



BTO Research Report No.622

**Habitat Use by Avocet and Dark-bellied Brent Geese
on the Deben Estuary Over the High Tide Period**

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1. INTRODUCTION

1.1 Background

This study investigates the use of habitats on the Deben Estuary in Suffolk by Avocets *Recurvirostra avosetta* and Dark-bellied Brent Geese *Branta bernicla bernicla* over the high tide period.

1.2 Site Description

The Deben Estuary is a long, narrow estuary located on the coast of Suffolk in eastern England, with its head at Woodbridge and its mouth just to the east of the busy container port of Felixstowe. There are relatively wide mudflats on the inner part of the estuary but these are much narrower towards the mouth. Most of the surrounding area is agricultural in nature, with much of the outer estuary flanked by low-lying grazing marshes. There is also a fringe of saltmarsh around much of the estuary. Martlesham Creek, on the west bank at the northern end of the site is the largest of a number of small side creeks. Recreational activities such as sailing and watersports are perhaps the most obvious sources of disturbance to waterbirds on the site. The site is also popular with walkers, and many of the footpaths along the sea walls and mudflat edge may bring birds and people into close contact.

1.3 Designation

The Deben Estuary was designated as an SPA in 1996 and covers 978.93 ha (Stroud *et al.* 2001). The area qualifies under article 4.1 of the Wild Birds Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

Avocet *Recurvirostra avosetta*, 95 individuals representing at least 7.5% of the wintering population in Great Britain (5 year peak mean 1991/92-1995/96).

The area also qualifies under Article 4.2 of the Wild Birds Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

Dark-bellied Brent Goose *Branta bernicla bernicla* supporting 0.8% of the Western Siberia/western European population (5 year peak mean 1991/92-1995/96)

Both Avocet and Dark-bellied Brent Geese were listed on the original citation, though only Avocet was included in the SPA Review.

The Deben Estuary is also designated as a Ramsar site. The area qualifies under Ramsar criterion 6 – species/populations occurring at levels of international importance:

Qualifying Species/populations (as identified at designation): Dark-bellied Brent Goose *Branta bernicla bernicla*, 1953 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)

Whilst also noteworthy are Pied Avocet *Recurvirostra avosetta*, Europe/Northwest Africa, 167 individuals, representing an average of 4.9% of the GB population (5 year peak mean 1998/9-2002/3)

1.4 WeBS Alerts

The WeBS Alerts System identifies species that have undergone major declines in numbers and flags these species by issuing an Alert. Trends are assessed over the short-, medium-, and long-terms (5, 10 and up to 25 years respectively) and also since site-designation. If declines exceed 50%, then a High-Alert is issued and if declines exceed 25% then a Medium-Alert is issued. Only Avocets have been assessed as they appear on the SPA designation whereas Brent Geese were only included on the citation but not subsequent review. Due to the substantial increase in numbers since 1986/87 when the species first appeared on the site, no Alerts have been triggered (Thaxter *et al* 2010).

1.5 WeBS Core Counts

The WeBS Core Counts scheme is the principal scheme of The Wetland Bird Survey. Counts are made annually at around 2,000 wetland sites of all habitats; estuaries and large still waters predominate. Monthly coordinated counts are made mostly by volunteers, principally from September to March, with fewer observations during summer months. During 2008/09, WeBS counters covered 3,300 count sectors at around 2,000 count sites, during the crucial 'winter' period of September to March. At least 1,500 sites are counted in any one of these months and almost 1,100 are covered continually throughout this period. Large sites such as the Deben Estuary are split up into manageable count sections to cover the whole estuary (see Fig. 1) and coordinated counts are carried out here monthly. The success and growth of these count schemes accurately reflects the enthusiasm and dedication of the several thousands of volunteer ornithologists who participate. It is largely due to their efforts that waterbird monitoring in the UK is held in such international high regard.

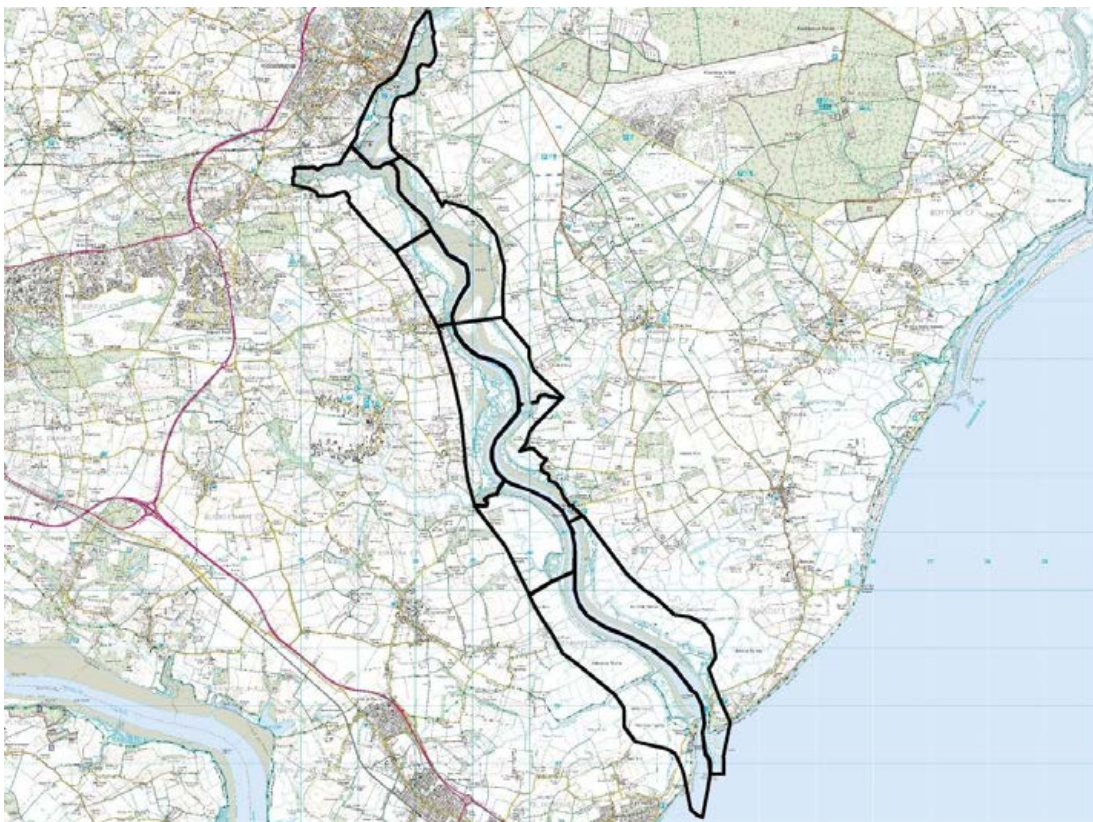


Figure 1. WeBS Core Count sections on the Deben Estuary.

2. METHODS

2.1 Overview of methods used

Three different methods have been used to assess the distribution of Avocets and Dark-bellied Brent Geese on the Deben Estuary. Monthly WeBS Core Counts are carried out on the site, which are used to assess the wintering populations of both species. Targeted counts were carried out at hourly intervals across the high tide period in order to assess the specific habitat use and activity of birds. WeBS Low Tide Counts carried out in 2006/07 have been used to give background information on the distribution of largely feeding birds on the estuary.

2.2 WeBS Core Counts

WeBS Core Counts are made using so-called 'look-see' methodology (Bibby *et al.* 2000), whereby the observer, familiar with the species involved, surveys the whole of a predefined area. Counts are made at all wetland habitats, including lakes, lochs/loughs, ponds, reservoirs, gravel pits, rivers, freshwater marshes, canals, sections of open coast and estuaries. At many estuarine sites where birds at high tide move out of the estuary onto adjacent agricultural land, these areas will also be counted to ensure these birds are not missed. Numbers of all waterbird species, as defined by Wetlands International (Rose & Scott 1997), are recorded. In the UK, this includes divers, grebes, cormorants, herons, Spoonbill, swans, geese, ducks, rails, cranes, waders and Kingfisher. Counts of gulls and terns are optional. In line with the recommendations of Vinicombe *et al.* (1993), records of all species recorded by WeBS, including escapes, are collected to contribute to the proper assessment of naturalised populations and escaped birds. Counts are made once per month, ideally on predetermined 'priority dates'. This enables counts across the whole country to be synchronised, thus reducing the likelihood of birds being double counted or missed. Such synchronisation is imperative at large sites, which are divided into sectors, each of which can be practicably counted by a single person in a reasonable amount of time. Local Organisers ensure coordination in these cases due to the high possibility of local movements affecting count totals. All nine WeBS Core Count sections (see Fig. 1) have been counted each year during the period 2005/06 to 2009/10, usually in every month.

2.3 Counts to determine bird distribution around the high tide period

In addition to the WeBS core counts, specific counts of Avocets and Dark-bellied Brent Geese were carried out during a five hour period over the high tide between Kirton Creek to the north and Ramsholt Marshes to the south on four dates in February and March 2012. This area was selected due to the presence of the primary roost site for Avocets (see Fig. 4) just south of Ramsholt and the area is well used by Brent Geese. This area was split into four discrete count sections – Kirton Creek TM295418, Ramsholt to Rocks TM305415 north to TM295425, Falkenham Creek to Kirton Creek TM307400 north to TM296416, Ramsholt to Green point TM307414 south to TM308400 (see Fig. 2).

In addition to noting the numbers of birds present, the activity and habitat was also noted.

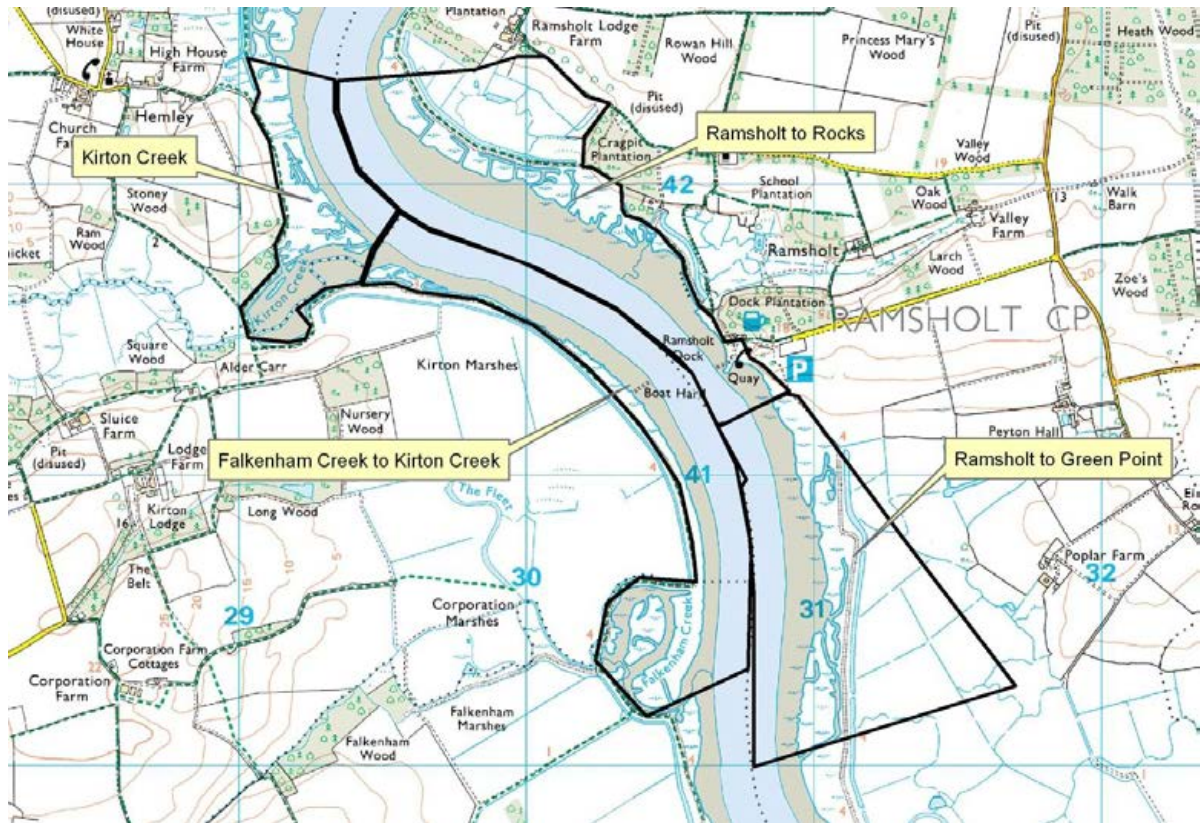


Figure 2. Through the Tide Count sections

2.4 Low Tide Counts 2006/07

The Low Tide Count scheme provides information on the numbers of waterbirds feeding on subdivisions of the intertidal habitat within estuaries. Given the extra work that Low Tide Counts entail, often to the same counters that carry out the Core Counts, WeBS aims to cover most individual estuaries about once every six years, although on some sites more frequent counts are made. These counts complement the Core Counts, which generally provide the best estimate of total numbers present at high tide roosts by helping to identify important feeding areas. The next set of Low Tide Counts are due in 2012/13.

The count methods for Low Tide Counts are much the same as for Core Counts, although unlike for the standard monthly WeBS Core Counts, the Low Tide scheme doesn't demand that counts are made on specific dates. The principal reason for this is that the primary purpose of the scheme is to investigate relative distribution, averaged over several dates, and not to determine overall population sizes. Also, on some estuaries, counters take more than one day to cover all sectors. This is justified in that the scheme aims to measure relative bird density on sites: that is, if a sector is important for birds at low water, it does not matter if a flock of Dunlin recorded there was also recorded elsewhere - the outcome is that we know both areas to be important.

The Low Tide sections used differ from those used for Core Counts, being smaller to allow finer detail of distribution of birds within the estuary.

3. RESULTS

3.1 WeBS Core Counts of each species

Every year, the Wetland Bird Survey (WeBS) produces an annual report “Waterbirds in the UK”, listing the key sites against the national and international threshold numbers for each species which are calculated from the monthly Core Counts. The latest five year means taken from the 2009/10 Report are presented below, with counts in parentheses being undercounts:

3.1.1 Avocet *Avosetta recurvirostra* Annex 1 International Threshold: 730 GB Threshold: 75

Avocets are found in Nationally important numbers on the Deben Estuary, with a five year mean (2005/06-2009/10) of 285 birds (Holt *et al* 2011).

2005/06	2006/07	2007/08	2008/09	2009/10	Five-year Mean
236	315	224	342	306	285

3.1.2 Dark-bellied Brent Goose *Branta bernicla bernicla* Annex 2 International Threshold: 2,000 GB Threshold: 910

Dark-bellied Brent Geese are found in Nationally important numbers on the Deben Estuary, with a five year mean (2005/06-2009/10) of 1,366 birds (Holt *et al* 2011). Bracketed counts refer to undercounts.

2005/06	2006/07	2007/08	2008/09	2009/10	Five-year Mean
(1,449)	1,759	(1,409)	1,038	1,173	1,366

3.2 Counts to determine bird distribution around the high tide period

A summary of the through the tide counts for both Avocet and Dark-bellied Brent Geese is given in Appendix 1. During the observations, neither Avocets nor Brent Geese made extensive use of the saltmarsh. Avocets were seen roosting along the saltmarsh edge or on the water at high tide and as the tide retreated, the birds followed the tide out to feed, and were never observed on the saltings themselves. Brent Geese spent much of the high tide period in fields behind the sea wall, especially on Kirton Marshes, though some of the flock did occasionally land to feed on the saltmarsh in the Ramsholt to Green Point section when the mud was fully covered.

3.3 Location of main roosting areas

3.3.1. Avocet

Although Avocets are widely distributed along the estuary at Low Tide whilst feeding (see Fig. 5), at high tide they are much more localised, being found on the marshes south of Waldringfield and at Horley Creek. Observer comments suggest that Avocets do not use the saltmarsh, though may shelter in the creeks during strong winds, but are usually found on the edge with some on mud and some in the river. When the saltmarsh is covered then they are always on the water (R.Johnson pers. comm.). In addition, Avocet roosts are found at Ramsholt, along the edge of the saltmarsh by Kirton Creek and Falkenham Creek and near the Sewage Treatment works at Martlesham Creek. Sometimes they have a (sub-roost) in Kirton Creek when they will be on the mud edge of saltmarsh, never on the saltings (B.Harrington pers. comm.). Within the study area, the main Avocet roost is located on the east side of the estuary south of Ramsholt, where birds roost on the saltmarsh edge and on the water. During periods of strong easterly winds, these birds often move across the estuary to roost in Falkenham Creek (N.Mason pers. comm.).

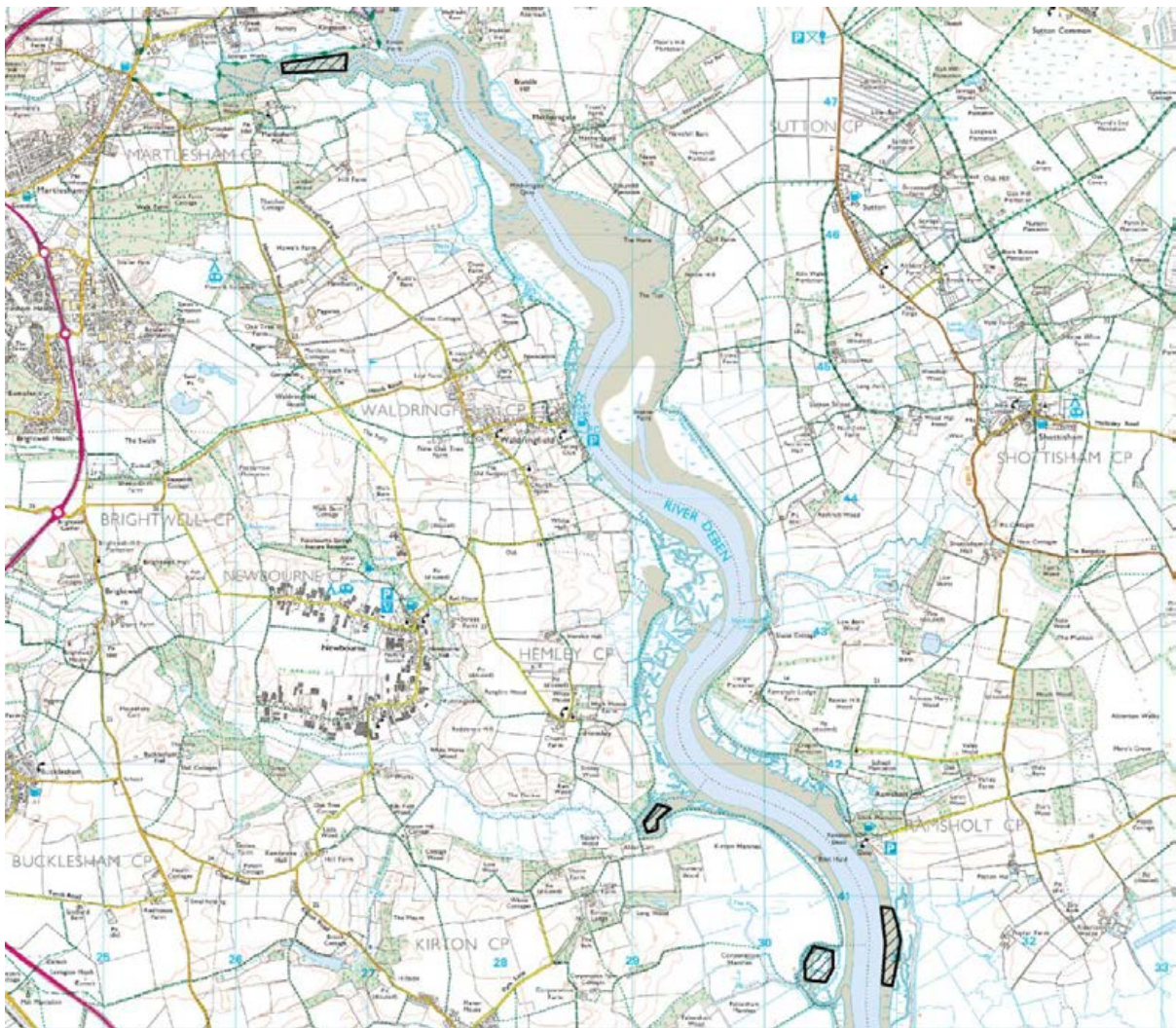


Figure 3. Avocet Roost sites on the Deben Estuary

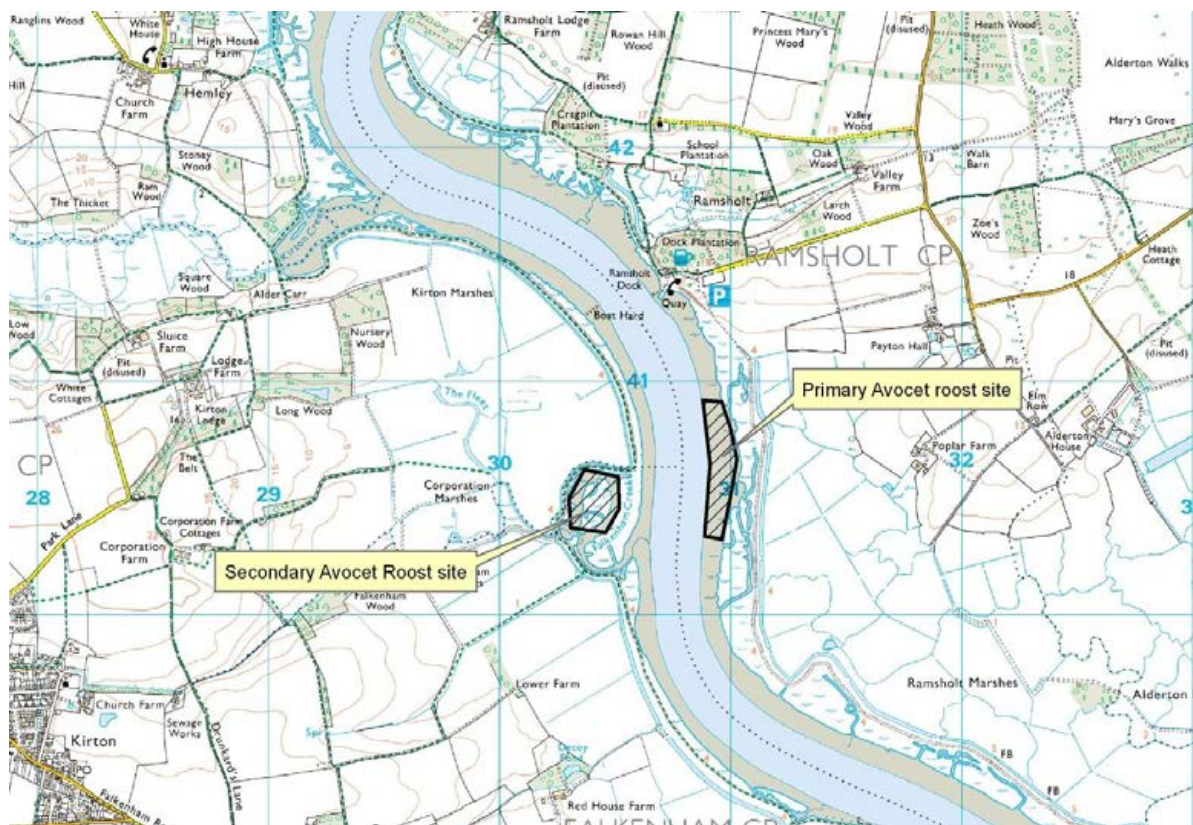


Figure 4. Avocet roost sites within the study area

3.3.2 Dark-bellied Brent Goose

Dark-bellied Brent Geese roost along both banks of the southern part of the estuary near the mouth and also at Ramsholt Marshes (see Fig. 5). Unlike the Avocets which are confined to the estuary, Brent Geese also make extensive use of the surrounding agricultural land for roosting and feeding, mainly using the estuary itself for loafing and bathing (N.Mason pers comm).

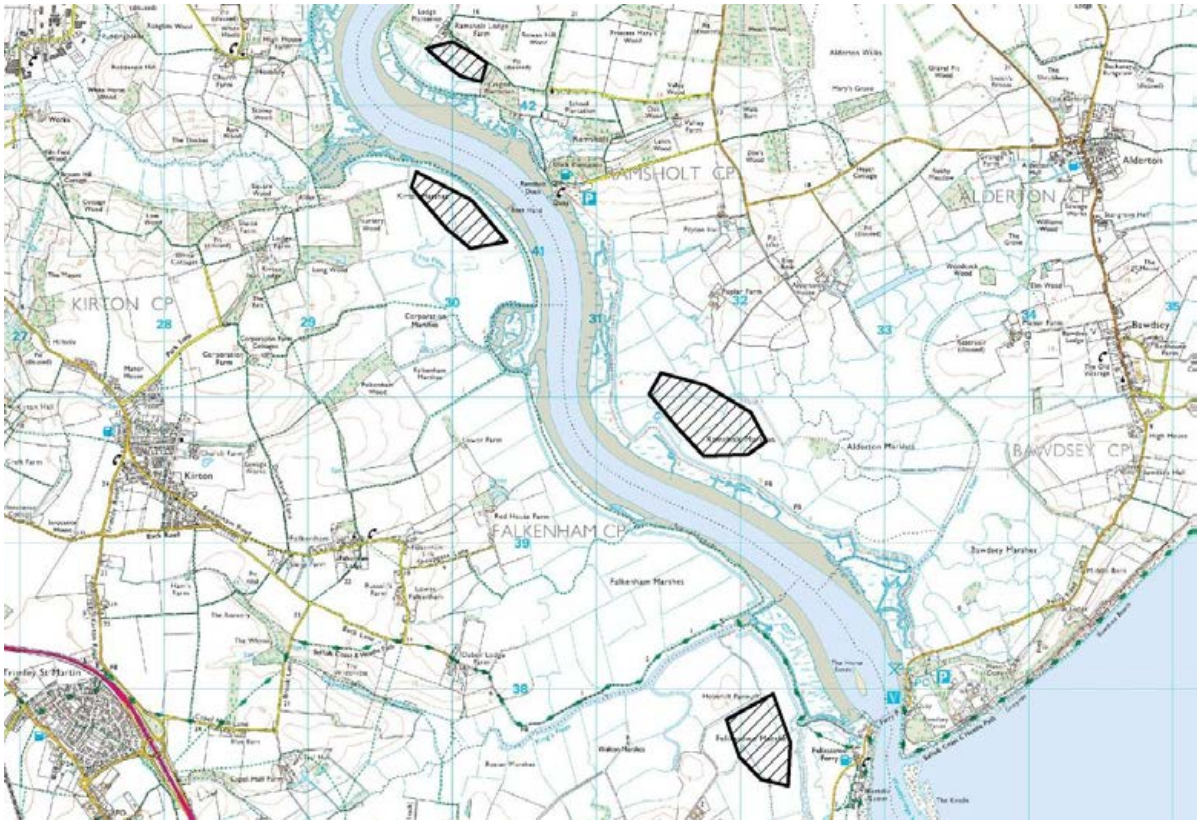


Figure 5. Dark-bellied Brent Goose roost sites

3.4 Feeding distributions

Dot density distribution maps from the Low Tide Counts of the Deben Estuary carried out in 2006/07 have been included in this report as an addition to the targeted studies of Avocet and Dark-bellied Brent Geese that were carried out. Sectors in grey were not counted.



Figure 6. Avocet Low Tide distribution 2006/07



Figure 7. Dark-bellied Brent Goose Low Tide distribution 2006/07

4. DISCUSSION AND CONCLUSIONS

Throughout the observations, neither Avocets nor Brent Geese made extensive use of the saltmarsh, and any narrowing of the saltmarsh would not have a significant impact on these species at this site. In particular a loss of saltmarsh will have a negligible effect on the Avocets as they do not use the saltmarsh for feeding, though may use the creeks within the saltmarsh for shelter in strong winds whilst roosting. The observations show that Avocets instead favour open flats and the water for both feeding and roosting.

Brent Geese do use the saltmarsh to graze, though during the winter also favour the marshes and agricultural land behind the seawall or eelgrass on the mudflats. As Brent Geese have several safe areas behind the seawall to feed and roost, narrowing of the saltmarsh on the Deben Estuary would not deprive them of important feeding or roosting areas in the winter months. Saltmarshes may be more important to Brent Geese during the spring as they fatten up before they migrate due to the highly nutritional plants which will be beginning to emerge on saltmarshes at this time (Spaans and Postma 2001).

Appendix 1. Counts to determine bird distribution around the high tide period raw data and counter's notes

Avocet and Brent Goose 22.02.2012

Avocet	Wind SW	Force 2-6			
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
09.00	93**			60*	* Flew S ** 70 on mud edge. 23 feed water
10.00	88**	62			*on water's edge ** feeding in water or water's edge
11.00	28				All feed in water
12.00				165	All roosting on water, in Force 6 wind
13.00				165	On water until 12.45 then at 13.00 on saltmarsh edge
14.00				165	All still on saltmarsh edge
15.00		63*		100**	*Feeding water's edge. Spread **still roosting but on mud

Brent					
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
09.00					zero
10.00					zero
11.00		26			1200 Brent flew on to Lodge Marsh 10.30am, then off
12.00				1200	800 on water, 400 on saltmarsh
13.00					zero
14.00		145			
15.00		780			Water's edge

Avocet and Brent Goose 27.02.2012

Avocet	Wind SW	Force 2			
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
12.30		7			All feed in water
13.00		7			5 feed water, 2 feed mud edge
13.30		7 all feed water		2 feed mud	
14.00		7			Feed edge of remaining mud
14.30					All mud covered
15.00	23				Edge of saltmarsh. Flew in at high tide
15.30	23				Edge of saltmarsh
16.00				23 from K Creek	Roost on water
16.30				23	Wet mud and water's edge feeding
17.00		12 – 8 water edge, 4 wet mud		11 water's edge	

Brent					
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
12.30					zero
13.00			85 mud	600 water 150 mud	No feeding oserverd
13.30					zero
14.00					zero
14.30				140 on water	
15.00					zero
15.30					zero
16.00					zero
16.30					zero
17.00					zero

At 14.15, 1200 Brent flew to B from other side of river. 5 min then back to fields west.

Avocet and Brent Goose – 6th March 2012

Avocet	Wind N	Force 3			
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
08.00	6 feed water	12 – 6water - 6 mud edge	9 feed water edge		
08.30	6 feed water edge	12 – 9 water edge - 3 mud	9 – 3 mud, 2 water, 4 roost water edge		
09.00	14 feed water edge	6 feed water edge	9 roost water edge		Wind NE force 2
09.30	1 feed water edge	3 preen stand in water	25 – 22 feed w edge – 3 feed water edge		Mud almost covered
10.00	10 feed water -with 36 BW		27 * roost on water		* 27 in mouth of Falkenham Creek
10.30	37 roost on water				All mouth of Falkenham Creek
11.00					All 37 moved S to TM315395 roost edge of saltmarsh
11.30					37 TM315395. Roost edge saltmarsh Wind round SE
12.00					37 roost. As tide went out all sidled down to water's edge
12.30		16 feed wet mud		7 feed wet mud	14 flew S towards Bawdsey
13.00		18 feed water edge			

Brent					
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
08.00		25 wash			
08.30		25 roost	120 wash		120 mouth Falkenham Creek
09.00		25	30 "loaf"		
09.30		25 alert			
10.00			8 feed saltmarsh		
10.30					none
11.00			130 – 50 feed saltmarsh		Mouth of Falkenham Creek
11.30					none
12.00		65 preen/bathe	78 water edge		
12.30		260 bathing etc			All flew off as helicopter over (55 back)
13.00		55			

Avocet and Brent Goose – 08.03.2012

Avocet	Wind N	Force 4			
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
09.00		3 feed water edge			
09.30		3 roost water			
10.00		3 roost water edge			Flew down river at 10.20
10.30		0			Mud covered
11.00		0			
11.30		0			
12.00		0			High Tide
12.30		0			

Went looking for the 3 Avocets but couldn't find them!

Brent					
Time	Kirton Creek	Ramsholt N to Rocks	Falkenham Creek N to Kirton creek	Ramsholt S to Green Point	Comments
09.00					
09.30		75 water and edge			130 flew over then away west
10.00		66 water	15 saltmarsh		
10.30		46 water			
11.00		11 water	65 water 20 saltmarsh*		* feeding
11.30					zero
12.00					
12.30					

At 10.45 the Red-breasted Goose flew upriver, calling. It circled over Lodge Marsh then flew back west and appeared to rejoin other geese.

I lost touch with the Brents when I went round to Bawdsey to look for the Avocets.

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