

the Lincolnshire and South Humberside Trust for Nature Conservation, and Norfolk County Council.

The sediment budget of the Wash has been a key issue in the Inquiry. Conflicting theories were presented in the evidence for and against the moratoria: there is uncertainty as to whether there is a finite supply of sediment to the Wash, and as to whether sediments are coarsening. Also, the effects on sediments of compression of the intertidal area through reclamation are not clear. NCC has proposed a two-year study by the Hydraulics Research Unit, and are seeking funding of several hundreds of thousands of pounds for the study. The outcome of such a sediment study would, however, be of interest to all participants in the debate on reclamation.

On the Wash, the moratorium has only three further years to run. Planning appeals have been referred to the Secretary of State for the Environment for a decision on whether the Structure Plan policies should be up-held. Both MAFF and the NFU consider that the Wildlife and Countryside Act 1981 is adequate protection for SSSIs (Sites of Special Scientific Interest, designated by the NCC). However, it must be emphasised that the provisions of the Wildlife and Countryside Act are an adjunct to current planning legislation, intended for cases where planning permission is not required. Planning permission is not needed if a saltmarsh is already considered to be used for agriculture, for example grazing. Most of the potentially-reclaimable saltmarsh sites on the Wash are of this nature and so are likely to come under the Wildlife and Countryside Act rather than the moratorium. The first of these sites proposed for reclamation is the outmarsh at Wrangle (see Figure 1), which the Secretary of State for the Environment has recently declared to be exempt from planning permission. Under the provisions of the Wildlife and Countryside Act, the NCC will be attempting to negotiate management agreements with the landowners at Wrangle. The outcome of these may indicate the future prospects for the conservation of much of the saltmarsh on the Wash.

At the time of writing, only the NFU have yet to present their evidence. The verdict on the moratoria is expected from the Inspector at the Public Inquiry later this year.

Rowena Cooper, Department of Zoology, University of Durham, South Road, Durham DH1 3LE, U.K.

## DECREASES IN THE WEIGHTS OF DUNLINS AND CURLEWS IN THE DUTCH WADDEN SEA DURING A COLD SPELL

by Steltloperringroep F.F.F.

Prompted by the recent boom in studies of the effects of severe weather on mortality and body condition of waders in Western Europe, we present here a short note on decreases in the weight of Dunlins *Calidris alpina* and Curlews *Numenius arquata* during a cold spell in February 1982 in the Dutch Wadden Sea.

On 13 February 1982 we were mist-netting 13 adult Dunlins and 18 Curlews on the mudflats near Wierum, Friesland (53°24'N, 06°01'E). On 26 February 1982 we caught 5 Dunlins (4 adults and 1 second-year bird) and 8 Curlews on the same site. The birds were weighed with Pesola spring-balances and were all processed within one hour after capture.

As the wing-length and bill-length of both species did not differ on the successive dates (Table 1), it is likely that the samples were taken from the same groups of birds, and that the effects of differences in body size on weight will have been minimal. The sex ratio of the Curlews was approximately the same on both dates: using data on wing-length and bill-length from the Wadden Sea (figure 123 in Boere & Smit 1980), we estimate that the percentage of males in the samples was 72% on 13 February and 75% on 26 February.

Table 1 shows that between 13 and 26 February the decrease in mean weights of Dunlins was 5.3%, but that the difference was just not statistically significant. An individual Dunlin caught on both evenings decreased in weight from 53 g to 48.5 g (8.5%). The mean decrease in weight of the Curlews was 9.8%. This difference was statistically significant.

Table 1. Biometrics of Dunlin and Curlew caught on the mudflats near Wierum, the Netherlands on two dates in February 1982.

		13 February			26 February			Students' t test
		n	mean	SD	n	mean	SD	
Dunlin	Wing	13	121.8	2.2	5	121.2	1.9	NS
	Bill	13	33.2	2.6	5	33.1	2.9	NS
	Weight	13	54.5	4.6	5	51.6	2.6	0.05 < p < 0.10
Curlew	Wing	18	310.7	11.9	8	307.4	11.3	NS
	Bill	18	126.0	11.5	8	127.2	14.1	NS
	Weight	18	932.5	90.6	8	841.3	88.4	p < 0.025

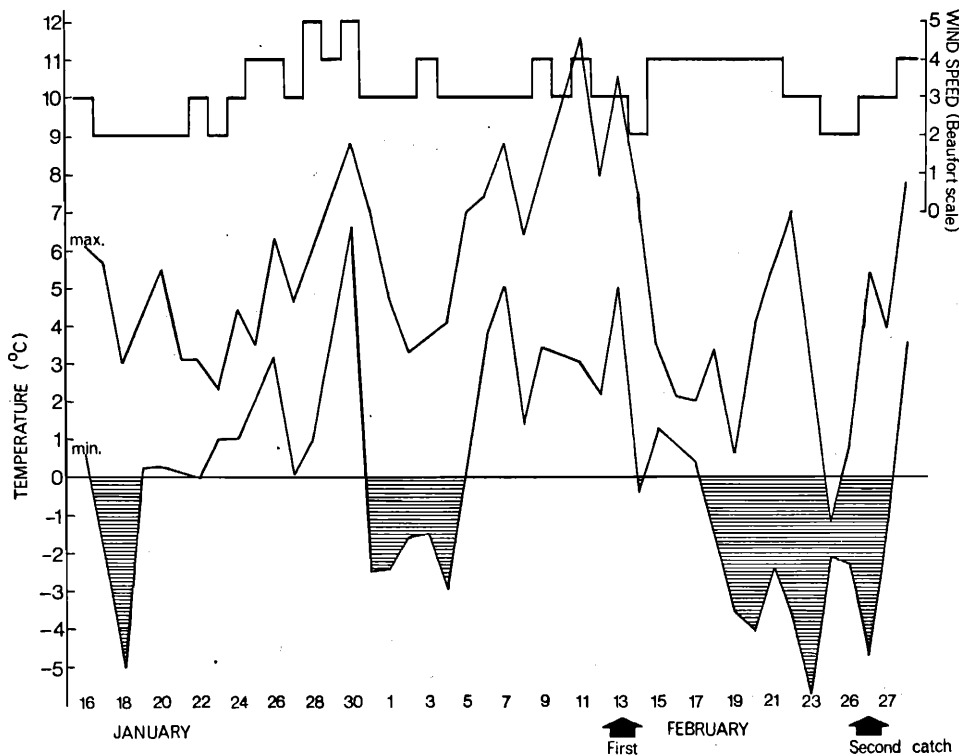


Figure 1. Daily maximum and minimum air temperatures (at a height of 1.5 m) and average windspeed (at a height of 10 m) in January and February at Leeuwarden, about 25 km SW of Wierum (source: Dagelijks Weerbericht 1982, KNMI, De Bilt). Windspeeds are probably somewhat higher in the study area on the coast.

Between the two catching attempts, the northern Netherlands experienced a cold spell with, for a week, rather strong winds (Figure 1). Therefore, there could be a causal relationship between the frosty period and the weight decrease of both wader species. However, at northern latitudes the weights of most waders decline after reaching a peak weight in December. According to Pienkowski et al. (1979), between December and March the total decrease in mean weight of adult Dunlins at the Wash, for example, is 8.0 g or 14.2%. This implies a mean decrease of 2.1% every two weeks, less than half the decrease in weight that we recorded during the cold spell in the Wadden Sea. However, it is known that, at least in Dunlins, the decrease in weight during mild winters is not perfectly linear and can be most rapid during February (N.C. Davidson, pers. comm.). Furthermore, the rate of weight loss during mild winters will depend partly on the size of the midwinter peak weight. If the peak weight is higher on the Wadden Sea than on the Wash, as might be expected (see Pienkowski et al. 1979), then the normal rate of decrease will also be greater. This would also mean that the weight loss during the cold spell was more similar to the mild winter pattern than it appears. We have been unable to collect midwinter weights during mild weather to examine this possibility. The mean weight of Curlews at the Wash decreased by 1.1% every two weeks between December and February (Jones 1981), also much less than the weight lost by Curlews on the Wadden Sea during the cold spell.

Comparison with the weight cycles of these species collected at the same site in mild winters, will provide the crucial test of a 'greater than normal' weight loss during February 1982. Our efforts to collect this data have been so far unsuccessful. In its absence, we would suggest that in even rather mild winter weather (no frozen, or ice covered, mudflats) can affect the food intake of wader species to such a degree that they cannot maintain normal body weights.

#### References

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Steltloperinggroep F.F.F. (Wader Ringing Group of the Fryske Feriening foar Fjildbiology), c/o Klass Koopman, Lyts Blijema 17, Grouw, Friesland, The Netherlands.