

RAPTOR MIGRATION IN NORTHWESTERN CANADA AND EASTERN ALASKA, SPRING 1982

DAVID P. MINDELL AND MARGARET H. MINDELL

ABSTRACT - Searches for migrant raptors in northern British Columbia, southern Yukon Territory and eastern Alaska were made between 29 March and 29 April 1982 at locations accessible by road along 3 potential, broadfront, migratory routes. Migration activity occurred within an intermountain route, passing between the Rocky and Pelly Mountains on the east and Coast and St. Elias Mountains on the west. We saw no migrant raptors coming from a coastal route north over Chilkat or White passes, or coming from a Canadian prairie route, east of the Rocky Mountains, over the pass along the Alaska Highway in the Summit Lake vicinity. We found concentrations of migrant raptors along the Lina Range by Atlin Lake, British Columbia, and at Johnson's Crossing and in the Takhini River valley of southern Yukon Territory. Northern Harriers (*Circus cyaneus*) were most frequently seen, followed in decreasing order by Red-tailed Hawks (*Buteo jamaicensis*), Golden Eagles (*Aquila chrysaetos*), Rough-legged Hawks (*Buteo lagopus*), Bald Eagles (*Haliaeetus leucocephalus*), and Peregrine Falcons (*Falco peregrinus*). Comparison with other studies suggest that migrant buteos and Golden Eagles make greater use of an intermountain route through northwestern Canada than of a coastal route along the Gulf of Alaska, while migrant Sharp-shinned Hawks (*Accipiter striatus*) more frequently use the coastal route.

Migrating raptors seeking the most direct overland route to breeding areas in extreme northwestern North America are funneled into areas of northwestern British Columbia, southwestern Yukon Territory, southeast and southcentral Alaska. Movements of migrant raptors to and from Alaska and northwestern Canada have been little studied although tens of thousands of raptors pass through this region biannually.

The north-south oriented ranges of the Rocky, Cassiar and Coast Mountains along with the Pacific shoreline delineate 3 broadscale, potential migration routes (Fig. 1) described as follows: 1) Coastal - along the west coast of British Columbia, and southeast Alaska, then either inland over mountain passes or continuing northwest along the Alaska coast south of the Chugach Mountains into central Alaska via the Copper River drainage, Portage Pass or other overland routes; 2) Intermountain - through the intermountain trenches in northern British Columbia and southwestern Yukon Territory into the Yukon and Tanana River drainages; and 3) Canadian prairies - through Alberta and northeastern British Columbia east of the Rocky Mountains, then crossing the Rocky Mountains, and heading northwest through British Columbia and/or Yukon Territory similar to the intermountain route. These 3 principal routes, all or in part, have been described previously by West et al. (1968) as apparent routes for migrating Lapland Longspurs (*Calcarius lapponicus*).

Raptor migration is generally a broadfront passage, occurring to some degree over nearly all land regions of the temperate zone. The distribution of visible migrants, however, is not random, partly due to topographic features either discouraging or

inducing travel in a particular direction. Gauthreaux (1979) has pointed out that despite the prominence of migration in avian lifestyles, routes, rates and calendars of migration are known for few species aside from waterfowl. The purpose of this study was to learn about distribution of migrant raptors moving through northwestern Canada and eastern Alaska, to locate specific areas of migrant concentration for future study, and to learn about timing of regional migration.

STUDY AREA AND METHODS

Between 29 March and 29 April 1982, 3970 km were driven between Dease Lake on Rt. 37 in British Columbia, Summit Lake on Rt. 97 in British Columbia and Anchorage, Alaska. Observations were made in 3 potential, broadscale, raptor migration routes to compare their relative use. We attempted to observe in areas physiographically conducive to concentrating migrants, such as along major rivers, lakes, southeast to northwest trending ridges, and mountain passes. Observations were made from roads or within 3 km hiking distance of roads, using binoculars or a 20X spotting scope to search for and identify migrants. Some of the most promising areas were rechecked on 2-3 non-consecutive days to reduce bias associated with varying weather conditions. Once an area was perceived to be used, we moved to another location. No attempt was made to count large numbers of birds or to determine magnitude of the migration.

Raptor migration in interior western North America occurs along a broader front (Hoffman 1981, and in press) with smaller local concentrations of birds compared to eastern North America (Heintzelman 1975) and elsewhere (Smith 1980, Christensen et al. 1982). We use the term "route" to denote a broadscale, dispersed movement, and do not suggest that lack of sightings in any area indicates complete lack of use by migrants. We attempted to spend sufficient time at different locations in each of the 3 possible routes mentioned, to enable comparison of their relative use.

The possibility of migrants departing from the general coastal route by moving northward through Lynn Canal and then into

mainland areas was checked by observing at Haines (Lentnikof Cove, Flat Bay) and Chilkat and White Passes. The intermountain route was sampled by observing at numerous locations along the Alaska Highway between Watson and Kluane Lakes (Fig. 1) and along Rt. 3 to Haines, Rt. 2 to Carcross, and Rt. 7 to Atlin. The possibility of migrants crossing the Rocky Mountains along the route of the Alaska Highway was checked from lookouts in the vicinity of Muncho and Summit Lakes, British Columbia. We distinguished migrants from possible residents by behavior. Sedentary birds or birds moving south or east were not counted unless they were south of their breeding range (e.g., Rough-legged Hawks (*Buteo lagopus*)).

RESULTS AND DISCUSSION

ROUTE USE. — All migrant activity seen occurred within the intermountain route, passing between the Rocky Mountains on the east and the St. Elias and Coast Mountains on the west. No migrant raptors were seen coming from a coastal route north over Chilkat or White Passes or from east of the Rocky Mountains over the pass travelled by the Alaska Highway in the Summit Lake vicinity. Migrant Northern Harriers (*Circus cyaneus*), Red-tailed Hawks (*Buteo jamaicensis*), Rough-legged Hawks and Golden Eagles (*Aquila chrysaetos*) were seen in the intermountain route (Takhini River valley west of Whitehorse) before, during, and after observations at Summit Lake and Chilkat and White Passes (Table 1), suggesting that the lower abundance of migrants coming over the passes and at Summit Lake was not due only to timing of observations.

Migrants passing through southern Yukon Territory in mid-April were apparently approaching

from northwestern and northcentral British Columbia and the intermountain route rather than from a coastal or a Canadian prairies route through northeastern British Columbia. Late April weather conditions were still severe in Chilkat and White Passes and along the route of the Alaska Highway (Rt. 97) through the Rocky Mountains with 1 to 3 m of snow cover, whereas the Takhini River valley and much of the intermountain route were more temperate with some bare ground showing by late April. This is not to imply that no migration occurs through these passes or areas with snow cover. Several groups of 3-6 Sharp-shinned Hawks (*Accipiter striatus*) were seen heading south through Chilkat Pass on 7 October 1980. Weather in these mountain passes may be generally milder during the fall migration than during the spring, and use by migrants may be correlated with the difference.

On 27 and 28 March 1982 an apparent vanguard of the Canada Goose (*Branta canadensis*) migration (over 440 individuals) was seen resting along the last unfrozen sections of the Fraser River in central British Columbia, between Lac La Hache and Quesnel. Six Red-tailed Hawks were also seen 40 to 30 km south of Quesnel on 28 March 1982. No migrant raptors or geese were observed during the subsequent 7 days spent driving north to Watson Lake and observing in the area between Watson and Teslin Lakes. On this basis, it seems unlikely that large numbers of raptors passed through northwestern British Columbia or southwestern Yukon Territory before observations began.

Table 1. Observation sites, date, and total raptor sightings for Spring 1982 migration in northwestern Canada and Eastern Alaska. (B.C. = British Columbia; Y.T. = Yukon Territory.)

Location	Dates	No. migrant raptors seen
Summit Lake, B.C.	16-18 Apr	0
Johnson's Crossing, Y.T.	1,14,15,19-21 Apr	73
Atlin Lake, B.C.	21-23 Apr	142
White Pass, B.C.	3, 24, 25 Apr.	0
Chilkat Pass, B.C.	8, 12, 13 Apr.	0
Haines area, Alaska ¹	9-12 Apr	0
Takhini River valley, Y.T.	5, 6, 13, 14, 26 Apr	53
Other ²	5-28 Apr	46

¹Lentnikof Cove, Flat Bay.

²<3 migrant raptors were seen at any one location, and all locations were within the intermountain route.

Based on physiographic features, 3 sub-routes can be distinguished within the broader intermountain route: 1) between the Rocky and Cassiar Mountains, entering Yukon Territory near Watson Lake, 2) between the Pelly and Cassiar Mountains and the St. Elias and Coast Mountains, entering Yukon Territory near Teslin, and 3) along the east slope of the Coast Mountains and Atlin or Tagish Lakes entering the Yukon River drainage near Whitehorse. Observed migrant activity was greater in sub-routes 2) and 3).

Recoveries of Alaskan banded birds show that at least some Peregrine Falcons (*Falco peregrinus*) (Ambrose et al. 1983) and Rough-legged Hawks (Kessel and Cade 1958) cross the Rocky Mountains, and many Alaskan breeding Red-tailed Hawks do so as well. Migrants cross the Rocky Mountains in many regions, however, Williston Lake west of Dawson Creek, British Columbia and the Jasper and Banff areas may be worthy of future study.

A coastal route through southeastern and south-central Alaska, along the Gulf of Alaska is used by many raptors based on observations by Islieb and Kessel (1973) and Swem (1982a, 1982b). Dates of migrant passage recorded by Swem (1982a) were such that if large numbers flew from the coastal migratory route north up Lynn Canal and over Chilkat or White Passes we would likely have seen some of them.

Specific Locations of Migrant Activity. — Within the intermountain route relatively high concentrations of migrants were found at 3 locations. On 22 April we counted 117 raptors in 6 hrs, flying north along the Lina Range on the east side of Atlin Lake, British Columbia. This included 65 Northern Harriers, 21 Golden Eagles, 18 Red-tailed Hawks, 8 *Buteo* sp., 4 Bald Eagles (*Haliaeetus leucocephalus*), and 1 Peregrine Falcon. The Lina Range rises 900 m above Atlin Lake, and most of the migrants were

observed from 300 m above the range to half-way down the slope.

At Johnson's Crossing, Yukon Territory we counted 73 raptors during 15.2 total hrs of observation during portions of 5 days between 14 and 21 April. Johnson's Crossing is at the outlet of Teslin Lake, a northwest trending lake approximately 80 km northeast of Atlin Lake. In descending order of abundance the migrants were: Red-tailed Hawks, Northern Harriers, *Buteo* sp., Rough-legged Hawks and Golden and Bald Eagles.

On 13 and 14 April 23 migrants were seen during 5.5 hrs of slow driving and observation in the Takhini River valley, 10 to 50 km west of Whitehorse. The Takhini River valley receives migrants that have come northwest along Teslin Lake, Atlin Lake, and Tagish Lake (intermountain route). The Takhini River valley is broad, however, we saw raptors from observation spots on Rt. 1, 3 km east of Champagne, 2 km east of the Kusawa Lake turnoff and at the Takhini River Crossing. We saw a total of 10 migrants during fast travel through the Takhini River valley on 5 and 26 April. Migrants proceeding through the intermountain route could pass along Kluane Lake, however, our observations there were after the bulk of the Northern Harrier and *Buteo* migrations had passed. We saw only a few migrants along the Tagish River at Tagish, Yukon Territory, and the Tanana River near Tetlin Junction, Alaska.

Species Abundances. — The Northern Harrier was the most frequently seen migrant (Table 2). At each of the 3 main areas of migrant activity, either the Northern Harrier or the 2 buteos as a group were most abundant. The largest flight of Northern Harriers and Golden Eagles was seen along Atlin Lake (Lina Range), while the largest flights of Red-tailed and Rough-legged Hawks were seen at Johnson's Crossing.

Table 2. Species percentages of migrant raptors (n=314) seen in northwestern Canada and eastern Alaska 5-18 April 1982.

	Red-tailed Hawk	Rough-legged Hawk	Northern Harrier	Golden Eagle	Bald Eagle	Peregrine Falcon
% of total sightings	29.1	9.4	40.2	15.7	5.2	0.4

Comparing our study with another conducted during the spring of 1982 along the Gulf of Alaska coast at Sitkagi Beach, west of Yakutat Bay (Swem 1982a), the Northern Harrier was the most abundant species along both the intermountain route and the coastal route passing Sitkagi Beach. Sharp-shinned Hawks, however, were the second most abundant species along the coastal route (26.5% of total) while none were seen in the intermountain route. Rough-legged and Red-tailed Hawks combined accounted for only 1.8% of the total sightings along the Gulf of Alaska at Sitkagi Beach, compared to 38.5% in the intermountain route. Golden Eagles were also comparatively rare along the coastal route, comprising 0.4% of total sightings, compared to 15.7% in the intermountain route.

Greater use of the coastal route by migrant Sharp-shinned Hawks and greater use of the intermountain route by migrant *buteos* and Golden Eagles is supported by Swarth (1924, and 1926) who found that Sharp-shinned Hawks were "never common in the Atlin, British Columbia region, not even in the fall after southward migration had begun", and by Islieb and Kessel (1973) who described Rough-legged Hawks and Golden Eagles as rare migrants, Red-tailed Hawks as casual migrants and Sharp-shinned Hawks as fairly common migrants along the Gulf of Alaska and in the Prince William Sound region. Swarth did observe migrating Sharp-shinned Hawks at Hazelton in the Skeena River valley of westcentral British Columbia, although hawks in this area may have been headed for the coast. A tendency for Sharp-shinned Hawks to migrate in greater numbers along the Pacific coast or along the southern edge of the boreal forest might help to explain the relative scarcity of migrant Sharp-shinned Hawks in inland western North America compared to inland sites in eastern North America such as Hawk Mountain, Pennsylvania, as suggested by Hoffman (in press).

Islieb and Kessel (1973) also described Red-tailed Hawks as regular fall migrants in southcentral Alaska along the Glenn Highway between King and Sheep Mountains in late September and early October. This corresponds with fall migration observations we made along the Glenn Highway in 1980 and 1981, and with observations by Bob Dittrick (pers. comm.).

Peregrines represented 0.8% of the sightings along the Gulf of Alaska, and 0.4% in the intermountain route. Swarth (1926) also saw migrant Peregrines within the intermountain route at

Tagish and Teslin Lakes. On the east side of the Rocky Mountains migrant Peregrines are consistently observed in spring passing through the Edmonton, Alberta region (Dekker 1979). The observed fall passage there is considerably less, suggesting seasonal difference in distribution of migrant Peregrines. Although no migrant Merlins (*Falco columbarius*) were seen during our study they have been seen both along the coastal route (Swem 1982a) and within the intermountain route (Swarth 1924, and 1926).

Chronology. — The first migrant Rough-legged Hawks, Red-tailed Hawks and Golden Eagles were all seen on 5 April in 1982. The first Northern Harriers were not seen until 14 April. Similarity in timing of migration for Rough-legged and Red-tailed Hawks is reflected in similar breeding chronologies in portions of Alaska (Gabrielson and Lincoln 1959, Mindell 1983).

Although the present study was not designed to determine timing of peak migration, the main migration of *buteos* in the intermountain route through southwestern Yukon Territory and northwestern British Columbia appeared to be over by 25 April, while some Northern Harriers were still passing through. This corresponds with average laying dates over a 4-yr period of 17 May for Rough-legged Hawks and 16 May for Red-tailed Hawks along the Kuskokwim River in western Alaska (Mindell 1983). On 23 April 1982 we observed a Red-tailed Hawk nest building at Tarfu Lake near the northern end of Atlin Lake. Swem (1982a) found the peak abundance of migrating raptors passing Sitkagi Beach near Yakutat Bay to be on 28 April, with stragglers of 7 species going by as late as 8 May.

ACKNOWLEDGEMENTS

We thank Mark Fuller for providing helpful comments on an earlier draft of this paper.

LITERATURE CITED

- AMBROSE, R., P. SCHEMPF, AND R. HUNTER. 1983. American Peregrine Falcon (*Falco peregrinus anatum*) studies on the upper Yukon River, Alaska, 1983. Unpubl. report prepared for the U.S. Fish and Wildlife Service, Office of Endangered Species, Anchorage. 19 pp.
- CHRISTENSEN, S., O. LOU, M. MUELLER, AND H. WOHLMUTH. 1982. The spring migration of raptors in southern Israel and Sinai. *Sandgrouse* 3:1-42.
- DEKKER, D. 1979. Characteristics of Peregrine Falcons migrating through central Alberta, 1969-1978. *Can. Field Nat.* 93:296-302.

- GABRIELSON, I.N. AND F.C. LINCOLN. 1959. The birds of Alaska. The Stackpole Co. Harrisburg, Pennsylvania. 922 pp.
- GAUTHREAU, S.A., JR. 1979. Priorities in bird migration studies. *Auk* 96:813-815.
- HEINTZELMAN, D.S. 1975. Autumn hawk flights: the migration in eastern North America. Rutgers Univ. Press, New Brunswick, N.J. 398 pp.
- HOFFMAN, S. 1981. Western hawkwatching. The Newsletter of the Hawk Migration Assoc. of North America 6(1):1-5.
- HOFFMAN, S. In press. Raptor movements in inland western North America: a synthesis. Proceedings of Hawk Migration Conference IV, Rochester, N.Y., March 24-26, 1983.
- ISLIEB, M.E. AND B. KESSEL. 1973. Birds of the north gulf coast - Prince William Sound region, Alaska. *Biol. Papers of the Univ. of Alaska*, No. 14.
- KESSEL, B. AND T.J. CADE. 1958. Birds of the Colville River northern Alaska. *Biol. Papers of the Univ. of Alaska*, No. 2.
- MINDELL, D.P. 1983. Nesting raptors in southwestern Alaska; status, distribution, and aspects of biology. BLM-Alaska Technical Report 8. Bureau of Land Manage., Alaska State Office, Anchorage. 59 pp. BLM/AK/TR-83/08.
- SMITH, N.G. 1980. Hawk and vulture migrations in the Neotropics. pp. 51-65 in *Migrant birds in the Neotropics*. Keast. A. and F. Morton, eds. Smithsonian Institution Press, Washington, D.C. 576 pp.
- SWARTH, H.S. 1924. Birds and mammals of the Skeena River region of northern British Columbia. *Univ. of Cal. Publ. in Zool.* 24(3):315-394.
- SWARTH, H.S. 1926. Report on a collection of birds and mammals from the Atlin Region, northern British Columbia. *Univ. of Cal. Publ. in Zool.* 30(4):51-162.
- SWEM, T. 1982a. Results of the Sitkagi Beach raptor migration study, spring 1982. Unpubl. report prepared for U.S. Fish and Wildlife Service, Office of Endangered Species, Anchorage, Alaska. 21 pp.
- SWEM, T. 1982b. Results of the Sitkagi Beach raptor migration study, autumn 1982. Unpubl. report prepared for U.S. Fish and Wildlife Service, Office of Endangered Species, Anchorage, Alaska. 14 pp.
- WEST, G.C., L.J. PEYTON, AND L. IRVING. 1968. Analysis of spring migration of Lapland Longspurs to Alaska. *Auk* 85:639-653.

Department of Zoology, Brigham Young University, Provo, Utah 84602. Address of second author: 11 South 200 East, Lindon, UT 84062.

Received 2 December 1982; Accepted 1 May 1983

Position Available — NATURALIST/STAFF BIOLOGIST. Hawk Mountain Sanctuary Association seeks a naturalist/staff biologist for a two-year position beginning in August 1984. Responsible for all field studies, including fall raptor migration count. Will also participate as resource person in education program. Excellent opportunity to initiate new studies and analyze migration statistics. Computer system available. Minimum qualifications are M.S. in biology or related field, experience in conducting field studies and data analysis/write-up, experience with raptor identification, and ability and interest in working with volunteers and general public. Computer experience strongly preferred. Salary plus housing on grounds. APPLY TO STANLEY E. SENNER, EXECUTIVE DIRECTOR, HAWK MOUNTAIN SANCTUARY ASSOCIATION, Rt. 2, KEMPTON, PA 19529.

Hawk Mountain Research Awards. The Hawk Mountain Sanctuary Association is accepting applications for its eighth annual award for raptor research. To apply for the \$500 award, students should submit a description of their research program, a curriculum vita, and 2 letters of recommendation by 30 September 1984, to James J. Brett, Curator, Hawk Mountain Sanctuary, Rt. 2, Kempton, Pennsylvania 19529. The Association's Board of Directors will make a final decision late in 1984. Only students enrolled in a degree-granting institution are eligible. Both undergraduate and graduate students are invited to apply. The award will be granted on the basis of a project's potential to improve understanding of raptor biology and its ultimate relevance to conservation of North American raptor populations.