

BALD EAGLE WINTER SURVEY IN THE SNAKE RIVER CANYON, WYOMING

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ABSTRACT.— A 5-year winter bald eagle survey was conducted along 22 km of the Snake River Canyon in northwestern Wyoming. Surveys were done on 94 days requiring 1,414 hrs and 1,888 km driving. In all, 220 (85 percent adults) bald eagles were seen. Seventy-seven percent of all eagles were perching, 15 percent were flying, 4 percent were feeding on road-killed mule deer, and 4 percent were flying low over water. Perching sites were identified as 32 percent cottonwoods, 30 percent spruce, 17 percent Douglas-fir, and 22 percent other. Eagles were somewhat clumped in distribution.

This paper describes a 5-year winter bald eagle survey along part of the Snake River Canyon in northwestern Wyoming. Data on eagle population size and age structure, temporal and spatial distribution, activities, and perching sites were obtained.

The 22 km canyon study area lies south of Jackson Hole, Wyoming, and begins 6.2 km north of Hoback Junction (highway junction of U.S. 89 and 187) and terminates at a point just north of where the Snake River turns abruptly west (Fig. 1). About 90 percent of the river is observable from the highway that parallels it. Elevations range from 1800 m at the river to 3000 m at the tops of the canyon walls.

The river bottom is dominated by narrow-leaf cottonwoods (*Populus angustifolia*), black cottonwood (*P. trichocarpa*), and whip-lash willows (*Salix lasiondra*). Blue spruce (*Picea pungens*) is intermixed. South-facing canyon walls are dominated by Douglas fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), and sagebrush (*Artemisia* spp.). North-facing slopes are vegetated by dense stands of Engelmann spruce (*Picea engelmannii*).

Human population is greatest at Hoback Junction and for about 1.6 km on either side. Mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and moose (*Alces alces*) winter in and near the canyon.

METHODS

The survey was conducted from an automobile along U.S. Highway 89 beginning in midwinter 1974–1975 and continued at irregular intervals, as time and weather permitted, until late 1979–1980. Frequent stops were made along the route as roads, traffic, and winter conditions allowed. Binoculars were used to scan the river, adjacent trees, and canyon walls for birds at each stop. The canyon was also visually scanned while driving. It required about 1.5 hrs per survey and all raptors were noted. Each survey was conducted generally in late afternoon by a single observer (AHK).

RESULTS

Surveys were done on 94 days over the 5 winters (Table 1) and included 1414 hrs visually scanning and 1888 km driving. Two hundred twenty bald eagle sightings were recorded. Adults ($N=193$) comprised 85 percent of the sightings. In September, one eagle was seen; in October, one; in November, 21; in December, 16; in January, 29; in February, 55; in March, 88; and in April, 9.

The mean number of bald eagles seen per survey was 2.3 (range 1–3). The 1974–1975 winter showed a mean of 2.8 birds per

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survey; 1975-1976, 4.7; 1976-1977, 1.9; 1977-1978, 1.7; and 1980, 3.0. March showed the largest mean number of birds per survey with 3.1, followed by February with 2.7, December 2.3, January 1.8, November 1.5, April 1.3, and September and October 1.0.

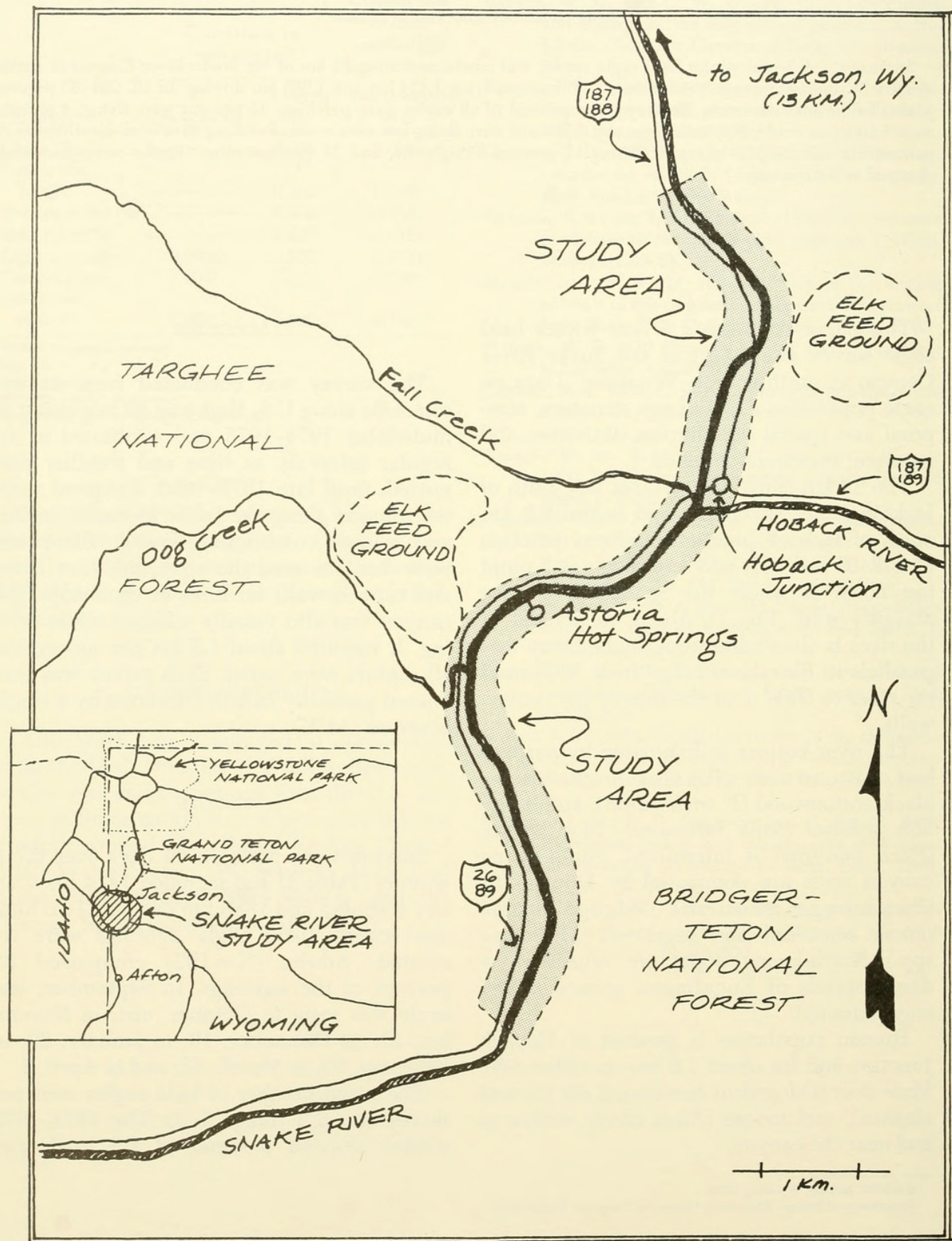


Fig. 1. Location of bald eagle study area in Snake River Canyon, Wyoming (1975-1978, 1980).

Activities were recorded for all 220 birds sighted: 77 percent were perching; about 14.6 percent were flying; 4.4 percent were seen feeding on road-killed mule deer; and 3.9 percent were flying low over water.

The perching site was identified in 169 cases. Fifty-five eagles (32.5 percent) used cottonwoods, 50 (29.6 percent) used spruces, 28 (16.6 percent) used Douglas-fir (old nest site), 19 (11.2 percent) other sites (e.g., ground, rocks), and 17 (10.1 percent) dead snags.

Bald eagles used only the upper one-third of spruce trees for perching (50 in 50 cases), and the middle one-third for cottonwoods (55 in 55 cases), whereas they used the upper two-thirds of snags of both species (17 in 17 cases).

Eagles were clumped in distribution along the 22 km study route. Six concentrations were found. The areas at km 1 and 2, 7, and 13 contained numerous perching sites and the areas at km 16, 20, and 22 all contained one or more active or old nests.

DISCUSSION

The resident winter bald eagle population in the study area is relatively small, probably less than 6 birds. If so, these eagles represent about 20 percent of the greater Jackson Hole population (Davenport and Weaver, in press).

The percent of subadult bald eagles we observed in Wyoming is about half the percentages found in other populations in Utah (Edwards 1969), Montana (McClelland 1973), South Dakota (Steenhof 1976), and in Washington (Stalmaster et al. 1979, Knight et al. 1979). But other areas had as few as 6 percent subadults (Southern 1963, Swenson

1975). Low subadult percentages in Wyoming may reflect low density of carrion as suggested by Stalmaster et al. (1979), which forces subadults to winter further south as suggested by Southern (1964) and Sprunt and Ligas (1966).

Stalmaster and Newman (1979) found that bald eagles in northwestern Washington strongly preferred dead trees for daytime perches. Firs and Douglas-firs were avoided in their study. In South Dakota, Steenhof et al. (1980) found bald eagles preferred mature cottonwoods. We found that bald eagles used the upper two-thirds of cottonwoods and upper one-third of conifers. These perching sites allowed the greatest range of visibility and provided relatively unobstructed flight paths through the crowns as indicated by Stalmaster and Newman (1979), but Steenhof et al. (1980) found proximity of trees to the river and to food more important in habitat selection than tree characteristics.

The clumped distribution of bald eagles along the Snake River was probably due to availability of perching sites and significantly influenced by sites of carrion and fishing areas. Knight et al. (1979) found clumping of eagles in Washington, as did Steenhof et al. (1980) in South Dakota. Stalmaster and Newman (1979) felt that clumping of birds was due to clumping of key habitat elements of diurnal perch sites, proximity to water, feeding sites, nearby open regions, and sighting distances from the perch. Our study did not include measurement of parameters mentioned by Stalmaster and Newman (1979). But from December 1978 to February 1979, 44 dead ungulates provided about 4296 kg of potential food in our study area according to Davenport and Weaver (in press).

TABLE 1. Sampling schedule in days/month by year for the bald eagle winter surveys, Snake River Canyon, Wyoming.

Winters	Months								Total
	S	O	N	D	J	F	M	A	
1974-1975					5	3	7	2	17
1975-1976				2		1	4		7
1976-1977			6	2	2	3	2		15
1977-1978	1	1	8	3	7	1	5		26
1980					2	12	10	5	29
Totals	1	1	14	7	16	20	28	7	94



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