

## WINTER BANDING OF PASSERINES ON THE ALASKA PENINSULA

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Between February 1969 and May 1973, bait traps were operated during winter at Cold Bay (55° 12' N, 162° 43' W), Alaska, headquarters of the Izembek National Wildlife Range. The purpose of the study was to determine local movements and band return rates, to observe flock behavior, and to record migration patterns and population flux of some of the passerine birds migrating through and wintering in the area.

During four winters one Australian Crow trap and two funnel design walk-in traps were operated nearly continuously with a commercial wild bird seed mix as bait. All captured birds were banded with U. S. Fish and Wildlife Service metal bands, and during the last two winters colored plastic bands were also used to denote the year of banding and to facilitate recognition of individual birds. Mortalities were dissected to validate plumage criteria used in sex determination. Sexual dimorphism is subtle in the Gray-crowned Rosy Finch (*Leucosticte tephrocotis*). However, the male is brighter and has more rose color on the tail, flanks, and wings. I found that the degree of pink coloration on the underwings is the best criterion for sex differentiation; only one error was discovered upon dissection of 47 rosy finches. The amount of white on the wings readily distinguishes sex in Snow and McKay's buntings (*Plectrophenax nivalis* and *P. hyperboreus*).

The southern Alaska Peninsula and Aleutian Islands region is primarily tundra, composed mainly of crowberry (*Empetrum nigrum*) and various grasses and sedges. Patches of alder (*Alnus crispa*) and willows (*Salix* spp.) occur on lower slopes and along water courses on the Peninsula and easternmost Aleutians. Only four miles separate the Pacific Ocean and Bering Sea at Cold Bay, and the climate throughout the region is maritime with generally inclement weather. The mean January temperature at Cold Bay, elevation 90 feet, is 27.8°F. Wind velocity between November and May averages 17.6 mph, yielding frequent windchill temperatures of -30°F or lower. The cold is further accentuated by 85 percent cloud cover during winter months. Annual mean snowfall is only 51 in. Frequent blizzard conditions made maintenance of bait traps difficult or impossible. Red foxes (*Vulpes fulva*), Northern Shrikes (*Lanius excubitor*), and domestic dogs and cats sometimes disrupted the trapping operation.

### RESULTS AND DISCUSSION

*Banding totals, population flux, and sex ratios* — A total of 2,824 birds representing five species was banded during principally four winters (Table 1). Snow Buntings accounted for over two-thirds of the birds captured. A preponderance of males was captured in all species. Trapping success was clearly associated with low windchill temperatures and snow-covered ground. Capture of birds was greatest during blizzard conditions when energy demands were

TABLE 1.  
Summary of winter banding and returns of passerine birds at Cold Bay, Alaska (February 1969 - May 1973).

	Number of birds banded <sup>1</sup>					Returns of birds banded in the previous four winters (recaptured birds banded prior to November 1972)						
	Males	Females	Unknown	Total	Percent males	Males	Percent males	Females	Percent females	Unknown	Total	Percent of birds recaptured
Snow Bunting	1,350	514	21	1,885	71.6	239	23.0	38	10.4		277	19.5
Gray-crowned Rosy Finch	214	110	32	356	60.1	109	54.8	27	27.3		136	42.0
Lapland Longspur	368	162	0	530	69.4	32	11.0	2	2.0		34	8.7
McKay's Bunting	23	14	0	37	62.9	1	4.5	2	15.4		3	8.6
Northern Shrike	—	—	16	16	—	—	—	—	—	1	1	7.1
Totals	1,955	800	69	2,824	69.2 <sup>2</sup>	381	24.6 <sup>2</sup>	69	11.9 <sup>2</sup>	1	451	20.6 <sup>2</sup>

<sup>1</sup>Winter banding and return totals:

February 1969 = 39

January-May 1970 = 676 (5 returns)

November 1970 - July 1971 = 646 (101 returns)

November 1971 - June 1972 = 828 (131 returns)

November 1972 - May 1973 = 635 (214 returns)

<sup>2</sup>Means

highest. During the rare periods of little wind, few birds visited the traps, and practically none were caught when rains melted snow because flocks scattered over the tundra and along beaches. Trapping success was best in the winter of 1971-1972, the harshest of the four winters. Birds began visiting the traps in late November, and the last birds, primarily migrant Lapland Longspurs (*Calcarius lapponicus*), arrived about 1 May. Longspurs were strictly summer residents, dispersing to nest in late May. In Michigan, on the other hand, trapping of Snow Buntings was better in milder winters, because fewer birds remained in the area in severe winters (Bryens, 1944).

Gray-crowned Rosy Finches were the first to appear at the traps in the fall. They preferred perching on and then dropping into the crow trap, whereas Snow Buntings almost always remained on the ground and thus used the funnel traps. Rosy finches were the most sedentary; they nested and roosted in abandoned buildings around Cold Bay. The number of rosy finches recaptured in following winters was 42 percent, more than double the band return rate of any other species (Table 1), indicating their apparent resident status. An excess of males was apparent in all species, and the percentage of banded male buntings, rosy finches, and longspurs recaptured in subsequent years was much greater than for females (Table 1), suggesting a reduced female survival rate or differential migration. Nearly 55 percent of banded male rosy finches were recaptured subsequent winters, whereas the band return rate for females was only 27 percent. The excess of males in rosy finch populations has been noted by other observers both in winter and summer (King and Wales, 1964; Twining, 1938; Dawson, 1923; Johnson, 1965; French, 1959). With smaller sample sizes the above authors cited ratios ranging up to one female per six males. Hanna (1922) also found surplus males with *L. t. griseonucha*, the Aleutian race found at Cold Bay. French (1959) found that territoriality displayed by the Black Rosy Finch (*L. t. atrata*) centers around the female rather than the nest site probably because of the unbalanced sex ratio, and the paucity of females was believed to be the chief limiting factor to population increase. Twining (1938) also noted that "territory" moves with the female in *L. t. dawsoni*.

I believe Snow Buntings are far more numerous on the southern end of the Alaska Peninsula than rosy finches, and Snow Bunting populations appear more unstable, evidenced by much greater population fluctuations. Migrant buntings periodically augmented the apparent resident population, whereas rosy finch numbers remained fairly constant through the winter. Buntings from more northern areas seemingly winter around Cold Bay, and large migrant flocks appear in March or April, the times depending on the severity of the winter. Hence, the greatest numbers of buntings were captured in March 1970 and in April 1971, 1972, and 1973. The winter of 1969-1970 was mild and spring came earlier. Most migrants in other Snow Bunting breeding regions also appear in April, and they arrive earlier with amelioration of the climate

(Nethersole-Thompson, 1966). The newly arrived migrants behaved noticeably differently from the regular visitors at the traps. Migrant flocks were larger and much more wary, and few repeats occurred in the traps after they arrived. Spring migrants also weighed less than birds caught earlier in the winter. Up to 65 new buntings were caught in a single day during spring migration compared to a winter average of about 10 per day. Severe weather timed with newly arrived flocks accounted for maximum trapping success. No spring rosy finch population influx was detected with new birds or band returns as with Snow Buntings (Fig. 1).

Both migrant and resident Snow Bunting populations were also noted in the Pribilof Islands, 320 miles northwest of Cold Bay (Hanna, 1923). Although doubtful to me, Hanna believed young birds were probably migrants whereas adults were primarily residents. Snow Buntings are considered sedentary in the Commander Islands, but in winter birds from further north may replace local populations (Nethersole-Thompson, 1966).

The band return rate for Snow Buntings at Cold Bay was 19.5 percent (Table 1). In Michigan, Bryens (1941) reported a 10.6 percent return rate from 916 Snow Buntings banded over a period of several years. Bryens made no mention of sex ratios. Tinbergen (1933) noted in Greenland during spring that female buntings arrived a month later than males, but no general unbalanced sex ratio was reported. Also, as on the Alaska Peninsula spring migration dates in Greenland varied markedly in different years. Some European and Canadian records also show that male flocks arrive ahead of females in spring migration, and surplus males have been recorded in Baffin Island, Iceland, and other breeding areas (Nethersole-Thompson, 1966). Larionow (1927) noted male preponderance in wintering areas in western Siberia and believed that male Snow Buntings were winter residents whereas females were migrants.

In July 1971 a Snow Bunting nest was found atop a mountain five miles from Cold Bay, and the four nestlings were banded. In April 1972 one of them was captured at the bait traps, further indicating that some Snow Buntings in the area are only summer residents. If this nestling were a year-round resident, it presumably would have been caught in the fall.

Several Snow Buntings color-banded at Cold Bay were reported at Dutch Harbor on Unalaska Island, 200 miles west of Cold Bay in the Aleutians. On 19 April 1972, I saw a recent color-banded female feeding on the beach at Dutch Harbor, indicating migrants pass through the Cold Bay area enroute to the Aleutian Islands. On 22 December 1973, two buntings (male and female) banded in January and February 1971 were both captured at Adak Island, 650 miles west of Cold Bay, where rosy finches and buntings also were being banded. Most of the birds trapped on Adak, however, are apparently resident rosy finches (pers. comm., G. V. Byrd). Banded Snow Buntings also were reported at Nelson Lagoon (P. Kust, pers. comm.), a village on the north side of the Alaska Peninsula about 80 miles north of Cold Bay. These marked indi-

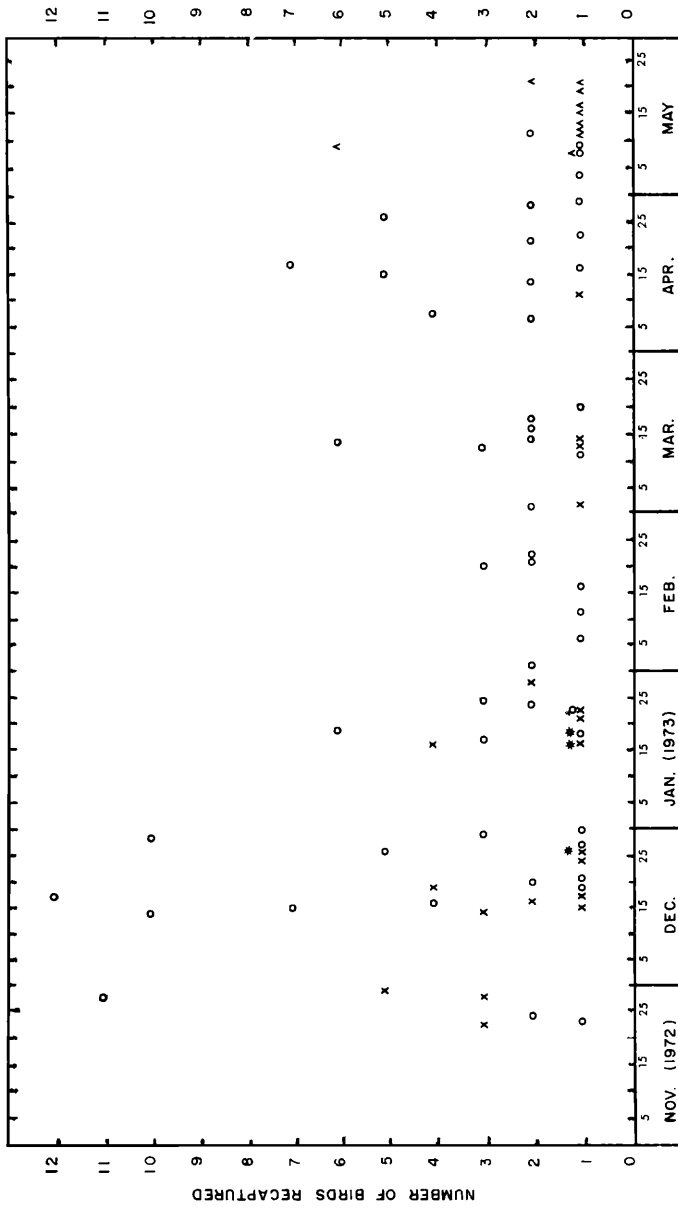


FIGURE 1. Number of banded Gray-crowned Rosy Finches (x), Snow Buntings (o), and Lapland Longspurs (\*) recaptured in the winter of 1972-1973.

viduals were seen in January and February, illustrating wide-range or nomadic midwinter movements. Wandering flocks were also indicated by the midwinter disappearance of some banded birds which previously were repeatedly recaptured. Were it not for the paucity of villages in the Aleutians, more banded birds probably would have been reported.

The number of Lapland Longspurs trapped each May and June depended on weather conditions prior to dispersal of the newly arrived flocks. The first longspur flocks were nearly all males, arriving about 1 May. No longspurs remained after September. The early arrival of predominantly males in Alaska is described by Williamson (1968), Williamson and Emison (1971) and West et al. (1968). On Amchitka Island in the Aleutians, Williamson and Emison (1971) noted that the number of female longspurs increased steadily until late May when the sexes were present in approximately equal numbers. Williamson (1968) states that the apparent surplus of males during the nesting period results from mated males being attracted to any female that happens to be away from the nest. West et al. (1968) indicates that the sex ratio changes gradually from initial flocks of 90 percent males to the last flocks of about 25 percent males. Consequently it is possible to determine the state of migration by examining the sex ratio of flocks at any particular time and location.

Northern Shrikes frequently disrupted trapping in midwinter by killing many finches and buntings. Shrikes were released away from the trap site. Enigmatically shrikes vanished in February when winter severity intensified and Snow Bunting numbers increased. Shrike numbers were highly variable from year to year; only one bird appeared the last two winters of the project.

McKay's Buntings are rare winter visitors in the Cold Bay region. They normally winter on the Yukon-Kuskokwim Delta in southwestern Alaska and nest on Hall and St. Mathew islands in the Bering Sea (Gabrielson and Lincoln, 1959). Thirty-three of the 37 birds banded appeared during the winter of 1971-1972, the coldest winter on record for Cold Bay. This species has never been banded before according to the Bird Banding Laboratory.

Of the 214 band returns recorded during the last winter of the project, 41 of the birds were also recaptured the previous winter, and 18 of them were caught in all three years. Three of the 39 birds banded the first winter in 1969 were recaptured four years later. Examination of the returns also revealed that many birds were recaptured in following years on or about the same day of the month as initial capture; this was especially true with migrant buntings and longspurs. Moreover, some buntings were recaptured on precisely the same date two years in succession. Of 53 Snow Buntings and Lapland Longspurs recovered in April and May 1973, 33 were recaptured within a week of the same date a year or two later. There is also evidence that winter flocks are composed of many of the same individuals in successive winters. For example, three male Snow Buntings that were banded on 7 April 1971 were recaptured together on 15 April 1973. These three individuals probably migrated together for at least two years.

*North American banding records analysis* — Computer printouts of all birds banded since 1955 and all recovery data from inception of the nationwide banding program for the five species listed in Table 1 were obtained from the Bird Banding Laboratory in Laurel, Maryland.

Through August 1971, a total of 3,060 Gray-crowned Rosy Finches was banded, but unfortunately only 131 of these birds were sexed; 65 percent of these were males. Analysis of band returns of this species revealed only 36 returns in North America, exclusive of Cold Bay. All Gray-crowned Rosy Finches were recovered in winter at the same site where banded. Although this species appears to be a resident in the Aleutian Islands and at Cold Bay, the population in Utah is regarded as a regular, precise annual migrant (King and Wales, 1964). The maximum interval between banding and recovery dates for this species is 4 years and 2 months (Behle, 1973).

A total of 3,455 Snow Buntings has been banded in North America since 1955. Males accounted for 57 percent of the 773 birds for which sex was reported. Excluding Cold Bay, Snow Bunting returns amount to 191, and 78 percent of the 112 sexed birds were males. Up to eight years elapsed between date of banding and recovery (Byrens, 1941). Most Snow Bunting returns were in winter at the same locale where banded, but several distant migrations (up to 4,000 miles) are recorded.

A total of 27,667 Lapland Longspurs has been banded in North America. Fifty-two percent of the 5,677 birds with reported sex were males. Only 28 returns were shown on the computer printouts, mostly local returns, and one bird was recaptured nearly five years after being banded.

There are records of 32 Northern Shrike band returns from 633 individuals banded since 1955. The return at Cold Bay is the only one for western North America. The longest time between banding and recovery dates is only 1 year 7 months.

#### SUMMARY

Between February 1969 and May 1973, 2,824 passerines, primarily Snow Buntings, Gray-Crowned Rosy Finches, and Lapland Longspurs were banded during winter at Cold Bay, Alaska. Of the 1,885 Snow Buntings banded 71.6 percent were males. Males also predominated in the other species.

A total of 451 band returns was recorded. The return rate for rosy finches, Snow Buntings, and Lapland Longspurs was 42, 20, and 9 percent, respectively. The return rate for males in the above three species was more than twice that for females, suggesting reduced female survival or differential migration patterns.

Color-banded Snow Buntings were observed as far as 200 miles away from the banding site and two birds were captured at Adak Island, 650 miles distant. Both resident and migratory Snow Bunting populations were evident, whereas Gray-crowned Rosy Finches appeared to be nonmigratory. McKay's Buntings were banded and recaptured for the first time. Lapland Longspurs were strictly summer residents, appearing in May.

Nationwide banding data on the aforementioned species were analyzed.

#### ACKNOWLEDGMENTS

I especially wish to thank Calvin Reeve, Refuge Maintenance-man of the Izembek National Wildlife Range, for assistance in the banding project and maintenance of the traps during my absences. G. Vernon Byrd, Refuge Manager of the Aleutian Islands National Wildlife Refuge, assisted the banding operation during the winter of 1971-1972, and is conducting a similar banding project at Adak Island in the Aleutians.

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Received 18 March 1974, accepted 11 June 1974.