town of Montrose in the east.

By contrast, in 1997/98 Knot were present in internationally important numbers, but by 2005/06, their mean winter numbers had dropped. Although they were still present in nationally important numbers, the site density had decreased from 1.97 to 0.67 birds per ha. This low water decline, however, was not matched by Core Count figures and were not severe enough to have triggered any alerts. This perhaps suggests that either birds roosting at Montrose Basin now feed elsewhere, or that feeding areas now used are more difficult to survey accurately; the latter is thought to be the more likely by local experts, particularly as the geomorphology of the basin is known to change consistently. The low tide distribution of Knot in 1997/98 shows the birds concentrated into three discrete areas; to the west of Rossie Island, by Steinshell Burn and north of Rossie Mills (Figure 67.). In contrast, in 2005/06, birds were much more widely distributed across the site, with areas not previously frequented now being utilised. Areas such as near Tayock and Tayock Bridge in the north of the basin were not used in 1997/98; also in the previously favoured areas north of Rossie Mills, birds were more thinly distributed in the later winter.

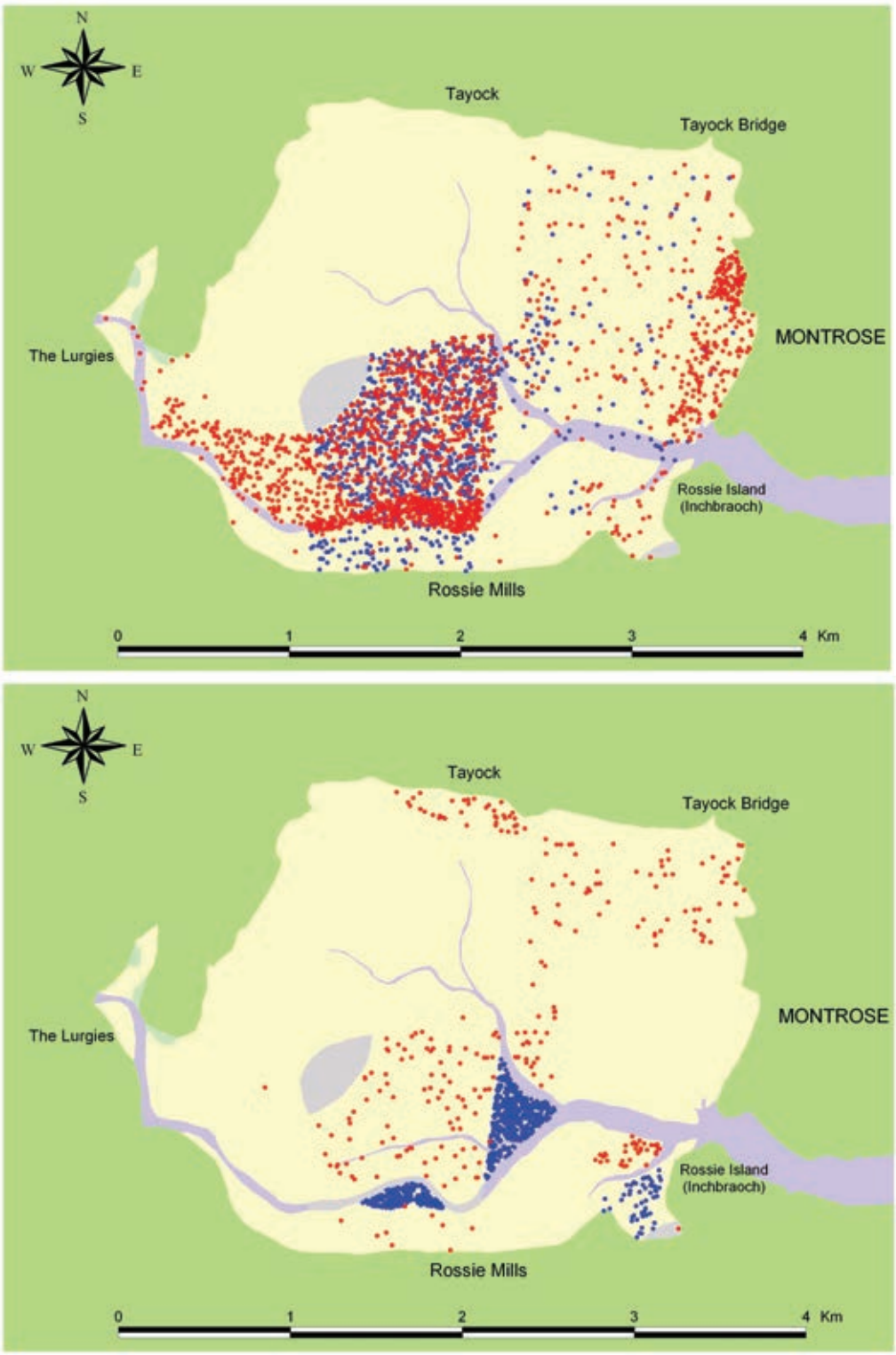

Figure 67. Low tide distribution of Wigeon (above: 1 dot = 2 birds) and Knot (below: 1 dot = 2 birds) at Montrose Basin for the winters of 1997/98 (blue dots) and 2005/06 (red). Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Grey areas not counted in later winter.

MORECAMBE BAY

Site description

Situated on the north west coast of England, Morecambe Bay is a huge tidal embayment, draining the Lake District through the rivers Leven, Lune and Kent, and parts of the Bowland Fells in Lancashire through the River Wyre. In the west of the bay, Walney Island shelters an area of rich intertidal mud known as South Walney & Piel Channel Flats. The site is characterised by extensive invertebrate-rich sand and mud flats, stretching as far as 7 km offshore, with localised rocky outcrops ('skears') often providing suitable mussel *Mytilus edulis* beds. Indeed the flats represent the largest continuous area of such habitat in the UK; this factor, in addition to the huge tidal range in the bay, has made comprehensive WeBS Low Tide Counts impossible in the past, though mid-tide counts have occurred in parts of the bay. However, the site is of rare importance, supporting ten different species of international importance during the winter, as well as providing crucial breeding and passage habitat for other species of waterbirds. For this reason, Natural England funded a unique low tide aerial survey of the entire bay for the winter of 2005/06, in addition to volunteer support covering the four major estuaries feeding the bay using standard count methods (Banks 2006). This is therefore the first attempt to describe low water distribution of waterbirds across the whole of Morecambe Bay, and comparative distribution analysis is not possible. A huge combined area of 42,795 ha was surveyed. A general point about Morecambe Bay is that due to tidal patterns, birds may have finished feeding before low water. It is therefore possible that these surveys overlooked birds using the bay that had returned to roost or pre-roost areas by the lowest low tide.

i. AERIAL SURVEY

Area covered 36,400 ha; Mean total birds 20,816; Mean bird density 0.88 birds per ha.

It is obvious that using a low-level aircraft to survey this site has advantages; the figure of 36,400 ha covered dwarfs low water coverage of anywhere else in the UK. However, there are associated disadvantages, the foremost being that identification can be difficult and that numbers can be greatly underestimated. This is particularly true of small waders such as Knot and Dunlin that congregate in tight flocks. Subsequently, waders and wildfowl were often categorised into size classes. This problem is not overly detrimental to distribution surveys, as species density is relative and 'hotspots' of distribution still emerge. However, some species, such as the distinctive Oystercatcher, were readily identifiable and recorded easily. The average winter distribution of the species is presented (Figure 68.), from which it is evident that although the species was widespread, not all of the sand and mud flats were selected in equal proportion. Areas close to the shore at Newbiggin, Warton Sands and Cockerham Sands held the highest densities of Oystercatcher; the mouth of the Kent and the outermost flats the lowest. The distribution of the species at low water superficially corresponds to knowledge of roost sites, in that highest concentrations of Oystercatchers seem to occur near to the largest roosts (R. Horner, *pers. comm.*). Although the distribution is representative, the mean winter average for Oystercatcher at low tide in the parts of Morecambe Bay surveyed from the air comprised 10,253 individuals. This figure is merely a fifth of the five-year site mean recorded on Core Counts illustrating how aerial surveys can underestimate numbers. Unidentified small waders (principally Knot and Dunlin) were on average the next most abundant species counted (a mean of 5,961 over the winter). These were patchily distributed across the intertidal habitat, with particular aggregations at Cockerham Sands, Preesall Sands and the Kent Channel toward Hest Bank. Curlew and Lapwing typically fringed the intertidal and saltmarsh sectors, with these species also detected in surrounding farmland on approach to the bay. Shelduck, another readily identifiable species, tended to be associated with intertidal areas close to the shore, whereas the equally distinctive Eider were most densely distributed around the south tip of Walney Island, with more surprisingly advanced into the bay in the channels near Warton Sands.

ii. KENT ESTUARY

Area covered 1,106 ha; Mean total birds 3,977; Mean bird density 3.6 birds per ha.

The Kent Estuary, a shallow-banked river channel in the north east of the bay, supported 21 different species at low water, a relatively low diversity of waterbirds. Three species of international importance for Morecambe Bay SPA were however present in noteworthy densities; Pintail, Oystercatcher and Dunlin. The most numerous was Dunlin, with a winter average of 1,522 birds. Figure 68. shows that these were almost exclusively concentrated at the mouth of the river, and never above the viaduct at Arnside [note that the southern extent of the distribution marks the boundary of the count sector and not necessarily the limit of Dunlin]. North of the bridge contained few waders except for some scattered Redshank and more densely distributed Curlew. These species were found in greater density near Grange-Over-Sands at the mouth of the river; these sectors were most heavily used overall, with Oystercatcher and Shelduck also exploiting the feeding flats. The latter was more thinly spread north of the Arnside viaduct. Sectors near the mouth of the river were additionally used by wildfowl such as Wigeon and Pintail, which were exclusively found in this area, owing to accreting saltmarsh at Grange-Over-Sands. Peak low tide counts of Pintail exceeded 1,000 birds, which exceeds the international importance threshold for the species. Individuals of other species, including Red-breasted Merganser and Spotted Redshank, were recorded on the estuary.

iii. LEVEN ESTUARY

Area covered 1,342 ha; Mean total birds 1,668; Mean bird density 1.2 birds per ha.

Of the riverine branches surveyed as part of Morecambe Bay in 2005/06, the Leven Estuary supported waterbirds in the lowest overall density (1.2 birds per ha), despite its large size and extensive saltmarsh and intertidal habitat. The mean winter count for the site was greatest for Redshank, whilst densities of Dunlin and Oystercatcher were identical to that of Redshank at 0.21 birds per ha. Distributions of these species were broadly similar, with least birds towards the river head and most in the middle and outermost reaches. It is the distribution of Redshank that is shown here (Figure 69.). The suite of common wildfowl found on most estuaries in the UK were present: Shelduck, Wigeon, Teal and Mallard, at varying densities. Pintail were much scarcer than on the Kent, the winter average for the Leven totalling just eight. Relatively low numbers of godwits, plovers, Knot and Curlew were registered. Lapwing and Golden Plovers may have been underrepresented, as many were seen in surrounding farmland; it is possible the estuary is also used but not during periods of observation. In general, highest bird densities were on the flats at the river mouth near Ulverston and on the east of the middle reaches.

iv. LUNE ESTUARY

Area covered 1,037 ha; Mean total birds 13,140; Mean bird density 12.7 birds per ha.

In contrast to the Leven, the Lune Estuary held the highest mean bird density of the estuarine areas surveyed in Morecambe Bay in 2005/06. For the purposes of this survey, the Lune Estuary also included some areas of foreshore at Middleton, Morecambe and Half Moon Bay not covered by aerial survey. The latter contained an estimated 14,000 Knot in December 2005, resulting in a high mean species density (6.41 birds per ha) and contributing to the high bird density of the site as a whole. Also at high density were the common winter plovers Lapwing and Golden Plover. The distribution of the former was extensive on the estuarine sectors, with the area at Conder Green especially heavily populated (Figure 69.). The latter was more restricted to the lower reaches of the river, particularly north of the channel to the east of Bazil. Oystercatcher were recorded on the coastal sectors, principally at Half Moon Bay and Morecambe where rocky skears are exposed during low tide periods. Of the wildfowl, a mean count of 130 Mute Swan was notable, the equivalent figure of Wigeon totalling over 1,000 birds. Comparatively few Shelduck appeared on the Lune relative to the other estuaries around Morecambe Bay.

v. SOUTH WALNEY & PIEL CHANNEL FLATS

Area covered 2,231 ha; Mean total birds 13,347; Mean bird density 6.0 birds per ha.

The area known as South Walney & Piel Channel Flats contains a variety of habitats, including the sheltered intertidal mudflats

along Piel Channel, the more exposed flats on the west of Walney Island, the limited saltmarsh in the north towards Vickerstown, the large non-tidal waterbody of Cavendish Dock in Barrow-in-Furness and the rocky skears around Foulney Island. Subsequently a diverse array of waterbird species is typically recorded at low tide; in 2005/06, 35 species, including 14 waders, were discovered. At high densites were Tufted Duck and Coot, both restricted to Cavendish Dock but present in high mean winter numbers. Elsewhere, Oystercatcher were found at high densities on most intertidal sectors apart from South Walney and Roosecoote Sands. The latter is important for Oystercatchers and other waders, especially in cold weather (J. Sheldon, *pers. comm.*), and the lack of Oystercatchers recorded probably reflects the single survey of the sector (in November); redistribution in response to raptor disturbance is common and may have contributed to this pattern. In particular, the flats and skears around Foulney Island were strongly favoured (Figure 70.), as was the area in the north west of the channel. Roosecoote Sands did, however, support Shelduck and Redshank at relatively high densites, species which were more thinly scattered on other intertidal count sectors. Knot were limited to the area west of Piel Island and south of Roosecoote Sands, while in contrast Dunlin were thinly and widely spread across the sheltered feeding flats. Curlew shared a similar though less dense distribution to Oystercatcher, with the Foulney Island and Blackamoor Ridge areas especially important. These locations also held large numbers of Eider in a small area, meaning this species was at the highest density recorded (7.4 birds per ha). It is likely that individuals of these species feed on the shellfish beds found here.

vi. WYRE ESTUARY

Area covered 679 ha; Mean total birds 6,359; Mean bird density 9.4 birds per ha.

The River Wyre reaches Morecambe Bay at the bisection of Fleetwood and Knott End-On-Sea, having run through extensive areas of intertidal and saltmarsh. The west bank is industrialised to an extent, though the surrounding conurbations rarely encroach on to the estuary. By contrast, the east bank is characterised by lowland agricultural habitat. This may help to explain why at a mean 3.46 birds per ha and winter average of 2,348, Lapwing represents the most abundant species recorded at low water in 2005/06. It was most densely distributed between Skippool Marsh and Little Singleton. The Skippool Marsh area was important for other species of wader too, including Dunlin and Golden Plover. Oystercatcher, on the other hand, were aggregated in sectors at the mouth of the river, whilst Curlew (Figure 70.) were present on all sectors. Their preferred areas were in the vicinity of Little Singleton, quite far upriver but amongst areas of farmland upon which they may also feed. Wildfowl recorded included Pink-footed Goose, Shelduck, Wigeon, Teal and Mallard, all at similar densities (0.26 – 0.38 birds per ha).

Aircraft of type used for aerial survey of Morecambe Bay (Alex Banks)

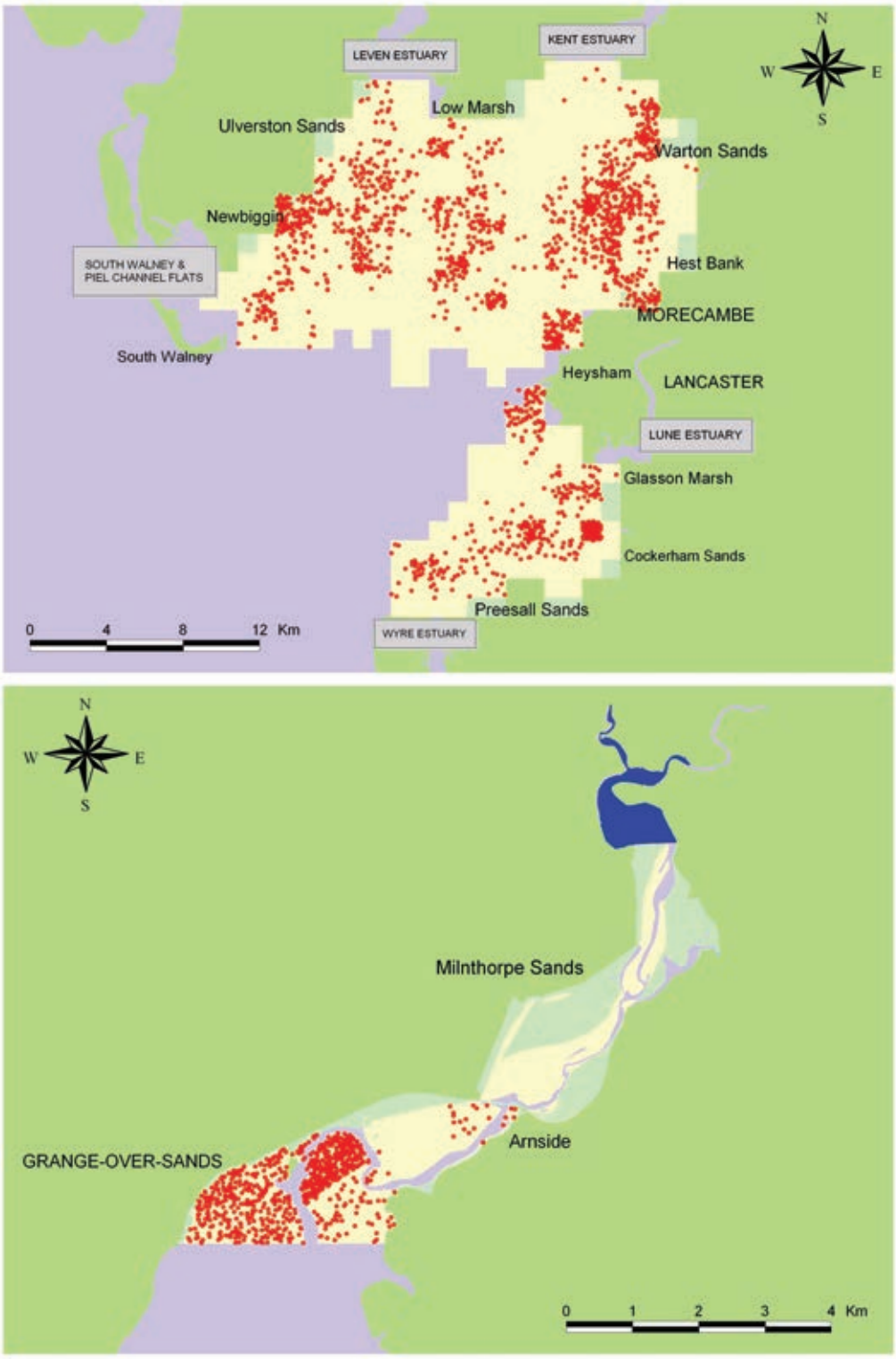

Figure 68. Low tide distribution of Oystercatcher (above: 1 dot = 5 birds) on aerial survey of Morecambe Bay in 2005/06, and Dunlin on standard survey of the Kent Estuary (below: 1 dot = 2 birds). Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Dark blue area not covered.

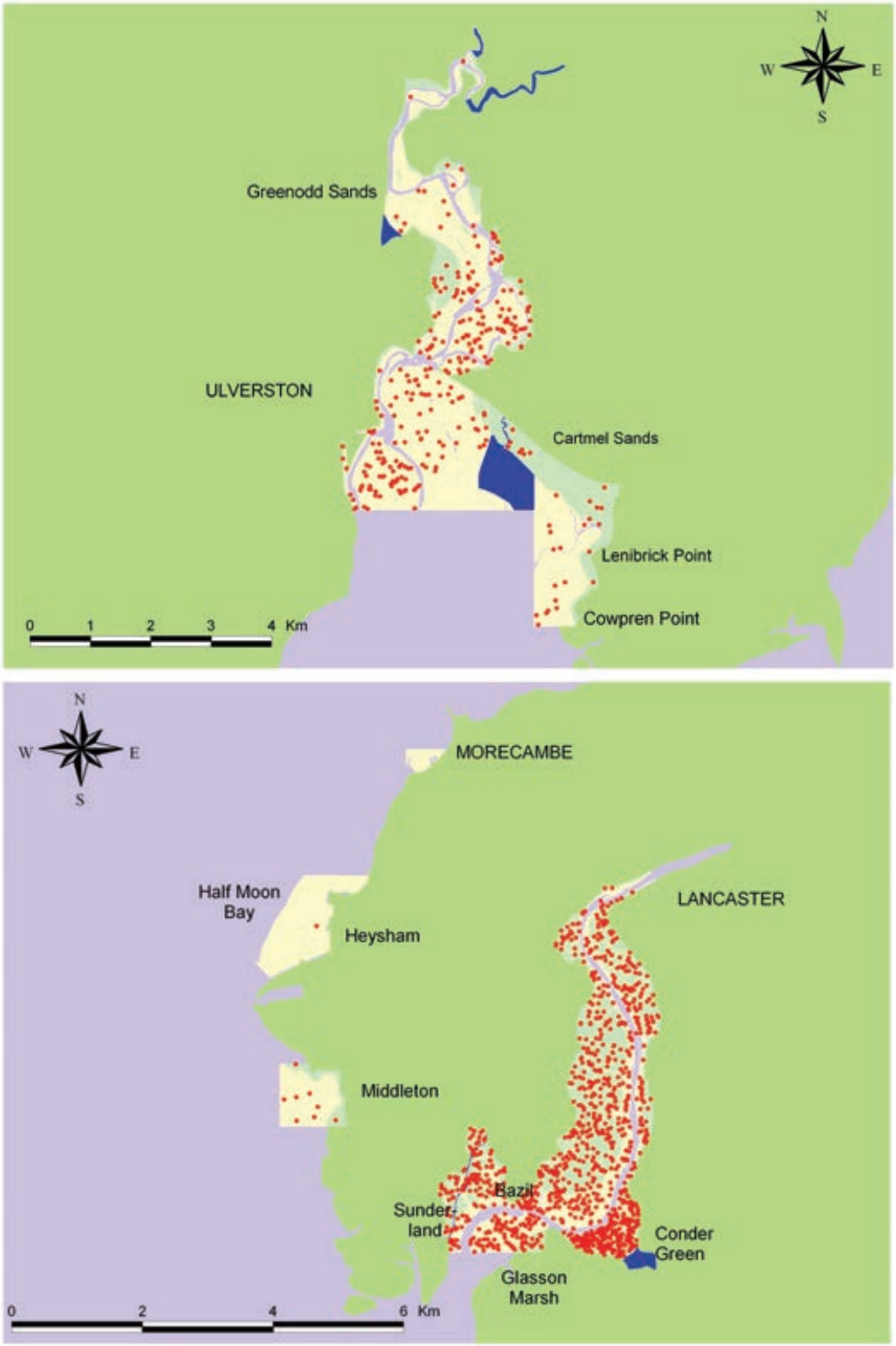

Figure 69. Low tide distribution of Redshank (above) on standard survey of the Leven Estuary in 2005/06, and Lapwing (below: 1 dot = 5 birds) on similar survey of the Lune Estuary. Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Dark blue areas not covered.

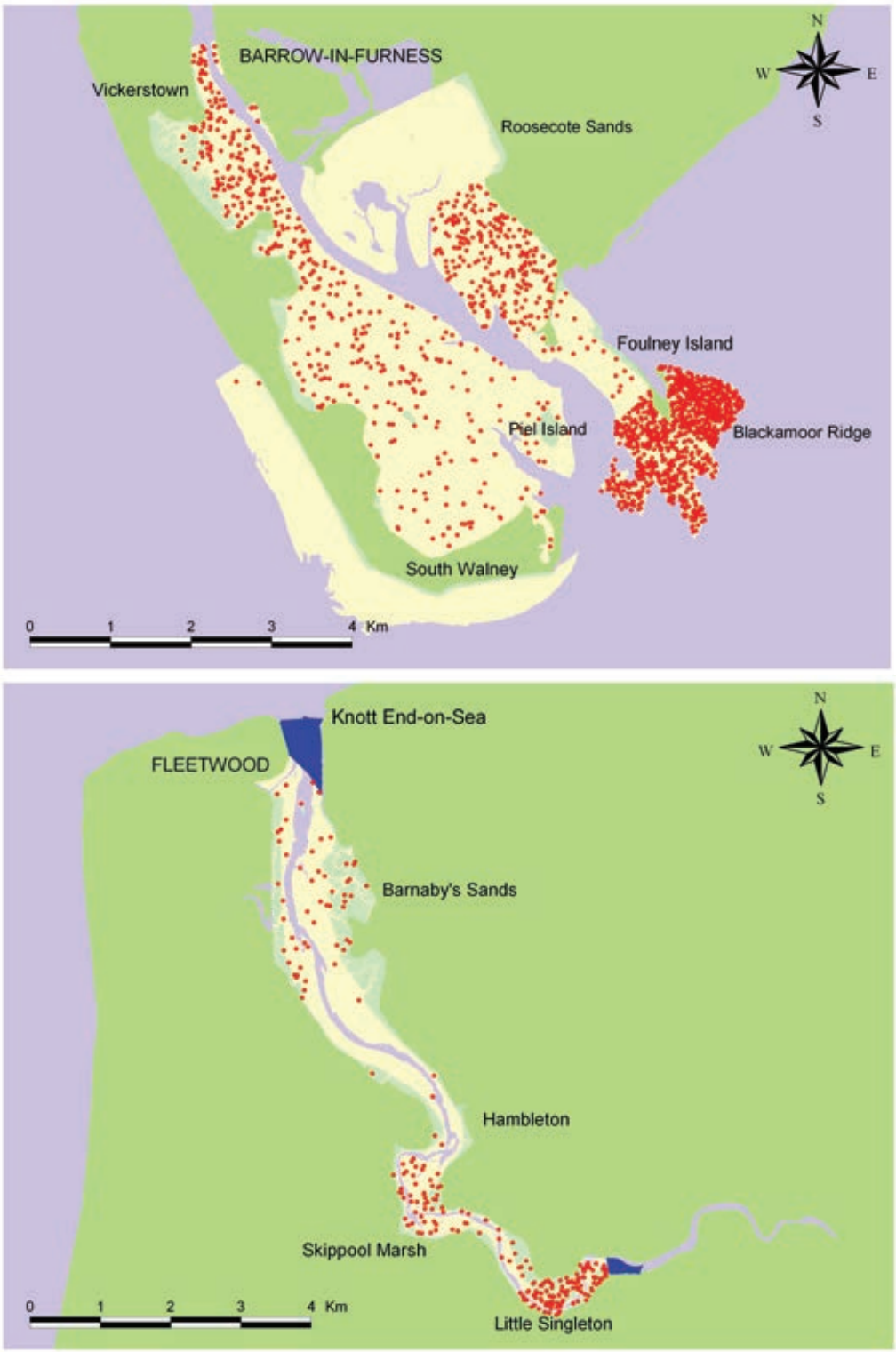

Figure 70. Low tide distribution of Oystercatcher (above: 1 dot = 3 birds) on standard survey of South Walney & Piel Channel Flats in 2005/06, and Curlew (below) on similar survey of the Wyre Estuary. Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Dark blue areas not covered.

STOUR & ORWELL ESTUARIES

Site description

The Stour is a long and straight estuary, which forms the eastern end of the border between Suffolk and Essex. The estuary's mouth converges with that of the Orwell, which extends from Ipswich to Felixstowe, as the two rivers enter the North Sea. The outer Stour is becoming sandier and substrates become progressively muddier further upstream. There are seven shallow bays along the estuary and sharply rising land or cliffs, covered with ancient coastal woodland and agricultural land, border much of its length leaving little room for saltmarsh development. Much of the intertidal substrate of the Orwell is fairly muddy. In mitigation for the latest port development, both the north and south shores of the lower reaches of the estuary have had soft silts placed behind stiff clay bunds within the intertidal areas, changing the substrate again. Additionally, suspended silts have been placed directly into the water column of both lower estuaries, also as part of the mitigation process. Long stretches of farmland and wet meadow are situated along the mid-estuary, the latter providing roost sites for waterbirds. Nature conservation in the area includes the Stour & Orwell Estuaries Ramsar site and SPA, with management by the RSPB, Woodland Trust, Essex Wildlife Trust and Suffolk Wildlife Trust. Some sailing and shooting occurs, though the continued expansion of dock operations and subsequent land claim of important feeding areas remains a concern. Recently, bait-digging and recreational pressure (especially dog walking) on the Orwell have increased, and may influence bird distribution where disturbance results. The estuaries are here considered together as a single unit to reflect the extent of the SPA designation.

General bird distribution 2005/06

Areas covered 1,627/1,227 ha; Mean total birds 38,605/17,953; Mean bird density 23.7/14.6 birds per ha.

Between the two sites, the Stour and Orwell Estuaries support ten species in nationally important numbers. In addition, the Stour also surpassed national passage threshold for Ringed Plover. In keeping with the national trend for the species, Avocet now achieve nationally important numbers on both estuaries for the first time. Little Egret too is now widespread on both estuaries, testament to the meteoric rate of increase nationwide. As in the winter of 2004/05, many areas of the Orwell were favoured by many species, areas such as near Nacton, Jill's Hole, Mulberry Middle, Trimley Marshes and Loompit Lake. The more sheltered intertidal habitats and series of bays on the Stour attract many species in greater numbers than its neighbour. Black-tailed Godwits occur here in internationally important numbers, favouring the inner reaches of the estuary around Jacques and Holbrook Bays west to Seafield Bay. Other species such as Grey Plover, Dunlin and Turnstone also occur here in nationally important numbers that do not reach equivalent levels on the Orwell. Single figure counts of Greenshank and Spotted Redshank were present on both estuaries, while other more unusual species recorded included Great Northern Diver, Slavonian Grebe, Black Brant, Scaup and Jack Snipe.

Comparative bird distribution

Comparisons with the winter of 1996/97 are displayed for Dark-bellied Brent Goose and Ringed Plover, two species that are undergoing declines of concern according to WeBS Alerts (Maclean & Austin 2006). Medium and short-term declines have led to Medium Alerts being triggered for Dark-bellied Brent Goose matching those occurring regionally and nationally and suggesting that adverse local conditions are less likely to be responsible for the triggering of these alerts. Low Tide Counts reveal different patterns on the two estuaries. Over the period in question, mean winter density decreased on the Stour, from 0.42 to 0.34 birds per ha (Figure 71.). On the Orwell, however, Loompit Lake, Trimley Marshes, and other areas of sub-tidal habitat near the mouth have seen increases over time, leading to a higher mean density of the species in 2005/06 (0.53 birds per ha) than in 1996/97 (0.33), and thus contributing to a net increase across the SPA as a whole; this is due to changes in use and management of the hinterland, which has benefited wildfowl in general.

Ringed Plover numbers have declined more severely to trigger a High Alert (Maclean & Austin 2006), but low tide distributions differ from these Core Count analyses. The species has increased in mean winter density on both estuaries (Figure 71.), the Stour in particular witnessing on average over 100 individuals more in 2005/06 than in 1996/97. Bathside, Holbrook and Seafield Bays were the chief beneficiaries of this change. This suggests that at least some of the birds occurring in the estuaries at low tide may well be roosting outwith the site, perhaps on Hamford Water to the south.

The Stour & Orwell Estuaries are covered by Suffolk Wildlife Trust under contract to Harwich Haven Authority. These data are generously made available to The Wetland Bird Survey.

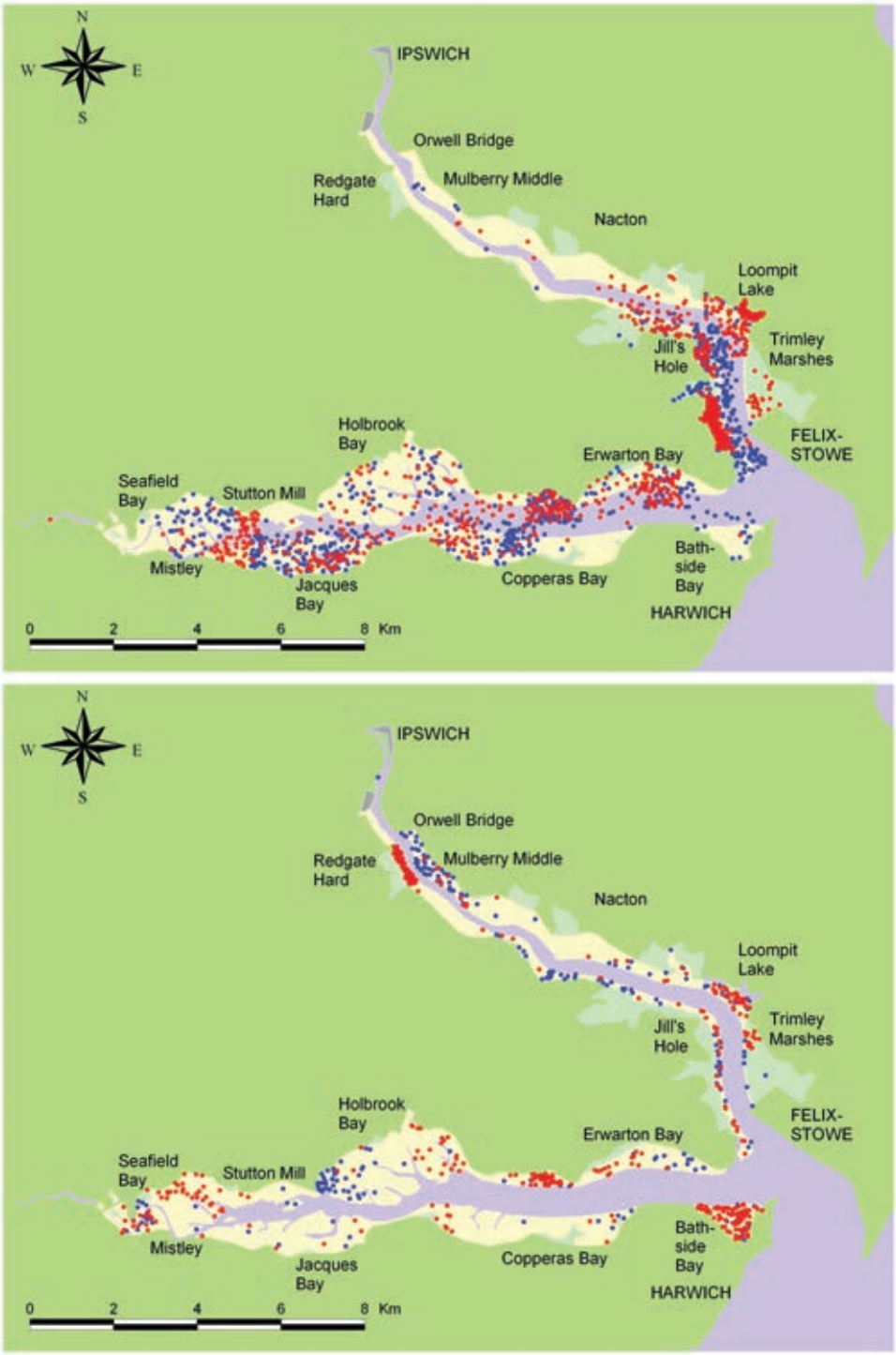

Figure 71. Low tide distribution of Dark-bellied Brent Goose (above: 1 dot = 2 birds) and Ringed Plover (below) on the Stour & Orwell Estuaries for the winters of 1996/97 (blue dots) and 2005/06 (red). Yellow = intertidal; pale blue = subtidal; pale green = intertidal. Grey areas not counted in earlier winter.

STRANGFORD LOUGH

Site description

Strangford Lough is a large shallow sea lough on the east coast of Northern Ireland, protected as a SPA, a Marine Nature Reserve, and a Ramsar Site. The site includes the Narrows, a deep rocky channel to the Irish Sea. The main body of the lough is sheltered to the east by the Ards Peninsula, and is fed by various rivers and tributaries. Downpatrick and Newtownards are the largest human habitations nearby. Within the lough there are numerous rocky outcrops and small islands. The north of the lough in particular holds extensive intertidal mud and sand flats and there are countless other bays and inlets, and large expanses of open water, providing a wide diversity of habitat. Since 2001, mobile gear fishing has been banned in Strangford Lough to allow populations of the Horse Mussel *Modiolus modiolus* to recover. Static fishing and catching of crustaceans still occurs. There is some recreational activity within the lough, including sailing. Despite the enormity of Strangford Lough, dedicated counters are able to count along the majority of its shoreline, and do so at low tide annually – an impressive achievement.

General bird distribution 2005/06

Area covered 4,325 ha; Mean total birds 44,396; Mean bird density 8.86 birds per ha.

As with most winters of survey, counter effort was rewarded with a wide diversity of species (51 different types of waders and wildfowl), many at high densities and in mean winter numbers exceeded only by the Blackwater Estuary. Certain species were ubiquitous, found on most if not all sectors containing intertidal habitat; unsurprisingly the dominant species were waders, especially Curlew, Dunlin, Oystercatcher and Redshank, Light-bellied Brent Geese, which occur in internationally important numbers at Strangford Lough. Shelduck, a species with similar status, was also widespread though most densely concentrated in the north where the feeding flats are most favourable. The lough is one of only two sites in Northern Ireland holding internationally important numbers of Bar-tailed Godwits; these birds were found at Castle Espie and on the north east shoreline. Other abundant wildfowl included Teal and Wigeon, whilst Lapwing and Golden Plover were fairly widely and densely distributed. At much lower density but also widely scattered were an average of 36 Greenshank.

Comparative bird distribution

Distribution data from Low Tide Counts undertaken in 1995/96 are displayed for comparison with bird distribution ten years later in 2005/06, for Pintail and Knot, both species occurring in important numbers. In keeping with the national trend, Pintail numbers have been steadily increasing over the past ten years. This shows with a comparison of the mean winter count for the two winters; in 1995/96 the figure was 118, compared to 631 in 2005/06. Around Strangford Lough, birds were confined to the northern areas, with distinct concentrations in both years at Ardmillan Bay, Mount Stewart and in the very northern tip around Newtownards (Figure 72.).

In contrast, Knot numbers peaked in the mid 1990s (Maclean & Austin 2006) but since then have seen a steady decline sufficient to trigger a High Alert. The mean low tide density for the winter of 2005/06 was 1.3 birds per ha, compared with 1.9 birds per ha in 1995/96, reflecting a decline in Knot at the site. As with Pintail, the main concentrations of Knot are in the northern bays, especially around Castle Espie, Comber and Newtownards (Figure 72.). Previously favoured areas on the east side of the lough, such as Greyabbey and Mount Stewart, appear to be used by fewer birds than ten years previously.

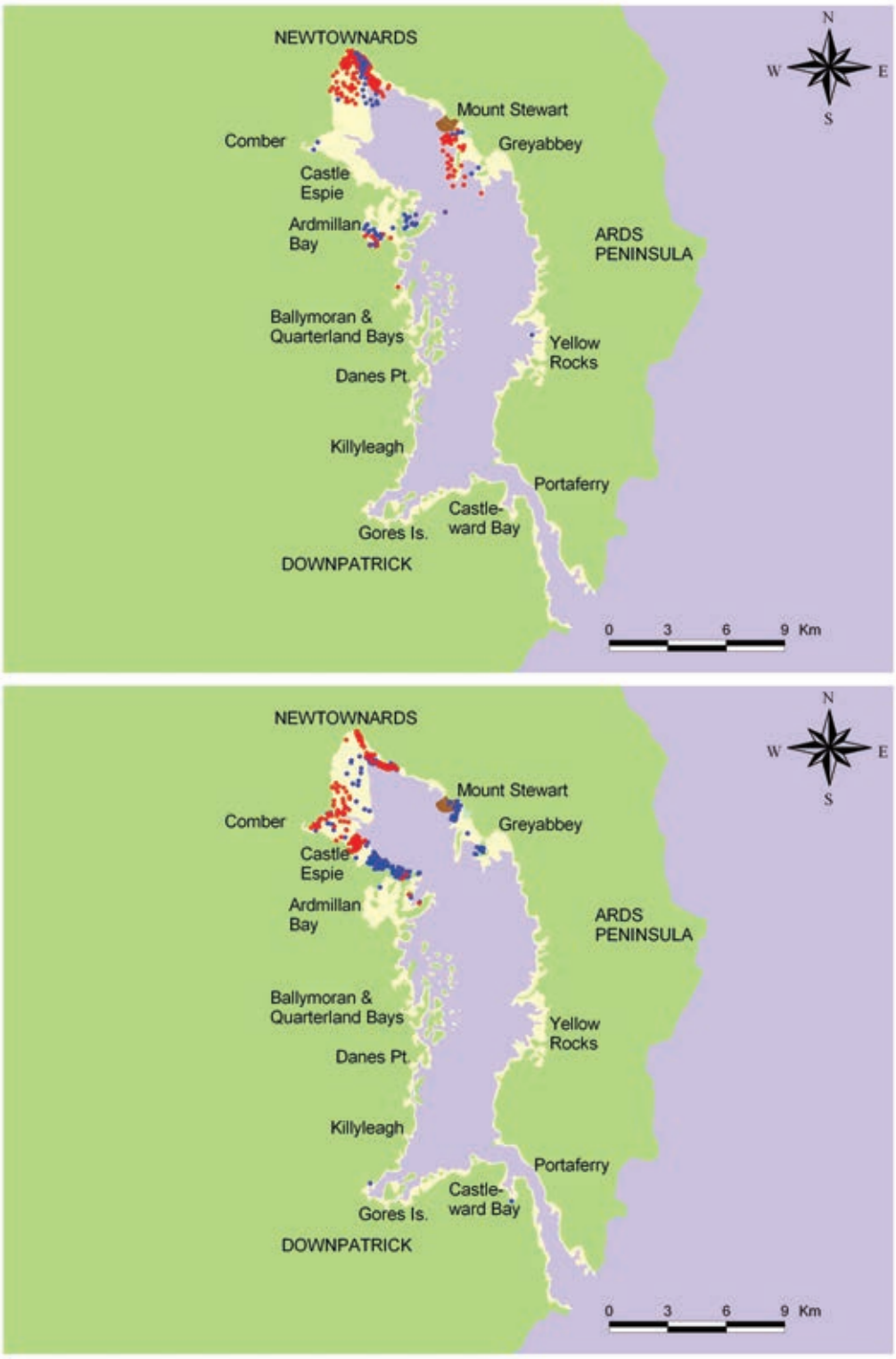

Figure 72. Low tide distribution of Pintail (above: 1 dot = 2 birds) and Knot (below: 1 dot = 30 birds) at Strangford Lough for the winters of 1995/96 (blue dots) and 2005/06 (red). Yellow = intertidal; pale blue = subtidal; pale green = nontidal. Brown area not counted in later winter.