HABITAT USE BY BREEDING REDSHANKS ON SOUTH UIST

by D.F. Chandler and A.J. Walker

INTRODUCTION

The Outer Hebrides in North West Scotland support large numbers of breeding waders, chiefly Oystercatchers *Haematopus ostralegus*, Lapwings *Vanellus vanellus*, Redshanks *Tringa totanus*, Snipe *Gallinago gallinago*, Ringed Plovers *Charadrius hiaticula* and Dunlins *Calidris alpina*. Large numbers breed on the three islands of South Uist, North Uist and Benbecula. The waders are associated mainly with the machair, which occurs along the western seaboard of the islands (Green 1984). The machair habitat is described by Fuller and Buxton (1983).

To assess the importance of these breeding wader populations, and the impact on them of the Integrated Development Programme (IDP), which provides EEC funds for agricultural improvement, WSG and the NCC have made extensive and intensive surveys of the breeding waders (see Green 1984, Fuller, Green and Pienkowski 1985). As part of this work, we studied the breeding Redshank populations on South Uist during May and June 1984. Here we report on the habitat choice by breeding Redshanks - and on the activities associated with each habitat. Family group movements of Redshanks at the same sites are described by Walker and Chandler (1985).

STUDY SITES

Three study sites were used (Figure 1), each chosen to include a transition zone between two habitat types:

1. Stilligarry. A dry machair/wet machair transition area of approximately 47 ha, containing areas of dry and wet machair, loch edge and both old and new ditches, each with its own characteristic flora. Cattle were occasionally grazed on the area.

2. West Gerinish. A wet machair/blackland transition site of approximately 41 ha, containing areas of ploughed and fallow machair, areas grazed by sheep, marshy areas, iris beds, old and new ditches and blackland. Blackland is characteristically undulating grassland (grazed by cattle) with rock outcrops.

3. Drimsdale. Blackland/moorland transition site of approximately 78 ha, chiefly heather *Calluna vulgaris* moorland with marshy and rocky loch edges and blackland. The blackland part of this site included both marshy and rocky loch edges. There were some old but not new ditches. The area was extensively grazed by sheep and cattle.

METHODS

Each site was visited 17-20 times between 21 May and 20 June 1984. An attempt was made to locate all breeding pairs of Redshanks in each study area. Observations of the location and activity of birds were made using 10 x 50 binoculars and/or a 15 - 60 x 60 telescope. Observations were made usually from a car parked on centrally located farm tracks or roads. A portable hide was sometimes used, but proved too unstable for frequent use, and also alarmed Oystercatchers *Haematopus ostralegus* for long periods, with consequent effects on the behaviour of Redshanks. Observations from the car were sometimes difficult where the ground was undulating, especially on blackland and moorland.

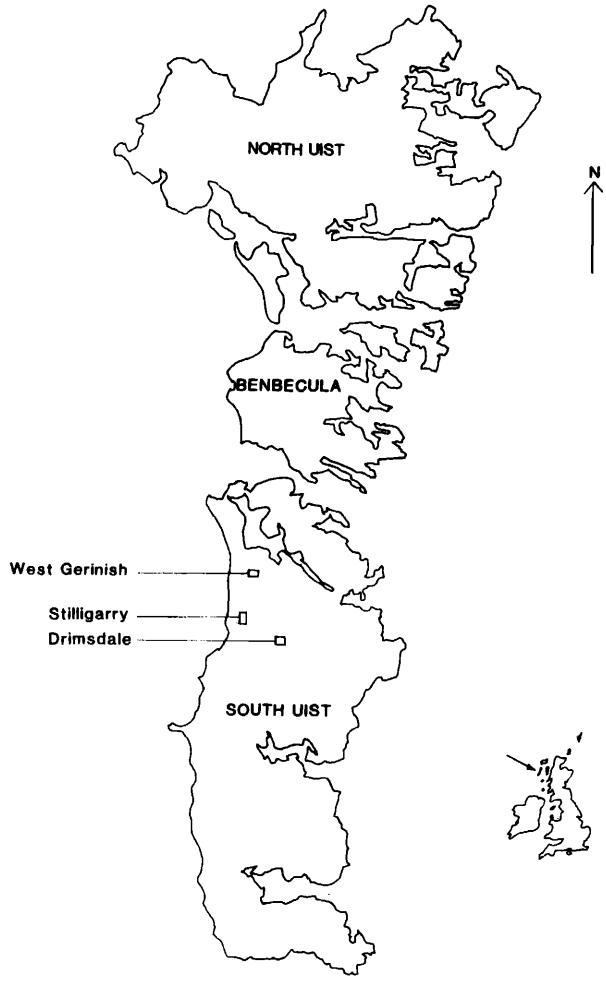

Figure 1. The southern islands of the Outer Hebrides, with the location of study sites.

For the purposes of this survey we assumed all adult birds to be breeding since Redshanks breed usually at one year old (Cramp and Simmons 1982). Adults were not individually colour-ringed, but were often in association with colour-ringed chicks, indicating that these adults were breeding.

Table 1. Habitat use by breeding adult Redshank on South Uist.

	STILLIGARRY			WEST GERINISH			DRIMSDALE		
	% time[a]	% area	time/area	% time[b]	% area	time/area	% time[c]	% area	time/area
Grass	92.7	67	1.38	54.5	46	1.18	33.5	5	6.70
Heather	-	0	-	-	0	-	0	66	0
Marsh	0.2	20	0.01	14.4	30	0.48	10.0	10	1.00
Iris	0	5	0	1.1	10	0.11	2.2	2	1.10
Juncus	0	3	0	0	5	0	0.6	2	0.30
Recent Plough	-	0	-	20.9	2	10.45	-	0	-
Loch edge	-	0	-	-	0	-	36.0	10	3.60
Old ditch	0	3	0	0	4	0	0	5	0
New ditch	0.2	2	0.10	0	3	0	-	0	-
Post and fence	6.9	-	-	9.1	-	-	17.7	-	-

[a]535 observations in 8 bouts
[b]263 observation in 4 bouts
[c]362 observations in 8 bouts.
Flying birds are not included.

We defined 10 sub-habitats to assess habitat choice, as follows:

1. Grass. Includes both wet and dry grassland (dry grassland occurred only at Stilligarry). Herb rich grasslands, typically with Silverweed *Potentilla anserina*, Birds-foot Trefoil *Lotus corniculatus*, Daisy *Bellis perennis* and Meadow Buttercup *Ranunculus acris*; most diverse at West Gerinish. Tormentil *Potentilla erecta* and Lousewort *Pedicularis sylvatica* were characteristic of wetter areas, and were most abundant at Drimsdale.

2. Heather. Only at Drimsdale. Chiefly Ling *Calluna vulgaris*.

3. Marsh. Typical vegetation included Marsh Marigold *Caltha palustris*, Marsh Pennywort *Hydrocotyle vulgaris*, Marsh Cinquefoil *Potentilla palustris* and Horsetail *Equisetum spp.*

4. Iris. Extensive beds of Yellow Flag *Iris pseudacorus* in wet areas.

5. Juncus. Extensive areas of rushes *Juncus sp.*. Absent from Stilligarry.

6. Recent Plough. Only at West Gerinish.

7. Loch Edge. At Stilligarry and Drimsdale.

8. Old Ditch. At least partially silted up shallow ditches with dense vegetation.

9. New Ditch. Recently cleared, with little vegetation. Deeper and wider than old ditches.

10. Post and Fence.

Activities of Redshanks were classified as:

1. Feeding.

2. Sitting/Standing, including brooding.

3. Walking, when the bird was neither alert nor feeding.

4. Alert. Usually with the neck stretched up, and/or with 'chipping' alarm calls. Bobbing (see Cramp and Simmons 1982) was also often involved. We also included intra-specific aggression here.

5. Comfort Movements, including preening, scratching and bathing.

6. Other. Chiefly flying, mobbing and roosting, all of which occurred infrequently.

Habitat use was measured by locating and watching an adult Redshank continuously for as long as possible, for a maximum one hour. The sub-habitat in which the bird was located, and the birds activity was recorded every 30 seconds. Observations ceased if the bird was out of sight for more than 2 minutes. Data for an observation bout was discarded unless it included a minimum of 50 observations (25 minutes). However, at Drimsdale it proved very difficult to watch Redshanks continuously for even these periods, so we used a minimum of 30 continuous observations (15 minutes).

RESULTS

The percentage of time spent in each of the sub-habitats is compared to the estimated area of that sub-habitat for each study area in Table 1. A time/area value greater than unity indicates selection for that sub-habitat.

There was selection for grass at all sites especially at Drimsdale. Recently ploughed land, where available, was also highly favoured, although the area available was small. Posts and fencing are frequently used by adults as observation posts. At Drimsdale Iris and loch edge are also favoured. Heather was completely avoided at Drimsdale despite the large available area.

Table 2 shows the percentage of the time spent that was in wet sub-habitats. Wet sub-habitats were favoured as feeding areas at all study

Table 2.Percentage of time feeding by adult Redshanks spent in wet[a] sub-habitats.

	% area	% time spent feeding
Stilligarry	45	58.7
West Gerinish	100	100
Drimsdale	34	100

[a]Wet subhabitats are all grass (except dry machair at Stilligarry), marsh, iris, *Juncus*, loch edge, old ditch, new ditch, recent plough.

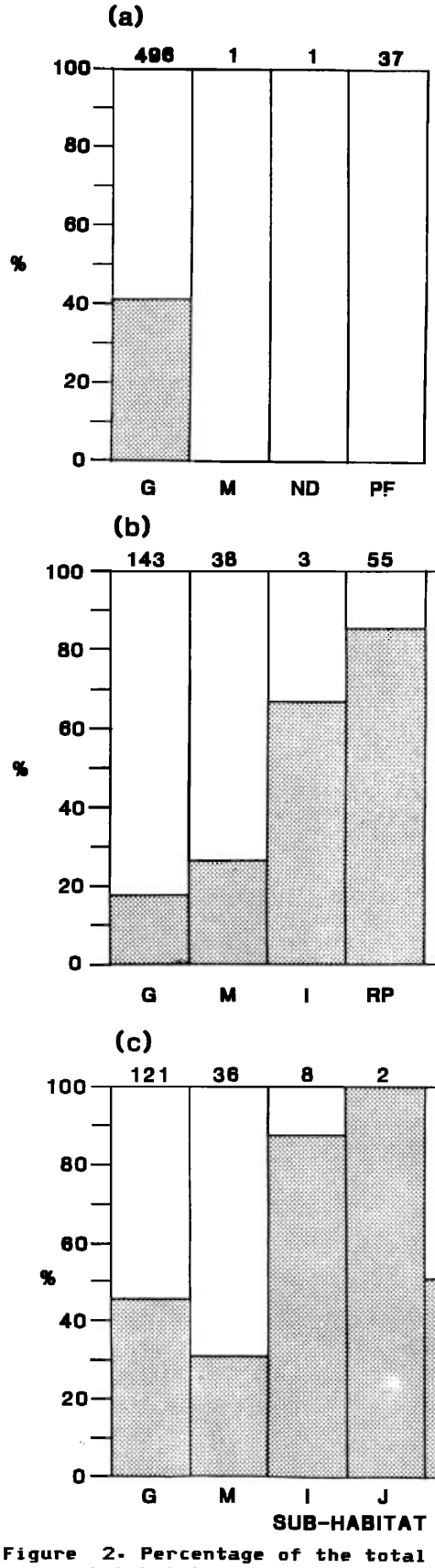

Figure 2. Percentage of the total time in each sub-habitat spent feeding (solid parts), at a) Stilligarry, b) West Gerinish and c) Drimsdale. Numbers above columns give number of observations.
Sub-habitats are G grass, M marsh, I iris, J *Juncus*, LE loch edge, ND new ditch, PF post and fence, RP recent plough.

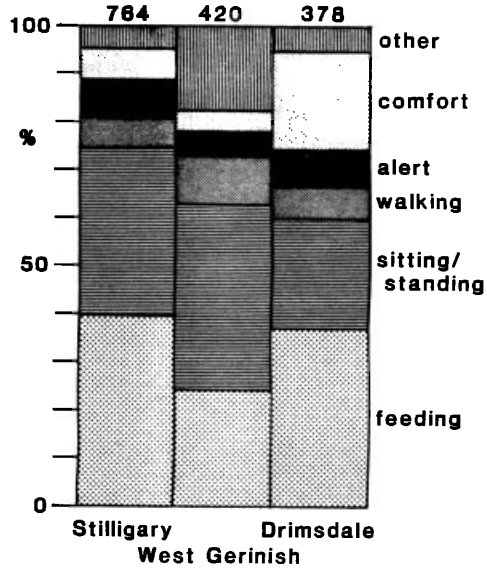

Figure 3. Time budgets of adult breeding Redshanks with unfledged chicks at 3 sites on South Uist. Numbers above columns give the number of observations.

sites. Selection was particularly strong at Drimsdale where 66% of the area was heather (dry). No dry sub-habitats were present at West Gerinish so all feeding had to be on wet sub-habitats.

Figure 2 shows for each study site the percentage of the total time spent in each sub-habitat that is spent feeding. At Stilligarry birds fed only on grassland. However, at both West Gerinish and Drimsdale, birds fed in several sub-habitats, including grass. At West Gerinish recent plough and marsh were important. At Drimsdale loch edge was the most important feeding area, and birds fed also in marsh. On the few occasions that birds visited Iris and juncus they fed there.

Figure 3 shows the time budgets of adults at each of the three sites. Budgets were similar at each site; with 25-40% of time spent feeding, and a similar proportion of the time spent inactive. However, at Drimsdale Redshanks spent 20.4% of their time in comfort movements (chiefly preening), compared to only 6.4% at Stilligarry and 4.3% at West Gerinish.

DISCUSSION

Grass was favoured for foraging at all study sites, most notably at Drimsdale where only 5% of the area was grass yet 34% of the time was spent in this sub-habitat. At West Gerinish recent plough was also highly favoured; on one occasion large numbers of Redshanks, Lapwings and Oystercatchers were observed feeding together on this area. Loch-edge was also important for feeding at Drimsdale. Although Redshanks do nest in heather in some areas (Jones 1983), at Drimsdale the large area of heather was avoided. Posts and fencing were preferred as vantage points by the adults, and large rocks were sometimes used similarly. Redshanks fed mainly in wet areas, especially at Drimsdale. At Stilligarry feeding was found

only in the grass sub-habitat, whilst recent plough was also used at West Gerinish. These were usually grasslands, and use of recent plough is presumably opportunistic since it is not always present. Redshanks on the moorland at Drimsdale were particularly associated with loch edges and marshy areas; similarly Jones (1983) found that in Teesdale standing water contributed significantly to the presence of Redshanks.

Patches of Iris and *Juncus* were only occasionally used for feeding in our study. In contrast Jones (1983) found that the presence of marshy patches and grazed *Juncus* attracted Redshank. The low grazing intensity, and hence tall Iris and *Juncus* vegetation in our study sites may have discouraged Redshank from feeding there, although Rankin (1979) found that Redshank will tolerate a wide range of grazing intensity.

At all sites the proportion of time spent feeding was low: less than 40%. This may be because adults had little difficulty in obtaining their food requirements, and because Redshank chicks are self feeding (Cramp and Simmons 1982). We can offer no explanation of why Redshanks at Drimsdale spent more time in comfort behaviour than elsewhere.

Hale (1980) states that water is a vital part of Redshank breeding habitat. Redshanks favoured damp to wet areas in South Uist, so is the IDP likely to have adverse effects on the breeding population? Grants are available for drainage, and ditches are being deepened, widened and cleared of vegetation. Ditches were little used by adults, but our experience of trying to catch chicks for ringing showed that the chicks readily use old ditches for hiding.

A more likely effect of ditch clearance is indirect: improved drainage will dry parts of wet areas in which Redshanks spend most of their time feeding.

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