

4.50 CONWY ESTUARY



LTC site code:	EC
Centre grid:	SH7976
JNCC estuarine review site:	32
Habitat zonation:	1009 ha intertidal, 608 ha subtidal, 27 ha nontidal
Statutory status:	N/A
Winter waterbird interest:	N/A

SITE DESCRIPTION

The River Conwy drains the eastern slopes of Snowdonia National Park, and flows into the eastern end of Conwy Bay. The site counted for the scheme comprises two distinct areas: a relatively narrow inner estuary, counted from the bridge at Tal-y-cafn northwards, and the wide expanse of Conwy Sands which lie between the Great Orme and Conwy Mountain. The RSPB has recently acquired a reserve at Glan Conwy, to the south of Llandudno Junction. The intertidal flats support extensive growths of *Zostera* and mussel beds. Although saltmarsh vegetation fringes much of the estuary, the total area is small. The whole area is heavily used by tourists, although more so during the summer. A tunnel has recently been built under the estuary to relieve traffic congestion in Conwy.

COVERAGE AND INTERPRETATION

The Conwy Estuary was covered during the winter of 1996–97, although no count was made during February. Figure 4.50.1 shows the positions of the 11 sections counted for the survey.

The Conwy Estuary does not overlap with any SPA or SSSI.

Movements of birds occur between the Conwy Estuary and Lavan Sands to the west, which holds far higher numbers of feeding birds. The shore between these two LTC sites is a long stretch of sandy beach, rockier in places, that also supports some feeding birds (I. Higginson pers. comm.).

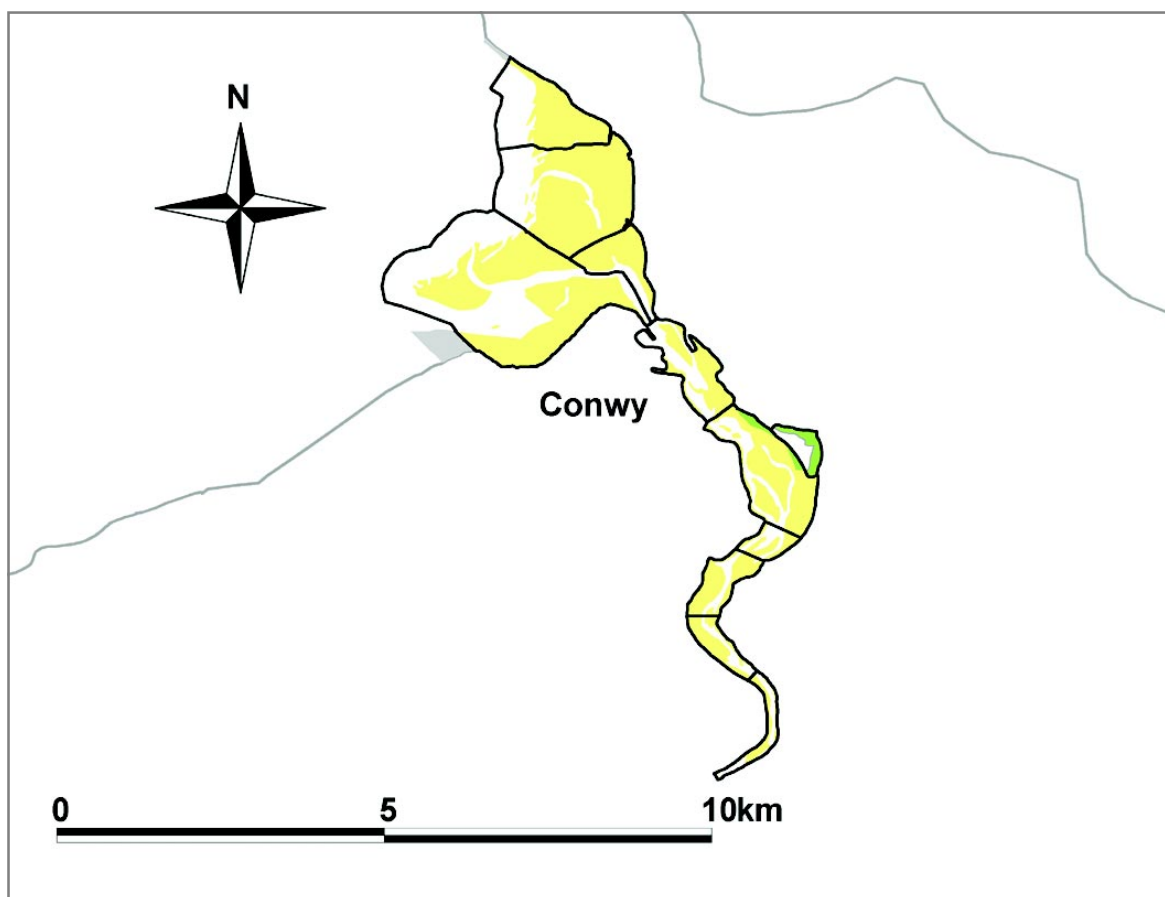


Figure 4.50.1: LTC sections at the Conwy Estuary, winter 1996–97

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1996–97 are presented for total birds and total birds weighted by 1% threshold value (Figure 4.50.2).

The two totals maps show a similar pattern, with a fairly even spread of birds across the site but a concentration at the Glan Conwy reserve, mostly made up of Lapwings and a selection of wildfowl. Amongst the other species recorded, there were

clear differences in habitat preferences. The inner estuary supported the majority of the Shelducks and Redshanks whilst Oystercatchers were very much more concentrated on the outer sandflats, with most of the Cormorants also on the outer estuary. Curlews and Red-breasted Mergansers were distributed more evenly.

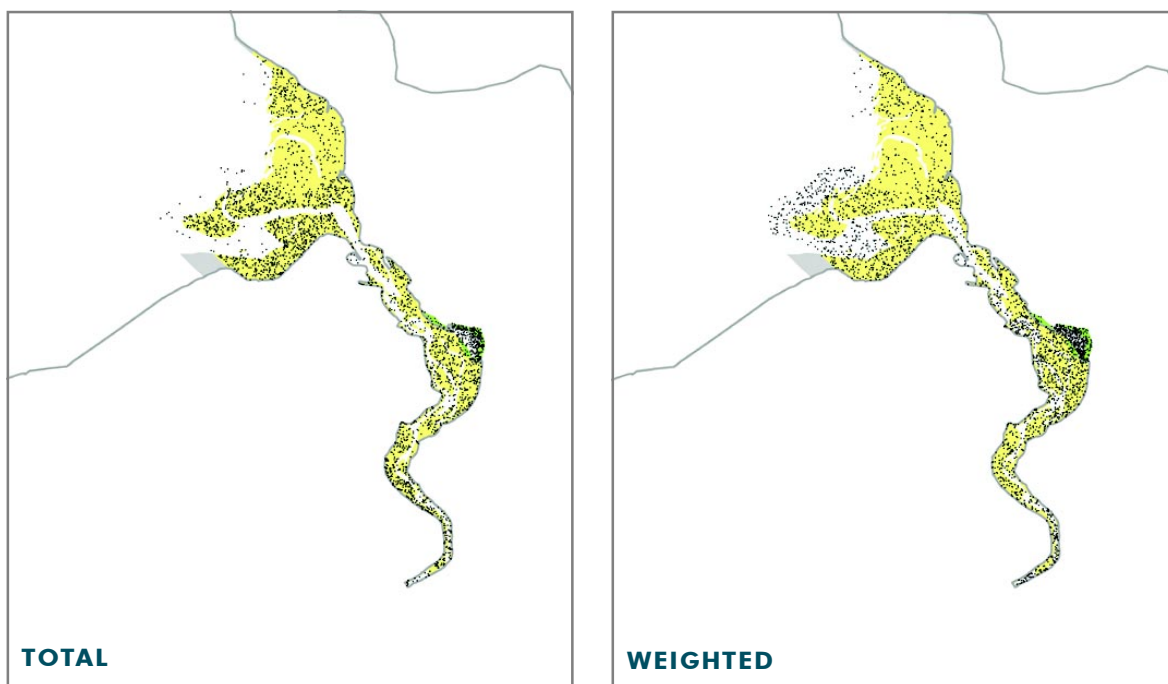


Figure 4.50.2: Low tide waterbird distributions recorded at the Conwy Estuary, winter 1996–97

4.51 CLWYD ESTUARY



LTC site code:	CG
Centre grid:	SJ0080
JNCC estuarine review site:	33
Habitat zonation:	174 ha intertidal, 164 ha subtidal, 0 ha nontidal
Statutory status:	N/A
Winter waterbird interest:	Cormorant, Common Scoter

SITE DESCRIPTION

The Clwyd is a small estuary on the North Wales coast. The river channel is narrow and entirely canalised, with a restricted mouth opening onto a wide sandy beach at Rhyl. The inner estuary is mostly muddy with a limited saltmarsh fringe. The adjacent marine lake at Rhyl is also a suitable feeding ground when drained in the winter. Most disturbance to the site comes from human recreational activities, most intensively during the summer months, but industrial activities are limited.

COVERAGE AND INTERPRETATION

The Clwyd Estuary was counted during 1992–93, during all four months of the winter. Figure 4.51.1 shows the positions of the six sections counted for the survey.

The Clwyd Estuary overlaps with no SPAs or SSSIs, the only protection coming from Local and County Structure Plans (Buck 1993b).

The site is not far from the Dee Estuary, although probably far enough that there is little interchange of birds on a daily basis. The area of outer beach chosen to survey for the LTCs, however, was

somewhat arbitrary, and some birds are likely to occur east and west of the mapped sections.

WATERBIRD DISTRIBUTION

The low tide distribution map from the winter of 1992–93 is presented for one of the two species of principal interest listed above, namely Cormorant. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.51.2). The other listed species, Common Scoter, occurs offshore in Liverpool Bay and was not recorded during the survey.

The highest densities of birds were found on the inner estuary, as well as on the marine lake. Cormorants were recorded in only very low numbers at low tide and presumably disperse out into Liverpool Bay to feed. Amongst the other species recorded, the inner estuary supported the majority of the Lapwings and Curlews, Shelducks occurred more evenly along the river channel and Oystercatchers were more common on the outer sandflats along the edge of Liverpool Bay. Redshanks occurred throughout but more densely along the river.

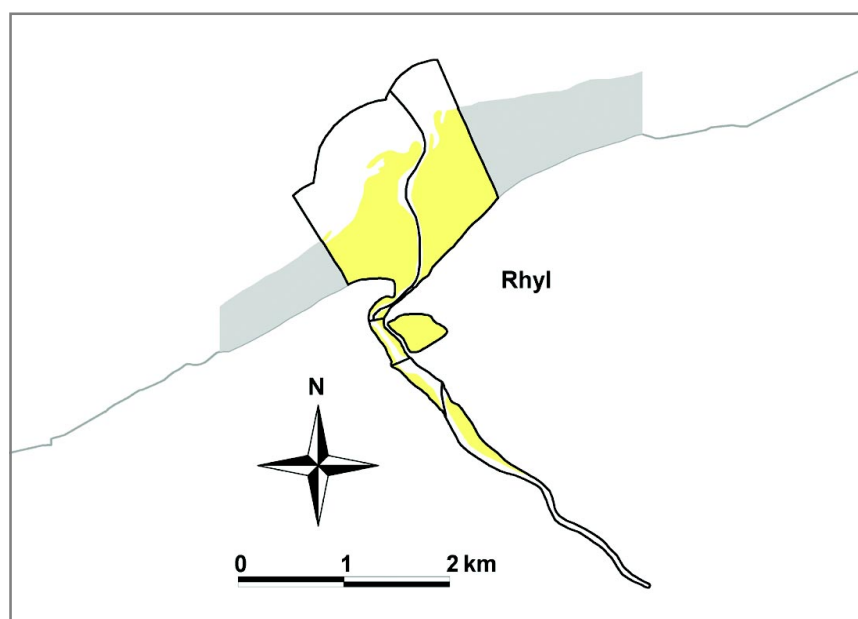


Figure 4.51.1: LTC sections at the Clwyd Estuary, winter 1992–93



Figure 4.51.2: Low tide waterbird distributions recorded at the Clwyd Estuary, winter 1992–93

4.52 DEE ESTUARY & NORTH WIRRAL SHORE



LTC site code:	DD
Centre grid:	SJ2674
JNCC estuarine review site:	34
Habitat zonation:	9376 ha intertidal, 3039 ha subtidal, 1517 ha nontidal
Statutory status:	The Dee Estuary SPA (UK9013011), The Dee Estuary Ramsar (7UK020) [Also Mersey Narrows and North Wirral Foreshore proposed SPA (UK9013011), Mersey Narrows and North Wirral Foreshore proposed Ramsar (7UK153)]
Winter waterbird interest:	Great Crested Grebe, Cormorant, Shelduck, Wigeon, Teal, Mallard, Pintail, Oystercatcher, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone, Waterbird assemblage

SITE DESCRIPTION

The Dee is a large estuary on the border between Wales and north-west England, comprising very extensive sandflats, mudflats and saltmarsh. The main channel of the Dee runs close to the Welsh shore for most of its length and so the mudflats are less wide on this side. At the northern end of the Dee are a series of rocky islands at Hilbre nearer the eastern shore and there is an area of sand dunes at Point of Ayr on the western shore. The site, as considered by WeBS, also includes the adjacent North Wirral Shore, an area of intertidal sand, mudflats and developing saltmarsh which reaches eastwards to the mouth of the Mersey. The Dee is a heavily industrialised and urbanised area (particularly along the Welsh shore) which suffers from pollution, windsurfing, jet-skiing (and other general disturbance) and commercial cockling. Recently, there have been port developments and associated channel dredging (C. Wells pers. comm.).

COVERAGE AND INTERPRETATION

The Dee Estuary and North Wirral Shore were counted in entirety (the 41 sections depicted in Figure 4.52.1) during the winter of 1996–97, although no November count was made in that winter. During the following two winters, 1997–98 and 1998–99, repeat counts were carried out of the North Wirral Shore only (a total of 12 sections), counts being returned for all months for these two winters.

Figure 4.52.2 shows that the Dee Estuary SPA has been largely covered by the LTCs, but that there were areas along the Welsh shore for which access was not possible. Additionally, some of the outer sandflats at the mouth of the Dee were uncounted for reasons of distance from the counter. The North Wirral shore LTC area will overlap with the Mersey Narrows and North Wirral Foreshore pSPA, although the latter is not depicted since, at time of writing, the boundary has not been finalised. The boundary of the Ramsar site is entirely coincident with that of the SPA.

Movements by birds between this site and others nearby occur on a daily basis and an understanding of this must be taken into account when discussing the birds of the Dee Estuary and North Wirral shore. The degree to which birds in the main part of the Dee move to and from other sites is not clear, although there is likely to be a small amount of dispersal west along the Welsh coastline from the Point of Ayr high tide roost. At the south end of the site, birds may interchange with areas further upstream and to and from other nearby wetlands. More significant, however, is the situation at the north-eastern end of the site. Interchange of birds is frequent between the North Wirral Shore and the contiguous Mersey Narrows (the latter counted as part of the Mersey to date). Some movement further up the Mersey to Rock Ferry could also occur. Furthermore, birds feeding at both the Mersey Narrows and North Wirral

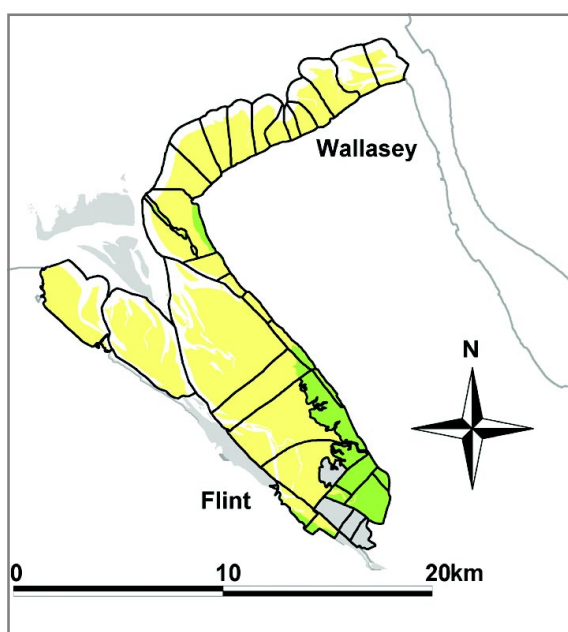


Figure 4.52.1: LTC sections at the Dee Estuary, winter 1996–97

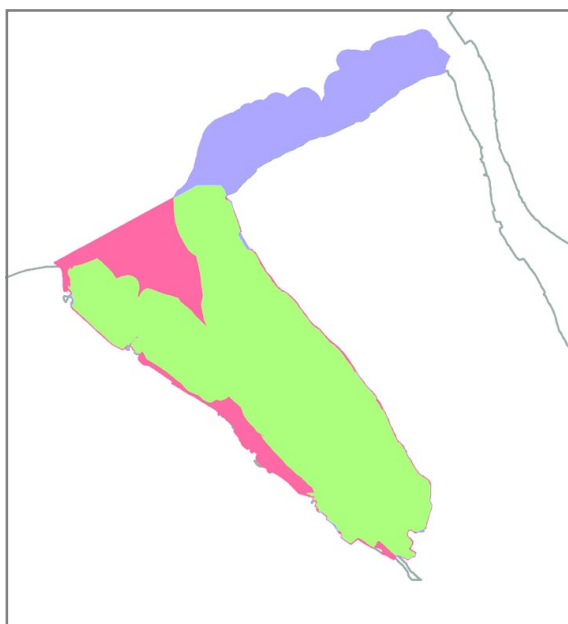


Figure 4.52.2: LTC and SPA boundaries, with overlap, at the Dee Estuary

Shore are known to roost, at least in part, across the water at the Alt Estuary (Mitchell *et al.* 1988).

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1996–97 are presented for 17 of the 18 species of principal interest listed above. For clarity, smaller dots are used to display the distributions of a number of these species. Furthermore, maps for Teal, Oystercatcher, Knot, Dunlin and Bar-tailed Godwit are displayed at a scale of one dot representing five birds. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.52.3). Only a single Great Crested Grebe (not mapped) was recorded at low tide at the Dee during the the 1996–97 winter, compared to over 200 on Core Counts,

and the species was presumably far offshore at low tide.

The Dee Estuary supports very large numbers of waterbirds, apparent even when the totals map is displayed at a scale of one dot for every 20 birds. However, by far the highest overall bird density is at Mockbeggar Wharf on the North Wirral Shore. The weighted totals map also picks out this section, but further highlights parts of the main Dee Estuary off Flint and along the east shore between Caldy and Heswall; in both of these cases the weighting is strongly driven by Black-tailed Godwits which occur in their highest densities at these two areas. Other species which showed a clear preference for the main Dee Estuary were Shelduck and the four *Anas* ducks. The largest concentrations of the *Anas* species occurred almost exclusively in the inner half of the main estuary, although some Pintail were found towards the mouth along the Welsh shore. Shelducks were more widespread and a few made it round to the North Wirral Shore. Species occurring mostly or entirely along the North Wirral Shore were Grey Plover, Sanderling, Bar-tailed Godwit and Turnstone, the latter species also concentrated at Hilbre Island (although larger numbers were present adjacent to the Dee Estuary LTC site, at the mouth of the Mersey Estuary). Species widely distributed across the whole area were Oystercatcher, Dunlin, Curlew and Redshank. Knot and Lapwing were clumped across the site. Cormorants were only noted in two discrete areas, the inner Dee and off Mockbeggar Wharf.

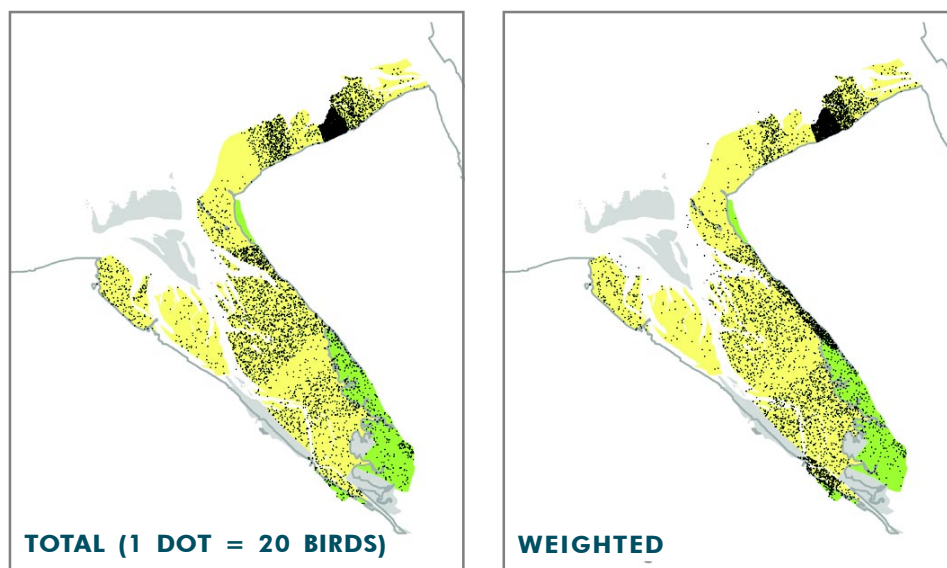


Figure 4.52.3 (i): Low tide waterbird distributions recorded at the Dee Estuary, winter 1996–97

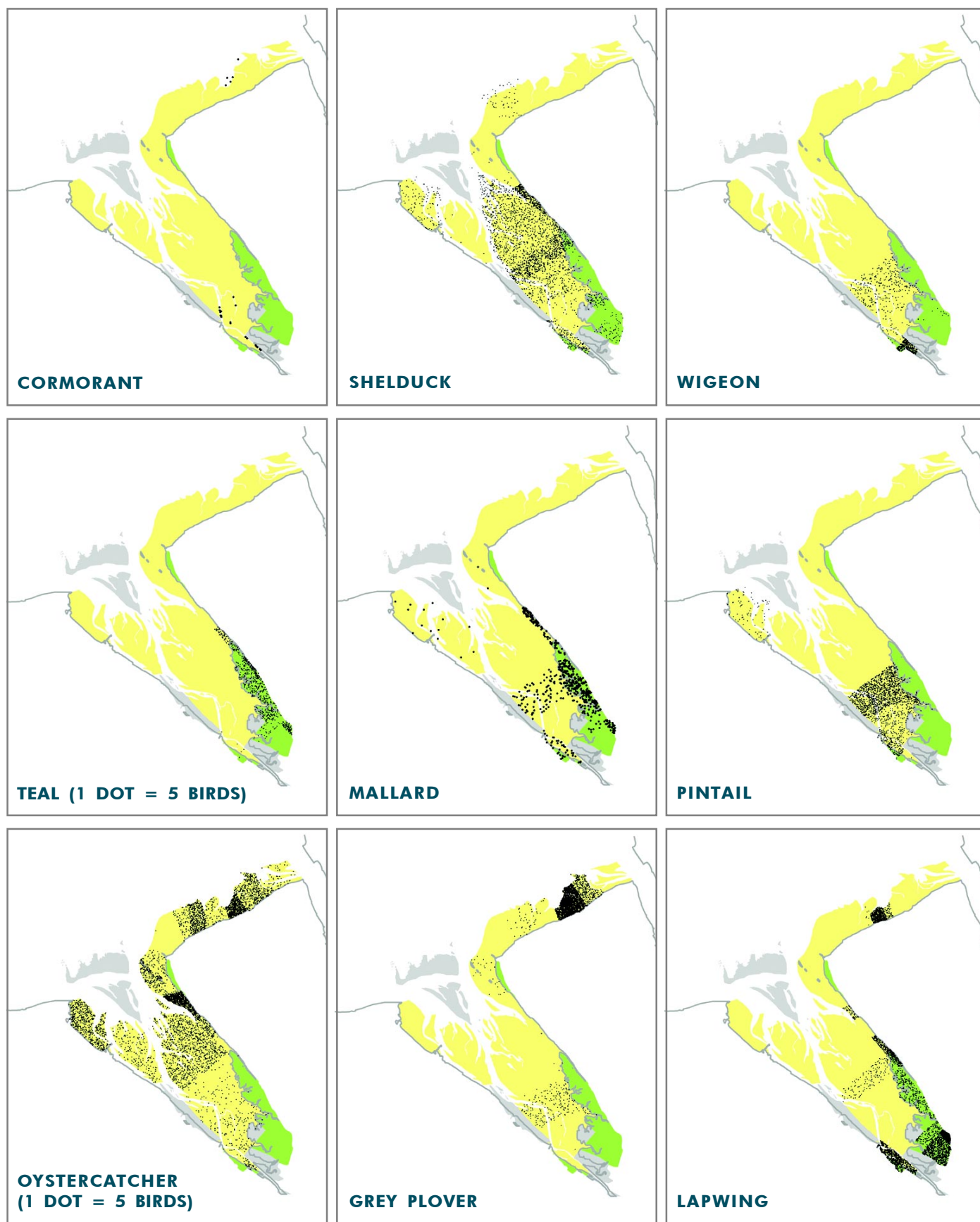


Figure 4.52.3 (ii): Low tide waterbird distributions recorded at the Dee Estuary, winter 1996–97

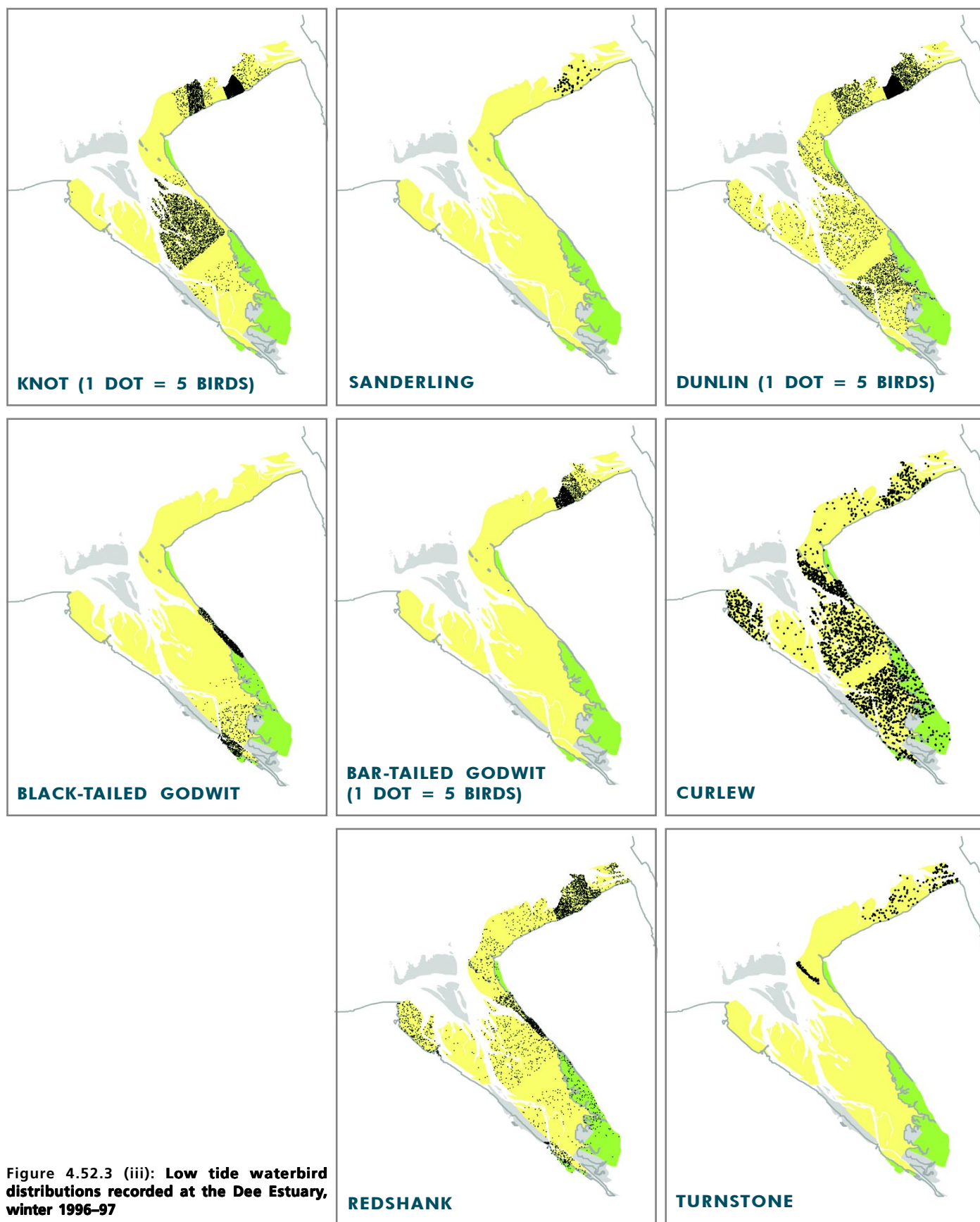


Figure 4.52.3 (iii): Low tide waterbird distributions recorded at the Dee Estuary, winter 1996–97

4.53 MERSEY ESTUARY



LTC site code:	BM
Centre grid:	SJ4180
JNCC estuarine review site:	35
Habitat zonation:	2520 ha intertidal, 1074 ha subtidal, 882 ha nontidal
Statutory status:	Mersey Estuary SPA (UK9005131), Mersey Estuary Ramsar (7UK096) [Also Mersey Narrows and North Wirral Foreshore proposed SPA (UK9013011), Mersey Narrows and North Wirral Foreshore proposed Ramsar (7UK153)]
Winter waterbird interest:	Great Crested Grebe, Cormorant, Shelduck, Wigeon, Teal, Pintail, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Curlew, Redshank, Turnstone, Waterbird assemblage

SITE DESCRIPTION

The Mersey is one of the most heavily developed estuaries in the UK (although pollution levels have lessened somewhat in recent years), with the outer sections of the estuary in particular infringed upon by Liverpool and Birkenhead. The large towns of Widnes, Runcorn and Ellesmere Port are also adjacent to the site. Extensive areas of saltmarsh on the southern shore, as well as the Ince and Stanlow Banks, are protected from disturbance to some degree by the Manchester Ship Canal. As well as the usual problems which occur on heavily industrialised estuaries, such as pollution and disturbance from a variety of sources, a more specific issue which could be detrimental to wintering waterbirds is a proposal for a second runway for Liverpool Airport to be built on land claimed from the estuary. Additionally, there has been a proposal in recent years for a Mersey barrage to generate power from tidal energy, which could be revived in the event of the economics of tidal power being considered more realistic by energy producers (Rehfisch *et al.* 1991, Holloway *et al.* 1992, T. Parker pers.comm.).

COVERAGE AND INTERPRETATION

The Mersey Estuary was counted for the scheme during the three consecutive winters of 1996–97, 1997–98 and 1998–99, data being returned for all months except November 1996. Figure 4.53.1 shows the positions of the 28 sections counted for the survey during 1996–97 and 1997–98. The two count sections downstream of Runcorn Gap were lumped into a single count section in 1998–99. Note that large areas of sandflats in the outer estuary were not counted. This was largely because the counters considered them to be of little interest for birds, but some areas were also difficult to access. Another important point is that the Mersey is a highly mobile estuary and its true shape changes from year to year. The maps depicted are an approximation based on OS maps last revised in the early 1990s and count section boundaries provided by the counters did not always match well. Thus, especially along the middle south part of the site, distributions should be interpreted as being approximate to some degree.

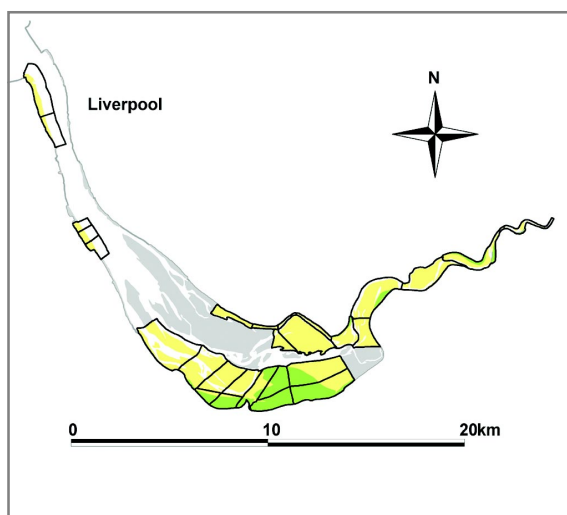


Figure 4.53.1: LTC sections at the Mersey Estuary, winters 1996–97 and 1997–98

The overlap of the LTC site with SPA boundaries (Figure 4.53.2) is currently complicated in that there are two SPAs involved, one of which is still at the proposed SPA stage. Additionally, the Mersey Estuary SPA is, at the time of writing, in the process of being extended to include the New Ferry SSSI (not shown). Considering only the Mersey Estuary SPA, the LTCs cover most of the important feeding grounds but do not include the outer sandbanks, as discussed above. Conversely, the inner estuary upstream of Runcorn Gap was counted for the LTCs but is not part of the SPA. The mouth of the estuary was counted for the LTCs and is equivalent to the Mersey Narrows part of the pSPA, although the boundary of the latter is not depicted as it has not, at the time of writing, been finalised. The boundary of the Ramsar site is entirely coincident with that of the SPA.

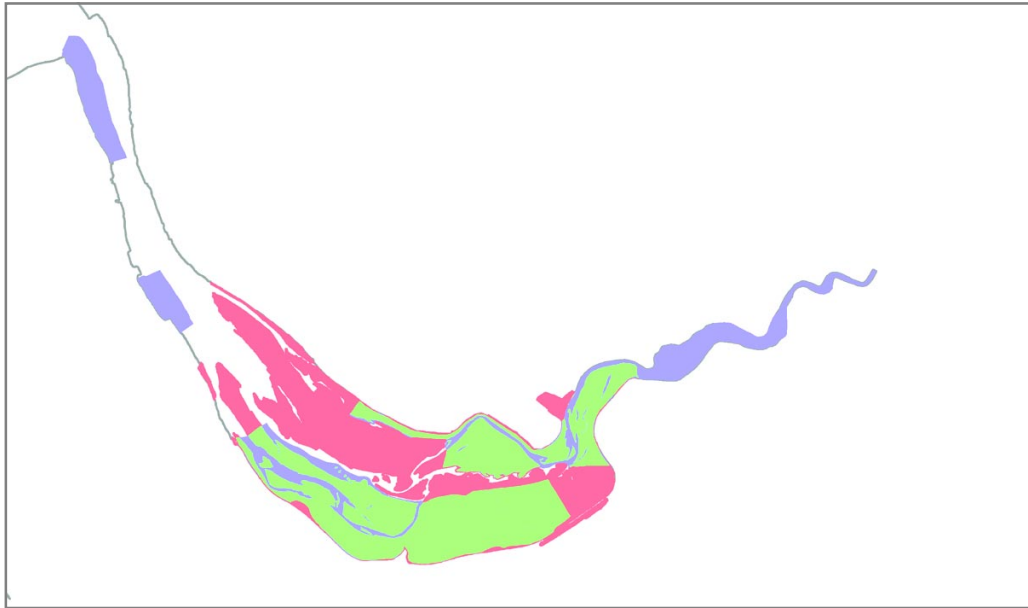


Figure 4.53.2: LTC and SPA boundaries, with overlap, at the Mersey Estuary

Significant inter-site movements do occur on a daily basis, with many of the birds feeding at the mouth of the Mersey roosting on the Alt (including Seaforth NR), although an increasing number of Turnstones, at least, have begun to roost at Egremont itself (C. Clee pers. comm.). Similarly, intertidal habitat at Egremont is contiguous with that on the North Wirral Shore, treated to date by the LTCs as part of the Dee. It is now established that there is also interchange of birds between the main part of the Mersey Estuary and the Dee (T. Parker pers. comm.). Additionally, tidal movements occur between the Mersey and adjacent areas such as Frodsham sludge beds, Fiddlers Ferry power station lagoons and nearby farmland.

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1998–99 are presented for all of the 16 species of principal interest listed above. For clarity, smaller dots are used to display the distributions of many of these species. Furthermore, maps for Lapwing, Knot and Dunlin are displayed at a scale of one dot representing five birds. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.53.3).

The totals map shows that overall bird density was at its highest around Stanlow Banks and at New Ferry, with the weighted total map particularly emphasising the latter area as well as the Mersey Narrows. Dunlin were clearly the dominant species over much of the middle estuary with Wigeon and Teal numbers around the southern saltmarshes also very high. Lapwings were also common in the middle estuary but were clearly the dominant species in the inner reaches, along with smaller numbers of Golden Plovers. The middle parts of the site were also important for Shelducks, Knot, Grey Plovers, Black-tailed Godwits, Curlews and Redshanks. Further downstream, the New Ferry shore was of critical importance to Pintail as well as holding high densities of Shelducks, Black-tailed Godwits, Oystercatchers, Knot and Redshank. Finally, the mouth of the estuary was the key area for Turnstones with high densities also of Oystercatchers and Redshanks. Great Crested Grebes and Cormorants were relatively scarce at low tide.



Figure 4.53.3 (i): Low tide waterbird distributions recorded at the Mersey Estuary, winter 1998–99

MERSEY ESTUARY

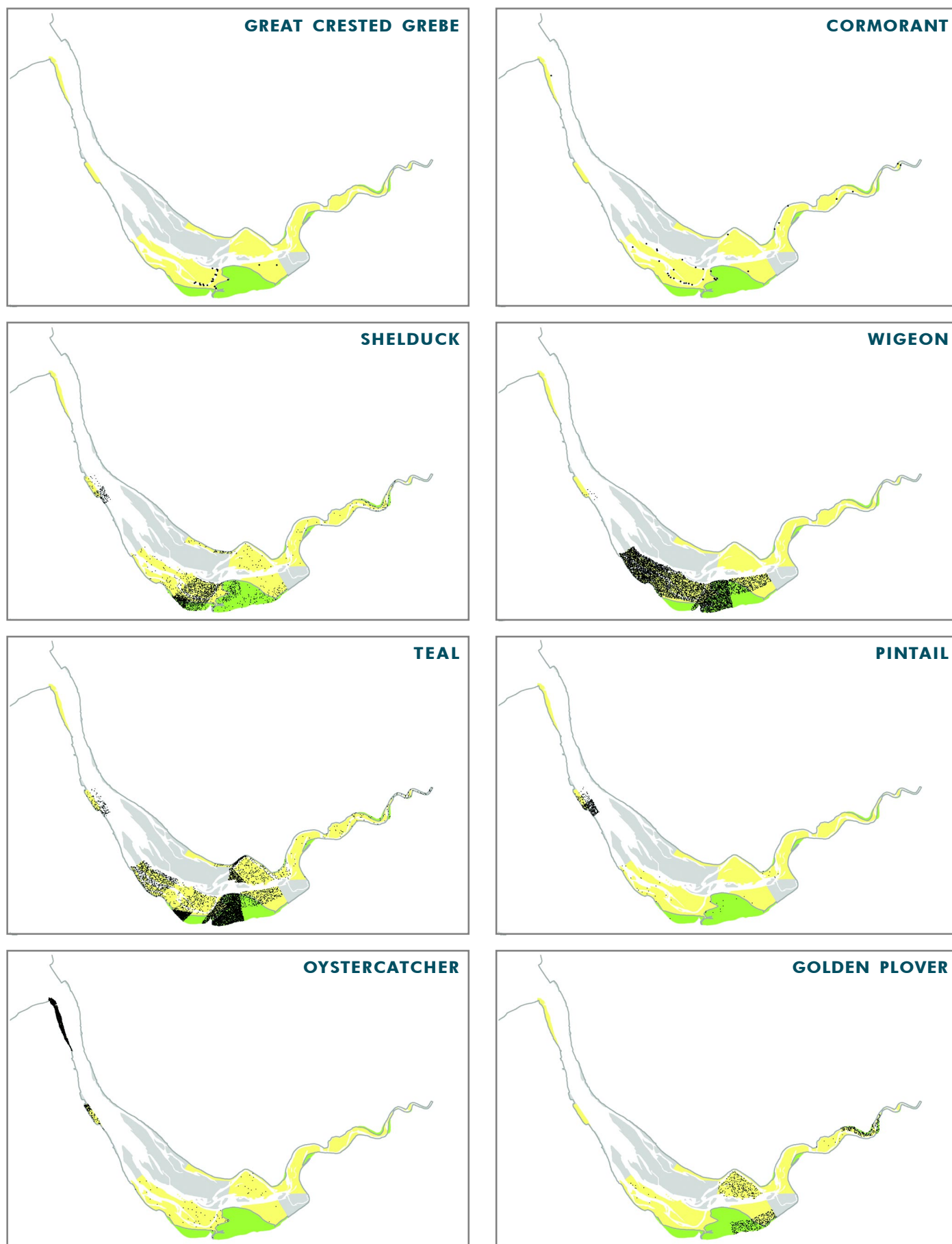


Figure 4.53.3 (ii): Low tide waterbird distributions recorded at the Mersey Estuary, winter 1998–99

MERSEY ESTUARY

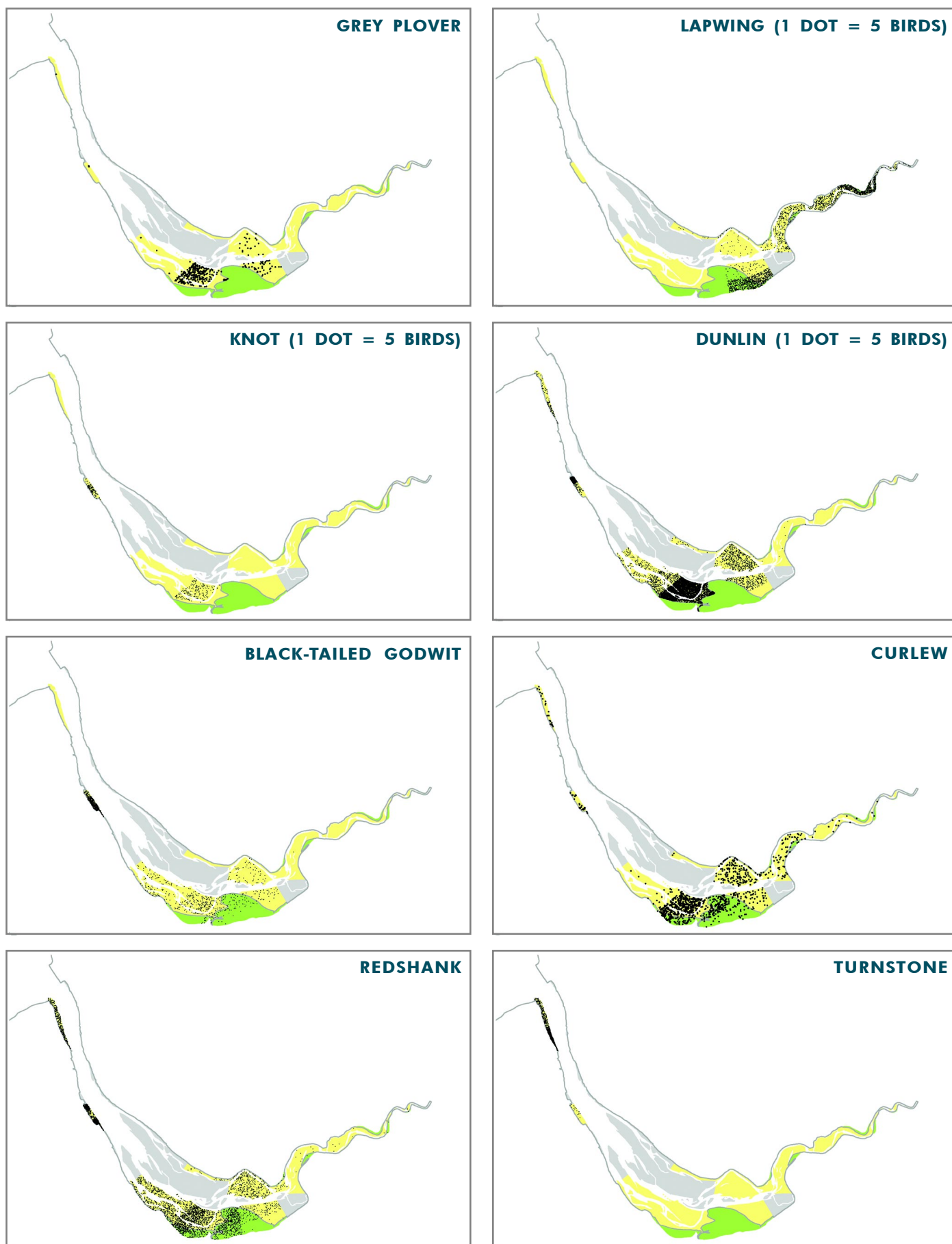


Figure 4.53.3 (iii): Low tide waterbird distributions recorded at the Mersey Estuary, winter 1998–99

4.54 ALT ESTUARY



LTC site code:	BA
Centre grid:	SD2903
JNCC estuarine review site:	36
Habitat zonation:	1 646 ha intertidal, 997 ha subtidal, 0 ha nontidal
Statutory status:	Ribble and Alt Estuaries SPA (UK9005103), Ribble and Alt Estuaries Ramsar (7UK083)
Winter waterbird interest:	Cormorant, Bewick's Swan, Whooper Swan, Pink-footed Goose, Shelduck, Wigeon, Teal, Pintail, Common Scoter, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Waterbird Assemblage

SITE DESCRIPTION

The River Alt emerges as a creek on the shore-line of Liverpool Bay between the Ribble and Mersey Estuaries. The majority of the site is sandy in character, although somewhat muddier around the river mouth where there are also some rocky areas. A large area of saltmarsh used to be present at the mouth of the Alt but has mostly been lost to land-claim, principally in the early 19th century. The whole site is backed by one of the most important dune systems in the country, although much of the southern part of this has been lost to housing and dock development at Crosby. Human activities are few on the estuary and are not intensive.

of the 16 sections counted for the survey which were the same during each winter, with the exception that the northernmost section was not counted during the first winter.

Figure 4.54.2 shows how the Alt Estuary is a relatively small part of the Ribble and Alt Estuaries SPA. Any assessment at the SPA level must also take into account the results of the Ribble Estuary LTCs. A further important feature, however, is that the southernmost part of the LTC site is not included within the SPA boundary. The boundaries of the Ramsar site are coincident with those of the SPA so far as the intertidal zone is concerned, but the former also includes an area of dune habitat from the River Alt north to Southport.

COVERAGE AND INTERPRETATION

The Alt Estuary was covered by the scheme during the three consecutive winters 1996–97 (no November count), 1997–98 and 1998–99 (no January count). Figure 4.54.1 shows the positions

When interpreting LTC data from the Alt Estuary, it is crucial to consider the effects of daily movements between the Alt and adjacent sites, not only the Ribble Estuary to the north but also the North Wirral Shore and the mouth of the Mersey Estuary. The numbers of birds roosting

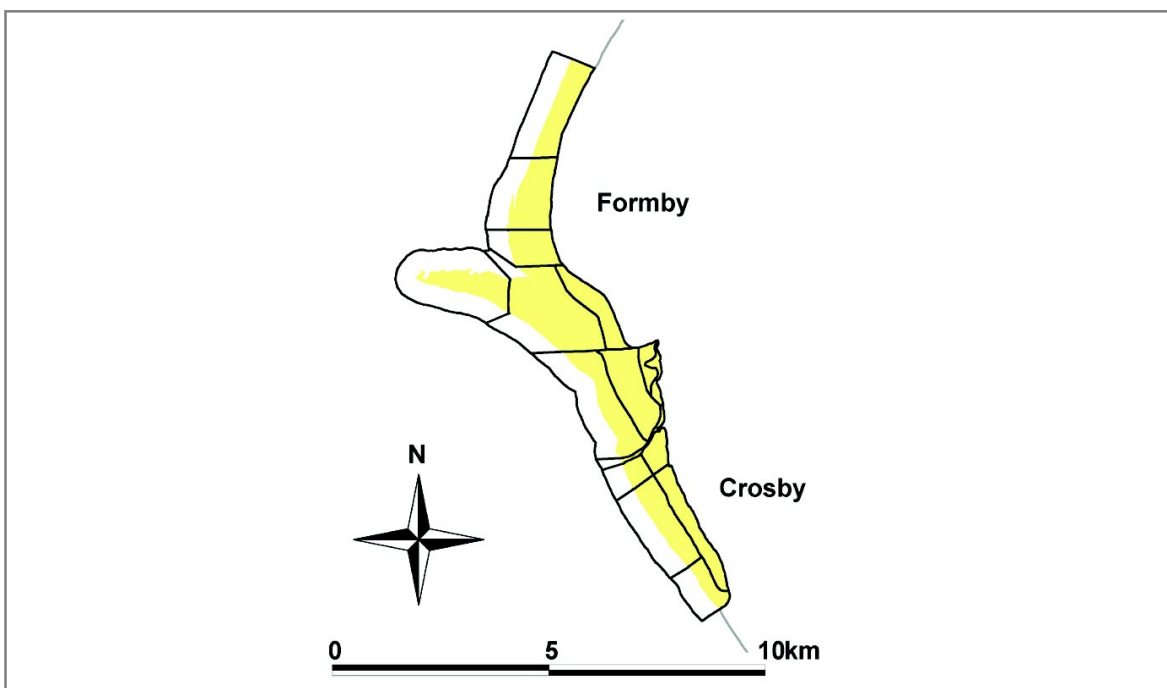


Figure 4.54.1: LTC sections at the Alt Estuary, winters 1997–98 and 1998–99

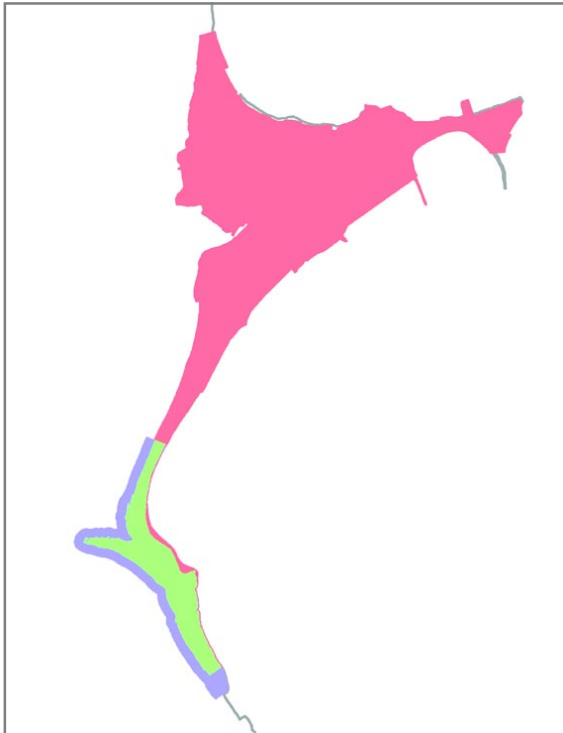


Figure 4.54.2: LTC and SPA boundaries, with overlap, at the Alt Estuary

at the Alt increased greatly following increased disturbance of previous roost sites in the outer parts of the Dee Estuary and North Wirral Shore, but birds still returned to those areas to feed (Mitchell et al. 1988). Movements may also occur between the site and inland (e.g. for Pink-footed Geese) or further offshore (e.g. Common Scoters).

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1997–98 are presented for 13 of the 20 species of principal interest listed above. For clarity, smaller dots are used to display the distribution of Dunlin. Additional maps of total birds and total birds

weighted by 1% threshold value are also presented (Figure 4.54.3). Of the remaining species, very small numbers of Pink-footed Geese were recorded at low tide on several occasions but there were no records of Bewick's Swan, Whooper Swan, Wigeon, Teal, Pintail or Black-tailed Godwit; these species occur to the north on the Ribble Estuary part of the SPA.

The totals map suggests that the highest overall bird densities were found along the channel of the River Alt and at its mouth. The weighted totals map revealed little difference. Notably lower densities were recorded on the upshore sections where the beach had been split into upshore and downshore. Additionally, the long spit of Taylor's Bank was occupied mostly by Cormorants (and some of the gulls) with very few waders present, although it is possible that the greater distance involved may have hampered viewing of smaller species. Species occurring in their highest densities along the channel of the Alt and its immediate surroundings were Shelducks, Lapwings and Golden Plovers. Curlews and Redshanks also occurred at higher densities closer to the channel. Other species widespread on the lower shore which nevertheless occurred at high densities near the Alt mouth were Sanderlings, Grey Plovers, Dunlin and Bar-tailed Godwits. Oystercatchers and Knot were less attracted by the river mouth. Common Scoters were noted only offshore from the northern part of the site; numbers noted at low tide were low compared to those known to be present in Liverpool Bay.

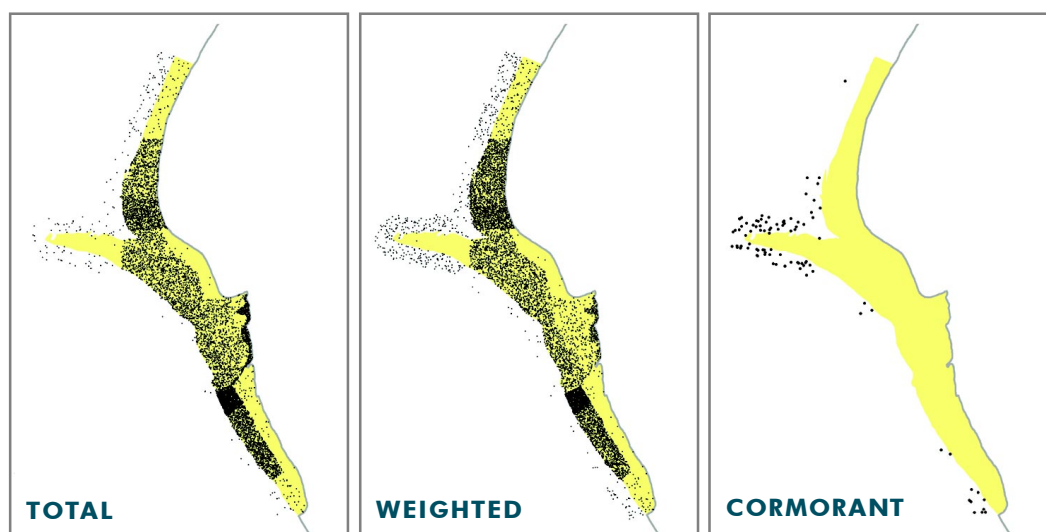


Figure 4.54.3 (i): Low tide waterbird distributions recorded at the Alt Estuary, winter 1997–98

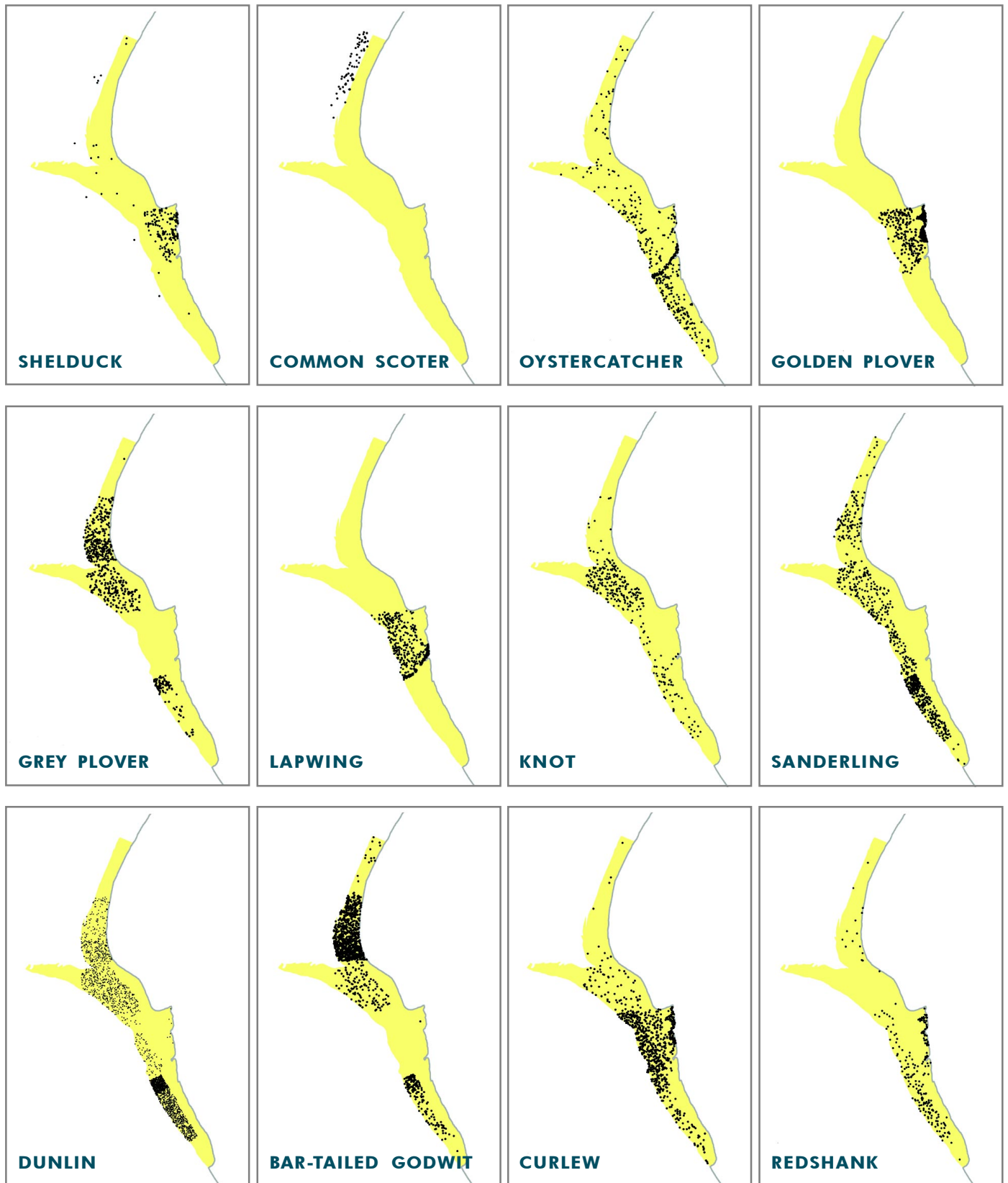


Figure 4.54.3 (ii): Low tide waterbird distributions recorded at the Alt Estuary, winter 1997–98



4.55 RIBBLE ESTUARY

LTC site code:	BR
Centre grid:	SD3424
JNCC estuarine review site:	37
Habitat zonation:	7261 ha intertidal, 1722 ha subtidal, 428 ha nontidal
Statutory status:	Ribble and Alt Estuaries SPA (UK9005103), Ribble and Alt Estuaries Ramsar (7UK083)
Winter waterbird interest:	Cormorant, Bewick's Swan, Whooper Swan, Pink-footed Goose, Shelduck, Wigeon, Teal, Pintail, Common Scoter, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Waterbird assemblage

SITE DESCRIPTION

The Ribble Estuary comprises a long, relatively narrow inner estuary, which is flanked by very large areas of saltmarsh, and a huge area of intertidal flats as the outer regions of the estuary. These flats run south as a wide, sandy shore, past Southport and merge into the area treated by the LTCs as the Alt Estuary. On the northern side the area extends to the southern outskirts of Blackpool. Current issues concerning the Ribble include the level of sand winning which is carried out, and the use of vehicles on the flats by fishermen. More general disturbance comes from recreational use, wildfowling and the presence of the Warton aerodrome on the north shore. However, disturbance levels are generally low and development pressures are currently light, much of the area being a National Nature Reserve (M. Gee, R. Lambert pers. comm.).

COVERAGE AND INTERPRETATION

The Ribble Estuary was covered for the scheme during the 1997–98 winter, with data returned for all four months. Figure 4.55.1 shows the positions

of the ten sections counted for the survey. As one of the largest sites covered by the LTCs, with vast expanses of intertidal habitat, there was a very real issue of safety and a finer-level subdivision of the estuary was unfortunately not possible at this time.

Figure 4.55.2 shows the LTC and SPA boundaries. The major difference is clearly that the SPA also includes the Alt Estuary. Further areas of SPA not counted were extensive areas of saltmarshes at Warton Bank, Hutton Marsh and around Banks Marsh, difficult to access safely by counters. All of the Ribble counted for the LTCs was included within the SPA. The boundaries of the Ramsar site are mostly coincident with those of the SPA around the Ribble Estuary, although there are some additional areas of dune habitat south of Southport also included within the Ramsar site.

The amount of daily interchange of birds between the Ribble and other estuaries to the south is unknown but clearly must occur to some degree at the boundary with the Alt. Some dispersal north along Blackpool beach also doubtless occurs. More

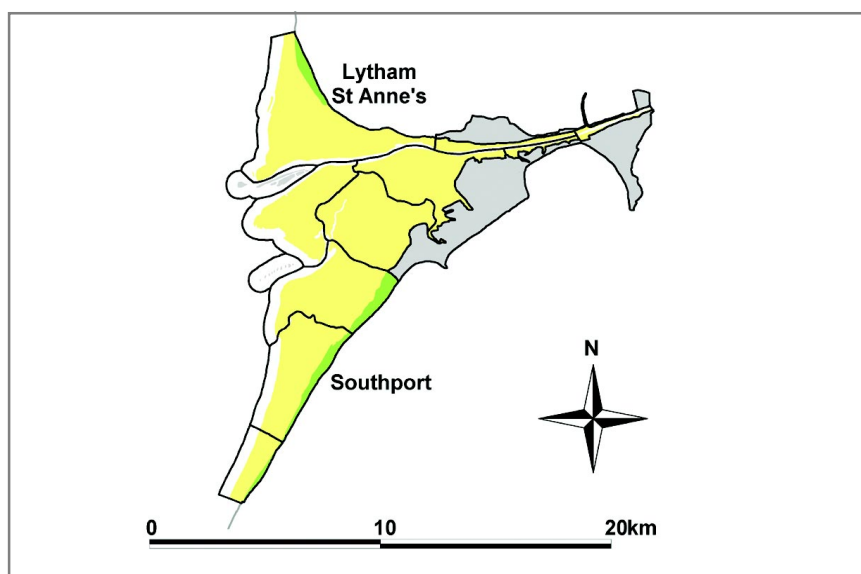


Figure 4.55.1: LTC sections at the Ribble Estuary, winter 1997–98



Figure 4.55.2: **LTC** and **SPA** boundaries, with **overlap**, at the Ribble Estuary

notably, anecdotal evidence suggests that there may even be regular interchange of birds between the Ribble and Morecambe Bay. However, since even within the site the regular tidal movements of birds can involve long flight distances, it is difficult to be certain how far some birds are moving. In addition, Pink-footed Geese and the winter swans make use of a wide variety of sites in south-west Lancashire, notably Martin Mere. Other wildfowl species also make use of surrounding areas, but mostly at night, making the extent of the movements difficult to determine.

WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1997–98 are presented for 19 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 4.55.3). Common Scoter, the only species of interest not mapped, occurs offshore in Liverpool Bay, mostly off the Alt Estuary.

The totals map (and similar weighted totals map) suggests that the highest overall bird densities were found on Foulnaze, Southport Sands and the inner estuary. However, even more than at other sites, the mapped distributions at the Ribble are extremely approximate given the very large size of most of the sections. Feeding flocks were

clumped within these sections, often (but not always) along channels or the lower shore, hence discussion can be at the broadest scale only. Therefore, the apparent importance of Foulnaze compared to Marshside Sands, say, may hide a more complex pattern of high and low density usage areas at a finer scale. With this in mind, it may be safest to restrict comments to the following. The inner estuary (where narrow and flanked by saltmarshes) was the principal area for Bewick's and Whooper Swans, Pink-footed Geese, Shelducks, Teal, Golden Plovers and Lapwings. In addition, the two very widespread species Redshank and Curlew appeared to occur on the inner river in higher densities. Wigeon were widespread but the highest concentrations appeared to be at Banks Sands, with Pintail mostly found on Salter's Bank; these two species roost on the estuary during the daylight hours and feed inland at night. Sanderlings also occurred in locally high densities at Salter's Bank as well as Ainsdale/Birkdale Sands. Black-tailed Godwits were mostly at Ainsdale Sands and on the inner estuary. A number of waders (Oystercatcher, Grey Plover, Knot, Dunlin, Bar-tailed Godwit) were found in their highest densities on the outer parts of the estuary, mostly showing a higher apparent density at Foulnaze, but Grey Plovers more so on Southport Sands.

RIBBLE ESTUARY

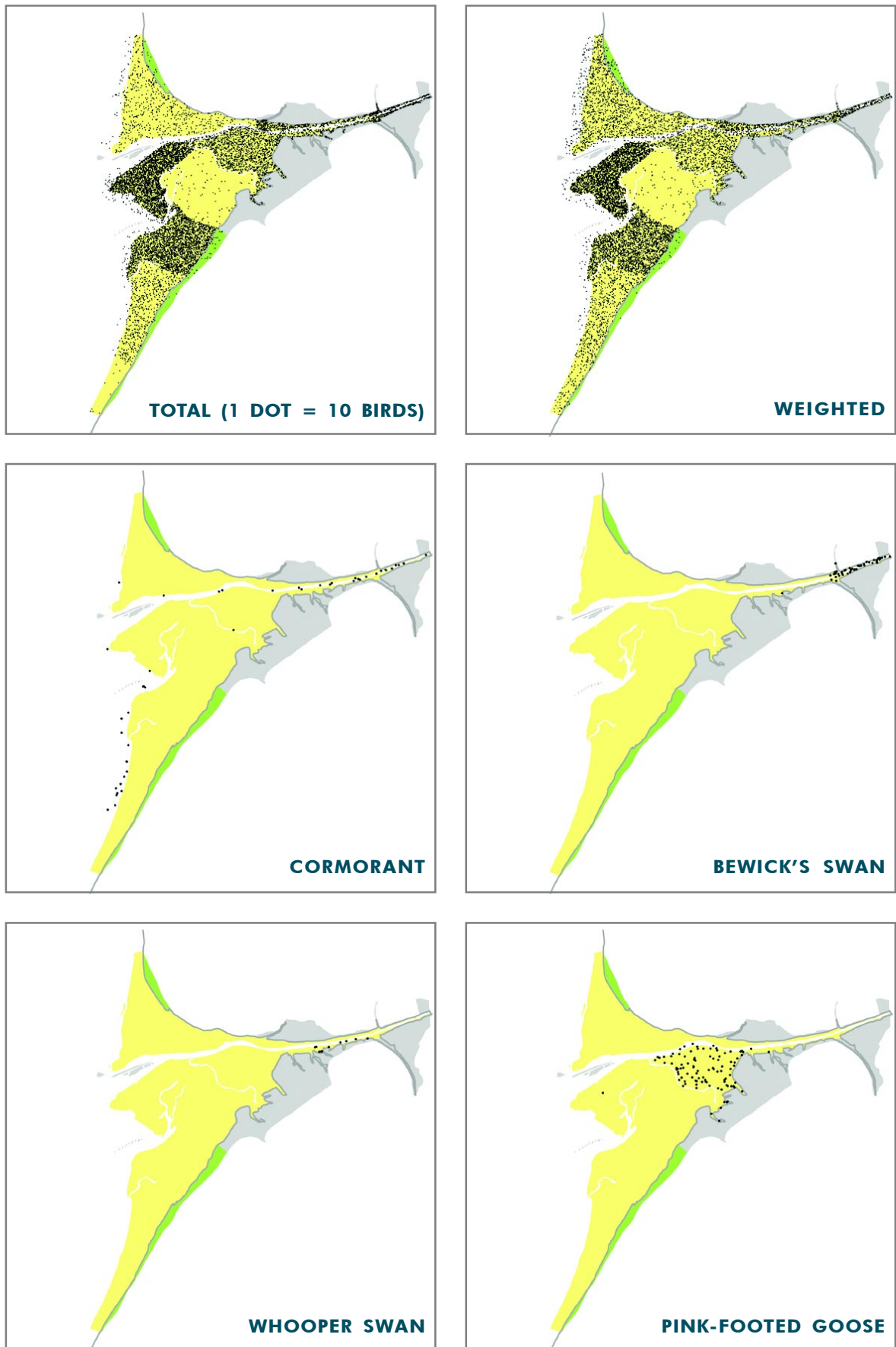


Figure 4.55.3 (i): Low tide waterbird distributions recorded at the Ribble Estuary, winter 1997–98

RIBBLE ESTUARY

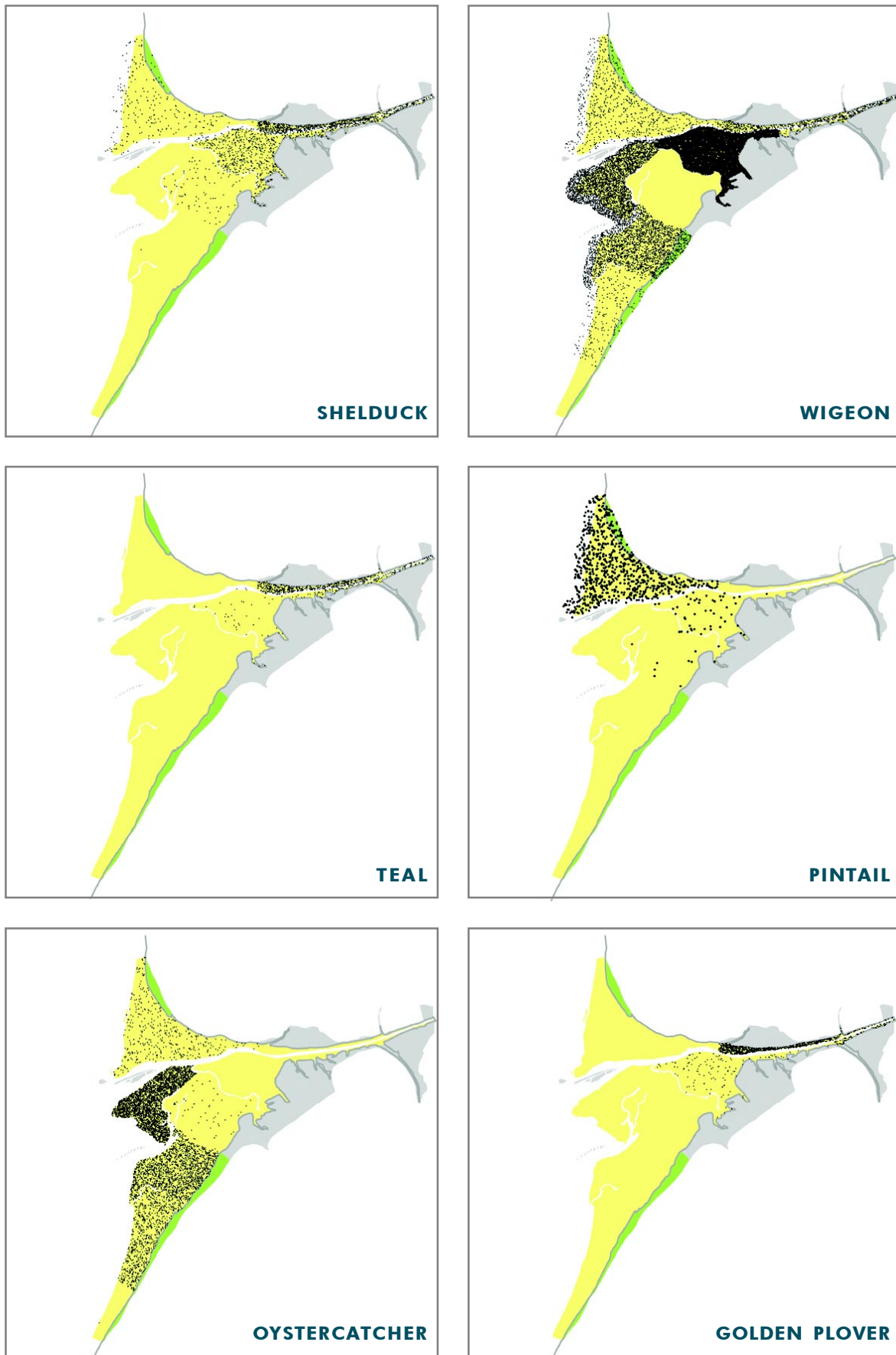


Figure 4.55.3 (ii): Low tide waterbird distributions recorded at the Ribble Estuary, winter 1997–98

RIBBLE ESTUARY

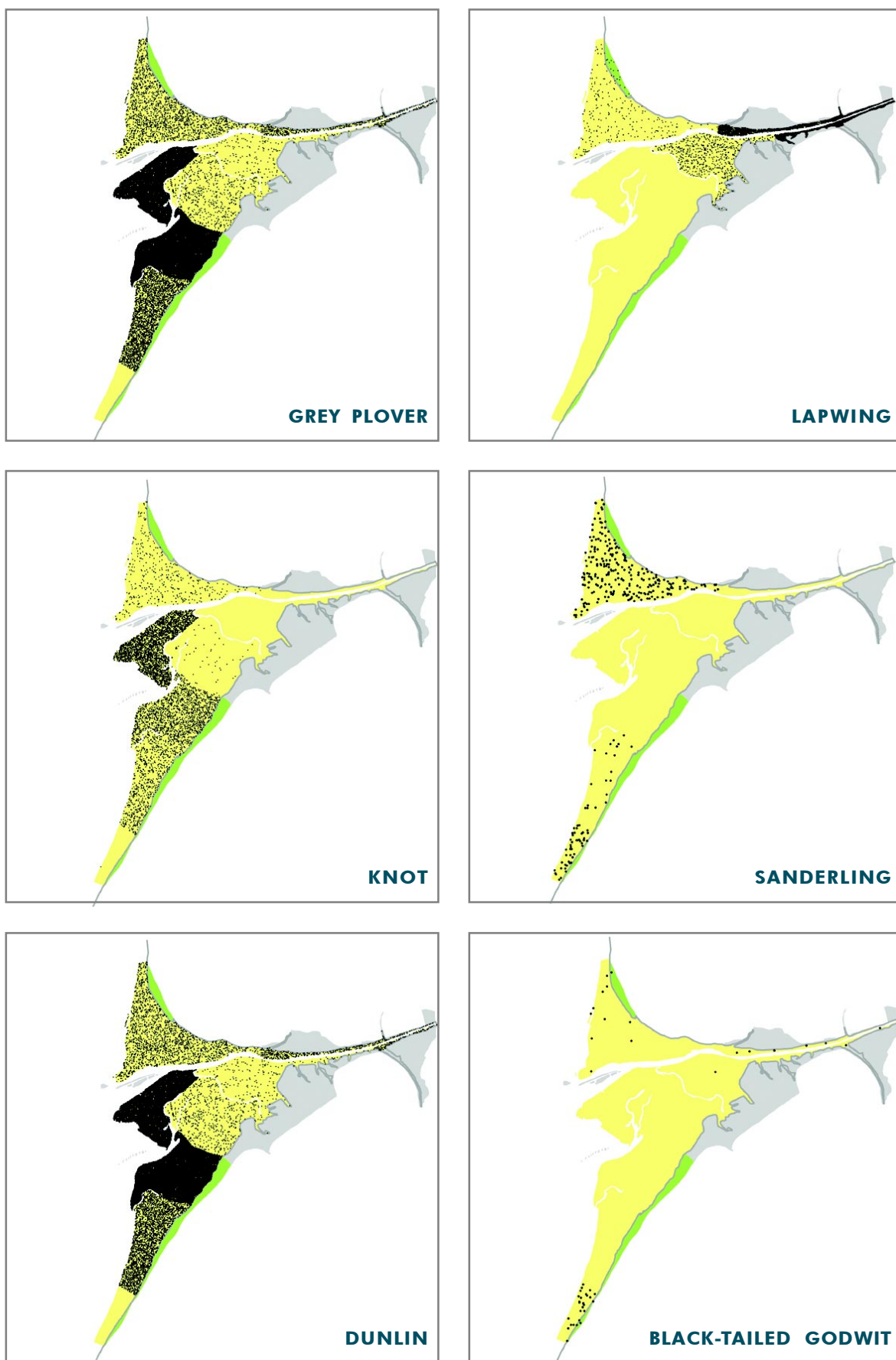


Figure 4.55.3 (iii): Low tide waterbird distributions recorded at the Ribble Estuary, winter 1997–98

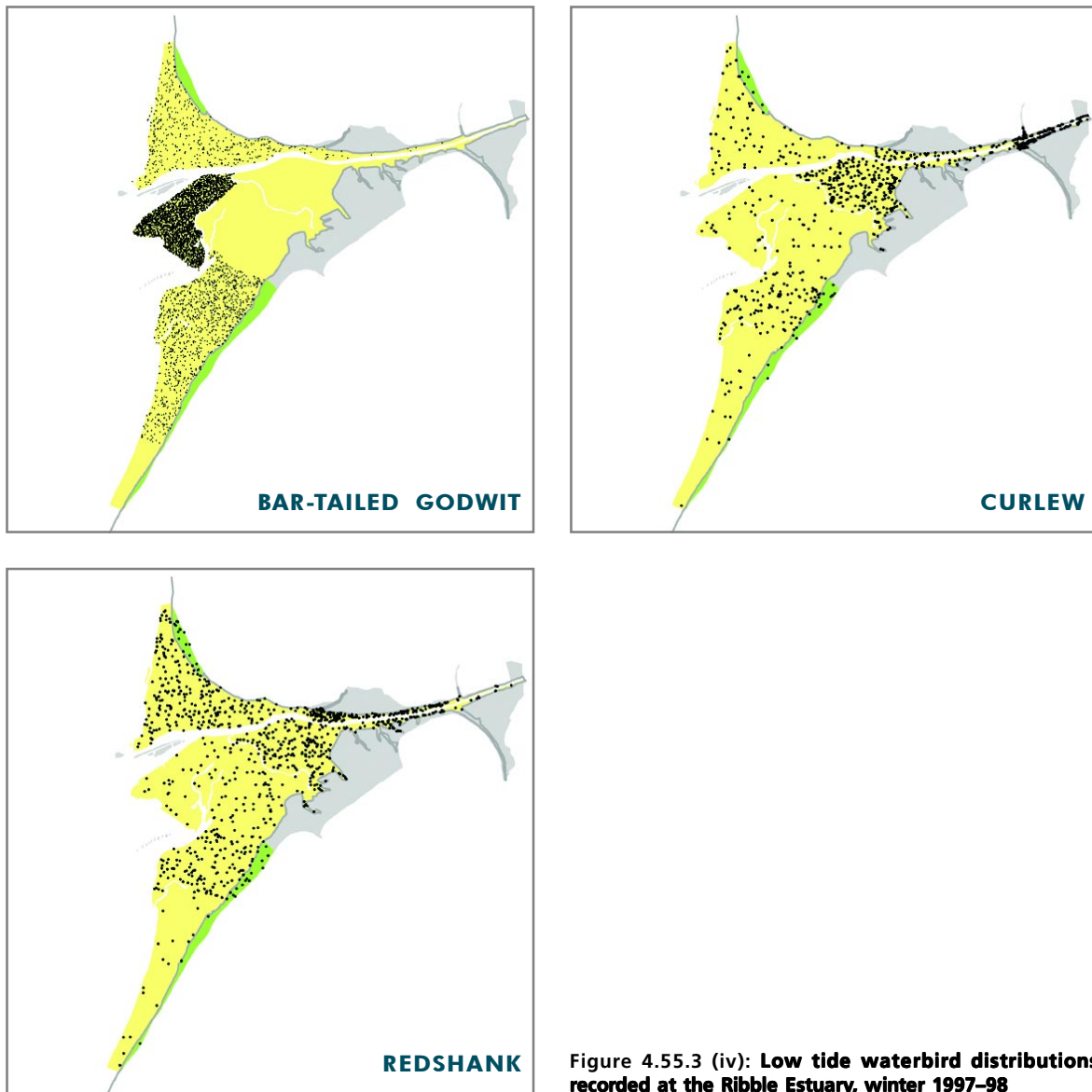


Figure 4.55.3 (iv): Low tide waterbird distributions recorded at the Ribble Estuary, winter 1997–98