

JOINT SERVICES EXPEDITION TO PRINCESS MARIE BAY, ELLESMERE ISLAND, 1980: PRELIMINARY REPORT

by B. Witts and R.I.G. Morrison

The Joint Services Expedition to Princess Marie Bay, Ellesmere Island, 1980 carried out a programme of biological work from late May to late August 1980 on the north side of Princess Marie Bay on the east coast of Ellesmere Island, N.W.T., Canada (Figure 1). The basis for the scientific programme was a study of the breeding biology of shorebirds in the area over a complete season, and this was supported by studies of the seasonal abundance of potential invertebrate food resources and of nesting habitat and habitat use. The following preliminary report indicates the type and scope of work undertaken.

The expedition consisted to 12 men (10 military and 2 civilian) and was divided into 2-man teams working on various projects, which included shorebirds, entomology/shorebird food resources, botany/habitats, air photo mapping/habitats, Snow Buntings *Plectrophenax nivalis*, meteorology, and also archaeology and exploration. Brian Witts and Ron Coulter formed the shorebird team and were joined by Guy Morrison for 2½ weeks in late June/early July.

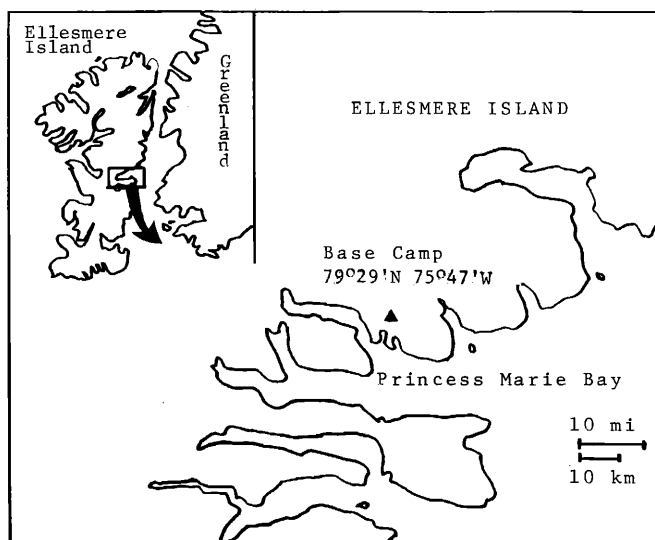


Figure 1. Location of the study area on the east-central coast of Ellesmere Island, N.W.T., Canada.

The main study area consisted of the northern and western sides of the unnamed valley in which Base Camp was located at 79°29'N 75°47'W (Fig. 1). Parts were searched thoroughly every day and the entire area censused over a period of several days. As much information as possible was recorded for shorebirds on all aspects of nesting and feeding behaviour and migration, and observations plotted on maps. Information on habitats, nests and contents etc was recorded using methods similar to those employed in Greenland in 1974 by Green and Greenwood (1978). Adult shorebirds were caught mostly at the nest for weighing and measurement using wire mesh drop door or walk-in traps: young were caught while flightless. All birds were ringed and colour-ringed for individual recognition and most adults feather-dyed.

Nesting Studies and Ringing

The most numerous shorebird nesting in the valley was the Baird's Sandpiper *Calidris bairdii* and 16 nests were found: other species bred in much lower numbers (see Table 1), though nest survival was generally very high, despite the regular occurrence of predators (mostly Long-tailed Jaegers *Stercorarius longicaudus*, arctic foxes *Alopex lagopus* and arctic weasels *Mustela erminea*) in the area.

A total of 123 shorebirds was caught during the summer, consisting of 27 adults and 96 flightless young of five species (Table 1). One British-ringed Knot *Calidris canutus* was collected on 1 July.

Table 1. Nests, nest survival and ringing totals.

| | Nesting Data | | Ringing Totals | | |
|---|-----------------|---------------|----------------|-------|-------|
| | no. nests found | nest survival | adults | pulli | total |
| Ringed Plover <i>Charadrius hiaticula</i> | 1 | 100% | 1 | 3 | 4 |
| Turnstone <i>Arenaria interpres</i> | 1 | 100% | 1 | 4 | 5 |
| Knot <i>Calidris canutus</i> | 4 | 50% | 3 | 26 | 29 |
| Baird's Sandpiper <i>Calidris bairdii</i> | 16 | 100% | 22 | 58 | 80 |
| Sanderling <i>Calidris alba</i> | - | - | - | 5 | 5 |
| | 22 | | 27 | 96 | 123 |

Species Notes

Ringed Plover *Charadrius hiaticula*

First sighted on 9 June; only a few, mainly singles, present during the remainder of the season. At least one pair bred in the sand/gravel bed of the braided river system: the nest contained four eggs when found on 27 June and hatched on 12 July. Juveniles and adults gathered for feeding near the mouth of the river from 10 August, a maximum of 13 juveniles and 4 adults occurring on 16 August.

American Golden Plover *Pluvialis dominica*

Two birds were observed feeding on the edge of a marshy area at the north end of the valley on 20-21 June.

Turnstone *Arenaria interpres*

The number of Turnstones in the valley appeared surprisingly few, given their relatively abundant status at other areas further north and west on Ellesmere Island (e.g. Lake Hazen, Savile and Oliver 1964; Alert, MacDonald 1953, Morrison 1975; Fosheim Peninsula, Parmelee and MacDonald 1960). The first single bird was seen on 1 June and the first pair on 9 June. Although noisy and conspicuous in other areas, little display was apparent and the only nest (4 eggs) found during the season was discovered not far from Base Camp on 3 July on an open area of clay/*Dryas* hummocks. Small flocks of 5-10 birds (adults and juveniles) were observed feeding near the river mouth later in the season.

Knot *Calidris canutus*

First heard singing on 26 May and first seen on 27 May. A flock of ± 50 recently-arrived birds was observed on 27 May on a snow-free patch of south-facing gravel/*Dryas* terraces overlooking Princess Marie Bay; pairs and singles were seen nearly daily thereafter until the middle of June. Two nests found early in the season were later predated, one just after completion of the clutch for which nest-scraping and laying of the first egg had been observed on 7 June. Nests were widely spaced and very difficult to find owing to the discrete behaviour and tight sitting of the incubating birds. Knot fed in wet, marshy areas bordering streams, often at some distance from the nest: for instance, a marked individual from a nest (found 23 June, hatched 9 July) at the north end of the valley was found some 3-4 km away near Base Camp on 30 June. Many birds fed on

plant material early in the season. Young were caught in several areas of suspected nesting and growth information was obtained for chicks from recapturing broods several times before fledging. Flocks of adults were observed from 2 August and of juveniles from 14 August, feeding at low tide on the river delta. Maximum numbers observed were 53 juveniles and 6 adults on 17 August.

Baird's Sandpiper *Calidris bairdii*

The Baird's Sandpiper was described as "certainly the rarest scolopacid" on the Fosheim Peninsula west of the study area in 1955 by Parmelee and MacDonald (1960), and the discovery that they were the most abundant breeding shorebird in the area in 1980 provided a welcome and unexpected opportunity to study this little-known species near the northern and eastern end of its range.

The first pair was sighted displaying on 14 June and numbers increased rapidly over the next few days. Much displaying appeared to take place in marshy areas which cleared of snow early, though birds were also found either displaying, alarming or sitting quietly on the gravel/*Dryas* terraces along the west side of the valley where many nests were later found. During and after egg-laying, display flights decreased considerably and nests were difficult to find until incubation started, when the sitting bird would return to the nest after being disturbed. Members of most pairs appeared to have highly contrasting behaviours - one bird was relatively tame and solicitous, remaining near the nest alarming and scolding when disturbed, whereas the other bird would fly off and behave inconspicuously with little alarm or distraction behaviour.

The first nest was located on 21 June and by 4 July 16 nests had been found. Most were located on or around a series of barren, sparsely vegetated (*Dryas* and sedges mostly) gravel terraces on the west side of the valley in an area of lateral moraine; some occurred on stony creek outwash areas and one atypical nest was found on a hummock in a wet marshy area. Nests were generally well-lined with *Dryas* leaves; which the incubating bird picked from the surrounding vegetation and flicked over its back into the nest cup. Clutches were normally of four eggs and both birds incubated. The first eggs hatched on 13 July and most nests had cleared by 17 July, indicating nesting was well synchronised in the population. Both adults attended young after hatching: on two occasions both adults from a nest were observed attempting to brood the same young simultaneously. Fifty-eight pulli were ringed and weight and measurement data obtained through to fledging.

Although intruders were normally driven from nesting territories during incubation, off-duty birds fed together socially in neutral areas. Colour-marked individuals from different nests at times gave the appearance of being paired while feeding. Feeding habitats included dry gravel/*Dryas* terraces, stony creek outwash deltas and sandy banks along the braided river system, as well as marshy areas lining creeks.

Flocks of juveniles gathered and fed at the river mouth and adjacent areas, peaking at 29 birds on 18 August.

In summary, Baird's Sandpipers appeared to conform to the 'conservative' breeding system outlined by Pitelka et al. (1974).

Sanderling *Calidris alba*

A very uncommon shorebird: one pair was observed on 18 June. No nests were found, but four pulli were caught and ringed on 23 July indicating the species had bred in the area.

Habitats

Maps of the study area were prepared from aerial photographs and over 100 representative areas visited on the ground for characterisation of major vegetation type and cover, slope, aspect, drainage etc. Ninety-two species of plants were collected during botanical work.

Food resources and invertebrates

Six major habitat types were sampled by pitfall and sticky board traps throughout the summer to obtain information on seasonal abundance of potential food resources for shorebirds. Approximately 150 species of invertebrates were recorded and more than 13,000 specimens returned from the field.

Other ornithological work

Twenty-five species of birds were recorded during the expedition. A study of the population of nesting Snow Buntings was carried out and investigations of the avifauna of neighboring valleys and coasts made during sledging trips. A highlight was the discovery of a colony of Ivory Gulls *Pagophila eburnea* high in the mountains well inland from the coast. The birds had first been heard in the area on 21 June and later exploration revealed a colony of some 80 birds on 20 August, one of the largest recorded in the Canadian arctic.

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- Brian Witts, 'Oakwood', Duffield Lane, Woodmancote, Nr. Emsworth, Hants., England, and R.I. Guy Morrison, Canadian Wildlife Service, 1725 Woodward Drive, Ottawa, Ontario, Canada K1A 0E7.