ECOLOGICAL EFFECTS OF MAN'S ACTIVITIES ON WADERS

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NORTH SEA FORUM

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ABSTRACT

The North Sea coasts of Britain support 60% of the waders which winter in Britain and 40% of those wintering in Europe. The conservation of these birds is of international concern, since they originate from breeding areas including Canada, Greenland, Iceland, Europe and the USSR. Populations on the North Sea are threatened by the destruction of their intertidal feeding areas (particularly estuaries) through industrial, agricultural and recreational developments. Some species are also threatened on their breeding grounds through drainage and afforestation. Protection of waders on their wintering areas only, may be inadequate to safeguard the populations. The British wintering populations of Knot, Dunlin and Redshank have declined by 45%, 22% and 25% respectively over the last 15 years. Studies are urgently needed to identify the factors responsible for these declines.

SUMMARY OF RECOMMENDATIONS

1. Urgent designation of important sites under Ramsar Convention, EC Birds Directive and Wildlife and Countryside Act (1981). Planning of estuarine developments to be considered at national rather than local level.

2. Further research and monitoring of the impacts of habitat loss on waders is required at all times of year.

3. Studies are required on the feasibility of creating mudflat feeding areas as compensation for loss of intertidal sites. Such experiments should be undertaken on areas of no existing conservation value, and several years in advance of the results being required as compensatory proposals for any land-claim scheme.

4. Studies are required of the impact of human disturbance on coastal wader populations.

INTRODUCTION

Approximately 1.3 million waders (Charadrii) winter on the coastline of Britain (Moser in press), representing almost 40% of the populations which winter in Europe. The birds which winter in Britain originate from parts of Canada, Greenland, Iceland, Faeroes, N.Europe and the USSR (Pienkowski & Evans 1984). Many waders also migrate through Britain to wintering areas further south in continental Europe and Africa. The protection of waders and their habitats in Britain is thus of international concern.

During their non-breeding season most waders are restricted to coastal habitats, principally the intertidal mud- and sandflats of estuaries. The British Isles are particularly important for waders because they are positioned on several major migration routes and have a relatively mild winter climate which prevents prolonged freezing of intertidal habitats (conditions which make the foods of these birds inaccessible). Additionally, the large tidal amplitudes around the coasts of Britain expose extensive intertidal feeding areas (Evans 1984), both on estuarine and non-estuarine shores.

During the last 100 years, the British estuaries have undergone considerable modification from man's activities. Agricultural, industrial and urban growth have resulted in large-scale loss of intertidal areas, while recreational developments have caused further losses and brought about greatly increased levels of disturbance. Industrial and domestic discharges have also led to high levels of pollutants and sewage at some sites.

CURRENT STATUS: Impacts and Implications

Recent comprehensive surveys reveal that over 760 000 waders winter on the North Sea coast of Britain, representing about 60% of the total number that winter in Britain (1.3 million). The present status of the twelve most abundant species is summarised in Table 1. The estuaries of the North Sea are also important as migration staging areas and moulting grounds for waders during the spring and autumn. Many of the birds present at this time are different individuals to those which are present during the winter months, and there may also be a very rapid turnover of individuals (Moser & Carrier 1983). So, a much greater number of waders than the 1.3 million which winter in Britain do in fact depend on our coasts.

The population trends of waders wintering in Britain have been monitored since 1969 through the BTO/NCC/RSPB Birds of Estuaries Enquiry (see indices of population levels in Salmon & Moser 1985). Three species give cause for concern, because of long-term declines in their numbers: the Dunlin which has declined by 22% from 550 000 to 430 000; the Redshank which has declined by 25% from 100 000 to 75 000 and the Knot which has declined by 45% from a peak of 400 000 in 1971-72 (Prater 1981) to 220 000. The causes of these declines are not yet understood, although any of the factors listed below may be important, as may other factors not considered.

All waders are potentially threatened on one or more of their breeding,

wintering, migrating or moulting areas. Protection during only one phase of their annual cycle may therefore be inadequate to safeguard the populations . In general, those species which breed in the High Arctic are thought not to be under serious threat during the breeding season. Species breeding in more temperate areas are however seriously threatened through the drainage of their inland breeding sites for agricultural improvements. The most recent survey of waders in lowland Britain (Smith 1983) reported marked declines of Redshank, Snipe and Lapwing (see also O'Connor & Shrubb in press), and the situation is equally serious elsewhere in Europe (Dubois & Maheo 1986). In upland areas, afforestation (RSPB 1985), agricultural improvement, overgrazing and the burning of moorland have also reduced the breeding habitats of several species while recreational disturbance may pose a threat to some coastal breeding waders (Pienkowski 1984).

During the non-breeding season, waders are threatened by habitat loss and modification, disturbance and pollution. In general, these problems are restricted to estuaries, although waders on non-estuarine coasts may also be threatened by chronic oil spills. The effects and implications of estuarine habitat loss have been considered by Evans & Pienkowski (1983) and Goss-Custard (1985). There is evidence that the number of waders that an estuary can support is limited by interference between individuals feeding at high densities. Birds displaced by habitat loss may either be unable to settle on the remaining areas, which are already full (eg. Townshend 1985), or be displaced onto less good areas where mortality may be greater (Goss-Custard 1985). The birds which are displaced will include many juveniles, the most vulnerable section of the population which represents the future

generations. The species most likely to be affected are those which feed for the highest proportion of the tidal cycle and therefore require high tidal level feeding areas, since areas nearest the shore are lost most rapidly to development. The spread of Cordgrass Spartina anglica has also reduced the extent of upper tidal feeding areas on some estuaries and may be implicated in the declines of certain wader species. Disturbance of waders is probably important at high tide, when the number of safe roosting sites may be limited on some estuaries (e.g. Furness 1972, Mitchell & Moser in prep), and in severe weather when foraging time may be insufficient to enable birds to obtain their daily requirements (Davidson 1981). Some waders have been found to carry high levels of pollutants in their body tissues, particularly of heavy metals. Cadmium is found at higher levels in older birds of a given species.

RESEARCH AND PROGRESS

Because waders are restricted to intertidal habitats during the non-breeding season, their population sizes and distributions are relatively well known both on the estuarine and non-estuarine coasts of Britain (Prater 1981, Moser & Summers (in prep.), Moser (in prep.)). Similarly, the origins and migration patterns of the waders which winter in Britain are relatively well known (Pienkowski & Evans 1984).

Detailed research has been undertaken on the population processes and spacing behaviour of Oystercatchers on the Exe estuary (Dr J.D.

Goss-Custard and team) and of Grey Plovers, Curlews and Sanderlings on the Tees estuary (Dr P.R. Evans and team). These detailed within-estuary studies all point to the role of competition, especially as it affects young birds, and they provide vital evidence of the potential impacts of habitat loss. One of these studies (Pienkowski & Evans 1985) has suggested that the British Isles, as the northernmost climatically suitable wintering area for many species, is the preferred settlement site for juveniles, because it minimises the distance they have to migrate in their first autumn, when mortality may be highest. Hence, loss of British wintering sites may be more significant than the loss of wintering sites further south. Further studies are required of more species on a wider range of sites. The role of the North Sea estuaries for migrating and moulting wader populations has yet to be fully evaluated (see Pienkowski 1984), although much unpublished information already exists, from the national counting and bird-ringing schemes organised by the British Trust for Ornithology.

ASSESSMENT OF URGENCY

In view of the dramatically increased use of estuarine resources by human populations during the last century, and the proposals for massive developments on some intertidal areas (eg water storage, tidal power barrage schemes), the conservation and research recommendations listed below require urgent consideration.

CONCLUSIONS

In terms of national and international significance for conservation, the wintering wader populations on the North Sea coasts of Britain are one of our most important natural resources. Loss of intertidal feeding areas is currently the most serious threat to these birds. The populations of three of the most common species have declined by 22-45% in the last 15 years. Although the reasons for these declines are not yet understood, urgent action is required to minimise the impacts of future developments on intertidal habitats, and to promote further research into the processes involved in the regulation and/or limitation of wader populations.

RECOMMENDATIONS

Conservation

Recent and comprehensive surveys of waders have identified those sites which meet the criteria of international importance (Spagnesi 1982) for designation under the Ramsar Convention and EC Birds Directive. The UK government has indicated that such sites should first be notified as SSSIs, under the Wildlife and Countryside Act, 1981. Sites which meet the requirements of SSSI status for waders (i.e. national importance (Moser in prep.)) have been identified. Urgent priority must therefore be given to enforcement of these designations, particularly on

threatened sites. Future planning of developments on estuaries should be considered on a national rather than local scale, because of the mobility of waders and their dependence on a network of key sites.

Many of the waders which visit Britain may spend a large proportion of the year in other countries. Protection of habitats in Britain alone will not ensure adequate conservation of these populations. Other countries visited by these birds should be encouraged to sign and ratify the Ramsar Convention, while conservation and research initiatives on waders should be shared internationally, as has happened already in western Europe.

Research for Conservation

1. Full priority should be given to continued long-term monitoring of British and international wader populations, during the non-breeding season. Such programmes provide essential site evaluation data and early warning of populations that may be endangered by Man's activities. Recent trends in the British wintering populations of Redshank, Dunlin and Knot, which have all shown substantial declines, require urgent investigation.

2. Further research is required into the implications of loss of intertidal areas for waders. Priority should be given to the following: a). to undertake detailed studies of the spacing behaviour of individual species (cf. those in progress for Oystercatcher and Grey Plover), with priority on the declining species; b). to examine the fate of waders which are displaced from mudflats by habitat loss; and c). to examine population processes of waders at a national and

local level and to evaluate the capacity of the British estuaries to absorb birds displaced by developments elsewhere.

3. Detailed, extensive experimental studies are required of the potential for creating artificial mudflats, as compensatory areas for mudflats which are lost to development. Such studies should cover the time periods needed for substrate preparation, sedimentation, invertebrate colonisation and subsequent bird usage and should be carried out on areas which have already been lost to development and/or have no nature conservation interest, and NOT on important bird areas. The studies will need to be carried out several years in advance of the need for the information.

4. Studies are required to assess the impact of recreational activities on wader populations. Current priorities include the effects of bait-digging on prey abundance; effects of disturbance by wildfowlers, bait-diggers and others on the foraging of waders in severe weather; and the effects of recreational disturbance on coastal breeding waders.

5. Estuarine bird populations offer considerable amenity value through bird-watching. Further emphasis should be placed on exploiting this amenity as an educational and recreational resource, particularly in urbanised areas, which are often located around estuaries, where threats to internationally important populations may be greatest.

6. Quantification is needed of the importance of British estuaries to passage migrant populations of waders.

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Table 1 Current status of wintering wader populations on the North Sea coasts of Britain (Shetland - Land's End inclusive). Assessment made by summing average January counts 1981-85 for each estuary and adding this total to the total for non-estuarine shores (from survey undertaken in December 1984 and January 1985).

	North Sea Wintering Population	% of British Total (Moser in prep.)	% of European Total (NOME 1982)
Oystercatcher	97000	35	14
Ringed Plover	11000	48	44
Grey Plover	18000	86	36
Knot	170000	77	49
Sanderling	7400	53	30
Purple Sandpiper	13000	81	52
Dunlin	280000	65	19
Black-tailed Godwit	3400	71	9[1]
Bar-tailed Godwit	35000	57	35
Curlew	49000	54	12
Redshank	53000	71	44
Turnstone	32000	71	53[2]

1 European estimate from Prater (1981).

2 NOME (1982) estimate revised to 60000 on account of large populations discovered on British coast.