

HABITAT UTILIZATION AND MIGRATION OF LAND BIRDS ON THE BARREN ISLANDS, ALASKA

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The Barren Islands (58°55' N, 152°10' W) in the northwestern Gulf of Alaska are the breeding stations for the largest marine bird populations in the region (Bailey 1976); however, little is known about the land birds breeding on or migrating through these islands. The only information available on land birds of the Barren Island area is by Isleib and Kessel (1973) and Bailey (1976). Rausch (1958) described the birds of Middleton Island, an isolated island in the northcentral Gulf of Alaska. In this paper, we briefly discuss the habitat utilization of breeding and migrant birds of the Barren Islands and the timing of their migration. Shorebirds are included because they utilized terrestrial habitat.

STUDY AREA AND METHODS

The Barren Islands are located in the middle of the southern entrance to Cook Inlet between the Kenai Peninsula and the Kodiak Island archipelago (Figure 1). Our camp and censuses were located on 435 ha East Amatuli Island (Figure 2) where we were conducting intensive studies of the breeding marine bird colonies. A more complete description of the Barren Islands can be found in Bailey (1976).

We censused birds 27 times along regular transects during June, July and August 1976. We recorded the number of individual birds of each species in each major habitat type along the 2.4 km census route. It normally took 1.5 hours to walk the transects. Eight habitat types were delineated, based on vegetative changes associated with geologic discontinuities (N. Manuwal, in press).

The vegetation of the beach community was restricted to a narrow band along the beach side of the dunes. Seabeach Sandwort (*Honckenya peploides*) and dune grass (*Elymus arenarius*) were the dominant species. The dune habitat was dominated by dune grass and other tall herbaceous plants, especially Cow Parsnip (*Heraculum lanatum*). The boulder habitat was formed by erosion of the hillside. The vegetation, which was lush due to seepage among the 1 m size boulders, was dominated by tall herbaceous plants and ferns such as Cow Parsnip, fireweed (*Epilobium angustifolium*) and Lady Fern (*Athyrium filix-femina*). The willow habitat was along a stream and was dominated by willow (*Salix*) shrubs. These habitats had an average height of 1 m.

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The grassland-meadow habitat occurred on the valley bottom and lower hillsides. It was floristically diverse. Several genera of grasses (*Festuca* and *Deschampsia*) were prevalent as well as forbs such as anemone (*Anemone narcissiflora*) and bunchberry (*Cornus suecica*). The riparian habitat was similar floristically; however, a stream ran through it and therefore more hydrophilic plants occurred. The average height of these habitats was 0.5 m.

The crowberry and fellfield habitats averaged 10 cm in height. The crowberry habitat was found on solifluction slopes; the fellfield habitat was in an area of high winds due to a "saddle" in the cliffs. Both habitats were characterized by crowberry (*Empetrum nigrum*).

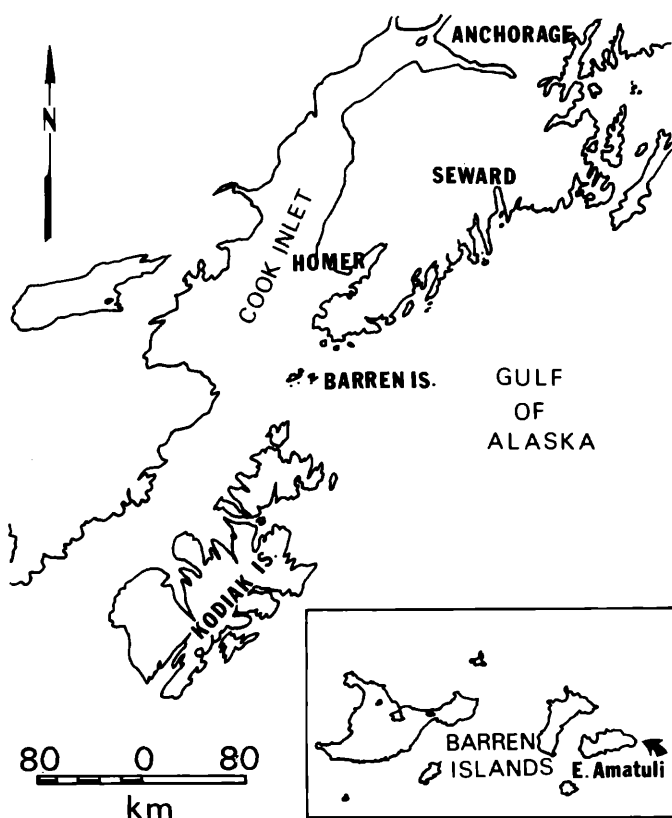


Figure 1. Location of the Barren Islands, Alaska.

RESULTS AND DISCUSSION

BREEDING BIRDS AND HABITATS

We found seven species of land birds breeding on East Amatuli Island; only four of these occurred on our census routes (Table 1). The Savannah Sparrow was easily the most abundant species. In descending order of abundance, the other species were the Golden-crowned Sparrow, Water Pipit, Gray-crowned Rosy Finch, Winter Wren, Common Raven and Peregrine Falcon. With the exception of Ushaget Island, which has a well-developed Sitka Spruce (*Picea sitchensis*) forest, the breeding avifauna of the other islands was nearly identical to that of East Amatuli Island.

We observed Savannah Sparrows in all habitat types; they preferred nesting in the grassland-meadow, crowberry and boulder habitats and used the riparian and willow habitats as escape cover and feeding areas. After fledging, young and adult Savannah Sparrows seemed to avoid the crowberry and fellfield habitats which offered little cover. By fledging time, the dune grass was nearly 1 m high in the dunes, so sparrows spent more time there than at any other time of the year (Figure 3). The large peaks in numbers between 30 June and 30 July represent the fledging of Savannah Sparrows (Figure 3).



Figure 2. Large valley on East Amatuli Island, Barren Islands, Alaska, showing topography and major habitat features.

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The Water Pipit was more specialized in its habitat preferences than the Savannah Sparrow. It avoided areas of tall vegetation and was most abundant in the fellfield, crowberry and grassland-meadow habitats (Figure 4). We occasionally observed it feeding on the beach. Adults fed fledged young in the fellfield and crowberry habitats. In the second week of August the breeding population apparently left the island. Migrant pipits appeared later and were found primarily in the crowberry, grassland-meadow and beach habitats.

Most breeding Golden-crowned Sparrows were in the grassland-meadow and boulder habitats and seemed to prefer relatively tall herbaceous cover. When flushed, many flew to nearby willow or riparian areas. Nests were usually located near the base of Cow Parsnip or angelica (*Angelica lucida*). This species was rarely observed outside its preferred habitat.

Gray-crowned Rosy Finches nested at the higher elevations of the island but frequently fed in low elevation fellfield and crowberry habitats. In late May we observed several rosy finches feeding on the previous year's seeds of Cow Parsnip and angelica which they gleaned off the edges of snow banks near the top of the island. Later in sum-

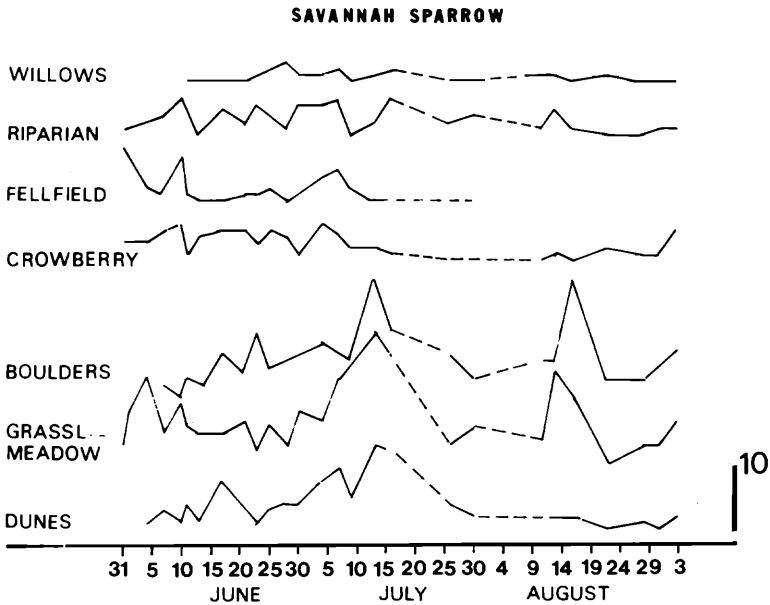


Figure 3. Relative abundance of the Savannah Sparrow in major habitats along census transects, East Amatuli Island, Alaska, summer 1976. Vertical scale on right is number of individuals.

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mer, we also saw them in the boulder area where they perched on top of large rocks or drank water from small puddles at the base of the rocks. By late July, adult and fledgling rosy finches were using the beach area and the steep south slopes and cliffs of the island for feeding.

Winter Wrens nested on the south slopes of the island, primarily in patches of Cow Parsnip and dense grass. Common Ravens and Peregrine Falcons nested on high cliffs.

BIRD MIGRATION AND HABITATS

We observed 53 land bird species from 14 May to 3 September 1976, of which 36 species were found on our transect routes through major habitats. Table 2 indicates when we observed these species. In general, spring migration was over by the first week of June. Autumn migration began around the first week of August and was heavy when we departed on 3 September. Several species that nested on Ushaget Island (or perhaps the mainland) visited the island outside the migration periods. These included the Tree Swallow, Hermit Thrush, White-winged Crossbill, Belted Kingfisher, American Robin, Bald Eagle, Golden Eagle, Merlin and Short-eared Owl.

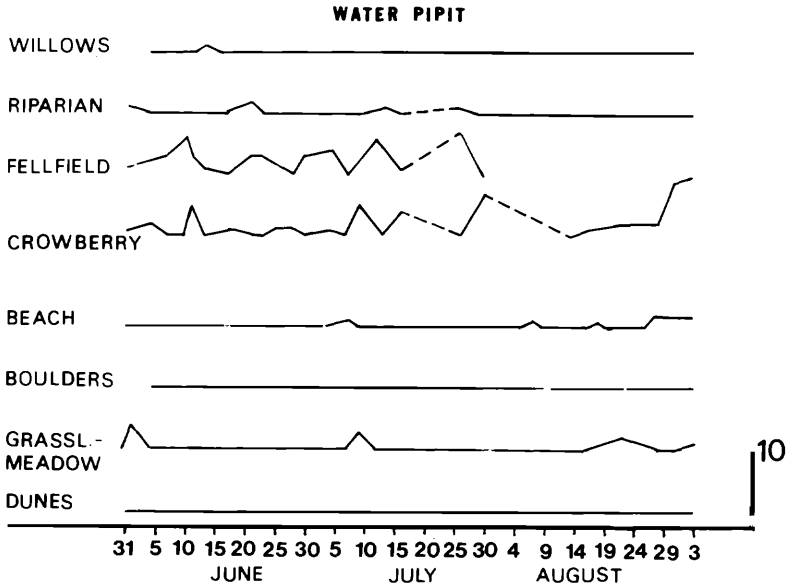


Figure 4. Relative abundance of the Water Pipit in major habitats along census transects, East Amatuli Island, Alaska, summer 1976. Vertical scale on right is number of individuals.

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Table 1. Number of individuals observed per census in each habitat type, East Amatuli Island, Barren Islands, Alaska, summer 1976.

	HABITAT TYPES							
	Dunes 27	Grassland- Meadow 27	Boulders 27	Crowberry 27	Willows 20	Fellfield 27	Riparian 27	Beach 13
Number of censuses								
LAND BIRDS								
<i>Empidonax spp.</i>					0.10			
Western Wood Pewee					0.05			
Horned Lark						0.04		
Violet-green Swallow				0.07		0.11		
Tree Swallow								
*Bank Swallow			0.04	0.10				0.15
*Winter Wren			0.07					
Varied Thrush			0.07	0.07	0.15			
Hermit Thrush		0.07			0.10		0.33	0.31
Gray-cheeked Thrush		0.04						
Wheatear						0.04		
Golden-crowned Kinglet					0.10			
Ruby-crowned Kinglet					0.05			
*Water Pipit		0.41		1.96	0.05	1.78	0.19	0.77
Orange-crowned Warbler			0.07	0.04	0.35			
Yellow Warbler	0.04	0.04	0.30		0.80		0.07	
Wilson's Warbler	0.04	0.07	0.26		0.50	0.04	0.19	0.08
*Gray-crowned Rosy Finch			0.41	0.41		0.30	0.04	
Common Redpoll					0.15		0.11	
Pine Siskin			0.22					
White-winged Crossbill					0.05			
*Savannah Sparrow	3.60	8.82	7.37	2.59	0.80	1.33	3.48	2.08
White-crowned Sparrow				0.04				
*Golden-crowned Sparrow	0.19	0.85	3.85	0.30	1.35	0.19	1.11	1.08
Fox Sparrow	0.37	0.22	1.30	0.11	1.10		0.11	
Lincoln's Sparrow					0.05			
*Song Sparrow	0.04		0.07					0.38

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Table 1 continued: Number of individuals observed per census in each habitat type, East Amatuli Island, Barren Islands, Alaska 1976.

Number of censuses	HABITAT TYPES							
	Dunes	Grassland-Meadow	Boulders	Crowberry	Willows	Fellfield	Riparian	Beach
WATERFOWL AND SHOREBIRDS								
Harlequin Duck	27		27	27	20	27	27	13
Semipalmated Plover								0.08
Black Turnstone								0.16
Common Snipe								0.08
Spotted Sandpiper		0.04						0.39
Least Sandpiper								0.39
* Glaucous-winged Gull								7.31
Mew Gull								0.08
Black-legged Kittiwake								0.08

* Denotes species nesting

LAND BIRDS ON THE BARREN ISLANDS

Table 2 continued. Seasonal occurrence of birds on East Amatuli Island, Barren Islands, Alaska, 1976.

	August							September				
	8-12	13.17	18-22	23-27	28-1	2-6	7-11	12-16	17-21	22-26	27-31	1-6
Rough-Legged Hawk, <i>Buteo lagopus</i>	—	—	—	—	—	—	—	1	1	—	—	—
Golden Eagle, <i>Aquila chrysaetos</i>	—	—	—	—	—	—	—	—	—	—	—	—
*Bald Eagle, <i>Haliaeetus leucocephalus</i>	5	5	5	5	5	5	5	5	5	5	5	5
*Peregrine Falcon, <i>Falco peregrinus</i>	5	5	5	5	5	5	5	5	5	5	5	5
Merlin, <i>Falco columbarius</i>	—	—	—	—	—	—	—	—	—	1	—	—
*Black Oystercatcher, <i>Haematopus bachmani</i>	5	5	5	5	5	5	5	5	5	5	5	5
Short-eared Owl, <i>Asio flammeus</i>	—	—	—	—	—	—	—	—	—	—	—	—
Belted Kingfisher, <i>Megasceryle alcyon</i>	—	—	—	—	1	—	—	—	—	—	—	—
Says Phoebe, <i>Sayornis saya</i>	—	—	—	—	—	—	—	—	—	—	3	—
<i>Empidonax</i> spp.	—	—	—	—	—	—	—	—	1	—	—	—
Western Wood Pewee, <i>Contopus sordidulus</i>	—	—	—	—	—	—	—	—	—	—	—	—
Horned Lark, <i>Eremophila alpestris</i>	—	—	—	—	—	—	—	—	—	—	—	—
Violet-green Swallow, <i>Tachycineta thalassina</i>	—	—	—	—	1	1	2	2	—	1	—	—
Tree Swallow, <i>Iridoprocne bicolor</i>	—	1	—	—	—	—	1	—	—	—	—	—
*Bank Swallow, <i>Riparia riparia</i>	5	5	5	5	5	5	5	5	—	—	—	—
*Common Raven, <i>Corvus corax</i>	5	5	5	5	5	5	5	5	5	5	5	5
*Winter Wren, <i>Troglodytes troglodytes</i>	5	5	5	5	5	5	5	5	5	5	5	5
American Robin, <i>Turdus migratorius</i>	—	—	—	—	—	1	—	—	—	—	—	—
Varied Thrush, <i>Ixoreus naevius</i>	—	—	—	—	3	2	4	5	5	5	5	3
Hermit Thrush, <i>Catharus guttatus</i>	—	—	—	—	—	—	1	—	—	1	1	2

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Table 2 continued. Seasonal occurrence of birds on East Amatuli Island, Barren Islands, Alaska, 1976.

	May			June			July					
	14-18	19-23	24-28	29-2	3-7	8-12	13-17	18-22	23-27	28-2	3-7	8-12
Gray-cheeked Thrush, <i>Catharus minimus</i>	—	—	—	—	—	1	—	—	—	—	—	—
Wheatear, <i>Oenanthe oenanthe</i>	—	—	1	—	—	—	—	—	—	—	—	—
Golden-cr. Kinglet, <i>Regulus satrapa</i>	—	—	—	—	—	—	—	—	—	—	—	—
Ruby-cr. Kinglet, <i>Regulus calendula</i>	—	—	—	—	—	—	—	—	—	—	—	—
*Water Pipit, <i>Anthus spinoletta</i>	5	5	5	5	5	5	5	5	5	5	5	5
Orange-cr. Warbler, <i>Vermivora celata</i>	—	—	—	—	1	2	—	—	—	—	—	—
Yellow Warbler, <i>Dendroica petechia</i>	—	—	—	—	1	5	—	—	—	—	—	—
Wilson's Warbler, <i>Wilsonia pusilla</i>	—	—	1	1	3	5	—	—	—	—	—	—
Rusty Blackbird, <i>Euphagus carolinus</i>	—	—	—	—	—	—	—	—	—	—	—	—
*Gray-cr. Rosy Finch, <i>Leucosticte tephrocotis</i>	5	5	5	5	5	5	5	5	5	5	5	5
Common Redpoll, <i>Carduelis flammea</i>	—	—	—	—	—	—	—	—	—	—	—	—
Pine Siskin, <i>Carduelis pinus</i>	—	—	—	—	—	—	—	—	—	—	—	—
White-w. Crossbill, <i>Loxia leucoptera</i>	—	—	—	—	—	1	—	—	—	—	—	—
*Savannah Sparrow, <i>Passerculus sandwichensis</i>	5	5	5	5	5	5	5	5	5	5	5	5
White-cr. Sparrow, <i>Zonotrichia leucophrys</i>	—	—	—	—	1	—	—	—	—	—	—	—
*Golden-cr. Sparrow, <i>Zonotrichia atricapilla</i>	5	5	5	5	5	5	5	5	5	5	5	5
Fox Sparrow, <i>Passerella iliaca</i>	5	5	5	5	5	5	5	1	—	—	—	—
Lincoln's Sparrow, <i>Melospiza lincolni</i>	—	—	—	—	—	—	—	—	—	—	—	—
*Song Sparrow, <i>Melospiza melodia</i>	5	5	5	5	5	5	5	5	5	5	5	5
Lapland Longspur, <i>Calcarius lapponicus</i>	—	—	—	—	—	—	—	—	—	—	—	—

LAND BIRDS ON THE BARREN ISLANDS

Table 2 continued. Seasonal occurrence of birds on East Amatuli Island, Barren Islands, Alaska, 1976.

	August							September 1-6			
	13-17	18-22	23-27	28-1	2-6	7-11	12-16		17-21	22-26	27-31
Gray-cheeked Thrush, <i>Catharus minimus</i>	—	—	—	—	—	—	—	—	—	—	—
Wheatear, <i>Oenanthe oenanthe</i>	—	—	—	—	—	—	—	—	—	—	—
Golden-cr. Kinglet, <i>Regulus satrapa</i>	—	—	—	—	—	—	—	1	1	2	—
Ruby-cr. Kinglet, <i>Regulus calendula</i>	—	—	—	—	—	—	—	—	—	1	—
*Water Pipit, <i>Anthus spinoletta</i>	5	5	5	5	5	5	5	5	5	5	5
Orange-cr. Warbler, <i>Vermivora celata</i>	—	—	—	—	—	1	—	—	2	1	3
Yellow Warbler, <i>Dendroica petechia</i>	—	—	—	—	—	1	1	2	2	4	5
Wilson's Warbler, <i>Wilsonia pusilla</i>	—	—	—	—	—	—	—	1	3	4	4
Rusty Blackbird, <i>Euphagus carolinus</i>	—	—	—	—	—	—	—	—	1	2	2
*Gray-cr. Rosy Finch, <i>Leucosticte tephrocotis</i>	5	5	5	5	5	5	5	5	5	5	5
Common Redpoll, <i>Carduelis flammæa</i>	—	—	—	—	—	2	2	3	3	1	—
Pine Siskin, <i>Carduelis pinus</i>	—	—	—	—	—	4	5	5	4	2	3
White-w. Crossbill, <i>Loxia leucoptera</i>	3	—	—	2	—	—	—	4	1	—	—
*Savannah Sparrow, <i>Passerculus sandwichensis</i>	5	5	5	5	5	5	5	5	5	5	5
White-cr. Sparrow, <i>Zonotrichia leucophrys</i>	—	—	—	—	—	—	—	—	—	—	—
*Golden-cr. Sparrow, <i>Zonotrichia atricapilla</i>	5	5	5	5	5	5	5	5	5	5	5
Fox Sparrow, <i>Passerella iliaca</i>	—	—	—	—	—	2	5	5	5	5	5
Lincoln's Sparrow, <i>Melospiza lincolni</i>	—	—	—	—	—	—	—	—	—	—	1
*Song Sparrow, <i>Melospiza melodia</i>	5	5	5	5	5	5	5	5	5	5	5
Lapland Longspur, <i>Calcarius lapponicus</i>	—	—	—	—	—	—	—	—	—	2	—

*Denotes nesting species

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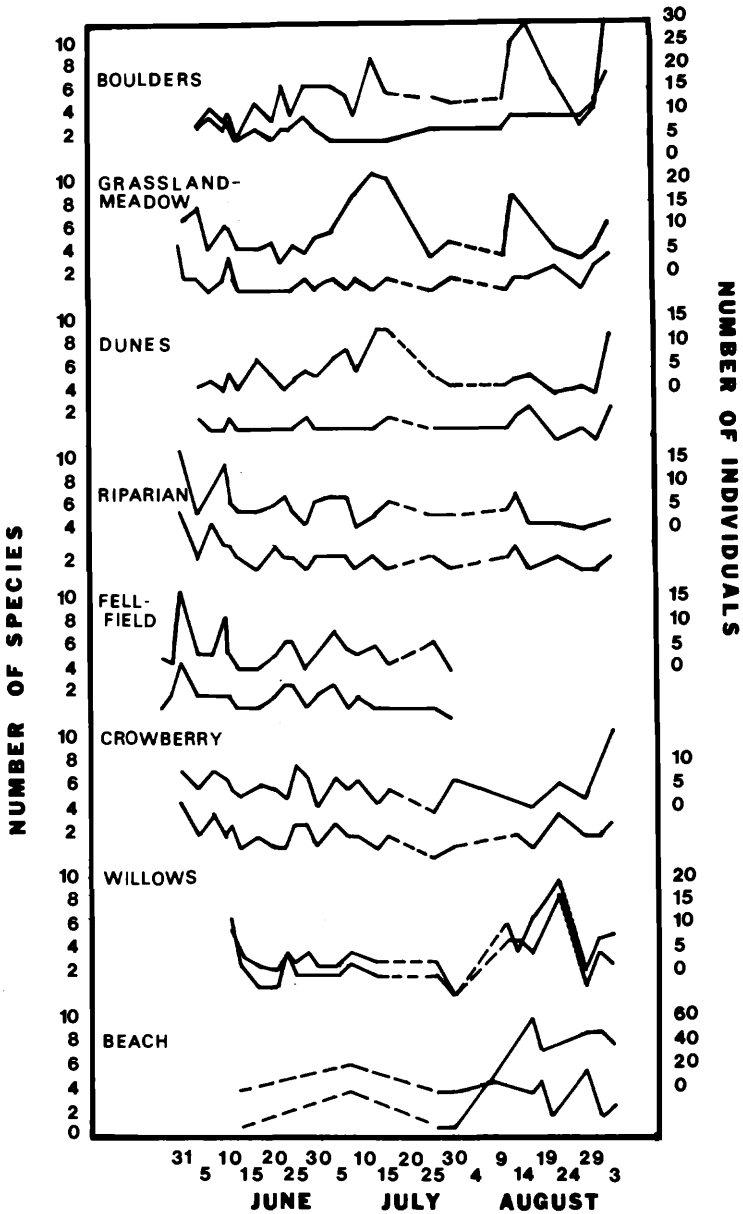


Figure 5. Number of species and individuals in the major habitats of East Amatuli Island, Alaska, during summer 1976. Upper line in each pair is number of individuals. Lower line is number of species. Dashed line represents periods when no data were taken.

LAND BIRDS ON THE BARREN ISLANDS

A severe storm front passed through the Barren Islands between 5 and 10 August and was immediately followed by the first large southerly movement of migrants (Figure 5). At this time, large numbers of Hermit Thrushes, Orange-crowned Warblers, Yellow Warblers, Common Redpolls, Pine Siskins, Savannah Sparrows, Fox Sparrows, Semipalmated Plovers, Spotted Sandpipers, Solitary Sandpipers, Wandering Tattlers, Least Sandpipers, Western Sandpipers and Rough-legged Hawks visited the island. These migrants used all the lowland habitats except crowberry and fellfields (Figure 5). Migrants were particularly abundant in the boulder, willow, grassland-meadow, beach and dune habitats. Isolated spruces scattered through parts of the grassland-meadow habitat were used for cover by large numbers of sparrows and thrushes.

DISCUSSION

The low number of breeding land bird species on East Amatuli Island is characteristic of structurally simple vegetation types. A thorough study of Ushaget Island is necessary before a comparison can be made of the avifauna of the entire Barren Islands group with the neighboring mainland; however, since the distance to the Kenai Peninsula is only 19 km, the unusual distribution patterns normally associated with more isolated islands would not be anticipated.

There is only one somewhat peculiar feature of the Barren Island avifauna. The absence of the Lapland Longspur is puzzling since "adequate" habitat seems abundant in the Barren Islands. Murie (1959) reported this species to be the most common passerine throughout the Aleutian chain, Alaska Peninsula and adjacent islands. Isleib and Kessel (1973) indicate that this species is "probably a local breeder in the North Gulf Coast-Prince William Sound region," where Rausch (1958) found it breeding on Middleton Island.

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Sketch by Steve Riddle