

SHOREBIRD STUDIES AT SARCPA LAKE, MELVILLE PENINSULA, NORTHWEST TERRITORIES

by Robert D. Montgomerie, Ralph V. Carter, Bruce Lyon and Rob McLaughlin

In May 1981 we began research on shorebird behavior and ecology at Sarcpa Lake, Melville Peninsula, NWT (68°33'N, 83°19'W; Figure 1). As far as we know, there are no published reports on the avifauna of the Melville Peninsula, save two brief accounts from the northeast coast and islands (Parry 1824, Bray 1943). As a result, range maps in Godfrey's (1966) "Birds of Canada" show question marks for some species (including 3 shorebirds) on the Melville, and other species' occurrence on the peninsula must simply have been inferred. The Melville Peninsula has thus been one of the few large areas of Canada that had never been the subject of a serious ornithological investigation.

A full report on our bird and mammal observations has been submitted for publication elsewhere (Montgomerie et al. MS). Here we have extracted information that might be of interest to shorebird biologists, and include details of banding and shorebird behavior not in our general report. We also describe briefly our ongoing studies.

Study Area

In 1981 we worked at Sarcpa Lake from 30 May to 21 August. During the summer we surveyed almost all of the area (35 km²) shown on Figure 1, but most of our time was spent in the "main study area" of 15 km², where most of the density estimates and nesting data were obtained.

Avifauna

We recorded 37 bird species at Sarcpa Lake; 20 of these were breeding. Only 7 of the breeding species were common: Rock Ptarmigan *Lagopus mutus*, American Golden Plover *Pluvialis dominica*, Baird's Sandpiper *Calidris bairdii*, White-rumped Sandpiper *C. fuscicollis*, Horned Lark *Eremophila alpestris*, Lapland Longspur *Calcarius lapponicus* and Snow Bunting *Plectrophenax nivalis*.

Habitats

Our Sarcpa Lake study area is a large hill rising about 30 m above lake level, bounded on the south and east by the lake. The south, west and east-facing slopes of this hill are well vegetated with *Dryas*-lichen tundra. There are scattered wet sedge meadows, particularly around the relatively few ponds. Much of the western slope is a solifluction zone, with vegetated "stripes" alternating with peaty "muck". The extensive northern slope of the hill is a granitic field of large boulders with relatively little vegetation.

Table 1. Numbers and densities of wader nests found and numbers of waders banded.

Species	Banded		Nests (Broods)*	Density** (km ⁻²)
	Adult	Young		
Semipalmated Plover	0	3	3	0.3
American Golden Plover	6	71	31	5.0
White-rumped Sandpiper	19	48	16(3)	1.5
Baird's Sandpiper	0	0	12(1)	3.3
Dunlin	0	0	1	0.1
Red Phalarope	0	0	2	0.3

* broods = only those broods for which no nest was found

** average nest density in our main study area (Figure 1).

Wader Banding and Nesting

Each bird caught was also individually colour-banded. If we get a reasonable proportion (>20%) of these adults returning in 1982, we will begin an intensive banding study of American Golden Plovers, White-rumped and Baird's Sandpipers to examine the degree of philopatry and year-to-year variations in mate choice and nest site selection in these species. Unfortunately, we found it impossible to catch male White-rumped Sandpipers, and only late in the season did we manage to design an efficient trap for American Golden Plovers (Lyon and Montgomerie MS), so this banding project got off to a slow start.

Shorebirds Observed

Semipalmated Plover *Charadrius semipalmatus*. These plovers nested only on disturbed gravel areas around buildings or garbage dumps. No more than five pairs were recorded. Displaying adults were first seen on 12 June and this species was last recorded on 14 August.

American Golden Plover *Pluvialis dominica*. This was the most common and conspicuous breeding shorebird in our region. Contiguous territories covered most of our study area in virtually all habitats except wet sedge meadows. Despite considerable variation in territory habitat, nest sites of this species were all very similar, on dry patches of *Dryas*-lichen tundra. Most nests were lined with the lichen, *Thamnomia vermicularis* (Sw.). Five nests were found before the last egg was laid and the incubation period for these last eggs was 25 days, on average.

Black-bellied Plover *Pluvialis squatarola*. We saw only 7 Black-bellied Plovers, all between 7 and 13 June, and all were chased by resident American Golden Plovers. We doubt that this plover nests in the interior of the Melville Peninsula, but they were fairly common breeders on 8 July at Roche Bay on the east coast of the peninsula about 35 km east of Sarcpa Lake. Our observations suggest that Black-bellied Plovers may be competitively (aggressively) displaced from upland habitats at Sarcpa Lake by the more pugnacious American Golden Plovers.

Ruddy Turnstone *Arenaria interpres*. We recorded only a single migrant on 14 and 15 June.

Pectoral Sandpiper *Calidris melanotos*. One bird was recorded on 6, 10, 20 and 22 June. We believe that this was the same individual each time, and suggest that they may occasionally breed in the vicinity.

White-rumped Sandpiper *Calidris fuscicollis*. This species nested very locally on solifluction slopes and in wet sedge meadows but at densities as high or higher than those recorded elsewhere (Drury 1961, Parmelee et al. 1968). We had, for example, 8 nests within a 1 km² area. Adults were first seen on 7 June, and display flights were very common for the next 3 weeks. Consistent with earlier studies (noted above and Pitelka et al. 1974): (i) this species mated polygynously, (ii) males neither incubated nor cared for the brood, and (iii) males departed from the breeding grounds long before the females. The incubation period of the last egg in one nest was determined precisely as 21 days, 6 hours and 49 min (+5 min)! This species was the only shorebird that did not suffer any nest predation in 1981.

Baird's Sandpiper *Calidris bairdii*. These birds were probably as common as American Golden Plovers, but less conspicuous. The first adults were seen (performing display flights) on 4 June. From then on, we saw display flights everywhere, around the clock, until 19 June. Nests were mainly on dry *Dryas*-lichen areas, often on exposed ridges.

Dunlin *Calidris alpina*. We found only one Dunlin nest, in a wet sedge meadow, and that was preyed on before hatching. No more than 2-3 birds were seen all summer. Presumably because there were no adjacent territories, we saw no display flights and only rarely heard their territorial call. Dunlin were last seen on 25 June.

Semipalmated Sandpiper *Calidris pusilla*. Two birds, one performing a low display flight, were seen on 10 June. This observation suggests that they may breed somewhere on the Melville Peninsula, but we did not record them again all summer.

Sanderling *Calidris alba*. We recorded only one Sanderling, foraging beside a tundra pool for several hours on 16 June.

Purple Sandpiper *Calidris maritima*. One bird was seen briefly on 11 July.

Red Phalarope *Phalaropus fulicarius*. Small flocks (up to 25 birds) arrived on 6 June and small groups of courting birds were seen regularly for the next two weeks. We found only 2 nests and these were less than 3 m apart in a wet sedge meadow beside a small pond. Both may have been laid by the same female, as the second was started only after the first was completed. Although Red Phalaropes were uncommon, probably 3-5 males bred within our study area.

Shorebird Studies

Listed below are the shorebird projects that we are conducting currently at Sarcpa Lake, either as a group or individually. Our work in 1981 was the beginning of long-term studies of these species that will continue for the next 5-10 years.

1) Breeding Synchrony (Group). Studies on the factors affecting both within- and between-species breeding synchrony. What are the consequences of nesting early or late during the breeding season? Is nest timing constrained by seasonal weather patterns, by food requirements of the young, or by something else?

2) Nest Habitat Selection (Group). An analysis of nest habitats to determine (i) whether coexisting species use different nest habitats; (ii) whether some kinds of sites are used more frequently than others; (iii) whether nests in some habitats suffer more predation than others.

3) Incubation Behaviour of White-rumped Sandpipers (Ralph Cartar). Because of their small size, and resulting increased sensitivity to environmental fluctuations, uniparental care may be particularly taxing for female White-rumped Sandpipers. We want to determine (i) how the weather affects incubation behaviour; (ii) how incubation attendance schedules of the female affects the length of the incubation period; (iii) how observed nest-attendance scheduling fits that expected from a model, incorporating egg cooling and rewarming rates, and the temperature effects on embryo development; (iv) Markovian properties of incubation behaviour, and (v) nest insulation, structure and orientation. Additional attention is being given to the energetics of this species' polygynous mating system. In 1981, time-activity observations of males and females were gathered during all stages of the breeding cycle. In 1982, the development of feeding behaviour in growing chicks of this species will also be investigated.

4) Parental Care in Baird's Sandpipers (Mary Reid). This study will begin in 1982. Two questions will be examined: (i) What are the relative roles of male and female during incubation? Baird's Sandpipers are known to have biparental care (Drury 1961) but the relative contribution of male and female is unknown. (ii) What are the relative investments of time and energy by male and female in antipredator behaviour? Vigorous antipredator displays of Baird's Sandpipers provide an opportunity to test parental investment theory: increased investment by both sexes as the opportunity for renesting diminishes.

5) Mate Choice and Parental Care in American Golden Plovers (Bruce Lyon). This investigation examines assortative mating, parental care, the affects of learning on antipredator behaviour, and the year-to-year variation in nest site selection and territorial behaviour.

Other Research

Members of our research group are also looking at the foraging ecology (McLaughlin) and territorial behaviour (Montgomerie) of Lapland Longspurs, the pollination ecology of *Pedicularis capitata* (Cathy Redsell), and the flowering phenologies and pollinators of tundra plants (Reid and Montgomerie) at this high arctic site. To provide baseline data for all of these studies, we made extensive plant and insect collections. Using a variety of traps we sampled insect densities at four day intervals throughout the summer, to give us at least a qualitative estimate of changing food supplies. We also began habitat mapping in our main study area, and in 1982 will establish an automatic weather station to continuously monitor a variety of environmental variables.

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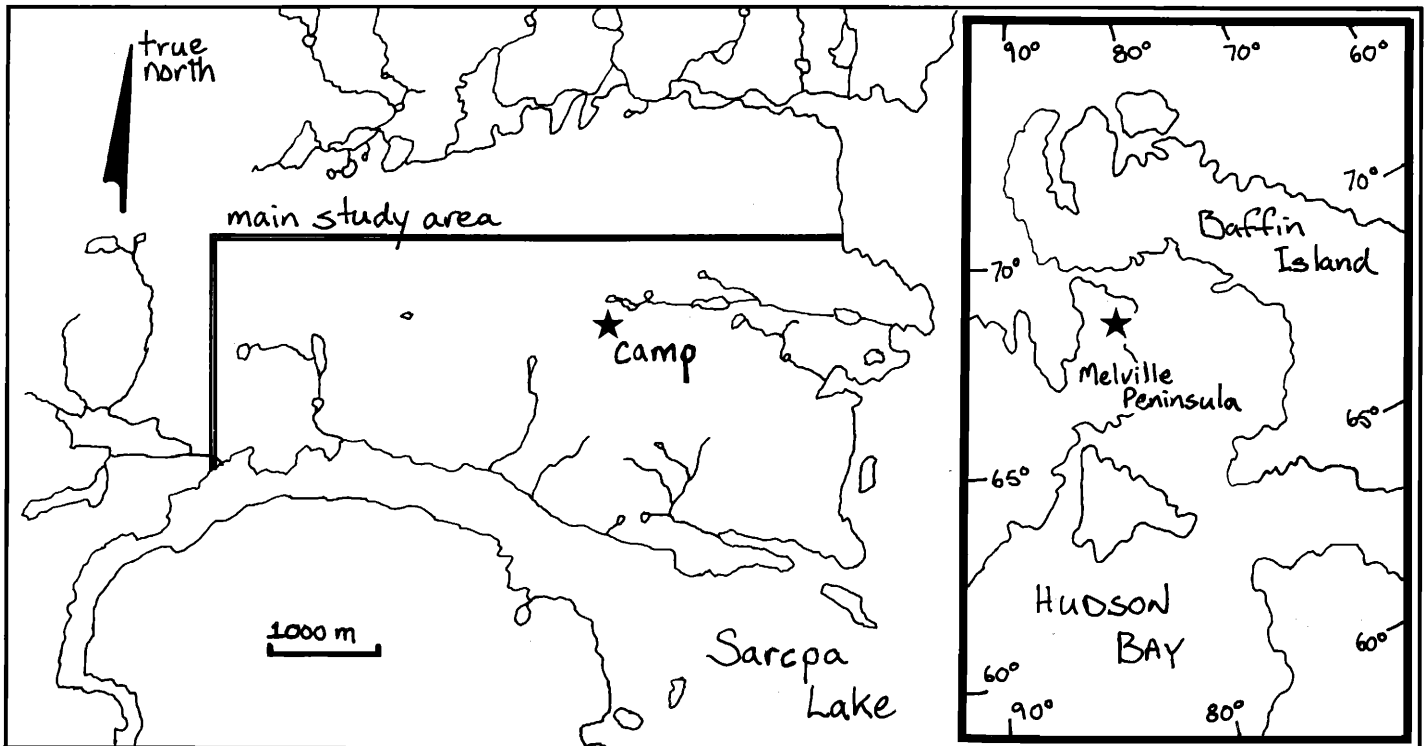


Figure 1. Map showing location of the Melville Peninsula (inset) and our Sarcpa Lake study area. Our camp is at the site of an abandoned DEW line station.

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THE 1980 DUTCH MINI-EXPEDITION TO SURINAME

by A. L. Spaans and C. Swennen

From 4-30 September 1980, a small expedition, consisting of Piet Duiven, Arie Spaans and Kees Swennen, visited the coastal area of Surinam, northeastern South America, to continue the longterm wader studies initiated in the early 1970's by the Surinam Forest Service and the Foundation for Nature Preservation in Surinam (STINASU) (Spaans 1979). The main objectives of the expedition were to assess the distribution of aquatic birds over the habitats, to obtain information on the biomass of the infauna of the intertidal flats and lagoons, and to relate this to the number of birds feeding on it. We also investigated the importance of webbing and toe length in waders exploiting the very soft intertidal mudflats. In this paper we will summarize some preliminary results.

The major areas visited were the tidal mudflat at Weg naar Zee, c. 10 km northwest of Paramaribo, the coastal area of Coronie in the west of the country, the near-by Wageningen rice polders, and the Matapica-Krofajapasi area east-north-east of the capital (Figure 1). We spent six days at Weg naar Zee, five days at Coronie-Wageningen, and 12 days in the Matapica-Krofajapasi area. Coastal habitats studied included soft tidal mudflats, firm tough clay banks, sandy beaches, and tidal and non-tidal muddy and shallow lagoons. For a detailed account of these habitats, see Spaans (1978). Areas visited have been dealt with in Morrison and Spaans (1979).