WADER RESEARCH IN THE DELTA OF THE SOUTHWEST NETHERLANDS

by Henk Baptist and Patrick Meire

Introduction

The Delta-area in the southwestern part of the Netherlands has been formed gradually by the estuaries of the rivers Rhine, Meuse and Scheldt during the last 2000-3000 years. After the storm-flood of 1953, when large parts of the area were inundated and over 1800 people were killed, the Dutch government decided to dam up five of the seven estuaries, the so called "Delta Plan". The Westerschelde and the Nieuwe Waterweg will remain open because these are the entrances of the ports of Antwerpen and Rotterdam respectively. Four estuaries have already been dammed up and changed from salt or brackish tidal areas into stagnant lakes.

The present situation from north to south is (Figure 1): an open, but very small, harbour mouth (Nieuwe Waterweg), two fresh water lakes (Brielse Meer and Haringvliet), a salt water lake (Grevelingen), an open salt estuary (Oosterschelde, a brackish lake (Veerse Meer) and an open salt to brackish estuary (Westerschelde).

In the original Delta Plan the Oosterschelde would also have been dammed up, after which all enclosed estuaries would be changed into fresh water lakes. As a result of changed views regarding the environment and fisheries, this decision has been changed. In 1985 the Oosterschelde will be closed by means of a storm-surge barrier. As a result of this the tidal amplitude will decrease from 3.1 to 2.7 m. In addition, in the eastern part of the estuary secondary dams will be constructed, which will cause a direct loss of tidal areas (Figure 1). Because of both changes, the intertidal area in the Oosterschelde will decrease from 16,880 to 9,400 hectares, a loss of 40%. This will cause drastic changes in the biotic characteristics of the area.

The consequences for the whole ecosystem as well as for the bird populations involved are still insufficiently predictable. The ecological knowledge of the area is not sufficient to develop an optimal land-use planning and management policy in relation to agriculture, aquaculture, fisheries, recreation and nature conservation. In particular, the consequences of changing ecological conditions for the large numbers of waterbirds using the area, will have to be studied intensively during the next years. An essential part of this study will be the comparison of the initial, present situation with the situation during the first years after damming the estuary, which can be considered as a unique opportunity to study the ecology of waders.

Formulation of the problem

As waders are the group likely to be affected most by the future changes, research will be focused on this group. The major problems we have to deal with are:
- what is the function of the Delta-area as a breeding, wintering, passage and moulting area?
- how many waders will visit the Oosterschelde in future?
- if there is a decrease in numbers, will this decrease differ for migrating and for wintering birds and in what way?
- which (sub)-populations will be involved and what will be the influence on the population sizes and on the winter distribution?
- which ecological factors limit the numbers at present and in the future?

Present knowledge and future plans

Numbers of birds. Regular ornithological research in the Delta-area started in 1963 with monthly counts along a part of the northwestern coast of the Oosterschelde (Wolff 1973a). These counts have been continued up till now. In 1966/67 the first three counts in the entire Delta-area were organized (Wolff 1967). These showed the presence of nearly 185,000 waders in the area in winter. The most numerous species were Oystercatcher, Curlew, Dunlin and Knot. Between 1964 and 1969 regular counts were carried out on the Ventjagersplaten, a brackish tidal area in the Haringvliet (Zwarts 1974). After the enclosure of two major estuaries, Haringvliet in 1970 and Grevelingen in 1971, eight counts in the entire Delta-area were organized (Saeijs and Baptist 1977a, 1978). Comparing the counts before and after these enclosures, it seems that these drastic changes did not cause a drop of wader numbers in the Delta-area as a whole. The numbers of waders in the remaining tidal areas increased.

Monthly counts of waterbirds, partly based on the scheme of IWRB, have been carried out since 1972. From the start waders were included in the counts as well. The quality of these monthly counts has been improved in the course of the years. During the last three years the entire Delta-area has been counted during the months September to April. Moreover, in all tidal areas and in the Grevelingen monthly counts during May to August have been carried out as well. These counts give a good insight in the numbers of waterbirds visiting the Delta-area. Average counts in January and average migration peaks of waders are given in Table 1. These results clearly show the major importance of the area as a habitat for waterbirds (see also Saeijs and Baptist 1977b, 1980). We intend to continue the monthly counts of waders on the high water roosts. Due to a lack of manpower the frequency of the counts cannot be increased. Only in a few small test-areas counts will be carried out weekly.

Feeding ecology of waders. An ecological interpretation of the distribution of waders was given by Wolff (1969), who also carried out a very extensive study of the macro-benthos (Wolff 1973b). The distribution of eight species of waders could be related to the distribution for one or more species of their main prey. For other birds the distribution could be related to other factors, such as substrate and wave-action.

Zwarts (1974) studied the ecology of waders in a brackish tidal area in the Haringvliet. Three major variables determining the distribution of waders on the feeding grounds (distribution of food, substrate, and distance between feeding area and high water roosts) were studied, as were dispersion, competition, feeding behaviour and food-intake of waders.

A detailed study of the feeding ecology of waders was started in 1979 at the "Slikken van Vianen" in the Oosterschelde (Meire 1980) (Figure 1). Density-levels and density-fluctuations of waders on different types of tidal flats are being studied. This is done by means of permanent plots, in which birds are counted and benthos is sampled. We also study the diet and the quantity of prey taken by Oystercatcher, Bar-tailed Godwit and Curlew. Thus we get information of the carrying capacity and the predation pressure on different levels of the tidal flats. One of the results of the study is the discovery that on mussel-beds there is a maximum density of Oystercatchers which does not increase above a certain level of prey density and biomass. This may indicate that there is a density-dependent regulation (cf. Evans 1979). This is very important regarding the future reduction of the tidal flats by 40%. Density, however, is very variable on different levels and types of tidal flats. Many physical and biological factors can influence densities and data on these are currently being analysed (Meire, in prep.).

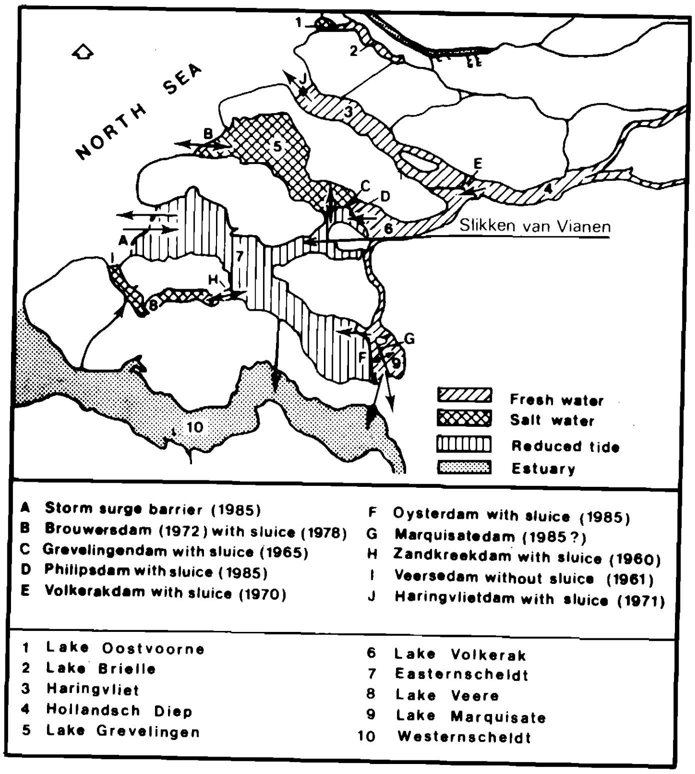

Figure 1. The Delta Region of the SW Netherlands.

Further studies will be carried out in two ways. Intensive studies in the Slikken van Vianen will be continued. At several other places in the Oosterschelde less intensive studies will be carried out to try to extrapolate the results for the whole Oosterschelde.

Ringing and marking of waders. Up till now only a small number of waders have been ringed in the area. It has been shown that at least Oystercatcher, Dunlin and Curlew moult in the Delta-area. We are planning to start a catching and ringing program in 1981. The goals of this program are:
- to determine the time of passage of different geographical populations or subspecies and try to find out origin and destination of some (sub-)species
- to obtain data on the condition of birds. For this purpose and for determining geographical sub-populations of some species biochemical methods are now being tested
- to study the function of the region as a moulting area
- to be able to study the intra- and inter-estuarine movements of marked birds
- to follow marked individuals on a mudflat

Conclusion

Despite the enormous opportunities the enclosure of the Oosterschelde offers to study bird reactions to the decrease of the intertidal area and the tidal amplitude, a lack of money and manpower forces us to limit the study to the most essential subjects. These studies are aimed to contribute to an ecological basis necessary for land-use planning and management of the Oosterschelde after 1985. The study will be integrated in an overall ecological study-programme in the Delta-area, including studies on soil, geomorphology, vegetation, zoobenthos, land-use planning and several aspects concerning the water, chemical as well as biological.

Species		Average January count	Average peak with month	
Haematopus ostralegus	Oystercatcher	107,000	110,000	Sep-Feb
Recurvirostra avosetta	Avocet	350	1,800	Aug-Sep, Apr
Charadrius hiaticula	Ringed Plover	+	4,200	Aug-Sep, Apr
Charadrius alexandrinus	Kentish Plover		1,500	Aug-Sep
Pluvialis apricaria	Golden Plover	+	25,500	Nov-Dec, Mar-Apr
Pluvialis squatarola	Grey Plover	4,100	7,100	Nov-Jan
Vanellus vanellus	Lapwing	+	20,000	Nov-Jan
Calidris canutus	Knot	21,000	21,000	Nov-Feb
Calidris alba	Sanderling	800	1,200	Aug-Sep, Nove-Jan
Calidris alpina	Dunlin	74,000	94,000	Aug-Mar
Limosa lapponica	Bar-tailed Godwit	6,100	8,000	Aug-Apr
Numenius arquata	Curlew	9,000	15,600	Aug-Oct
Tringa erythropus	Spotted Redshank	+	3,000	Aug-Sep
Tringa totanus	Redshank	3,000	4,500	Jul-Sep
Tringa nebularia	Greenshank	−	1,500	Aug-Sep
Arenaria interpres	Turnstone	2,300	2,300	Aug-Mar

Table 1. Counts of waders in the Delta-area in the southwestern part of The Netherlands (1975-1980)

+: present in small numbers; −: not observed

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IDENTIFYING COLOUR-RINGED OYSTERCATCHERS *HAEMATOPUS OSTRALEGUS*

by Bruno Ens

Oystercatchers on the shore,
getting banded by the score,
Oh how happy they would be,
were there no ecology.

(modified from Norton-Griffiths, unpublished PhD thesis, University of Oxford)

Correctly identifying a colour banded Oystercatcher has become a major challenge to the twentieth century ornithologists

Ringing combinations must belong to the most boring of subjects to read about, so I expect that only a few of hardline waderologists will reach the end of my article. Presumably they also contributed the bulk of the oystercatcher-sightings of which, according to Mike Pienkowski, only 10% can be tracked back to the original ringing scheme. Having observed oystercachers from three different ringing schemes I am convinced that these inaccurate observations can no longer be blamed on the carelessness of observers, but are mainly due to the great number of extant ringing programmes and methods. The combination of all these schemes has necessitated the use of very complex types of colour-bands and has led to what the well-intentioned outsider might seem like a conspiracy to prevent him from making correct identifications. Although few of these studies are primarily concerned with migratory movements, it would seem that observations from outside the ringing area could be very helpful in elucidating the amount of interchange between populations and the types of individuals involved.

The trickiest device developed so far in the ring race was invented by Chris Mead and developed by John Goss-Custard and will be called henceforth code-ring. It consists of a tall yellow plastic ring with horizontal black stripes on three positions. These stripes can be thick, thin or absent. In conjunction with the code-ring the birds ringed in the Exe estuary wear a small-sized colourband on the same part of the leg and some birds have an additional colour band on their other leg (see Fig.1). Leo Zwarts and Piet Zegers from the Netherlands also use code-rings but they are of various colours and the colour-bands are always on a different part of the leg or on a different leg altogether. Extreme care should be taken when thus-equipped birds are observed. Slightly less tricky is the multicolour-band previously used on Shokholm where three colours are stuck on one tall ring. Also, ordinary colour rings are not as ordinary as they might seem. Up to four bands can be found below the joint on one leg and a maximum of two above the joint on one leg in some ringing schemes. Although the number of colours used per scheme usually doesn't exceed six the total number used is extraordinary: white, yellow, orange, red, dark red, pale green, green, dark green, pale blue, blue, dark blue, dark brown and black. Sometimes the metal ring or the absence of a ring is considered a colour as well. A useful clue to nationality of Oystercatchers is that Dutch birds usually wear their metal ring above the joint; most others wear it below. On occasion people have used wing tags with a combination of colours and the latest fashion seems to be leg flags combined with staining. In Table 1 a summary of the ringing schemes is given as well as the total number of oystercatchers involved.

Although mudflats are almost ideally suited for reading rings, mud-splatters can cause nonexisting stripes on code-rings and seawater causes fading in some colour rings. Sometimes the yellow coating of the Goss-Custard code-rings has chipped off, leaving random black blobs on the ring. Colour rings tend to fall off or slip down. In this respect the extreme longevity of oystercatchers is not very helpful. According to Niko Tinbergen one pair ringed more than 15 years ago by Mike Norton-Griffiths still breeds every year at Ravenglass.