

Weight loss in Dunlin *Calidris alpina* over the high tide period.

Steve Dodd

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Steve Dodd, Wintergreen Nurseries, Bringsty, Worcester, WR6 5UJ, UK.

INTRODUCTION

Many species of wader are forced to roost for a number of hours over the high tide periods, when their intertidal feeding areas are covered. During this time, they are likely to be losing weight through evacuation of the gut and expenditure of energy in order to maintain body temperature. The majority of coastal waders are caught and weighed over the high tide period, a time when waders are rarely feeding, thus giving some comparability. Many papers have been written about the weights of waders, focusing on either seasonal changes (e.g. Johnson 1982, Johnson 1985), or changes in response to severe weather (Norman & Coffey 1994). Rochester & Moss (1992) attempted to establish the rate of weight loss between capture and weighing in order to correct weights to those at capture, but few have tried to relate the weight of the bird to when it was last feeding. Most of the feeding grounds for waders on the Lavan Sands in North Wales are covered at least two hours before high tide, during spring tides. This paper attempts to quantify weight losses during the high tide period, and to compare them to weight loss of birds between capture and weighing.

METHODS

On 27 January 1990, SCAN Ringing Group made a catch of 99 Dunlin in Bangor Harbour two hours before high tide. The group then made a second catch of 60 Dunlin at the same site two hours after high tide, giving an opportunity to compare the weights of the birds in the two catches. In each case, the birds were extracted quickly from the net and put in hessian keeping cages, about 20 per compartment. The birds were then ringed, aged, measured and weighed. Wing length was recorded to 1mm, total head length to 0.1mm, and weight to 1g on a 100g spring balance. For the first catch all birds were measured and weighed between 45mins and 1hr 40mins after capture; for the second catch the times were 40 mins and 1hr 20mins respectively. Since the interval between capture and weighing is very similar for both catches no correction was made for weight loss after capture. The two catches were made on a mild January

day with moderate wind, temperature 7.3C, cloudy, wind SSW force 5 for 11.00 a.m at RAF Valley. (Data from the National Meteorological Office). The measurements of the two groups were compared using a standard t-test.

RESULTS

The mean wing lengths and total head lengths of birds in the two samples were compared, to control for size differences between the two catches. No significant differences were found (table 1). The mean weights of both adults and juveniles were significantly lighter in the second catch ($t = 3.46$ $P < 0.01$ ads) and ($t = 2.72$ $P < 0.01$ juvs) (Table 1). During the four hours, adults had lost an average of 2.3g (S.E. ± 0.66), equating to 0.6g per hour or 1.2% of body weight per hour. Juveniles lost a similar weight, 3.0g (S.E. ± 0.91). Five birds (all adults) from the first catch were retrapped in the second. Four lost 2g in weight between catches, while the fifth lost 3g. These were similar to the mean weight loss.

DISCUSSION

The roosting flock was relatively undisturbed over the high tide period, occasionally flying for short periods. The recorded weight loss of 1.2% per hour is probably lower than average in these situations because of this and because weather conditions were good. Weight losses might be higher in cold or windy weather (Bangor Harbour is relatively sheltered from a SSW wind), or on a site with high disturbance levels, either from humans or predators.

The results of this study are similar to those found by Rochester & Moss (1983) who recorded weight losses of 1.23% and 1.18% per hour while Dunlin were held in captivity for 3.5 hrs in Feb 1983. Castro, Wunder & Knopf (1991) recorded a mean weight loss of 1.5% per hour, at temperatures of between 18 and 29 C. This higher rate may be due to water loss at higher temperatures, since they found a sharp increase in rate of loss above 30 C. It may be that, in temperate regions, the weight loss after capture is very similar to that experi-



Table 1 Measurements of adult and juvenile Dunlin from two catches on 27 January 1990

Adults				
	Mean weight (95% confidence limit)	Mean wing (95% confidence limit)	Mean total head (95% confidence limit)	n
Catch 1	48.85g (+0.72)	120.02mm (+0.62)	56.05mm (+0.57)	76
Catch 2	46.55g (+1.08)	120.55mm (+0.99)	56.23mm (+0.80)	38
	t = 3.46, p < 0.01	t = 0.88, ns	t = 0.36, ns	
Juveniles				
	Mean weight (95% confidence limit)	Mean wing (95% confidence limit)	Mean total head) (95% confidence limit)	n
Catch 1	47.34g (+1.07)	119.43mm (+1.15)	55.55 (+0.97)	23
Catch 2	44.31 (+1.42)	118.68 (+1.42)	54.80 (+1.37)	16
	t = 2.72, p < 0.01	t = 0.78, ns	t = 0.87, ns	

enced by birds roosting during a high tide period. Care should be taken when comparing weights between catches, to ensure that variation is not largely due to time of capture in relation to feeding / high tide, or weight loss after capture.

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