

Baird's Sandpiper *Calidris bairdii* - southward migration on the Canadian Prairie

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Southward migrating Baird's Sandpiper were systematically counted at the far eastern (Winnipeg, Manitoba) and far western (Calgary, Alberta) section of the Canadian prairie. Winnipeg counts at two sites numbered 366 over an 11 year period from 1980 to 1990. Calgary counts, at many small sites, numbered 254 over an 11 year period from 1979 to 1989. Migration patterns were established that augment and allow comparison with the literature.

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INTRODUCTION

Baird's Sandpiper *Calidris bairdii*, some wintering as far south as the southern tip of South America and summering from the North American low arctic to the high Canadian arctic (ca. 65° to 80°N), Russian Chukot Peninsula and NW Greenland, have an extremely long migration round trip. The summer and winter areas have been indicated by various authors since at least the 1940s and were summarised by the American Ornithologist' Union (1983). Descriptions of the route and timing of southward migration have been slow to evolve however.

Bent (1927) described the migration route as passing "through the Mackenzie Valley and between the Rocky Mountains and the Mississippi River." But Palmer (1967) indicated that the main migration lies along the backbones

(Rockies and Andes) of the continents. These contradictions were clarified by Jehl (1979) who indicated that the main southward adult migration is through the prairies—a return to the basic 1920s description but giving much more detail. The adults, females soon after the hatch and males somewhat later, move to stage narrowly in the northern prairie and then quickly migrate directly to the winter areas - most are gone by mid August. The juveniles leave the nesting ground in late July and peak to stage broadly (records from coast to coast) mid to late August.

This study summarises data from over a decade of Canadian prairie systematic shorebird counting. It focuses on two east-west prairie locations - Winnipeg (Manitoba) and Calgary (Alberta) and compares the data with published information concerning Canada.

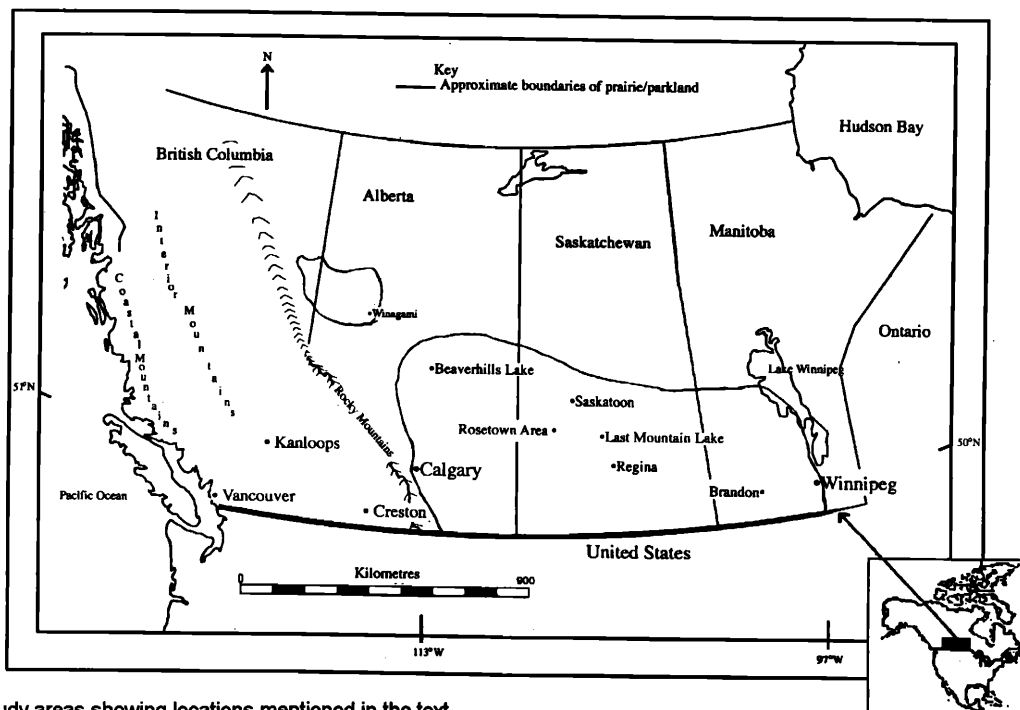


Figure 1. Study areas showing locations mentioned in the text.

STUDY AREAS

The Great Plain of North America stretches ca. 2,500 km north from the Gulf of Mexico to the Arctic Ocean. A southern portion is often called the prairies and parkland. In Canada, this area lies in the provinces of Manitoba, Saskatchewan, Alberta, and north-east British Columbia (Figure 1). It is an area of limited rainfall and most of its agricultural practices depend on rainfall in May and June. This varies from area to area and fluctuates from year to year creating an unstable habitat. The studies were made at almost the extreme south-east and south-west sections of the area, separated by a distance of ca. 1,300 km.

Manitoba counts (ca. 50°N, 97°W-elevation ca. 250 m) were made at Grassmere Creek, West St. Paul - at a fairly stable 43.7 ha sewage area containing 16 evaporating sludge ponds and Oak Hammock Marsh area - a restored cattail marsh containing ca. 1,953 ha of water in four

ponds and with large areas of pasture.

Alberta counts were made in a rectangular, undulating, agricultural high prairie area east of Calgary (50°55' to 51°20'N, 113°10' to 113°55'W-elevation ca. 1,000 m). Occasionally counts were made in the foothills/mountains (elev. ca. 1,200 m) west of the city. The birds were found in ephemeral pools, sloughs, lakes, and irrigation reservoirs. Count habitat was extremely unstable due to meteorological and human-manipulation factors. The interplay of these factors created phasing habitats ranging from unsatisfactory to ideal. A factor which often created satisfactory habitats was a continuing drought in the 1980s. Large shallow lakes tended to take years to dry and often made shorebird concentrations predictable. On smaller lakes they were often unpredictable however, as drying could occur in days or weeks. This example illustrates the unstable nature of the prairie habitat and the resulting difficulty in undertaking systematic counts.

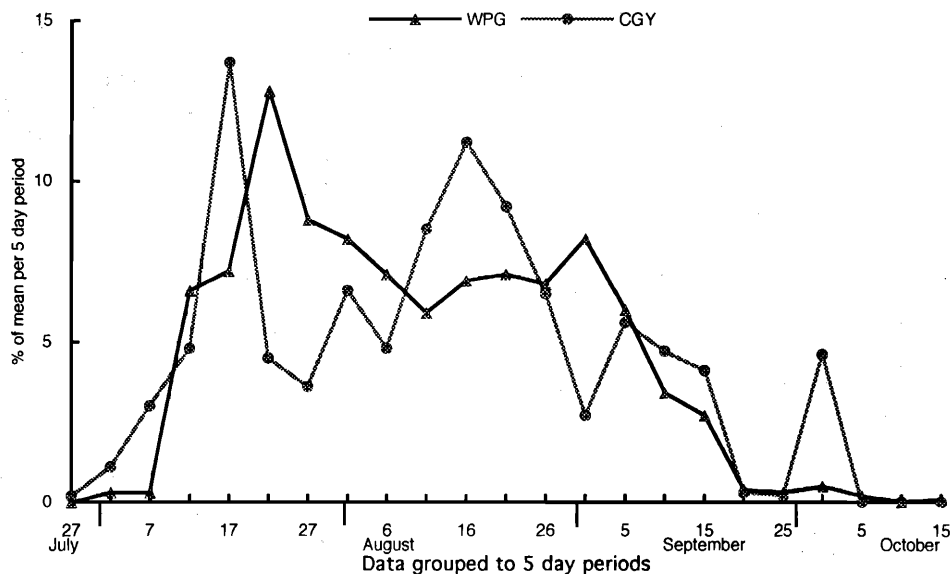


Figure 2. Migratory occurrence of Baird's Sandpipers at sites in Calgary and Winnipeg.

METHODS

Manitoba counts were made by SH, who conducted systematic sampling by walking around the ponds on a standard route: 489 counts were carried out at the Grassmere Creek sewage sludge ponds from 1981-89, and 166 counts, mainly within a 150 ha area of Oak Hammock Marsh north ponds, were carried out from 1980-90.

The Alberta data was gathered by JBS from 1979 to 1989. The main method was to make five hour counts from a car along the grid road system. The grid road system was established in the late 1800s with the division of the prairie into agricultural land parcels with road allowances. The allowances run every 1.6 km east to west and every 3.2 km north to south. Counts took place along these roads. Second counts, with minor exceptions, at any location took place at least six days later (a total of 254 counts-annual range 11-35).

Means were calculated by placing all count data into five day periods.

RESULTS AND DISCUSSION

The results are summarised in Table 1 and the migration patterns that were established are presented in Figure 2.

The migration pattern (Figure 1) at both locations is similar and is somewhat surprising. Consider that the species breeding from the low arctic to high arctic and therefore must have a wide range of nesting times. Also consider passage counts and the multitude of factors influencing shorebird presence at the count sites. At both sites the main passage consisted of two waves. At Calgary a third and possibly a fourth wave occurred.

Jehl (1979) after a literature search and specimen examination, concluded that adult females migrate before the fledging. Morrison (1984) concludes that first waves

contain a high proportion of subadult and probably failed breeders. We, therefore, presume that the early part of the first waves would have consisted of subadult and failed breeders followed by adult female post breeders. The Calgary peak was ca. 5 days earlier and could be explained by an earlier spring passage through Calgary (unpubl. data 1979 to 1990).

Table 1. Migration phenology, a summary of numbers passing, juvenile occurrence, and mode waves.

	Calgary	Winnipeg Grassmere Creek *Oak Hammock
Earliest observations	26 June	3 July
Average arrival date	6 July	18 July
Average departure date	27 September	18 September
Last observations	4 November	20 October
Approx. total numbers counted	10,000	14,000; *1,000
Daily maxima	500	350; *430
First juveniles	2 August	4 August
Mode waves	17 July 16 August 29 September	22 July 29 August

The second wave consisting, of presumably adult males at the beginning and juveniles later, occurred through August and September. The Winnipeg peak was ca. 13 days later than Calgary and could be the result of an the earlier Alaskan nesting and the passage of that population through the Calgary area. The percentage of adults during this period was not determined because of observational difficulties.

The third wave, at Calgary and possibly at Winnipeg, consisted of juvenile birds which may have hatched in the high arctic. A few stage late in each year, but the low September temperatures reduce the invertebrates so that southward migration quickly resumes.

Numbers on the eastern prairie section probably exceed those of the west but the lack of other systematic counts prevents definite conclusions.

We expect, because of increased interest in shorebirds that knowledge of the movements of this Calidrid will continue to evolve. We broadly support, particularly Jehl (1979), certain current literature, but differ markedly to others. The following part of the discussion focus on Canadian data, to literature inconsistencies and their relation to our data.

Bent's idea (1927) was that the "*main flight seems ... south through the Mackenzie Valley and between the Rocky Mountains and the Mississippi River*" -a mountain route is not mentioned. Palmer (1967) suggests that "*Apparently migrates ... on or along 'backbone' of the ... Rockies and Andes; in smaller numbers elsewhere.*" These two almost contradictory statements are reviewed

by Jehl (1979). In his abstract, he concluded that Cordillera migration "*is not supported by studies based largely upon museum studies*". That beginning abstract statement is ambiguous to the rest of the article and unfortunately reappears in other publications. Further reading reveals that: the adults, females soon after the hatch and males somewhat later, move to stage narrowly in the northern prairie and then quickly migrate directly to the winter areas-most are gone by mid-August; the juveniles leave the nesting ground in late July and peak to stage broadly with (records from coast-to-coast) in the USA mid to late August.

British Columbia literature indicates a mainly August and later staging in the valleys of the Cordillera-presumably juveniles. Cannings *et al.* (1987), at the Okanagan Valley (49° to ca. 51° N, ca. 119 to 120°W; elev. ca. 675 m), indicate a range from 7 July to 7 October and a mean 21 August. Their histogram is skewed to the right with a mode of 5 to 16 August. North, at Salmon Arm, and just out of their count area, yearly staging flocks of over 500 are seen. Ageing is not addressed but the date-data supports the Jehl (1979) finding of very few adults using the interior route. Campbell *et al.* (1990) gave the status as "*Very common to locally abundant ... in southern interior and on the south coast; fairly common in the north.*" Their data, from valleys at Creston and Kamloops indicates an August movement - several noteworthy flocks of 300 to 600 are mentioned. They comment on Jehl (1979) dispelling the myth "*often travels the full length of the treeless backbone of both continents*" and then mention several records of small numbers found at alpine levels-1,900 to 2,400 m. Palmer (1967) used the words "*along the backbones (Rockies and Andes) of the continents.*" We interpret this generally and think of birds dropping down to stage in the valleys (or higher)- e.g. Salmon Arm. The data supports this for the yearly August flocks-presumably for juveniles (no ageing data mentioned). Also, with increasing recognition that July movements occur and that adult identification is possible, systematic counts may yet indicate more of an adult July Cordillera valley movement.

Alberta literature continues to evolve from Salt and Salt (1976) who indicate that "*early fall migrants may be back in late July, but the main migration is in September. Late migrants have been seen in November.*" Unfortunately the Alberta literature is clouded because of an August-return-belief. Dekker's (1991) statement as regard July at Beaverhills Lake "*when few birdwatchers visit the lake or expect to see much ...*", supports our view that watchers have traditionally thought that shorebird migration is mainly during August and consequently seldom conduct July counts. During the 1980s it gradually was recognised that the return movement of shorebirds could start in late June. Sadler & Myres (1976) recognise a July arrival but little data is available. Pinel *et al.* (1991) stated that "*Early fall migrants can arrive in late June and July, with most birds having left the province by mid-September. In a few years, they were recorded as late as the end of October and early November. There are three migration records for the mountains.*" - their outline summary agrees with this study. A Steeves & Steeves (1984) report also agrees

- it summarises 152 counts and indicates occurrence patterns by histograms. Ambiguous is the Jehl (1979) presentation stating that the adult staging area is "bounded approximately by eastern Alberta" and a map showing the staging area almost to the coast of British Columbia-this study indicates south-western Alberta and there is no evidence from the British Columbia data that the July adults reach that far into the Cordillera - probably a mapping error. (Emphasis added).

Saskatchewan literature comes from a number of sources. Renaud & Renaud (1975) had a maximum fall count of 64 and their range was 3 July to 4 September. Adam *et al.* (1985), at Regina, by graph, indicated a range ca. 5 July to ca. end October, fairly common ca. 20 July to ca. 20 August, and common mid-half of August. Gollop *et al.* (1982), at Saskatoon, had it as uncommon transient and indicate a range of 12 July to 13 October. Systematic counts from 18 June to 28 August by Colwell *et al.* (1988) at Last Mountain National Wildlife Area revealed small numbers-maxima 35 and 25.

Manitoba data found in Cleveland *et al.* (1980) is indicated by a bar graph which has a range from about the second week of July to about the first few days of November. The peak, illustrated by an 'uncommon line' ranges from the beginning of August to the middle of September. The paucity of July data, as in Alberta, indicated lack of July observation because they say "*August is the start of fall migration ... and shorebirds.*" Observations, by others, may lead to concurrence with this studies' results-return migration starts early July.

Eastern Canada phenology is summarised by Godfrey (1986) and indicates that it is uncommon in Ontario and Quebec, scarce in the Maritimes and very rare in Newfoundland.

Some literature inconsistencies exist. Morrison (1984) in interpretation of Jehl (1979) states "*Adult Baird's Sandpipers ... through North America [generally late July - mid-August ... ,]*" and repeated the Jehl (1979) idea regarding boundaries of staging adults-"*by eastern Alberta and western Manitoba in southern Canada, ...*"- possibly the east and west references were unintentionally reversed. Cramp *et al.* (1983) somewhat ambiguously covered the "*Main migration routes ... along ... backbones of continents*" and then expressed Jehl's (1979) idea of 'differential migration patterns' of adults and juveniles.

It appears that the basic Baird's Sandpiper migration pattern is known. Detailed understanding which is emerging from using long term counts at many sites continues to develop. Short term studies should be used with caution because of the multitude of factors that influence shorebird presence. The species does not as yet appear to be in danger on the Canadian prairie because of its large total population (Johnsgard 1981), its great adaptability to various habitats (Salt & Salt 1976), its tendency to stage often in small groups and its wide migration route (Jehl 1979; Godfrey 1986).

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