An Analysis of Tay Ringing Group's Common Redshank *Tringa totanus* Recoveries

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An analysis of 345 recoveries reported between 1968-1999 indicated that birds ringed as pullus were likely to travel longer distances and that adults had longer periods between ringing and recovery than pulli and juveniles. The evidence suggests that in addition to British and Icelandic breeders, small numbers of Fenno-Scandinavian birds may pass through the Tay area. The most common causes of recovery were being controlled by a ringer or being found dead, with some evidence of seasonal variation in the proportions in each category. At least 6.7% of recoveries were due to cold weather, and 7% due to raptors. Birds ringed in summer are the least likely to be recovered; those ringed in autumn the most, although the peak recovery period was in winter.

Introduction

Summers & Nicoll (1979) indicated a winter population of 4500-6000 Common Redshank *Tringa totanus* in the Tayside area, which peaked during spring & autumn passage. They found both British and Icelandic breeders present in winter. Local breeding birds tended to winter in France and southern England, largely migrating down the east coast, although some wintered in eastern Scotland. They found high levels of winter site fidelity between years. Their work coincided with high levels of mortality in the 1978-79 winter, which they stated had a higher impact on juveniles than adults. Subsequent work (Insley et al 1997) has tended to support this assumption.

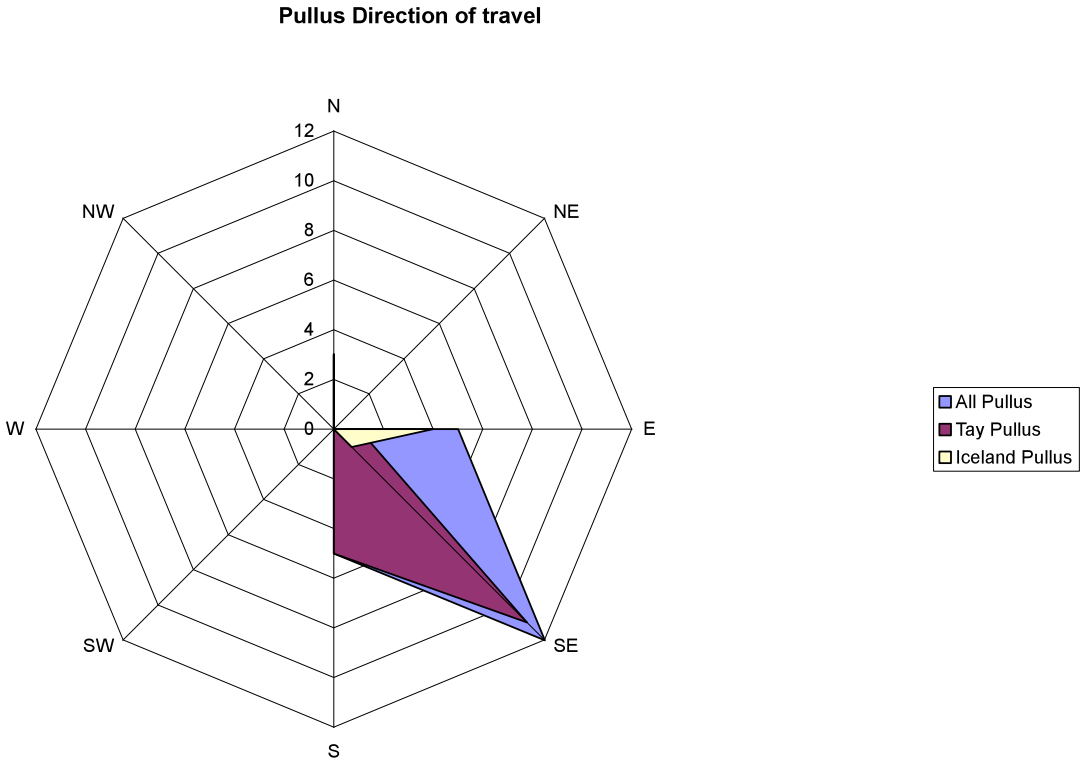
This current paper will concentrate primarily on data drawn from recoveries, of which a total of 345 have been generated between the period 17/2/68-11/11/99. The main areas examined will be differences in recoveries by age class in terms of direction, distance and mortality. Where possible, differences between British *Tringa totanus totanus* and Icelandic populations' *Tringa totanus robusta* will be highlighted.

Recoveries of Birds Ringed as Pullus

A total of 25 birds ringed as pullus have been recovered: 5 ringed as pullus in Iceland and recovered in Tay area, and 20 ringed in the Tay area (Fife, Tayside, Angus and parts of Perthshire). Of these Tay ringed pullus, 4 were recovered in France, 1 in Netherlands and 1 in Eire: a foreign recovery rate of 30%, considerably higher than that for full-grown birds (9%). Thirteen were recovered in England, as far south as Essex, and only 6 (5 of which were the Icelandic ringed pullus) in Scotland. The main orientation for all pullus recoveries was east to southeast (range 40°-360°). The mean distance travelled, at 629 kilometres (range 0-1541), was greater than that for full-grown birds (combined British and Icelandic birds), although the maximum distance was lower. The average elapsed time of 451 days between ringing and recovery was considerably less than for full-grown birds. The shortest recovery time was 22 days: a road casualty only 5 kilometres from the Angus ringing site. The longest was a bird ringed in Iceland on the 5/7/74 and controlled at Fifeness 8 years later on the 14/10/82 (3023 days).

Separating out pullus ringed in the Tay area from those from Iceland suggests that Icelandic pulli move in a mainly easterly direction whereas Tayside pulli are more likely to make south-easterly movements (see figure 1). Average recovery distances, at 451 (range 0-1360 km) kilometres, are shorter for Tayside ringed pulli. Icelandic ringed pulli were recovered an average of 1342 kilometres from the point of ringing (range 1196-1541 km). Tayside ringed pulli also have a shorter average recovery period (average 320 days, range 22-2252) than Icelandic birds (average 975 days, range 69-3023).

Figure 1. Pullus direction of travel



13 of the combined total of pulli were controlled by ringers (including all the Icelandic ringed pullus), 5 were shot (2 in England and 3 in France), the last in 1983. Seven were recorded as found dead: all between the months of May-September with traffic, cats, botulism and predators recorded amongst the causes of death.

Full Grown Recoveries

A total of 320 full grown recoveries have been reported. A small proportion of these have been reported as unaged (euring code 2), and have had to be excluded from some of the analysis. Of 34 foreign recoveries 20 were of adults, with 16 being found in Iceland (all during the breeding season), 3 in Ireland and one in Rogaland, Norway. 7 juveniles were recovered: 4 in Iceland, 2 in France and 1 long-range recovery from Nigeria (see Mead & Clark 1989 p183). Only one bird ringed as full-grown has been recovered in Tay area from Iceland.

The scattergram in figures 2 & 3 illustrates the direction of movement of adults (euring 4/6) and juveniles (euring 3/5) respectively, with recoveries ranging through the full 360 degrees. A high proportion of recoveries of both adults and juveniles are recorded as being recovered either at 0 or 360 degrees, indicating that many are recovered at the original ringing site. Whilst the pattern of adult and juvenile direction of movement is broadly similar, juveniles show more recoveries through the east to southeast and south.

Figure 2. Adult direction of Travel

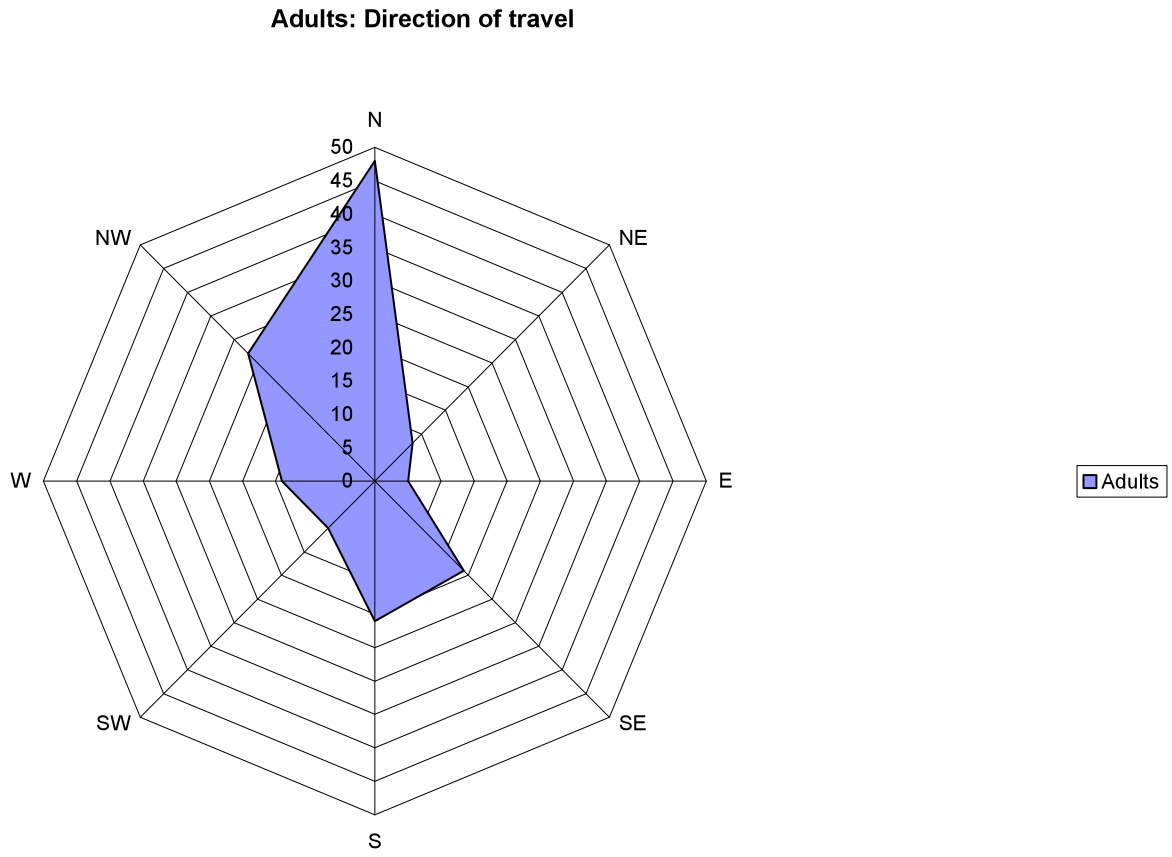
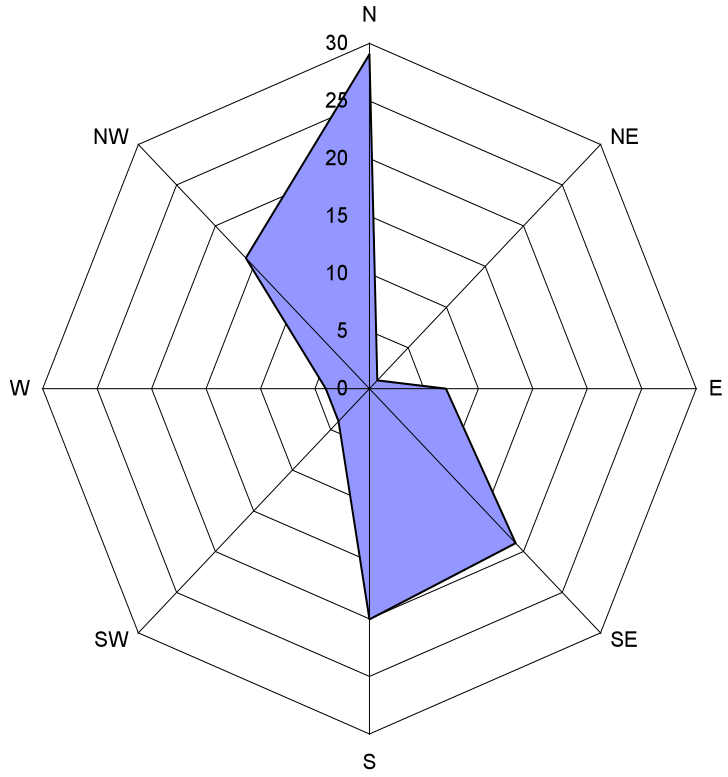


Figure 3. Immature Direction of travel



The mean distance travelled is very similar, with adults averaging 210 kilometres (range 0-1447) and juveniles 224 kilometres (range 0-5434). Time elapsed between ringing and recovery is longer for adults (1197 days, range 6-7773) than for juveniles (943, range 0-4192). Most of the long-range movements refer to birds returning to their Icelandic breeding grounds, although some relate to wintering grounds in France, Ireland and southern England. The longest distance movement is of a bird ringed as a juvenile (age 3) on the Eden Estuary, Fife, on the 27/9/87 that was subsequently killed by Nigerian Bush bird catchers on the 31/1/88. An analysis of full grown birds ringed between January-March, which on the basis of Summers et al 1988 work should comprise mostly Icelandic race birds, indicate these have a shorter average distance travelled, (127 km) but a greater range (0-1425 km) than presumed British adults ringed between April-June (average distance 219 km, range 0-625). It should be noted that many of the Icelandic birds will have been recovered at the same wintering site as they were ringed, hence the apparent anomaly between the range and the average movement (see discussion below).

Figure 4 illustrates the main circumstances of finding, and shows that the majority of both adults and juveniles are either controlled by ringers or are reported as simply found dead. Controlled by ringers accounts for 45% of adult and 40% of juveniles recoveries, with found dead providing 47% of adult and 53% of juvenile recoveries. Of those found dead, in 19 cases (6.7%) the finding remarks make specific reference to cold weather with 18 being reported from Montrose Basin in January and February. It is therefore likely that these results are influenced by a number of hard weather events and it is also probable that cold weather, mortality accounts for many of the birds reported dead with no cause stated. Finding of leg & ring only (assumed to be indicative of a raptor kill)

and direct mention of raptor kills indicates that a total of 21 (7.4%) full grown birds were taken, together with a further six taken by cats or other animals (including one record of an Arctic Fox).

Seasonal Pattern of Recoveries

For the purpose of analysis recoveries were analysed by season. Whilst there will be some overlap, spring and autumn are primarily passage periods (both the Breeding Atlas, *Gibbons et al 1993,* and the Winter Atlas, *Lack 1986,* make reference to birds moving to breeding grounds as early as mid February). Summer recoveries are largely from the breeding grounds. Winter recoveries are likely to be from birds' wintering grounds although some may still be moving slowly south even in January (*Lack 1986)* and others may still be on wintering grounds in February. A difficulty with this analysis is that it has not been possible to compare recovery rates with catch effort. In addition, a cold weather mortality event in January 1982 and a particularly large catch of Common Redshanks taken in conjunction with Grampian Ringing Group in October 1986 influence the data.

Table 1 suggests that birds ringed in autumn are the most likely to be recovered, and they are most likely to be recovered in winter, or on spring passage. Birds ringed on spring passage are more likely to be recovered in the spring and autumn passage period. Winter ringed birds are most likely to be recovered in winter or autumn.

Table 1: Season Ringed by Season Recovered

	Recovered Spring	Recovered Summer	Recovered Autumn	Recovered Winter	
Ringed Spring	18	1	15	13	47
Ringed Summer	1	9	17	12	39
Ringed Autumn	55	24	44	74	197
Ringed Winter	15	7	20	20	62
	89	41	96	119	**345**

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Figure 4. Recovery by Age & Type

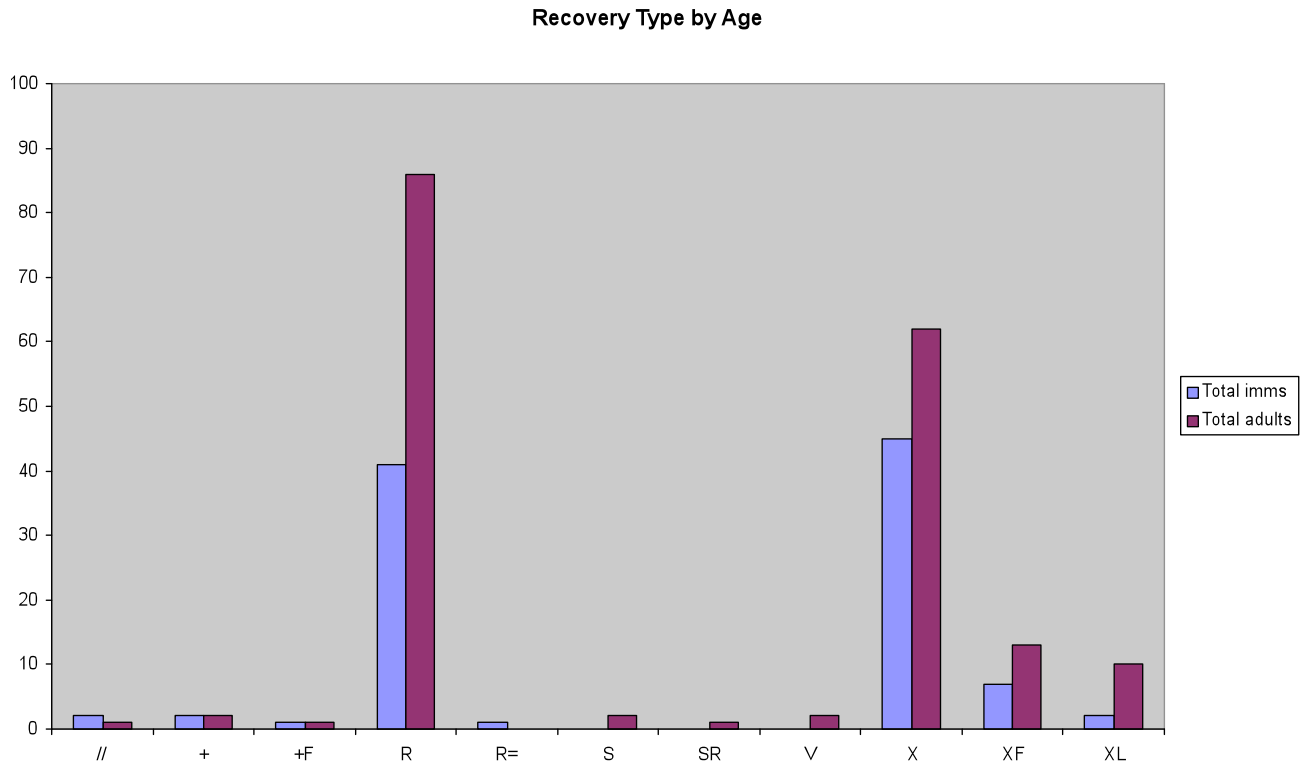

Table 2. Percentage of Recoveries by Cause & By Season.

Season of Recovery	% Controlled by Ringer	% Found Dead
Spring	51	46.8
Summer	46.1	35.8
Autumn	46.1	48.7
Winter	32.2	58

Table 2 indicates that in most seasons, except winter, the percentage of controls to recovered dead is relatively similar, but that, in winter, birds are more likely to be found dead than controlled by ringers. In summer, birds are slightly more likely to be controlled by ringers than found dead.

Recoveries by Site

For the purpose of this analysis, only those six ringing sites which generated more than ten recoveries each have been included. The total number of recoveries from each site has been measured against the total recoveries recorded on (or close to) the ringing site. Two sites, Dundee airfield and Newburgh, Grampian, had no birds recovered on site. The two sites that generated the largest number of recoveries were Montrose and the Eden. Recovery patterns were very different, however, with 60% of all recoveries of Montrose ringed birds occurring in or around Montrose; whilst the percentage for the Eden was only 26.4%. The two smaller datasets also show marked contrast, with Easthaven having a 69.2% local recovery rate and Boarhills only having 29.4%.

Both Montrose and the Eden had a similar proportion of adult to juvenile recoveries (Montrose 28 juveniles and 57 adults; Eden 16 juveniles and 36 adults). However, as table 3 illustrates, the percentage of recovered birds ringed and subsequently recovered on the Eden is lower, particularly for adults.

Table 3. Percentage Recovery of Birds Ringed & Recovered On the Same Site

Site	Juveniles (euring 3/5)	Adult (euring 4/6)
Montrose	67%	52%
Eden	50%	22%

Months of recovery for birds ringed and subsequently recovered at Montrose are primarily in January and February, which is probably linked to a major mortality event, whilst those on the Eden are more random.

Discussion

The analyses of the 345 recoveries, to date, support and reinforce many of the conclusions made by Summers & Nicoll (1979). In particular, there is evidence that locally ringed pullus winter primarily outwith Scotland and, on average, migrate longer distances than full-grown birds. However, the large numbers of Icelandic adults in the sample, many of which were recovered wintering on sites such as Montrose and Eden where they had been originally ringed, probably biases this data. The one known British breeding adult ringed in June was recovered 610 kilometres from its Tayside home, having been shot on its Somerset wintering grounds. Time elapsed between ringing and recovery for pullus (averaging 451 days) was considerably lower than for full-grown birds, of which juveniles (average 943 days) were lower than adults (average 1197 days). This tends to support Insley et al's (1997) conclusion that adults have lower mortality. Whilst Summers & Nicoll (1979) make reference to Icelandic birds there is also some evidence of Fenno-Scandanavian breeders being present, with a recovery in Norway (in April 1992) of a bird originally ringed as an adult at Montrose in October 1986. In addition, the Nigerian recovery is much more in accord with the migration pattern of this population than either Icelandic or British breeders (Cramp et al 1977).

Most recoveries are generated either by controls by ringers or birds found dead. Of those found dead, where the finding circumstances have been notified, 6.7% were due to cold weather and 7% due to raptors. It is likely that cold weather accounts for a much higher proportion of birds found dead, and it is probable that many of those reported in winter with no cause listed were cold weather casualties. Adults are more likely to be controlled by ringers and juveniles are more likely to be reported as found dead. This is particularly the case in winter, when 58% of juvenile recoveries are found dead.

Seasonal recovery patterns, with low number of recoveries in summer and high numbers in winter and on passage, probably reflect ringing activity as well as climatic and other factors. The fact that summer ringed birds are the least likely to be recovered may relate to the proportion of pullus ringed at that time, which have a lower survival rate. The absence of spring recoveries of birds ringed as pullus may indicate how few survive into the following year. Birds ringed as juveniles (age 3/5) also lack the spring peak of adults, although they closely mirror the August and January peaks of adult recoveries. The number of Icelandic recoveries reported could influence spring peaks of adults. Spring passage populations could also contain a higher proportion of breeding birds and these are more likely to be adults (this appears to be the case for Icelandic populations of Black-tailed Godwit *Limosa limosa* captured in spring pers. ob.).

The differences in recovery rates of adults, particularly at the two main ringing sites, Montrose Basin, Angus, and the Eden Estuary, Fife, may reflect differences in site quality although it may equally reflect differences in catching effort. Montrose Basin is internationally important for Common Redshank and is ranked in the top 15 sites for Britain whereas both the Tay and the Eden are no longer regarded as even nationally important (Cranswick et al 1999). There is evidence that adult birds are able to maintain themselves on the best quality areas and sites (Bob Swann *pers. comm)* leaving the juveniles to exist on sub-optimal sites. Common Redshanks are also more likely to attempt to sit out hard weather than move sites. The importance of Montrose

Basin is further underlined by the number of birds ringed on the Eden and elsewhere that have been subsequently recovered at Montrose, particularly in winter.

Caution is required in interpreting this data, however, as a number of factors may influence the results. The first is that the large number of recoveries at Montrose generated by severe weather may reflect differential probabilities of finding and reporting birds at the two sites. The second relates to capture methods. As Insley & Etheridge (1997) have pointed out, mist netting, particularly in early Autumn, tends to catch more juveniles than adults (adults are believed to be less likely to be caught due to their being in moult). It is not clear from the data how birds were captured, but Montrose has traditionally been one of the Tay Ringing Group's primary cannon netting sites, with a number of very large catches being taken in the 1970-1980's, often in association with Grampian Ringing Group. It is possible that the results may therefore, in part, be modified by differences in catching method, the timing of catches, and differences in catching success between the sites.

Acknowledgements

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