



## 4.56 DUDDON ESTUARY

LTC site code:	BD
Centre grid:	SD1977
JNCC estuarine review site:	39
Habitat zonation:	3589 ha intertidal, 1024 ha subtidal, 541 ha nontidal
Statutory status:	Duddon Estuary SPA (UK9005031), Duddon Estuary Ramsar (7UK121)
Winter waterbird interest:	Shelduck, Pintail, Red-breasted Merganser, Oystercatcher, Knot, Sanderling, Dunlin, Curlew, Redshank, Waterbird assemblage

### SITE DESCRIPTION

The Duddon is a large estuary on the Cumbrian coast which almost forms a northwards extension of Morecambe Bay, being contiguous to that site behind Walney Island. At low tide, the Duddon is mostly sandy with many narrow water channels. The northern reaches of the estuary are flanked by extensive areas of saltmarsh whilst important dune systems are present towards the mouth of the estuary. There is a large, man-made lagoon at Hodbarrow (formed by the flooding of old mine workings). The outer parts of the site grade into sandy beaches which continue north and south along the coast. Although most of the estuarine shore is rural in character, there are industrial areas at Barrow-in-Furness and at Millom.

### COVERAGE AND INTERPRETATION

The Duddon Estuary was counted for the scheme during the three consecutive winters 1992–93, 1993–94 and 1994–95, with no missing months. Figure 4.56.1 shows the positions of the 40 sections counted for the survey during each of the three winters. A short continuation of non-counted shoreline extending north and south along the coast is illustrated in grey for clarity.

Figure 4.56.2 shows that there is a high level of agreement between the LTC site and the SPA boundary on the inner estuary, with only a few small areas of nontidal habitat omitted by the scheme, but that large areas of SPA surrounding the outer estuary were not surveyed for the counts, notably the outer beach and some of the

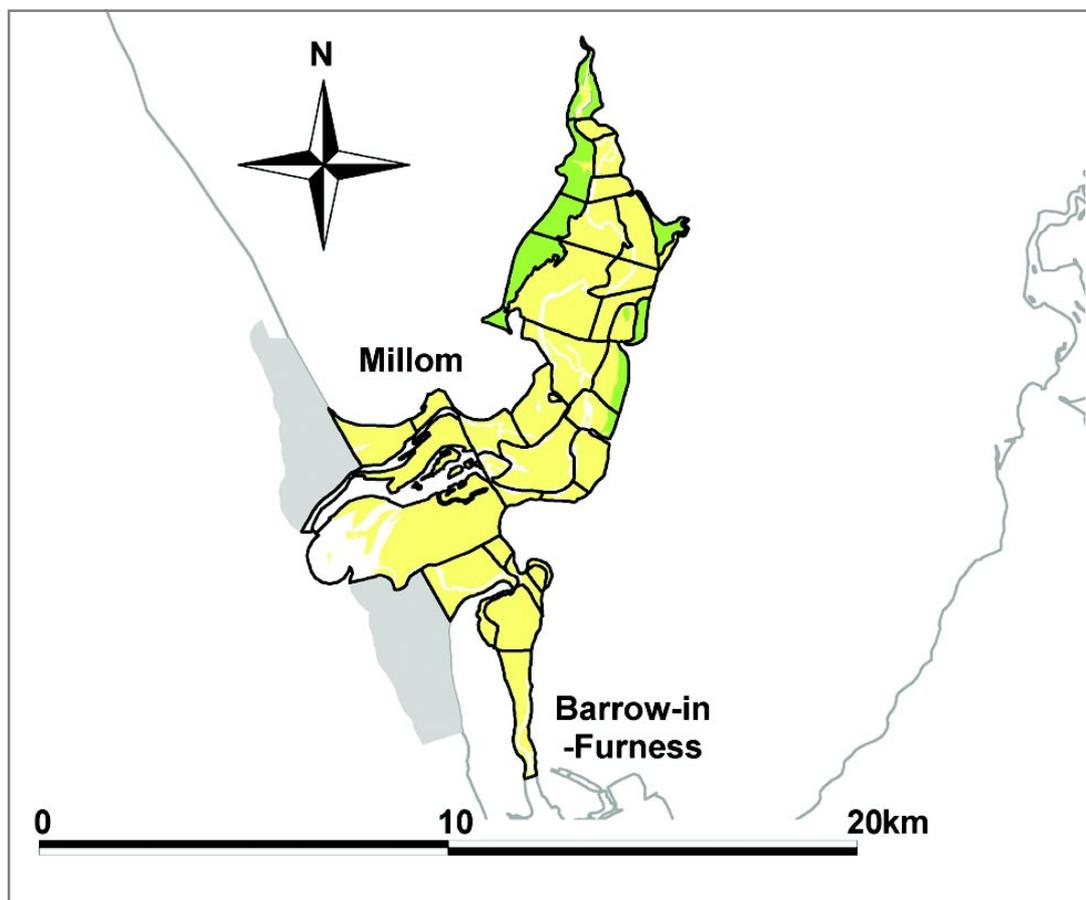


Figure 4.56.1: LTC sections at the Duddon Estuary, winters 1992–93 to 1994–95

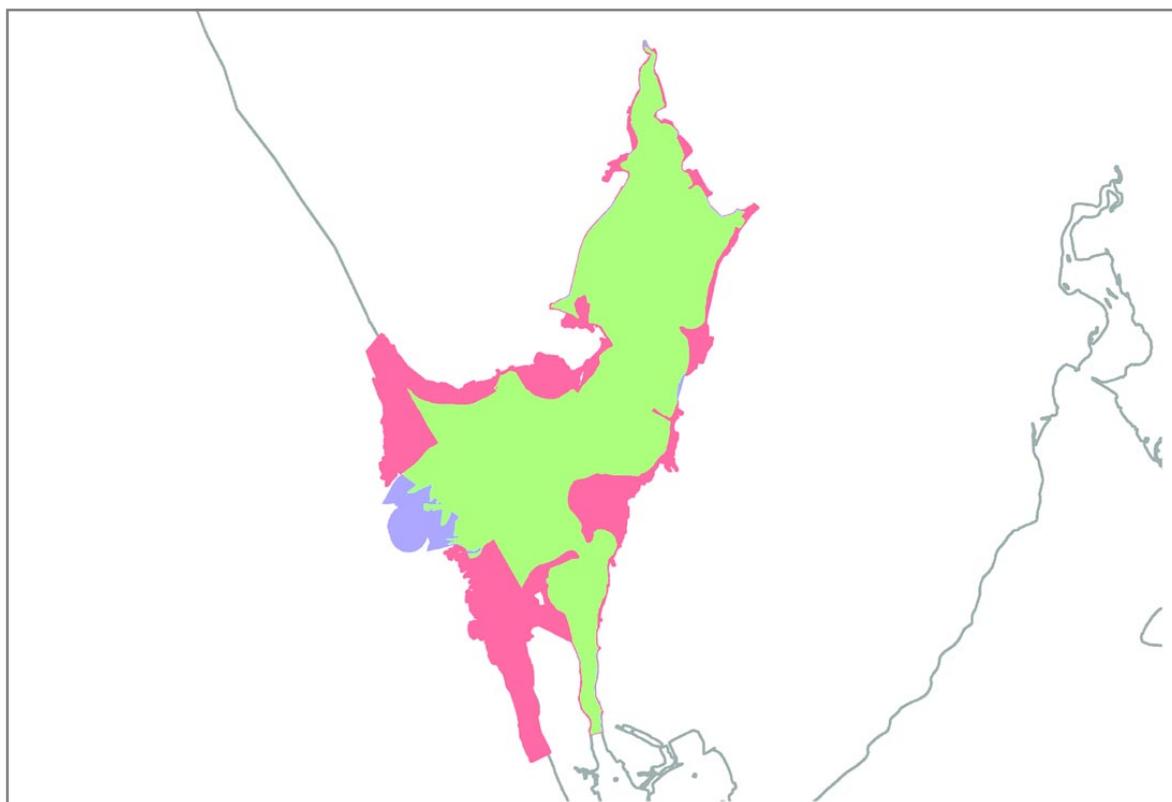


Figure 4.56.2: LTC and SPA boundaries, with overlap, at the Duddon Estuary

surrounding dune systems. The Ramsar site boundary is entirely coincident with that of the SPA.

A certain amount of interchange with birds in the Walney Channel area of Morecambe Bay is likely but not thought to involve large numbers of birds on a daily basis (N. Burton pers. comm.). Some dispersal along the outer beaches also seems likely.

### WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1994–95 are presented for all of the nine species of principal interest listed above. For clarity, smaller dots are used to display the distributions of a number of these species. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.56.3).

The totals maps clearly show higher densities of waterbirds on the eastern side of the Duddon and in the channel between the mainland and the north of Walney Island. The weighted totals map accentuates an area off Soutergate occupied by most of the Pintail on the site. Most of the individual species occurred in higher densities on the east side of the site. Pintail, Knot and Sanderling were particularly localised, although it seems likely that many Sanderlings using the SPA were not recorded by the LTCs given the lack of counts of the outer shore areas. Shelducks,

Oystercatchers and Dunlin were somewhat more widespread and Curlews and Redshanks were even more widely distributed. Red-breasted Mergansers also occurred widely along the channels of the estuary.

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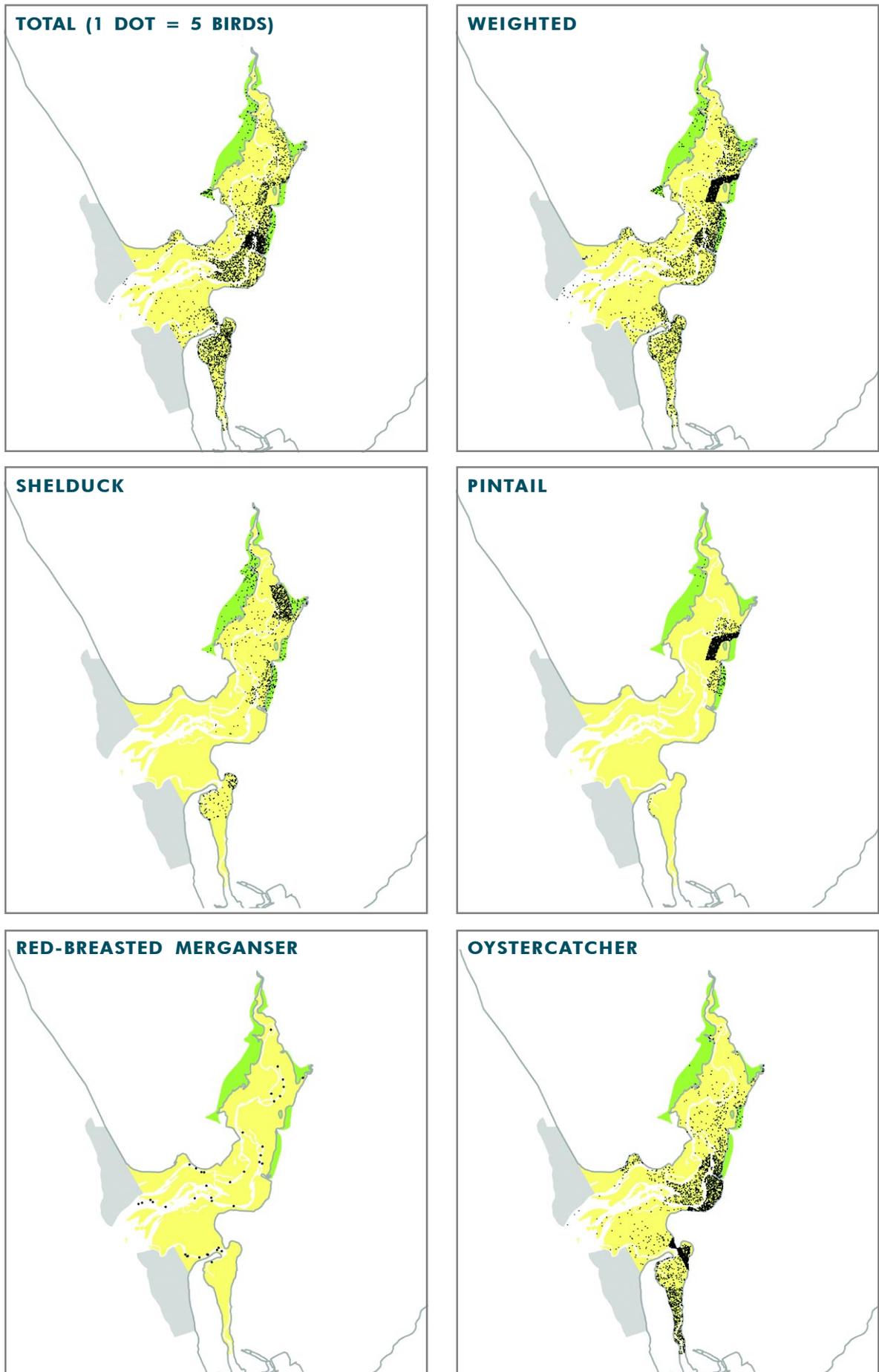


Figure 4.56.3 (i): Low tide waterbird distributions recorded at the Duddon Estuary, winter 1994–95

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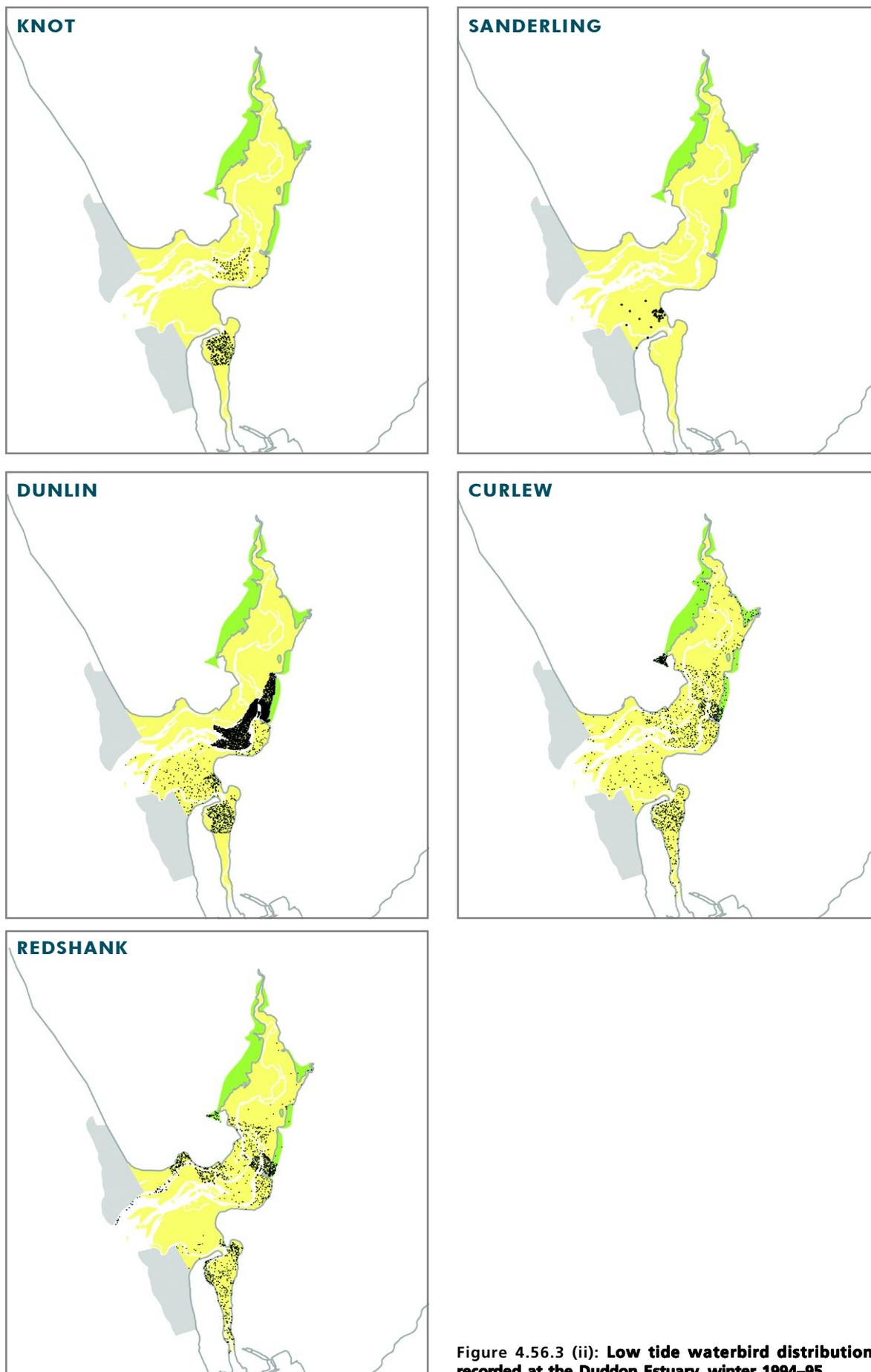


Figure 4.56.3 (ii): Low tide waterbird distributions recorded at the Duddon Estuary, winter 1994–95



## 4.57 SOLWAY FIRTH

LTC site code:	CV
Centre grid:	NY2762
JNCC estuarine review site:	41
Habitat zonation:	6065 ha intertidal, 1293 ha subtidal, 1155 ha nontidal
Statutory status:	Upper Solway Flats and Marshes SPA (UK9005012), Upper Solway Flats and Marshes Ramsar (7UK058)
Winter waterbird interest:	Great Crested Grebe, Cormorant, Whooper Swan, Pink-footed Goose, Barnacle Goose, Shelduck, Mallard, Pintail, Scaup, Common Scoter, Goldeneye, Oystercatcher, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Waterbird assemblage

### SITE DESCRIPTION

The Solway Firth, as considered by WeBS, comprises the coastline between Mersehead Sands on the Scottish coast to Workington in Cumbria, but only the inner estuary is considered here. The principal inputs to the inner estuary are from the rivers Esk and Eden, with the rivers Wampool and Waver entering at Moricambe Bay. The majority of the site is sandy in character with several isolated rocky scars, principally at the mouth of Moricambe Bay. The intertidal sediments are highly mobile, particularly in the lower reaches of the estuary. Large areas of saltmarsh are found along the south side of Moricambe Bay, between Glasson and Burgh, and at Rockcliffe. Most of the estuary is surrounded by low-lying farmland and there is little industry in the area. The main issues concerning waterbird conservation on the Solway concern exploitation of natural resources, especially commercial shellfish exploitation. In addition, the issue of wind-powered turbines for electricity generation is one which will need

careful consideration in the future (M. Carrier, C. Hartley pers. comm.).

### COVERAGE AND INTERPRETATION

The inner parts of the Solway Firth, roughly from Annan around to Skinburness, were covered for the scheme during the 1998–99 winter, counts being made during all four months. (Further coverage of the outer estuary was made in subsequent winters, outside the scope of this atlas.) Figure 4.57.1 shows the positions of the 40 sections counted for the survey.

Figure 4.57.2 shows that a large part of the SPA boundary was not covered by the LTCs in 1998–99, mostly the outer firth from Annan westwards on the north shore and the coast south of Skinburness on the south shore. Additionally, on the inner estuary, some of the saltmarshes adjacent to the site are included within the SPA but were not covered for the counts, notably Rockcliffe Marsh and Burgh Marsh. The boundaries of the Ramsar site are entirely coincident with those of the SPA.

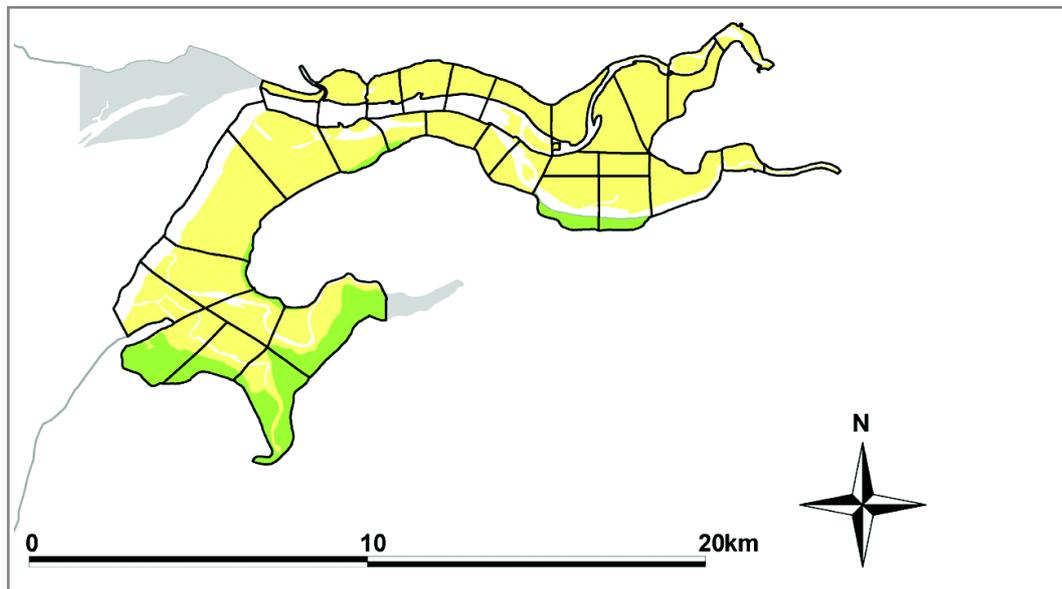


Figure 4.57.1: LTC sections at the Solway Firth, winter 1998–99

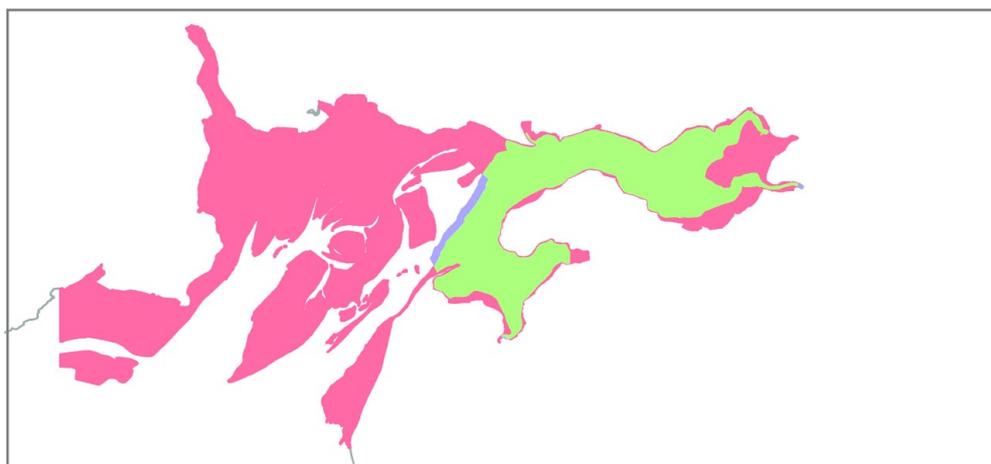


Figure 4.57.2: LTC and SPA boundaries, with overlap, at the Solway Firth

The Solway Firth is relatively isolated from other estuaries and thus its waterbirds are fairly self-contained on a day-to-day basis, although large within-site movements can occur. The site grades into non-estuarine shore suitable for wintering waterbirds and some dispersal and interchange does occur. For example, Bar-tailed Godwits roosting within Moricambe Bay are increasingly to be found feeding at low tide on the sandflats to the south of Silloth, outside the surveyed area (although within the SPA). Additionally, some species will make use of nearby non-coastal habitats at times, especially the geese (Barnacle Geese notably using Rockcliffe Marsh and the Caerlaverock area) and the grassland plovers. Finally, tidal movements occur involving some of the offshore species such as Red-throated Divers, Great Crested Grebes, Scaup and Common Scoters. Thus, the numbers of these species within the 'Solway' depends upon the site definition used and upon the state of the tide, points that should be borne in mind when assessing the site (M. Carrier, C. Hartley pers. comm.).

### WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1998–99 are presented for 21 of the 23 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 4.57.3). The two remaining species, Great Crested Grebe and Black-tailed Godwit, were noted in small numbers only. Most Great Crested Grebes at the Solway occur offshore in the outer parts of the estuary not covered by the scheme during 1998–99. Numbers of Black-tailed Godwits are generally low on the Solway but the five-year average was boosted by a particularly large count in December 1996.

The totals map suggests that the highest overall bird density is on the shore at Newbiebarns, with the middle stretches off Bowness also higher than average. The weighted totals map emphasises the inner Esk and Eden, the Newbiebarns foreshore and the middle parts of Moricambe Bay. Cormorants were widespread but most common off Cardurnock. The Barnacle Geese were noted at parts of Moricambe Bay and along the northern boundary of Rockcliffe Marsh, with a lower density on Cardurnock Flatts. A flock of Pink-footed Geese was also recorded on the south side of Moricambe Bay during February 1999. Shelducks and Mallards were both widespread, but the former were found in their highest densities at Moricambe Bay whereas the latter reached their highest densities off Bowness. Pintail were mostly found at Moricambe Bay and south of Rockcliffe Marsh. Only small numbers of Scaup and Common Scoters were recorded, off Moricambe Bay; much larger flocks of both species frequent the outer firth. Goldeneyes were widespread in the main Solway channels but few were found in Moricambe Bay. Small numbers of Whooper Swans were found along the River Eden only. Oystercatchers and Dunlin were widespread through most of the surveyed site but shunned the innermost areas. Lapwings were widespread but Golden Plovers were found in two main concentrations, on the north shore between Seafeld and Torduff Point and in the north-east of Moricambe Bay. Grey Plovers, Knot and Bar-tailed Godwits all preferred the outer parts of the site, generally downstream of a line between Annan and Bowness. Curlews and Redshanks were both fairly widespread, with Curlews found somewhat more densely in Moricambe Bay and Redshanks showing an unusual (for this species) relative absence from the innermost parts of the site. Only small numbers of Ringed Plovers and Sanderlings were recorded on the inner firth.

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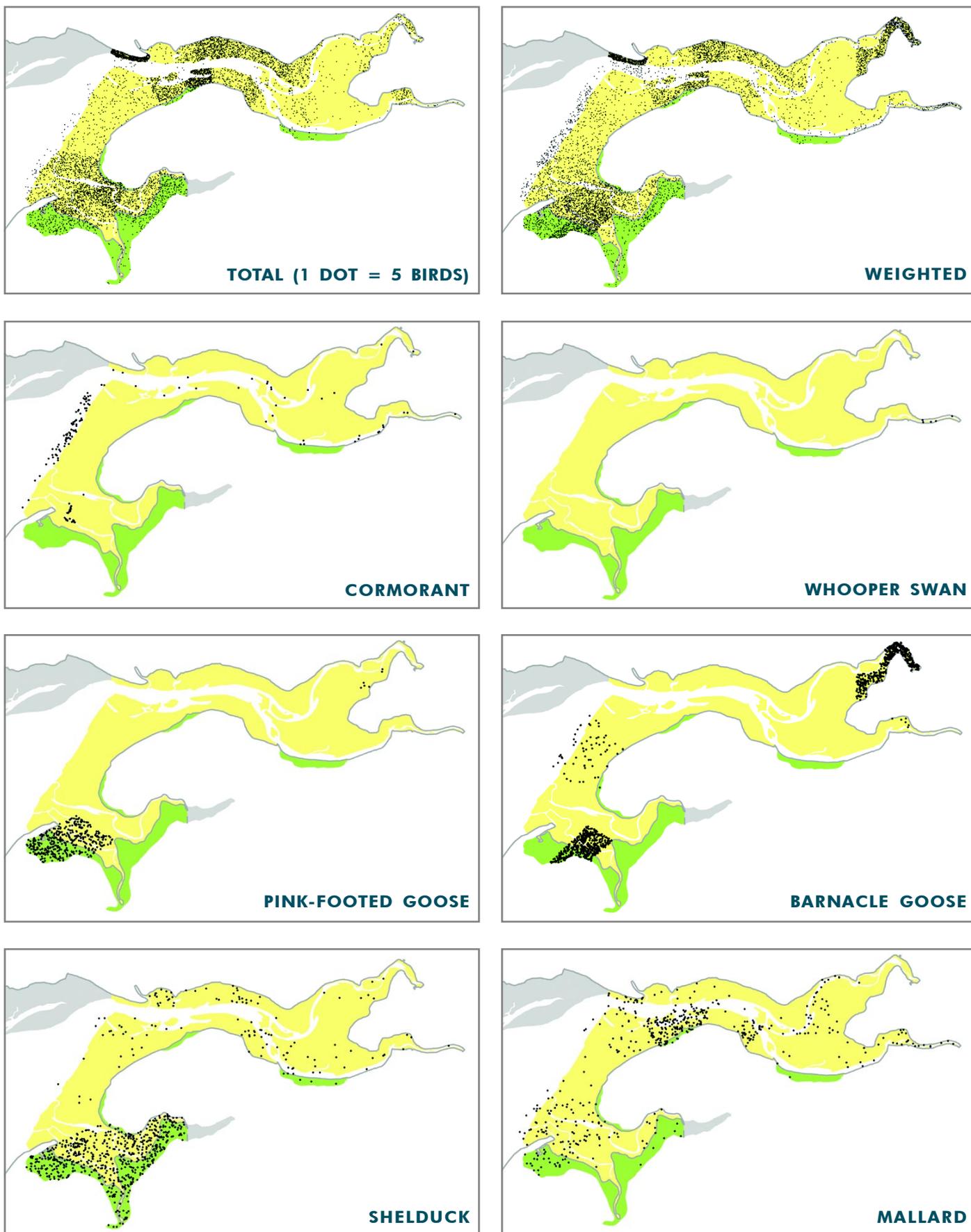


Figure 4.57.3 (i) Low tide waterbird distribution recorded at the Solway Firth, winter 1998-99

S O L W A Y F I R T H



Figure 4.57.3 (ii) Low tide waterbird distribution recorded at the Solway Firth, winter 1998-99

S O L W A Y F I R T H

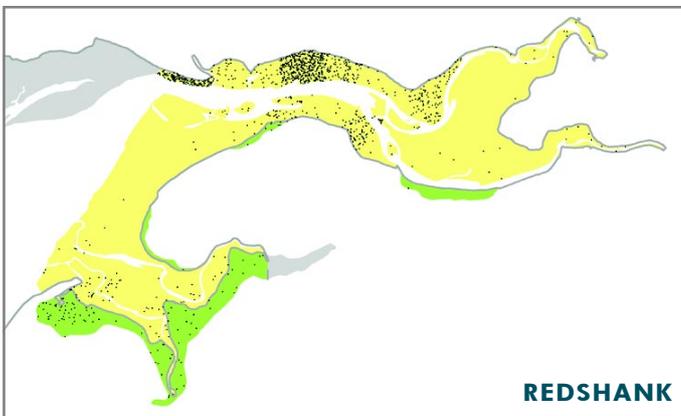
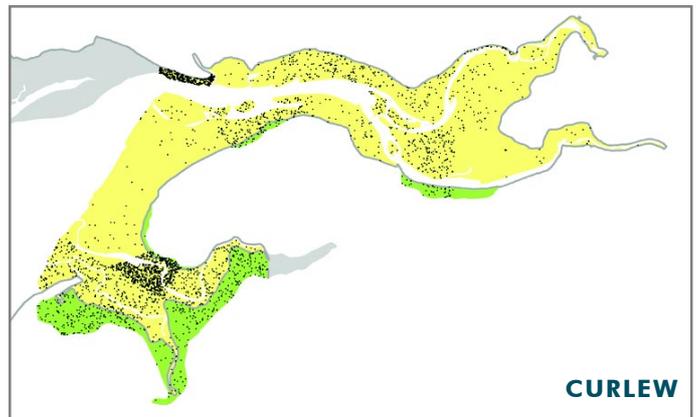
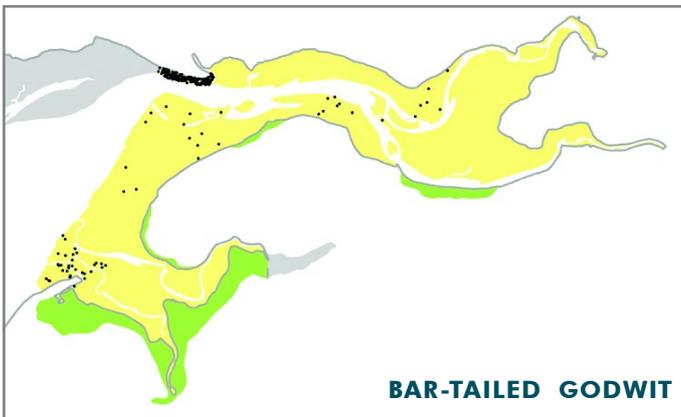
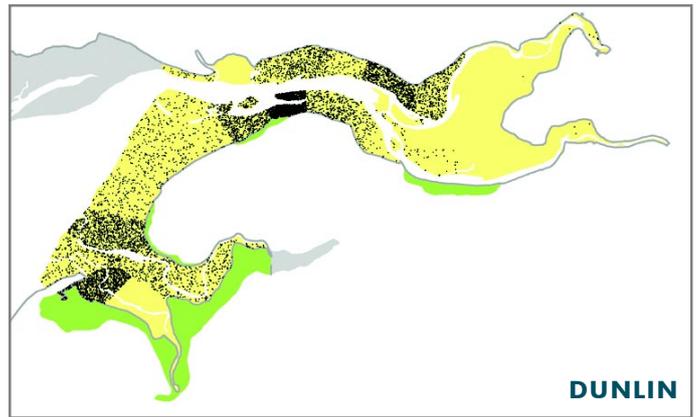
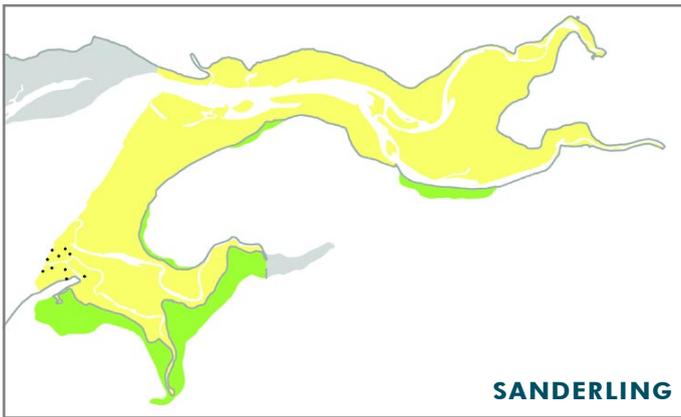
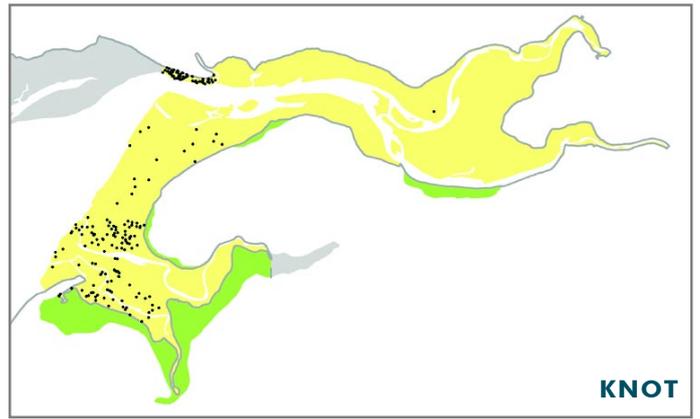
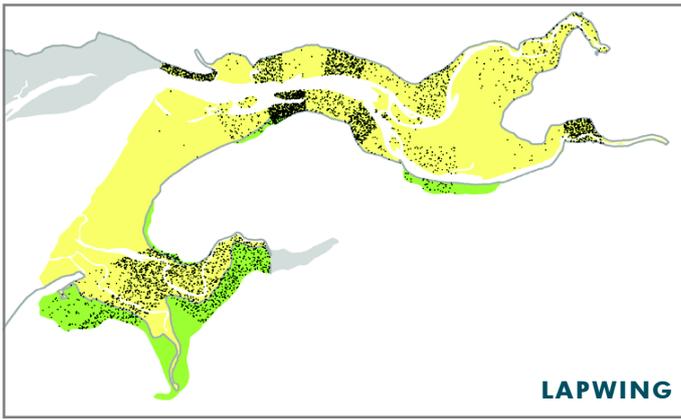


Figure 4.57.3 (iii) Low tide waterbird distribution recorded at the Solway Firth, winter 1998-99

## 4.58 WIGTOWN BAY



LTC site code:	BW
Centre grid:	NX4655
JNCC estuarine review site:	45
Habitat zonation:	2494 ha intertidal, 514 ha subtidal, 419 ha nontidal
Statutory status:	Cree Estuary SSSI
Winter waterbird interest:	Whooper Swan, Pink-footed Goose, Curlew

### SITE DESCRIPTION

Wigtown Bay is the estuary of the river Cree and is one of the largest estuaries in south-west Scotland. At low tide, the site is composed of extensive intertidal flats of mud and sand. Much of the western shore, particularly the north-west, is backed by saltmarsh. On the eastern shore there is a long ridge of sand and shingle. Most activities around the site involve natural resource exploitation, such as fishing, bait-digging and wildfowling. Leisure activities are not intensive.

### COVERAGE AND INTERPRETATION

Wigtown Bay was counted for the scheme during the winter of 1992–93, data being returned for all four months. Figure 4.58.1 shows the positions of the 24 sections counted for the survey.

As Figure 4.58.2 shows, the area covered by the LTCs overlaps closely with the Cree Estuary SSSI boundary, the main difference being at the head of the estuary where the SSSI extends further upstream.

Wigtown Bay is relatively close to Fleet Bay to the east and some interchange of birds between these two sites would seem moderately likely. Interchange with other estuaries seems less likely.

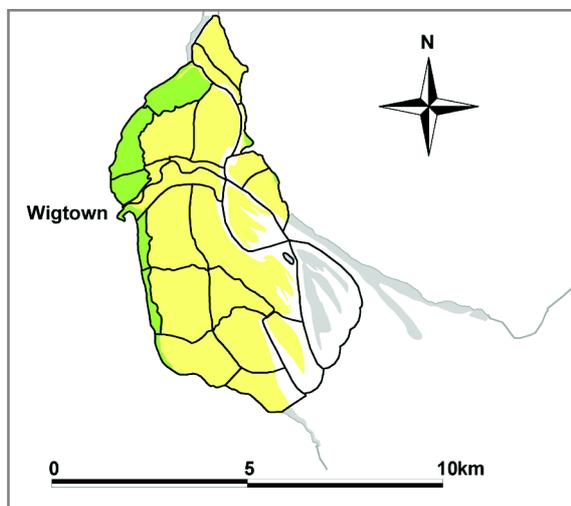


Figure 4.58.1: LTC sections at Wigtown Bay, winter 1992–93

### WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1992–93 are presented for two of the three species of principal interest listed above. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.58.3). The remaining species, Whooper Swan, was unrecorded during the counts and presumably makes use of adjacent nontidal habitats.

The totals map, supported by the weighted totals map, picks out two areas holding higher overall bird densities, the first at the south end of Baldoon Sands as a result of Pink-footed Geese (although this species uses the site principally as a nocturnal roost) and the second along the channel of the river Bladnoch, due to concentrations of wildfowl, notably Pintail and Shoveler. Curlews were widespread and evenly distributed across the site, as is typical for this species.

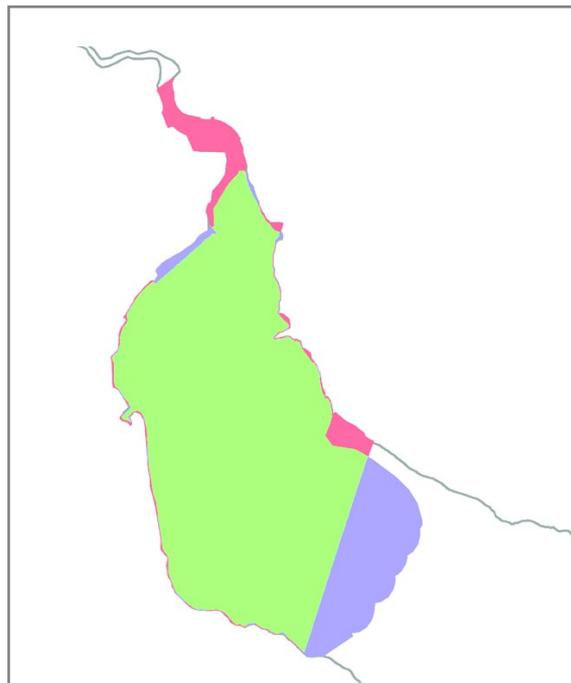


Figure 4.58.2: LTC and SSSI boundaries, with overlap, at Wigtown Bay

W I G T O W N   B A Y

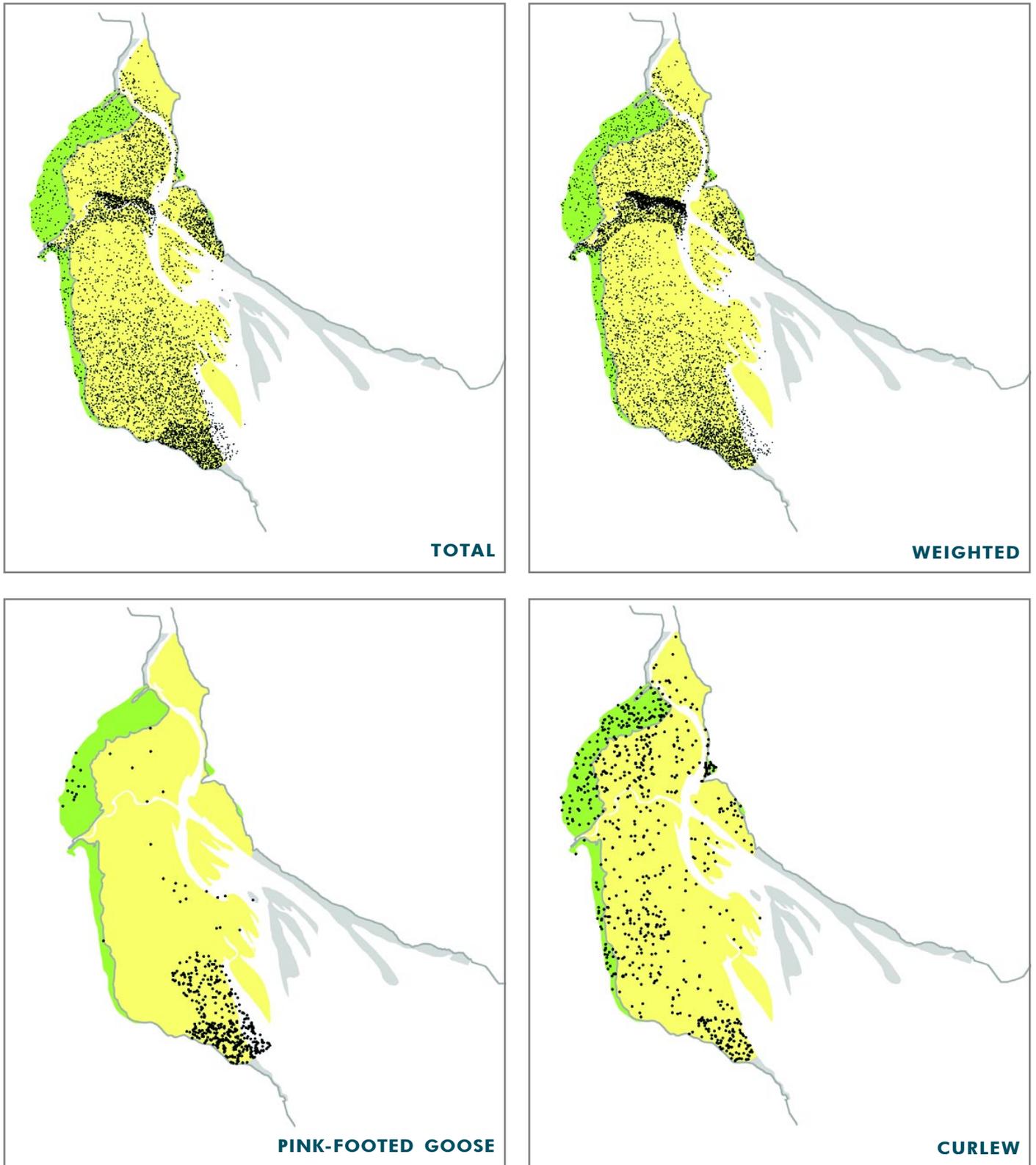


Figure 4.58.3: Low tide waterbird distributions recorded at Wigtown Bay, winter 1992–93

## 4.59 IRVINE–GARNOCK ESTUARY



LTC site code:	CI
Centre grid:	NS3039
JNCC estuarine review site:	47
Habitat zonation:	134 ha intertidal, 47 ha subtidal, 30 ha nontidal
Statutory status:	Bogside Flats SSSI
Winter waterbird interest:	Eider, Red-breasted Merganser

### SITE DESCRIPTION

This fairly small site is the estuary of the Irvine and Garnock Rivers and is situated about 25 miles south-west of Glasgow. Although small, it is the most significant intertidal area between the Clyde and the Solway and is thus locally important. As well as the mudflats, there is a relatively large area of saltmarsh. The outlet from the estuary into Irvine Bay is through a narrow channel. There is disturbance from bait-diggers, walkers and aircraft and there are industrial sites on the eastern shores of the estuary. Consent has recently been granted for a refuse dump at Bogside, adjoining the estuary. The water of the estuary, formerly highly polluted, has seen recent improvements in quality.

### COVERAGE AND INTERPRETATION

The combined estuaries of the Irvine and Garnock were counted for the scheme during the 1998–99 winter, counts being made during all four months. Figure 4.59.1 shows the positions of the nine sections counted for the survey.

The Irvine–Garnock Estuary is not designated an

SPA but overlaps closely with the Bogside Flats SSSI. Figure 4.59.2 shows how the two boundaries overlap. Those areas within the SSSI but not counted for the LTCs are nontidal. Areas counted but outside the SSSI were a small extension north along the Garnock, the estuary mouth and some downstream areas of mudflats along both arms of the estuary.

The site is very isolated from other estuaries. Movements of birds are possible between the estuary and nearby non-estuarine coasts and inland areas.

### WATERBIRD DISTRIBUTION

Low tide distribution maps from the winter of 1998–99 are presented for both of the two species of principal interest listed above. Additional maps of total birds and total birds weighted by 1% threshold value are also presented (Figure 4.59.3).

The totals map suggests that overall bird density is fairly even across the site, although the weighted total map gives a slight emphasis to the river channel of the Garnock, as a result of the two key interest species. Red-breasted

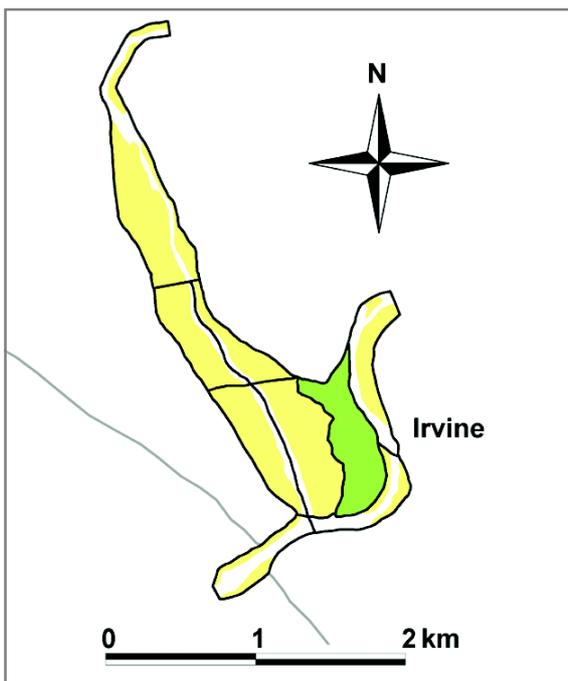


Figure 4.59.1: LTC sections at the Irvine–Garnock Estuary, winter 1998–99



Figure 4.59.2: LTC and SSSI boundaries, with overlap, at the Irvine–Garnock Estuary

IRVINE - GARNOCK ESTUARY

Mergansers occurred along the whole length of the rivers but Eiders frequented mostly the lower reaches and the mouth of the combined estuary. Fewer of either species occurred along the channel of the Irvine, presumably due to the narrower and more industrialised nature of the estuary here. Amongst other species, the small numbers of Goldeneyes were present in roughly equal densities on

both channels. Teal, Curlew and Redshank were distributed quite evenly across the site.

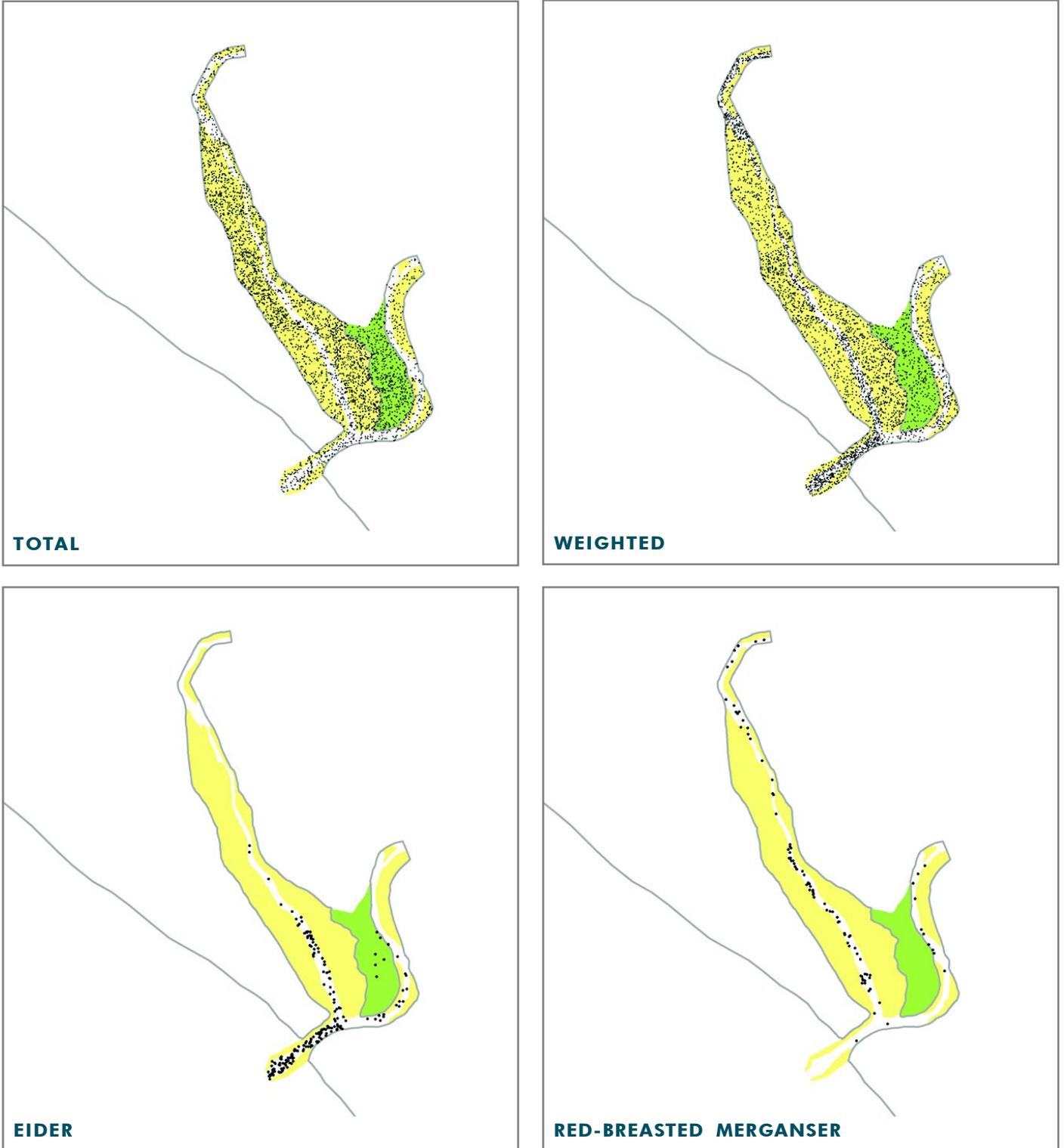


Figure 4.59.3: Low tide waterbird distributions recorded at the Irvine-Garnock Estuary, winter 1998-99