Breeding Waders on British Estuarine Wet Grasslands

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The wet grasslands and saltmarshes of British estuaries support important assemblages of breeding waders, and substantial parts of the British breeding populations of several species, notably Redshank, Lapwing, Oystercatcher, and the small populations of Black-tailed Godwit, Dunlin and Ruff. Some species, *e.g.* Redshank, seem to prefer saltmarsh; others breed chiefly on adjacent wet grasslands. Much saltmarsh has historically been converted to coastal grazing marsh. Much of this habitat has then been destroyed by agricultural intensification and urban and industrial development. Habitat loss and damage on both habitats is continuing. Future conservation of estuarine breeding waders in Britain will depend on preventing further saltmarsh and wet grassland habitat loss, and the management and reinstatement of degraded areas.

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Introduction

Large areas of lowland wet grassland in Britain, particularly in England and Wales, have been destroyed through drainage, arablisation, minerals extraction, and urban and industrial development (see *e.g.* Fuller 1987), and populations of waders breeding on these lowland wet grasslands are continuing to decline in numbers (Smith 1983, 1988, 1991). Many of the remaining areas of lowland wet grassland in Britain are associated with estuaries. These fall into several types, all of which are human-influenced. Parts of the machair grasslands of northern and western Scotland - a habitat of very great importance for breeding waders in Britain and Europe (Fuller *et al.* 1986, Piersma 1986) - are associated with estuaries. Other grasslands, notably associated with The Wash and the Severn Estuary are washlands for winter flood control. Most, however, are coastal grazing marshes. These places have developed considerable nature conservation importance for their breeding birds, and for their ditch vegetation and invertebrate faunas (Davidson *et al.* 1991).

Almost all these coastal grazing marshes have, however, been claimed by man over the last 2,000 years from the natural saltmarshes of estuaries. This agricultural land-claim has been very extensive in Britain: about 57,000 ha of saltmarshes, representing a 50% decline in a scarce habitat that is itself of great importance for breeding waders. Although the practice of claiming saltmarshes for agriculture has now almost ceased (Davidson *et al.* 1991), the coastal grazing marshes have themselves been under intense pressure, and 'secondary land-claim' has destroyed or fragmented many of these areas through agricultural intensification and urban and industrial developments. This destruction has been most extensive in south-eastern England (Williams & Hall 1987, Thornton & Kite 1990), where for example only about 30% of coastal grazing marshes in the Thames Estuary in the 1930s now remain. Destruction of coastal grazing marsh is continuing apace: for example the largest remaining area in the inner Thames Estuary is likely to soon become a leisure park.

There is thus a two-stage process of habitat change that affects waders that breed on estuaries: first the conversion of saltmarsh to grazing marsh and then the destruction of the wet grassland of these grazing marshes. This second change generally marks the end the area being suitable breeding habitat for waders, although where the change has been

to arable farmland some species such as Lapwing *Vanellus vanellus* can continue to breed.

As part of a major review of the nature conservation of the wildlife on British estuaries (Davidson *et al.* 1991) I have recently reviewed the size and distribution of breeding wader populations on the British estuarine resource. This paper summarizes the results of this review for the breeding waders of estuarine wet grasslands, and draws some comparisons with the breeding wader populations of the adjacent saltmarshes.

Results

Wet grasslands are associated with at least 59 of the 155 British estuaries, and there are data on numbers and densities of breeding waders on the grasslands of 55 of these estuaries. Saltmarshes have been surveyed less comprehensively and there are data on breeding densities for parts of only 36 estuaries, although saltmarshes occur on at least 135 British estuaries. Data for these assessments of estuarine wader populations have been extracted chiefly from surveys made during the 1980s, notably the NCC/BTO/RSPB survey of breeding waders in wet grasslands in England and Wales (Smith 1983), the WSG/NCC surveys of breeding waders on the Outer Hebrides (Fuller *et al.* 1986), and an NCC/RSPB survey of breeding waders on saltmarshes (Allport *et al.* 1986), supplemented by a variety of other sources listed in Davidson *et al.* (1991). Many of these wet grassland populations are believed to have further declined in size since these surveys were undertaken (Smith 1988, 1991).

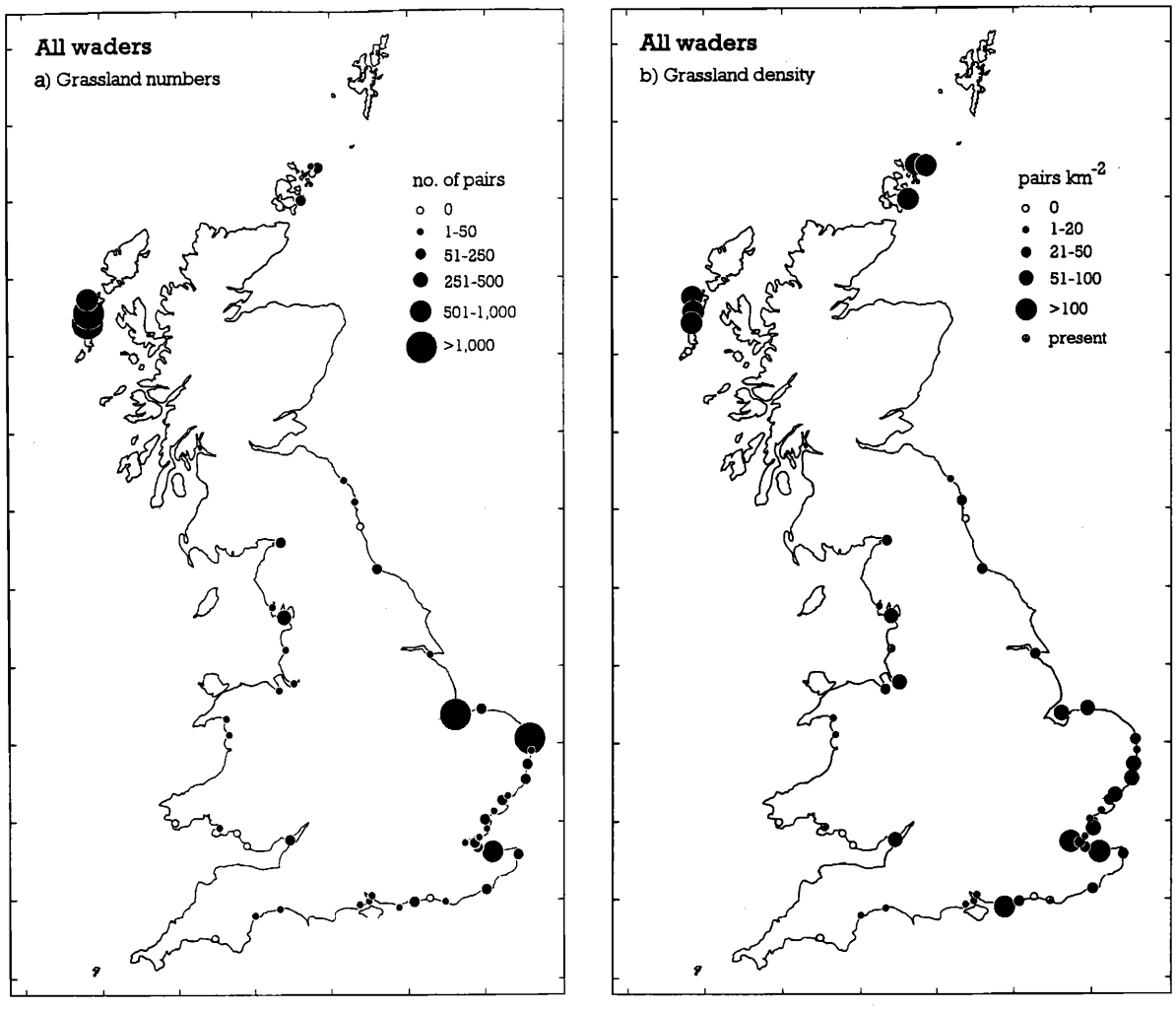

Figure 1. The distribution, numbers and density of breeding waders on British estuarine wet grasslands (from Davidson *et al.* 1991). a) total numbers of breeding wader pairs; b) maximum breeding densities (pairs/km^2).

The distribution and sizes of breeding wader assemblages associated with British estuaries in the 1980s is shown in Figure 1. Largest numbers are on the machairs associated with the coasts of the Outer Hebrides, the washlands associated with the tidal rivers of The Wash, and the extensive grazing marshes of the Norfolk Broads associated with the Breydon Water estuary. Overall almost 63% of the 9,116 pairs on estuarine wet grassland breed in just these three areas. Some individual species, notably Snipe *Gallinago gallinago* are even more focussed on these places. Nevertheless breeding waders are widely scattered around estuarine wet grasslands, occurring on 86% of estuaries for which there are data. They are, however, scarce or absent from grasslands in south-west England and Wales (Figure 1).

In Britain estuarine grassland breeding assemblages are dominated by Lapwings and Redshanks *Tringa totanus*, with smaller numbers of Oystercatchers *Haematopus ostralegus*, Snipe and Curlew *Numenius arquata* (Table 1). In addition there are smaller numbers of Ringed Plovers *Charadrius hiaticula*, Dunlins *Calidris alpina*, Avocets *Recurvirostra avosetta*, Ruffs *Philomachus pugnax*, Black-tailed Godwits *Limosa limosa* and Whimbrels *Numenius phaeopus* breeding on wet grasslands associated with British estuaries.

Highest breeding densities on estuarine grasslands are in two widely separated parts

Table 1. The sizes of the some breeding wader populations on wet grasslands associated with estuaries. Snipe were surveyed as numbers of displaying males.

Species	Estuarine population (pairs)	% of British breeding population
Lapwing	4,170	1.9
Redshank	2,194	6.7
Oystercatcher	1,143	3.0
Snipe	1,037	3.5
Dunlin	602	6.6
Curlew	57	0.2
Black-tailed Godwit	47	100
Ruff	<10	most
Whimbrel	5-10	1.0-2.0

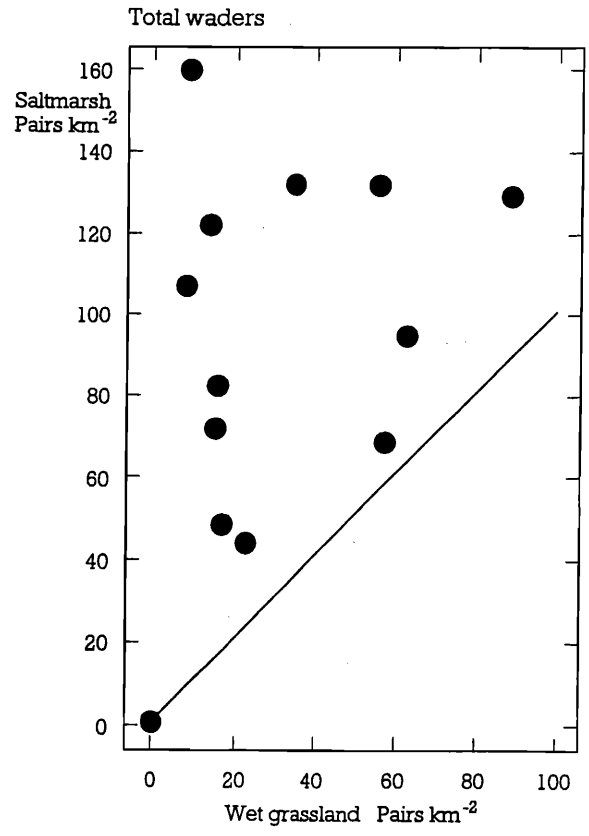

Figure 2. The total densities of breeding waders (maximum pairs/km^2) are consistently higher on saltmarshes than on adjacent wet grasslands. The line shows equal densities in the two habitats.

of Britain, both with densities exceeding 100 pairs/km^2: in south-east England, notably around the Swale Estuary and Pagham Harbour, and on the machairs of northern and western Scotland (Figure 1). Elsewhere, however, densities are rather lower, and on many estuaries are less than 50 pairs/km^2. In contrast densities on many saltmarshes around Britain are much higher, exceeding 50 or 100 pairs km^2 (Davidson *et al.* 1991). Comparison between peak densities on saltmarshes and on adjacent wet grasslands is possible for 13 estuaries (Figure 2). This shows that densities are consistently higher on saltmarshes, although it should be noted that no comparisons were possible for the Outer Hebridean machairs where some of the highest breeding densities on grasslands occur (Figure 1b). On some estuaries there is a ten-fold difference in densities.

Much of this pattern arises from the breeding distribution and densities of Redshanks, which are often the most abundant breeding

wader on saltmarshes. As for total wader densities, densities of breeding Redshanks on 15 estuaries are consistently much higher on the saltmarshes than on adjacent wet grasslands (Figure 3). Overall, British estuaries are of major importance as breeding habitat for Redshanks: the breeding population is in excess of 19,700 pairs - at least 61% of the British breeding population and 7% of the north-west and central European breeding population. Although almost 90% of the estuarine breeding population are on saltmarshes, wet grasslands adjacent to estuaries are nevertheless very important for Redshanks breeding in Britain. For example Smith's (1983) surveys found that almost 69% (1,525 pairs) of all Redshanks found breeding on wet grasslands in England and Wales were estuarine. Most grassland-breeding Redshanks adjacent to estuaries are on the large areas of grasslands in the Outer Hebrides, the Norfolk Broads, the Ouse and Nene Washes and the Swale Estuary.

Lapwings are more characteristic of grasslands than saltmarshes on estuaries. Few breed on saltmarshes in England and Wales, and none were found breeding on East Anglian saltmarshes in Allport *et al.*'s (1986) surveys. Although Lapwings are almost absent from estuarine wet grasslands

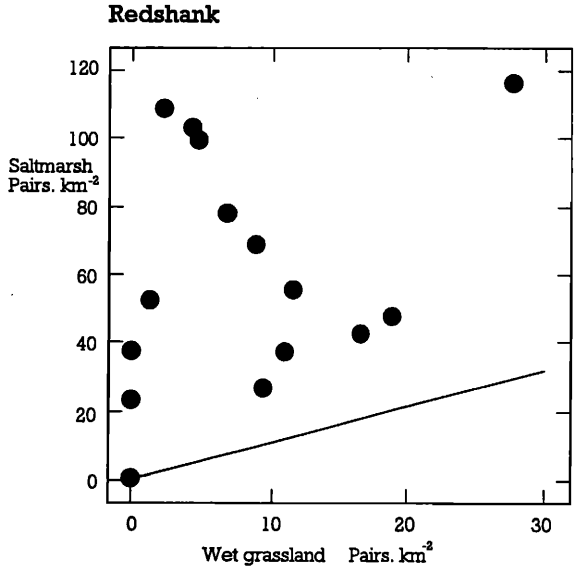

Figure 3. The densities of breeding Redshanks (maximum pairs/km^2) are consistently higher on saltmarshes than on adjacent wet grasslands. The line shows equal densities in the two habitats.

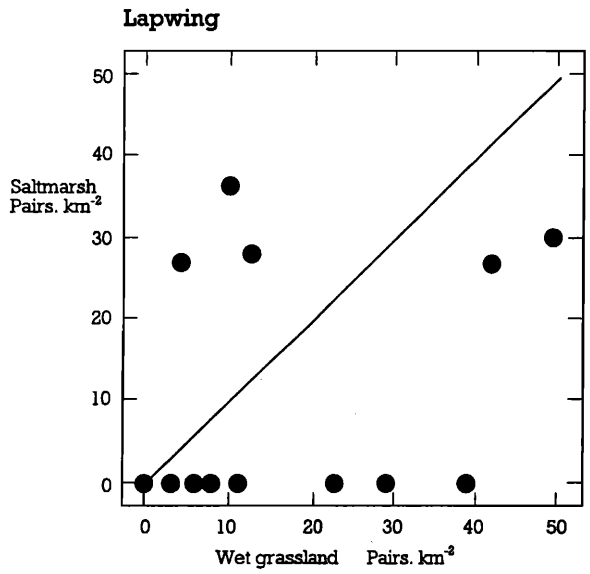

Figure 4. The densities of breeding Lapwings (maximum pairs/km^2) on saltmarshes compared to wet grasslands on the same estuaries. The line shows equal densities in the two habitats.

in Wales and south-west England, they are widespread and common on grasslands elsewhere, often in densities exceeding 20 pairs km^2. The pattern of comparative densities on grasslands and saltmarshes on the same estuaries is less clear-cut than for Redshanks (Figure 4). Interestingly, despite the more widespread distribution of Lapwings on grasslands there are two estuaries on which densities on saltmarshes exceed those on adjacent grasslands.

Oystercatchers are more widespread on saltmarshes (78% of estuaries) than on estuarine grasslands (56% of estuaries), and saltmarsh densities were generally higher. Oystercatchers are abundant on estuarine grasslands only in northern and western Scotland. Only small numbers breed, at low densities on grasslands in England and Wales.

For several other species including Dunlin, Black-tailed Godwit and Ruff, estuarine wet grasslands on just a few estuaries support important parts of the British breeding populations (Table 1, Davidson *et al.* 1991).

Conservation implications

Both the saltmarshes and estuarine wet

grasslands of British estuaries are very important as breeding habitat for the British and European populations of several species of waders. The maintenance of these populations and the habitats on which they depend is vital for the continued health of these wader species, and their safeguard is the subject of several international conservation measures, notably the 'Ramsar Convention' and the EEC Directive on the conservation of wild birds. Yet estuarine saltmarshes and grasslands are a scarce and diminishing resource in Britain. Habitat loss and damage through human activities continues to affect many British estuaries (Davidson *et al.* 1991). This is occurring despite many of these places being identified and designated as sites of national and international wildlife conservation importance (Stroud *et al.* 1990, Davidson *et al.* 1991).

Waders breeding on estuarine wet grasslands are highly concentrated in just a few parts of Britain where large areas of suitable habitat remain and where breeding densities are often high. Such places include the machairs of the Outer Hebrides, the Ouse and Nene Washes (The Wash), and the grazing marshes of the Norfolk Broads and the Swale Estuary. Elsewhere there are several smaller areas where densities are particularly high, such as Pagham Harbour in southern England, and grasslands on the Orkney Islands (Figure 1). Outside these areas, however, numbers and densities on wet grasslands are low. On such estuaries it appears that, assuming that higher breeding densities generally reflect better breeding habitat, saltmarshes provide better places for waders to breed than do most of the nearby wet grasslands. This trend is particularly marked for the Redshank, but also appears in at least some parts of Britain for other species such as Lapwing and Oystercatcher. It is particularly surprising for the Lapwing since this species is generally considered more typical of agricultural land than saltmarshes. These analyses particularly emphasise the very great importance of saltmarshes as a breeding habitat for waders in Britain.

Assessing why most of these British estuarine wet grasslands apparently now provide relatively poor breeding habitat for waders is beyond the scope of this review. It may reflect the current agricultural management practices involving high stocking rates, early timing of hay and silage cutting and lowering of water-tables, as is reported elsewhere in this volume. It is, however, alarming that Smith's (1983) surveys found that for some species such as Redshank the breeding population in England and Wales was now largely restricted to mostly coastal sites and that it had declined as an inland-breeding species in the last few decades. Subsequent monitoring has found further declines in wet grassland populations (Smith 1988, 1991), so even these apparently poorer quality coastal sites may now be assuming increased importance as breeding sites. In some parts of Britain, notably in southern England, estuaries and their adjacent habitats now support almost all the breeding waders in the region. For example, in Suffolk most of the breeding Redshanks and Oystercatchers are estuarine, and even 12% of the Suffolk population of a species as widespread as the Lapwing were associated with estuaries (Holzer *et al.* 1989). In Sussex 81% of Redshanks and 64% of Snipe were associated with estuaries (Mitchell 1983).

The high density of breeding waders on many saltmarshes, coupled with the history of human alterations to estuarine habitats implies that a progressive decline in breeding wader populations has occurred in several stages:

1) The progressive conversion of saltmarshes into coastal grazing marshes has probably resulted in substantial reductions in wader breeding density and overall decreases in the size of the British breeding populations, especially of species such as Redshank. Many of these grazing marshes then, however, established important assemblages of breeding waders including several species such as Snipe, Black-tailed Godwit and Ruff that breed on wet grasslands rather than saltmarshes.

2) Subsequent intensification of agriculture on these grazing marshes has further reduced the breeding wader populations,

and made these areas unsuitable for most wader species typical of saltmarshes and wet grasslands.

3) Urban and industrial developments on intensively-farmed land has then removed the last remaining breeding waders from these areas.

Each stage further reduces the breeding wader density but the damage and destruction of breeding wader habitat does not always follow the sequence through all these stages. For example many urban and industrial land-claims now remove the saltmarsh or wet grassland directly, so eradicating their breeding wader populations in one stage. Likewise much of the agricultural land-claim during the second half of the 20th century on estuaries such as The Wash have directly converted saltmarshes to arable land, so missing out the 'grazing marsh stage', with similar consequences for breeding waders.

Future conservation of breeding waders on British estuaries must therefore include preventing further overall saltmarsh and grazing marsh habitat loss and degradation. The management of the remaining areas of such habitats (including the possibility of reinstating severely degraded areas), so as to provide favourable conditions for high densities of breeding waders, is also essential.

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