

A further area of study concerning waders in severe weather conditions relates to movements in response to, or in anticipation of, low temperatures. In spite of the large numbers of waders that have been ringed in Britain in the last twenty years, the number of controls of birds indicating movement within the same winter is small, often because most catching effort has been concentrated in early autumn, with less effort made to catch regularly during the winter months. This could usefully be remedied! It is already known that not all waders go straight to the estuary or estuaries where they winter; some moult elsewhere, eg. on the Wash. Yet in the case of Dunlin, the peak winter weight achieved in an estuary is related to the average (expected) temperature there in mid-winter (Pienkowski, Lloyd & Minton 1979). This suggests that the peak weights are pre-programmed, rather than changing in response to the actual temperatures experienced in a given winter. If so, are there any differences in seasonal patterns of weight change between those individuals that move direct to an estuary and those that arrive later in the autumn or winter? and any differences in the ability to withstand severe conditions in these two groups of birds?

From this short discussion, it will be clear that there are problems of both scientific and conservation importance to be studied (the two areas overlap considerably!) in relation to the behaviour and survival of waders in severe weather. Many of these questions will be answered only by comparative studies in several estuaries around the British Isles, preferably undertaken in the same year(s). The importance of determining the "normal", mild winter, patterns of movements and weight changes will be obvious as will the need to make catches just before as well as during and just after spells of severe weather in as many areas as possible. Whilst there are considerable reasons for attempting studies on the responses of waders to cold and windy conditions, it needs stressing that no catching procedures should interfere with the chances of survival of the birds. This means that catches should be restricted in size and be processed quickly, so that as little potential feeding time as possible is lost to the birds by captivity or disturbance.

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## PRELIMINARY SURVEY OF THE ARCHIPEL DES BIJAGOS, GUINEA-BISSAU

by Olivier Fournier and William Dick

### Introduction

The enormous gap in our knowledge of the distribution of coastal waders in West Africa has been commented on frequently in this Bulletin and elsewhere. Between Senegal and South Africa lie some 5,000 km of coastline where practically no systematic survey of waders has yet been made. To the north, the outstanding importance of the Banc d'Arguin in Mauritania as a wintering area for waders is well established, with some 2,000,000 there. To the south, the coasts of South Africa have been well censused by the Cape Wader Group. Between these areas, estuaries are generally fringed or covered by mangroves, with consequent effect on the number and species of waders wintering on them.

The Archipel des Bijagos in Guinea-Bissau (Fig.1) is an exception in that it contains vast intertidal flats not covered by mangrove, the largest such area south of Mauritania. The breeding birds of the Archipel have been studied in detail by de Naurois (1969), but the waders have not been investigated. Prior to Independence, access to Guinea-Bissau was not possible on account of the political situation. However, more recently access to the country has become practicable and we decided to attempt an exploratory survey of the Archipel in early February this year. Our intention was to carry out as comprehensive a survey as was possible, to make contact with the relevant authorities in the country, and to assess the feasibility of future research. This report is written within two weeks of the survey and is therefore only preliminary.

### Description of area and Results

The Archipel consists of some 40 islands contained in an area of approximately 80km north-south and 100km east-west (Fig.2). In order to census such an extensive area of islands and mudflats, we had hoped to carry out an aerial survey to be followed up by a visit by boat. As funds were not forthcoming, our survey was carried out by boat only, and took place between 5 and 8 February 1981. On arrival in the town of Bissau, we found that there were considerable problems in arranging the hire of a boat and in obtaining sufficient food and petrol for the survey. However, we managed to hire a pirogue (a traditional type of open boat) equipped with an outboard motor and a crew of three. We travelled amongst the islands and mudflats for four days covering approximately 200km. On account of the shallow water (the tidal range is a maximum of 3 to 4 m), the inexperience of our guides, the problems of navigation in the channels, and the rather deep draught of the pirogue, most of our travel was at high tides. We spent many hours bogged on mudflats awaiting high tide, the pirogue tilted at an uncomfortable and alarming angle of 70 degrees! The results of our survey are therefore not complete, both in terms of the percentage of the overall areas covered, but also in the completeness of the areas which we did visit. Nevertheless, it was sufficient to show the immense importance of the Bijagos for waders.

The islands themselves are of low rocky or sandy base, mostly densely wooded. The shorelines vary from rock to open sand beach to muddy with a margin of mangrove. There are some more extensive mangrove areas on the lower islands and in the bays. The islands are of extreme natural beauty, with many palm-fringed white beaches which must come close to many people's idea of paradise! Some islands are inhabited. The intertidal areas vary considerably in substrate:

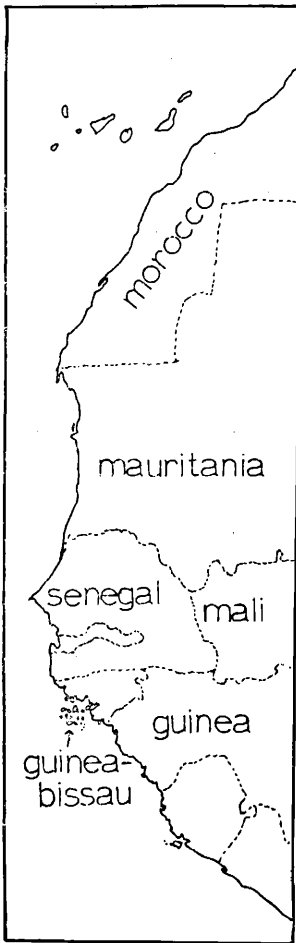


Fig. 1. Map of N.W. and W. Africa

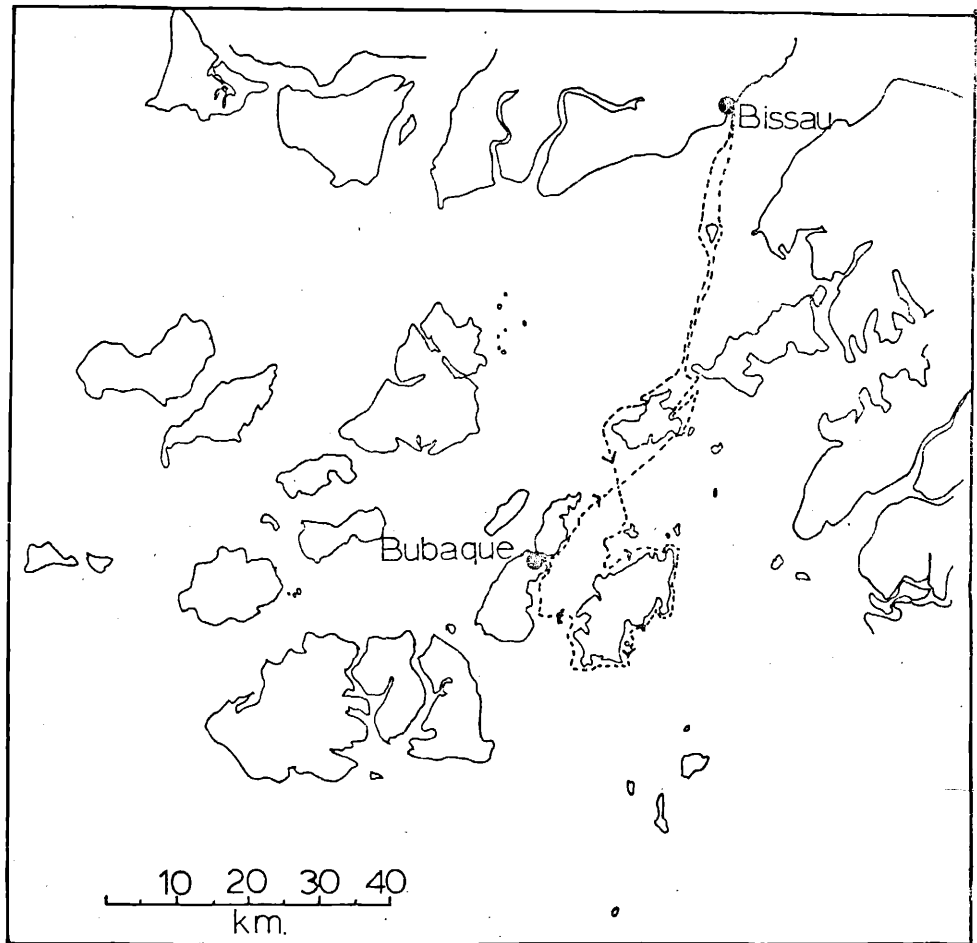


Fig. 2. The Archipel des Bijagos. Dotted line shows route followed.

in the main channels currents are very strong and the exposed areas are sandy with steeply shelving edges. In these areas we saw few feeding waders. However, there are vast muddy flats and bays covered with waders at low tide. Some flats are inhabited by huge numbers of crabs. Because of this variety of wader densities, it is difficult for us to speculate on the overall numbers of waders in the Archipel by extrapolating from those areas which we did visit. Large numbers of waders have also been observed on the mudflats in the south-east part of the archipelago which was not visited by us (A.R. Dupuy, pers. comm.).

The roosting habits of waders seem to be adapted to the lack of suitable sites on some of the islands because of the mangrove. We were amazed by the sight of waders roosting in large numbers on mangrove trees and, in one instance, by the sight of a flock of Bar-tailed Godwit *Limosa lapponica* and Knot *Calidris canutus* in a Beobab tree 15m high! The roost sites were well used judging from the colour of the leaves. The overall effect of the lack of roosting sites was a more dispersed roosting pattern to that we know in Europe (and Mauritania). Many roosted on rocks, sand spits and beaches.

The actual number of waders counted amounted to approximately 50,000, but this probably does not reflect more than a proportion of the waders within the areas visited. In many instances we saw large numbers of waders on distant mudflats and were unable to count them. We have not yet worked out the area of exposed flats in the Bijagos, but our map seemed accurate and we are planning to use satellite photographs. We censused, incompletely, not more than one fifth of the exposed areas in the Archipel, and there are further exposed areas off the mainland coastline. The overall numbers of waders must run into several hundreds of thousands.

Seventeen species were seen. Curlew Sandpipers *Calidris ferruginea* were most common: no Dunlin *C. alpina* were seen. Bar-tailed Godwit were second, followed by Knot, Grey Plover *Pluvialis squatarola* and Whimbrel *Numenius phaeopus*. These species accounted for 80 - 90% of all waders. Other species were Turnstone *Arenaria interpres*, Sanderling *Calidris alba*, Oystercatcher *Haematopus ostralegus*, Redshank *Tringa totanus*, Greenshank *T. nebularia*, Common Sandpiper *Actitis hypoleucos*, Wood Sandpiper *T. glareola*, Green Sandpiper *T. ochropus*, Ringed Plover *Charadrius hiaticula*, Kentish Plover *C. alexandrinus*, Little Stint *Calidris minuta* and Temminck's Stint *C. temminckii*. Their numbers and distribution are being analysed at present.

#### Conclusion

The modest survey we were able to undertake was sufficient to show the order of magnitude of waders at the Archipel des Bijagos, which establishes it as a wintering area of outstanding international importance. The survey was carried out under extremely difficult conditions but has, as intended, allowed us to assess the possibilities of mounting a larger and broader ecological study in the future.

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