

statistically. Raw growth data also were compared graphically by inspection. No statistical difference was found in either measure of growth when data were grouped by nesting habitat, year, or size of brood from which young fledged. Visual inspection of graphs of the raw data similarly revealed considerable overlap of measurements with no subgroup departing substantially from any other group. Mortality rates did not differ by year, but were significantly lower in mixed habitats than in cropland and pastureland. Mean size of broods at fledging was significantly larger in 1982 than the preceding two years. Dates of hatching did not differ significantly among years, habitats, or between nests in which one or more young died and nests from which all young fledged. The evidence is used to suggest that Red-tailed Hawks respond to major differences in prey availability according to year (but not by nesting habitat) by adjusting the number of eggs laid. No other reproductive parameter examined, including the growth of the young, is significantly affected by varying levels of prey availability.

Cress, Gary A. 1983. Growth and Productivity of Red-tailed Hawks (*Buteo jamaicensis*) in South-central Kansas. MSc. Thesis, Wichita State University, Department of Biology, 537 Hubbard Hall, Wichita, KS 67208.

MOVEMENTS OF BALD EAGLES ASSOCIATED WITH AUTUMN CONCENTRATIONS IN GLACIER NATIONAL PARK

Movements of Bald Eagles (*Haliaeetus leucocephalus*) associated with autumn concentrations in Glacier National Park were studied during 1979-81. The objectives of the study were to describe movements and habitats used by this group of eagles and to identify a conceptual framework for management of bald eagles and their habitats at the regional level.

Twenty eagles were captured and equipped with radio transmitters at Glacier National Park during autumns 1979 and 1980. Eagles moved south from Glacier through the Flathead and Swan valleys of northwestern Montana. Three eagles remained in these valleys during winter, but most continued south through eastern Idaho. Wintering areas were documented at American Falls Reservoir on the Snake River, Idaho; the Snake River headwaters region of Wyoming, Idaho, and Utah; the Weber River Valley, Utah; the Rush Valley, Utah; the Snake River near Ontario, Oregon; the Carson Valley, Nevada; and the Klamath Basin, Oregon-California. All wintering areas were within the intermountain region. Sightings of additional eagles equipped with colored patagial wing markers at Glacier during autumns 1977-80 fell predominantly (93%) within the intermountain region and were made most frequently in areas used by transmitter-equipped eagles.

In spring, adult eagles followed converging routes from wintering areas to northwestern Montana and continued north along the foothills of the Rocky Mountain through southern Alberta. Near Lesser Slave Lake, Alberta, 2 routes diverged. Some eagles moved north-northeast toward Lake Claire in Wood Buffalo National Park and the east arm of Great Slave Lake, Northwest Territories. Others moved north-northwest toward the west end of Great Slave Lake and Great Bear Lake, N.W.T. Summer ranges were documented at Lake Claire, the Taltson River, N.W.T., Great Slave Lake, and Great Bear Lake.

The most coherent unit for management of bald eagles and their habitats at the regional level appears to be a broad north-south zone, i.e., a flyway. A flyway system that transcends international boundaries seems to offer the greatest potential for long-term conservation of the species.

Young, Leonard Stephen. 1983. Movements of Bald Eagles associated with autumn concentrations in Glacier National Park. M.S. Thesis, University of Montana, Missoula. 102 pp. (Current address: School of Forestry, U. of Montana, Missoula, Mt. 59812)

HAWK MOUNTAIN RESEARCH AWARD

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.