



Turnstone-like feeding in Redshank

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Foraging behaviour of waders has been widely studied and different feeding strategies well established (Goss-Custard 1969; Baker & Baker 1973; Pienkowski 1978; Puttick 1979). Sandpipers (Scolopacidae) usually feed with a continuous searching strategy as they walk. Turnstone *Arenaria interpres* show six feeding techniques: routing, turning stones, digging, probing, hammer-probing and surface pecking (Marshall 1981; Whitfield 1990).

It is important to describe deviation from the usual foraging pattern in species forming mixed flocks (Paulson 1990) because of the relevance of this information to optimal foraging theory (Schoener 1971; Pyke *et al.* 1977). On the other hand feeding specializations have importance for evolutionary game theory and the concept of alternative strategies (Maynard Smith 1982; Whitfield 1990). Such concepts suggest that three main mechanisms may be responsible for individual feeding preferences, including individuals assessing how other individuals are feeding (Dawkins 1980; Davies 1982).

In the course of a study of waders foraging behaviour at the Ebro Delta (one of the main wintering areas for waders in the Mediterranean; in NE Spain), I observed a deviation from the usual foraging technique of Redshanks *Tringa totanus*. A flock of about 120 Dunlins *Calidris alpina*, eight Redshanks and one Turnstone *Arenaria interpres* were foraging on a sandy beach. Dunlins foraged in their usual manner in the water. Turnstones fed using the routing technique, bulldozing piles of seaweed and pecking to investigate or capture prey along the shore (Whitfield 1990).

Three of the eight Redshanks foraged using the same

technique as Turnstone, that is routing along the shore. The observation was made for twenty minutes. Foraging rate was determined from probing, pecking or routing (Table 1). The substrate exposed for foraging was only four metres wide as the tidal range is only a few metres in the Mediterranean Sea (Martinez-Vilalta 1984).

This routing behaviour has never been described for Redshanks (Burton 1974; Cramp & Simmons 1983). I suggest that the Redshanks were copying the Turnstone behaviour. Waite & Grubb (1988) pointed out that several mechanisms, besides decreased vigilance time, could promote foraging efficiency of an animal participating in mixed species assemblages; copying, beating and kleptoparasitism and that only copying could explain the advantage to low-ranking individuals of foraging in mixed-species flocks. The formation of mixed-species flocks in waders has been explained in terms of increasing the foraging time and decreasing the time devoted to vigilance (Silliman 1977; Abranson 1977; Metcalfe 1989). Under certain circumstances where intense competition for scarce resources occurs, flocks could allow an increase in the foraging efficiency by means of copying behaviour so as to avoid competition with other birds.

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Table 1.- Proportion of time devoted to each foraging technique. Note: Percentage of time walking is not shown.

SPECIES	% PROBING			% PECKING			% ROUTING		
	Number	Mean	Standard deviation	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Dunlin	5	52.8	13.4	5	0.6	0.8	5	0	0
Redshank (copying behaviour)	2	34.9	2.09	2	0	0	2	21.8	4.1
Redshank (without copying behaviour)	4	73.5	7.20	4	1.8	3.1	4	0	0
Turnstone	1	2.2	-	1	10.1	-	1	11.8	-



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Census-efficiency for breeding Common Sandpipers *Actitis hypoleucos*

D.W. Yalden & P.K. Holland

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The relative efficiency of detecting Common Sandpipers during each week in the breeding season was estimated by repeated observations of a colour-ringed study population. We were most likely to detect territories (78% detection) during the middle of May, but census efficiency was consistently greater than 50% throughout the central nine weeks of the breeding season.

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INTRODUCTION

In designing any censusing programme, it is useful to know how detectability of the target species varies with time. Thus Reed *et al.* (1985) showed that moorland waders are less detectable during the middle of the day than in the early morning (pre-09.00) or evening (post - 18.00); intensive studies can therefore be arranged to exploit these periods when the birds are more obvious, and extensive moorland surveys avoid them in order to achieve even coverage. Similarly Yalden & Yalden (1991) demonstrated that Golden Plovers *Pluvialis apricaria* are best detected in June, when they are guarding hatched

chicks, but are mostly overlooked in mid-April to mid-May when they are incubating. Common Sandpipers also seem to be rather cryptic during incubation, especially during the fourth week of May, though to a less extreme extent than Golden Plovers. This note is an attempt to quantify that impression.

METHODS

Our study area and the population dynamics of our study population have been described elsewhere (Yalden 1986; Holland & Yalden 1991). Between 7 (1992) and 22 (1977)