

# FAMILY GROUP MOVEMENTS BY BREEDING REDSHANKS ON SOUTH UIST

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

## INTRODUCTION

The size and density of the breeding wader populations on the Hebridean machair are exceptional by British standards, as demonstrated by the 1983 joint Wader Study Group (WSG) and Nature Conservancy Council (NCC) survey of 130 km<sup>2</sup> of Hebridean machair and adjacent land (Green 1983). The population of Redshanks *Tringa totanus* is particularly noteworthy with a total of about 2000 breeding pairs on the islands of the Outer Hebrides (Green 1984). However concerns have been expressed that these populations may currently be under threat from agricultural changes, such as drainage and new cropping regimes, stimulated by the EEC-funded Integrated Development Programme (IDP). This study is part of the long-term assessment of the wader populations in relation to the agricultural and natural changes to the environment. It examines one aspect of the breeding biology of Redshanks; the movement of family groups between hatching and fledging. Large-scale movements of Redshank family groups are well-known on the Ribble Estuary, north-west England (Hale 1980) and in West Germany (Grosskopf 1959). Here we investigate whether large-scale movements are characteristic of the Hebrides population, and whether movements differ between habitat types. An understanding of such movements is important in assessing the impact of any habitat changes on the machair and adjacent habitats as a result of the IDP. Habitat use by Redshanks on the machair is described by Chandler and Walker (1985).

## STUDY SITES

Three study sites were chosen on South Uist: Stilligarry (57°19'N 07°23'W), West Gerinish (57°21'N 07°23'W) and Drimsdale (57°18'N 07°22'W). These were selected a) because they were known to support large Redshank populations and b) to give a range of habitat types. Each site was an area of transition between two distinct habitats:-

- 1) dry/wet machair transition, at Stilligarry
- 2) wet machair/blackland transition, at West Gerinish
- 3) blackland/moorland transition, at Drimsdale.

The sub-habitats of each of these sites is described by Chandler and Walker (1985). Machair habitats are described by Fuller and Buxton (1983).

## METHODS

Each site was visited 17-20 times between 21 May and 20 June 1984. At each visit we tried to locate all Redshank family groups, and the position of each family was marked on large-scale maps. From these maps we later calculated the distance moved by each family group per day, and the distance of each family group from where it was first found. Family groups (ie. 1 or 2 adults plus chicks) were watched using 10 x 50 binoculars or 15-60 x telescope, usually from a car parked on centrally-located farm tracks or from a portable hide (for areas not visible from the car). Most observations were made from the car, since the hide proved difficult to use effectively.

23 chicks from 13 family groups were caught by an observer running from cover and searching the ground where they were last seen. Each chick was weighed and measured to give an estimate of age and individually colour-ringed. However, we were unable to catch and individually mark adult Redshanks, so the identity of broods had to be established by observations of the chicks. This often proved difficult because vegetation hid the legs of chicks and some groups could not be found for several days at a time. The location of groups was at times unknown for periods of up to a week.

## RESULTS

Figures 1 and 2 show the daily distances that groups moved in relation to the age of the chicks. The distances do not necessarily reflect the total distance over the ground walked by chicks during a day, but rather show the distance between foraging locations on succeeding days. Fledging age was 28-30 days. On the dry/wet machair site (Stilligarry) there was great variation in distance travelled per day by each family group (Figure 1). For example, the average distances moved by the four groups each day were 17, 16, 12 and 34 metres. However there was a trend in each group of shorter distances moved as the chicks became

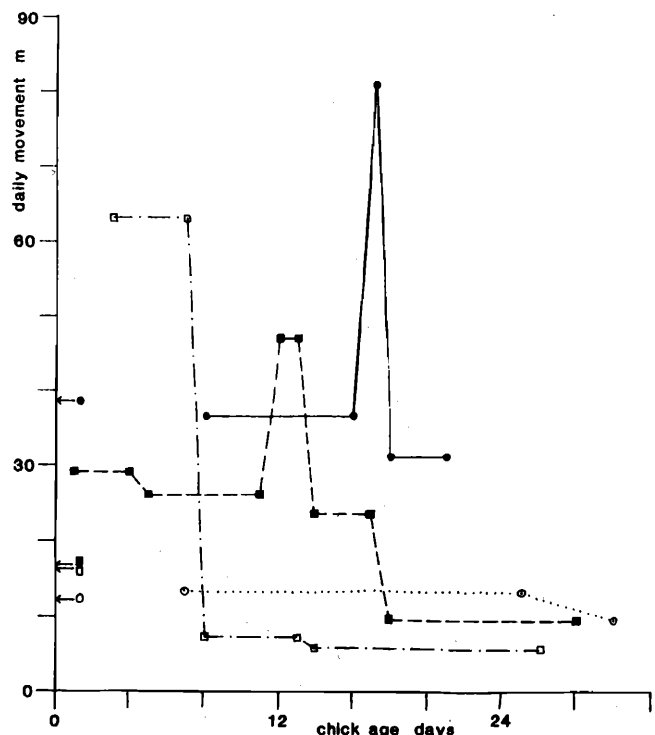


Figure 1. Distances moved per day by Redshank family groups on dry machair/wet machair at Stilligarry, South Uist. Arrowed symbols on the vertical axis show the average distance moved by each group.

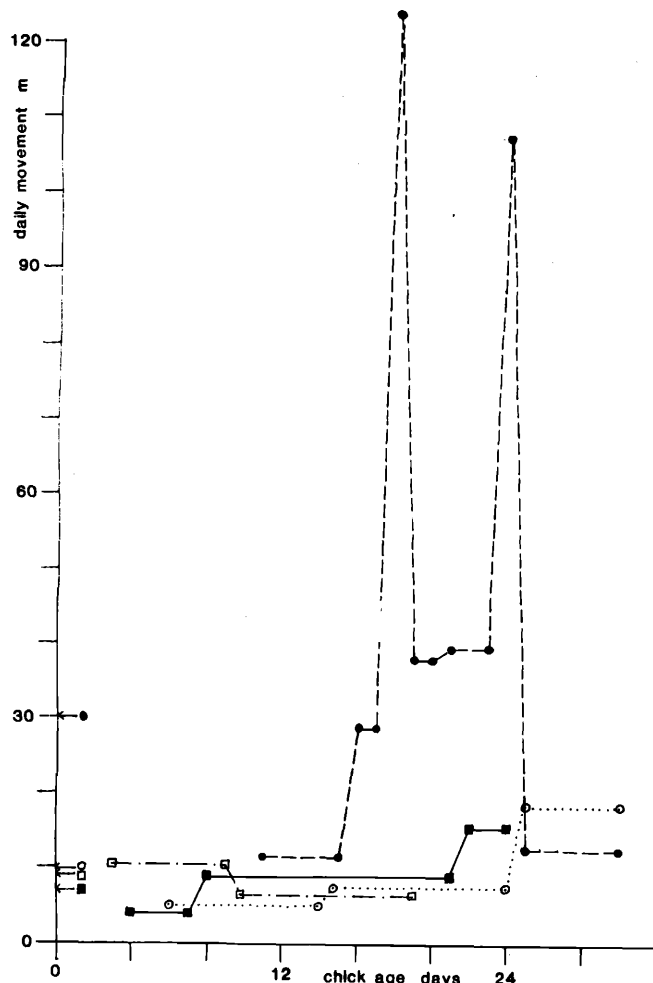


Figure 2. Distances moved per day by Redshank family groups on wet machair/blackland at West Gerinish, South Uist. Arrowed symbols on the vertical axis show the average distance moved by each group.

older, especially in the week before fledging. On the wet machair/blackland (West Gerinish) three groups moved only short distances each day (Figure 2). Average rates of movement were 7, 9 and 10 m/day. Two of these three groups moved slightly greater distances during the week before fledging. A fourth group at West Gerinish (Group D) was more mobile; moving an average 30 m/day. This group became especially mobile after the chicks were 2 weeks old. Rates of movement were between 12 and 120 metres per day, while the other groups at this stage were moving only about 10 metres per day.

Figure 3 and 4 show the linear distance of family groups from their place of capture. (No nests were located before hatching so the initial position of a family group is not necessarily the nest location.) At Stilligarry (Figure 3) all groups moved a considerable distance from the place of marking during the first two weeks after hatching. In two groups a movement of 250 m had occurred within 10 days of hatching. Thereafter the pattern of movement was variable, but groups remained mostly between 200–350 m from their marking site. At West Gerinish (Figure 4), three of the four family groups remained within 100 m of the initial marking site. Even group D, which had a high daily rate of movement (Figure 2), remained within 150 m of its marking site and when the chicks were 23 days old had returned to within 25 m of this location.

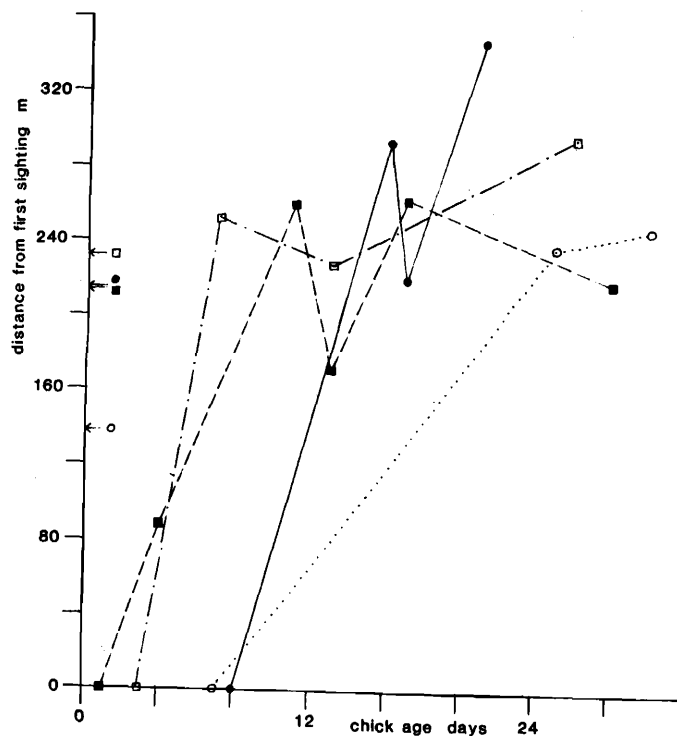


Figure 3. Distance from first sighting of family groups on dry machair/wet machair at Stilligarry.

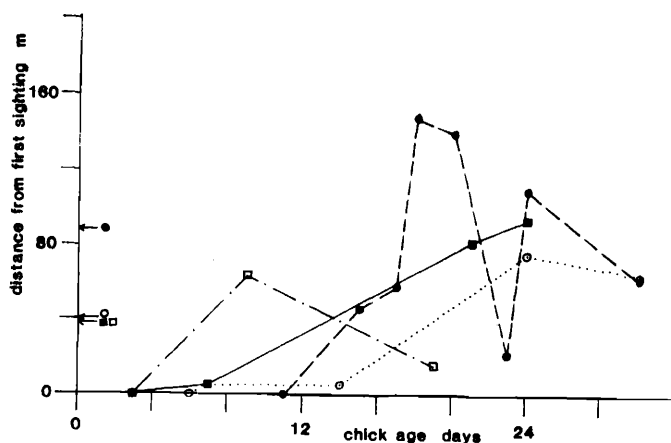


Figure 4. Distance from first sighting of family groups on wet machair/blackland at West Gerinish.

At Drimsdale, the blackland/moorland transition site, groups appear to have moved to different extents (Figure 5). Most groups fed in marshy loch edges (see Chandler and Walker, this issue). Figure 5 shows one family group on moorland that apparently moved 50 m over deep water, followed by a movement of 500 m across deep heather. (We presume the chicks swam across the loch because they are unlikely to have been able to negotiate the 75 metres of shoreline between the marshy areas. This shore was mainly a vertical, heather topped bank broken at one point by a two metre-wide drainage ditch.) The same group then moved, again across dense heather, 700 m back close to its earlier location. All these journeys were made between marshy loch edges. In contrast,

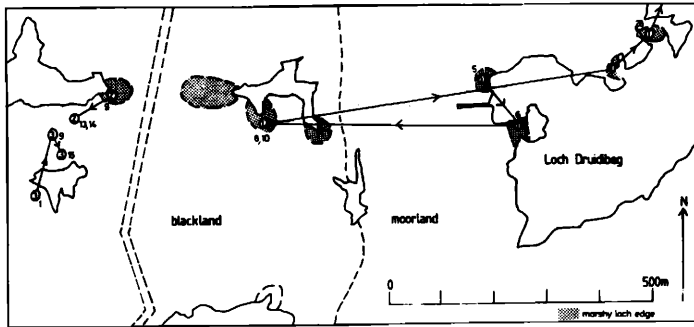


Figure 5. Family group movements on blackland/moorland at Drimsdale. Circled numbers identify different family groups. Numbers beside circles give age of chicks (in days) at each sighting.

family groups on the adjacent blackland appear to have moved only short distances of about 50 m, although data are few.

Did all large movements involve a change in habitat? At Stilligarry only one family group was found to have changed habitat, moving from machair to loch edge. The other three groups moved similar distances but stayed on the machair. Most machair habitats were not patchily distributed on the scale moved by Redshank groups, so most groups remained within a habitat. In contrast, on the moorland at Drimsdale one of the preferred habitats, marshy loch edge, was patchily distributed (see Figure 5). One family group at Drimsdale fed only in these isolated marshy areas, and movement between marshy areas necessitated journeys up to 500 m. At West Gerinish there were no observed changes in habitat, even by group D which had the highest daily rate of movement.

#### DISCUSSION

Hale (1955) found that family groups of Redshank on the moors of north-west England often moved from the nesting area to a wetter area suitable for feeding soon after the chicks had hatched. We also found selection for wet areas for feeding by chicks (Chandler and Walker 1985), so such movements also appear to be characteristic of Redshanks on South Uist. However we found marked differences in the extent of these movements between sites only a few kilometres apart. The extent of these movements was determined largely by localized habitat. At Stilligarry the family groups moved long distances in particular directions, with the move occasionally involving a change in habitat, when the chicks were only 3 or 4 days old. At West Gerinish the daily movements of the family groups were much shorter, groups remained within a small area, and changes of habitat were not found. What could account for these marked differences? The most likely answer is food availability, since the wetter areas probably provide more food. At Stilligarry the pattern of movements seems to stem largely from differences in the distribution of dry and wet machair. The movements of family groups soon after hatching suggest that the Redshanks had nested in drier areas that are unsuitable for feeding. This may be because the ideal feeding areas are too wet for successful nesting early in the breeding season. Nests in these areas would run the risk of inundation in wet springs. Soon after hatching the whole family group moves to a wetter area where the chicks can feed. The adults seem to lead the chicks to a particular

area eg. an area of loch edge. Lapwings *Vanellus vanellus* are also known to lead their young to a suitable feeding area soon after hatching (Klopp 1953). Most of the study area at West Gerinish was wetter than at Stilligarry. The birds probably nested close to wet areas that were suitable for feeding, so large scale movements to suitable feeding sites were unnecessary. Large-scale movements are likely to be avoided unless essential to reach suitable feeding areas, since they may increase the risk of predation on the chicks by gulls, and injury or separation from adults when crossing unfamiliar terrain. On moorland the adults probably nested on the marshy loch edge areas. These areas contained many clumps of grass of the height preferred by Redshanks as a nest site (Rankin 1979). The chicks fed in these same areas. However, much of the loch edge was rocky and unsuitable for feeding and so movement between marshy areas involved lengthy movements over land or swimming through deep water. The heather is probably unsuitable for feeding but may be ideal for concealment of the chicks from aerial predators.

One consequence of the funding through the IDP is an increase in the drainage of wet areas of machair and blackland, leading to an increase in the areas of drier machair. Redshanks attempting to breed in such areas would need to make large-scale movements as family groups to wetter areas to feed, as we found to occur at Stilligarry. Drainage of such wet feeding areas could limit the opportunities for successful breeding by Redshanks.

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