

A PRELIMINARY SURVEY OF RAPTORIAL BIRDS IN THE
IDAHO PRIMITIVE AREA

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The Idaho Primitive Area, a 7285 km² (2813 mi²) wilderness located in central Idaho, offers a unique area for studying animal populations under pristine conditions. Little is known about raptor populations in an environment that has been altered little by man's activities. Consequently, this wilderness expanse was selected as an area for studying birds of prey in a relatively undisturbed setting. The purpose of this investigation was to determine the relative frequencies and densities of raptors that breed in representative habitat types found in the Idaho Primitive Area.

STUDY AREA

The study area was located along 69.2 km (43 mi) of Big Creek from its mouth on the Middle Fork of the Salmon River upstream to the Big Creek Ranger Station (Fig. 1). Vision was often obstructed by ridges or cliffs due to the pronounced topographic relief, but approximately 9.97 km (0.6 mi) on each side of the river was surveyed for breeding raptors. The land area encompassed by the study site was approximately 133.6 km² (51.6 mi² or 1.8% of the Primitive Area). As time permitted other sections of the Primitive Area were sampled to determine species presence in those areas.

Vegetation within the Big Creek drainage study area consisted of approximately 58% conifer forest, 40% grassland and 2% riparian habitat (Fig. 2). A more detailed description of the study area can be found in Hornocker (1970) or Seidensticker et al (1973).

METHODOLOGY

The study area was surveyed throughout the summer (May 20 - August 3, 1977) in a systematic manner which included approximately 1070 km of travel (665 miles; 440 miles on foot, 225 miles on horseback). The Big Creek Trail, which closely follows Big Creek, served as a convenient route for censusing the study area. Other side trails were also used to survey the study area in more detail.

Nest sites were recorded when found, but the primary emphasis was directed toward establishing raptor nesting ranges and assessing densities of the various species inhabiting the study area. Binoculars were used when needed to confirm identifications. Sighting records of paired and single raptors were plotted on 7 by 15 minute topographic maps to help define nesting ranges. Even though a large number of observations is not generally needed to define a range with reasonable accuracy (Craighead and Craighead 1956), the size of some nesting ranges was not calculated because of insufficient sightings.

RESULTS

Twelve species were recorded within the study area during this investigation. These were the Goshawk (*Accipiter gentilis*), Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*), Marsh Hawk (*Circus cyaneus*), Red-tailed Hawk (*Buteo jamaicensis*), Golden Eagle (*Aquila chrysaetos*), Kestrel (*Falco sparverius*), Screech Owl (*Otus asio*), Great-horned Owl (*Bubo virginianus*), Long-eared Owl (*Asio otus*), Saw-whet Owl (*Aegolius acadicus*), and Pygmy Owl (*Glaucidium gnoma*). In addition to these, the Common Raven (*Corvus corax*), which also has raptorial habits, was sighted frequently and

an Osprey (*Pandion haliaetus*) was sighted in 1976 on June 10 and 12 in the Chamberlain Basin portion of the Primitive Area.

Kestrel

Kestrels began nesting in the warmer and drier portion of the study area near the Middle Fork of the Salmon River prior to our arrival on the study area (first nest recorded May 27). This species was the most abundant raptor in the study area and utilized the grassland and open cliffs as hunting and nesting sites. Nesting chronology near the mouth of Big Creek was 2 - 3 weeks ahead of Kestrels nesting 40.2 km (25 mi) upstream. In this segment of the drainage there was an elevation difference of 427 m (1400 ft). Young began to fledge in mid-June near the mouth of Big Creek and the last pair fledged on 22 July near Monumental Creek (Fig. 1). Kestrel territories did not extend much farther upstream. Beyond this point the vegetation changed from grassland on the south facing slopes to conifer forests of Ponderosa Pine (*Pinus ponderosa*), Douglas Fir (*Pseudotsuga menziesii*) and, at higher elevations, to Lodgepole Pine (*Pinus contorta*). The chronology of plant development exhibited roughly the same time lag between the mouth of Big Creek and Monumental Creek as the Kestrel reproductive cycle.

Twenty-three pairs of Kestrels had a nesting range which included at least part of the study area. Most of the land area covered by grassland or brush was utilized by at least one pair. The average size of the nesting range (n=23) was 1.76 km² (0.68 mi²; Table 1).

Because Big Creek primarily runs west and east, the south and

north slopes of the drainage support quite different types of vegetation. The north facing slope was predominantly covered by Douglas Fir and south facing slopes were composed mainly of bunchgrass (*Agropyron spicatum*) and balsamroot (*Balsamorhiza sagittata*). Since the Kestrel is adapted to the open country, the vegetation greatly influenced their utilization of the study area. Other factors which seemed to influence territory size and site selection were topography, location of favorite hunting perches, the location of the nest site and the relative abundance of prey. Figure 3 illustrates the size and shape of some of the nesting ranges. These ranges appeared to be roughly rectangular.

Sharp-shinned Hawk

The Sharp-shinned Hawk was the second most common hawk on the study area and was usually observed in open riparian or park-like stands of conifer forest. Since this type of habitat was often discontinuous in the study area, nesting sites exhibited a tendency toward isolation. The average nesting range (n=7) was 0.85 km² (0.33 mi²; Table 1) and the shape was generally structured to follow a waterway. Consequently, several nesting ranges were long and narrow. Observations of Cooper's Hawks and Goshawks were recorded in more variable habitat than the Sharp-shinned Hawks.

Red-tailed and Marsh Hawks

Both Red-tailed Hawks and Marsh Hawks were observed to nest within the study area in previous years but neither species was recorded to nest in the drainage in 1977. Red-tailed Hawks were found nesting in the higher meadows of Chamberlain Basin outside

the study area while breeding Marsh Hawks were completely absent from the study area and also from known nest sites recorded in Chamberlain Basin the previous year. One female Marsh Hawk was observed in the Big Creek Drainage on August 3, 1977.

Golden Eagle

Four pairs of Golden Eagles included the study area as part of their nesting range; two of those pairs nested in the study area. Colonies of Columbian Ground Squirrels (*Spermophilus columbianus*) in burned areas, and a Yellow-bellied Marmot (*Marmota flaviventris*) colony in talus, were hunted regularly by these eagles. Overlap of nesting ranges occurred at the peripheries, especially near favored hunting areas. However, these areas of mutual use were not observed to be hunted by different pairs at the same time. The average area of Golden Eagle nesting ranges (n=2) approximated 69.9 km² (27 mi²; Table 1).

Raven

Nesting ranges of this species tended to be widely separated from each other. Only the area close to the nest was vigorously defended against other ravens or hawks which flew near that vicinity. A nesting range of 8.29 km² (3.2 mi²; Table 1) was determined for one regularly observed pair.

Owl

The Owls were difficult to census because of their nocturnal habits. Nevertheless, representatives of the five species of owls recorded, were sighted throughout the summer. All of these were found in the Douglas Fir forest type which was the most abundant

forest cover in the study area. The Long-eared Owl and Great-Horned Owl were also found in Lodgepole Pine forests of the Chamberlain Basin. The Screech Owl and Long-eared Owl are additions to the bird checklist compiled for the Primitive Area by Seidensticker and Welch (1972). Additional studies, especially those utilizing prerecorded calls, should increase sightings of owls in the area.

DISCUSSION

The two most abundant raptors recorded in the Big Creek Drainage of the Idaho Primitive Area was the Kestrel and the Sharp-shinned Hawk. Respectively, they composed 68% and 20% of the recorded nesting raptors. In general, the Kestrel confined its activities to open country and the Sharp-shinned Hawk resided almost exclusively in the open forest and riparian habitats. In grassland habitat the Kestrel density averaged 4.3 pairs per 10 km² (11.1 pairs per 10 mi²). The average nesting range of 1.76 km² is within the average range recorded by Craighead and Craighead for 11 pairs of Kestrels (2.02 km² in Wyoming; 1956) and Balgooyen for 32 pairs (1.09 km² in California; 1976). A maximum density for Sharp-shinned Hawks in riparian and park-like stands of conifer was recorded at 1.9 pairs/10 km² (5.0 pairs per 10 mi²). The average size nesting range of 0.86 km² corresponds to a nesting range size of 1.1 km² obtained in Wyoming for 2 pairs of Sharp-shinned Hawks (Craighead and Craighead 1956). Lack (1966) and Brown (1969) concluded the size of Kestrel territories served to space individual pairs in the available habitat.

Virtually all of the grassland habitat was well surveyed and therefore all of the Kestrel pairs that utilized the study area were probably recorded. However, because in forested habitat the viewing distance is limited by trees, only about 40% of this habitat was adequately surveyed. Therefore woodland hawk populations are probably higher than our census indicated even though most of the riparian habitat and creek bottoms were well searched. Since this habitat appears to be favored by Sharp-shinned Hawks, Cooper's Hawks and Goshawks these species are more likely to be observed there. Consequently, a reasonable estimate of approximately 13 pairs of Sharp-shinned Hawks utilized the study area for nesting. In forested habitat an average of 1.6 nesting pairs of Sharp-shinned Hawks could be expected per 10 km² (4.2 per 10 mi²). Cooper's Hawks and Goshawks may also prove to be more abundant.

The Golden Eagle was the other major component of the raptor population. These birds preyed extensively upon scattered colonies of Columbian Ground Squirrels. Their relatively large nesting ranges that averaged 70 km² reflect the territory size necessary to support a breeding pair. This compares with the average size nesting range in California of 93 km² (Dixon 1937) and 70 km² in Scotland (Lockie 1964).

Why was there an absence of intermediate size hawks such as Red-tailed Hawks and Marsh Hawks in the study area this year when they have been known to nest there in previous years? We hypothesize that the lack of moisture this year may be associated with their absence. The low spring runoff for the last several winters has caused ground water reserves to become depleted. Consequently above ground stream flow has decreased or ceased altogether. New

plant growth and seed production was probably less this year, and plants went into winter dormancy earlier. These events may influence the small mammal populations dependent on these plants. By the middle of July this year, Kestrels that fledged young began to disperse. By the end of July most of the Sharp-shinned Hawks began to migrate from the area as their songbird prey base diminished.

To examine what effect these dry conditions may have had on the prey base, a brief census of the small mammal population was conducted. In late July we retrapped some of the transects which had been sampled in June of the previous year. Three hundred trap nights were recorded in the bunchgrass habitat and 100 trap nights were obtained in riparian habitat. Four deermice (*Peromyscus maniculatus*) were taken, all adults. Neither of the two females recorded were pregnant. This compares with 26 mice taken from the same areas for the same number of trap nights a year before. These data suggest that small mammal populations may have been depressed from the year before and the decline in raptor populations on the study area could have reflected this prey base decline. Balgooyen (1976) hypothesized the difference in nesting range sizes between his Kestrel data and that presented by Craighead and Craighead (1956) was a function of available prey. Both Red-tailed Hawks and Marsh Hawks also prey heavily on small rodents (Craighead and Craighead 1956). Both have previously been known to nest in the study area. However, in 1977 Red-tailed Hawks were restricted to the mountain meadows and Marsh Hawks were entirely absent from the nesting population.

Apparently the available prey base was still sufficient to

support the smaller raptor species, but they also left as soon as their young had fledged. By August only a few representatives of these species remained from the summer nesting population.

The possibility of the Big Creek drainage serving as a release site for species such as the Prairie Falcon (*Falco mexicanus*) definitely has merit. Suitable nesting cliffs exist from Mile Hi to Cabin Creek and also near the mouth of Big Creek. The level of human disturbance would be low. Columbian Ground Squirrels could serve as a food base and are present in the Mile Hi area in large concentrations. If the irrigated pastures near Cabin Creek are allowed to become recolonized by the ground squirrels this food base would increase substantially.

SUMMARY

The objective of this study was to gather preliminary information on the densities of raptors in the pristine habitat of the Idaho Primitive Area. Between mid-May and early August, 12 raptor species were recorded in the study area along Big Creek. The most abundant species was the Kestrel and it inhabited the grassland habitat at a species density of 4.3 pairs per 10 km². The Sharp-shinned Hawk was the most common woodland dweller and restricted its nesting to the open forest and riparian habitats. A density of 1.9 nesting pairs of this species per 10 km² of suitable habitat was estimated.

It is hypothesized that due to the drought conditions in the study area this year, the small mammal prey base was depressed. This may have resulted in the lack of Red-tailed Hawks and Marsh Hawks in the study area where they had nested the previous year.

The dry conditions may have forced resident raptors to migrate from the study area earlier than usual.

Table 1. Nesting season ranges of raptors along Big Creek, Idaho, 1977.

SPECIES & Sample Size		OBSERVED AREA		MAXIMUM DIAMETER		OBSERVATIONS PER NESTING RANGE
		mi ² (Acres x 640)	km ² (Hectares x 100)	mi	km	
Kestrel n=23	\bar{x}	0.68	1.76	1.17	1.88	25.4
	s	0.19	0.49	0.24	0.38	15.4
	Range	0.41-1.20	1.06-3.11	0.8-1.8	1.29-2.65	7-75
Sharp-shinned Hawk n=7	\bar{x}	0.33	0.86	1.51	2.43	12.1
	s	0.09	0.23	0.26	0.42	11.5
	Range	0.22-0.47	0.57-1.22	0.95-1.70	1.53-2.74	4-34
Golden Eagle n=2	\bar{x}	27.00	69.90	30.50	49.08	45.0
	s	4.24	10.99	2.12	3.42	14.1
	Range	24-30	62-78	29-32	47-51	35-55
Cooper's Hawk n=1		0.76	1.97	1.70	2.74	3
Raven n=1		3.20	8.29	2.60	4.18	30

Idaho Primitive Area

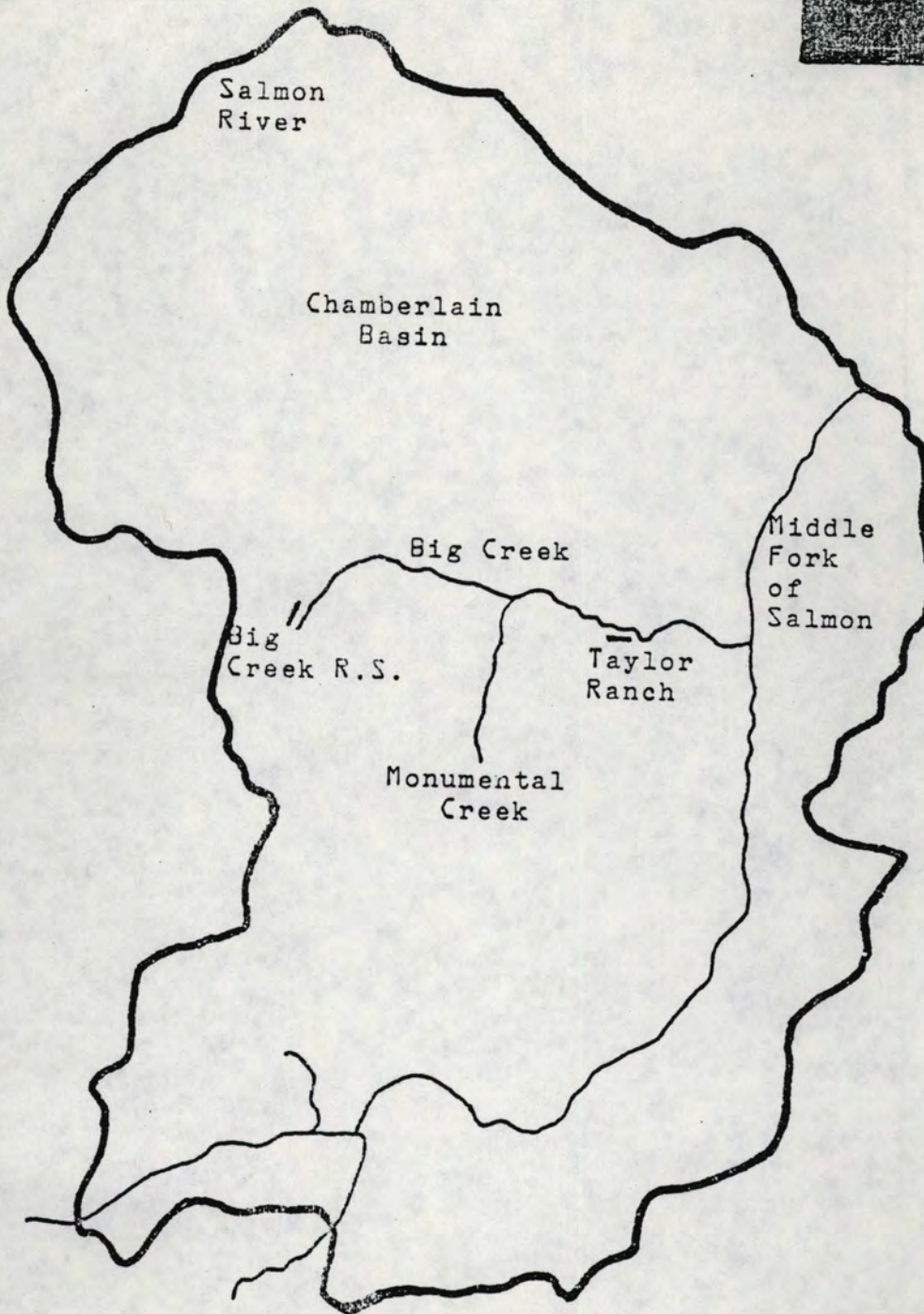


Figure 1. Big Creek in relation to the Idaho Primitive Area.

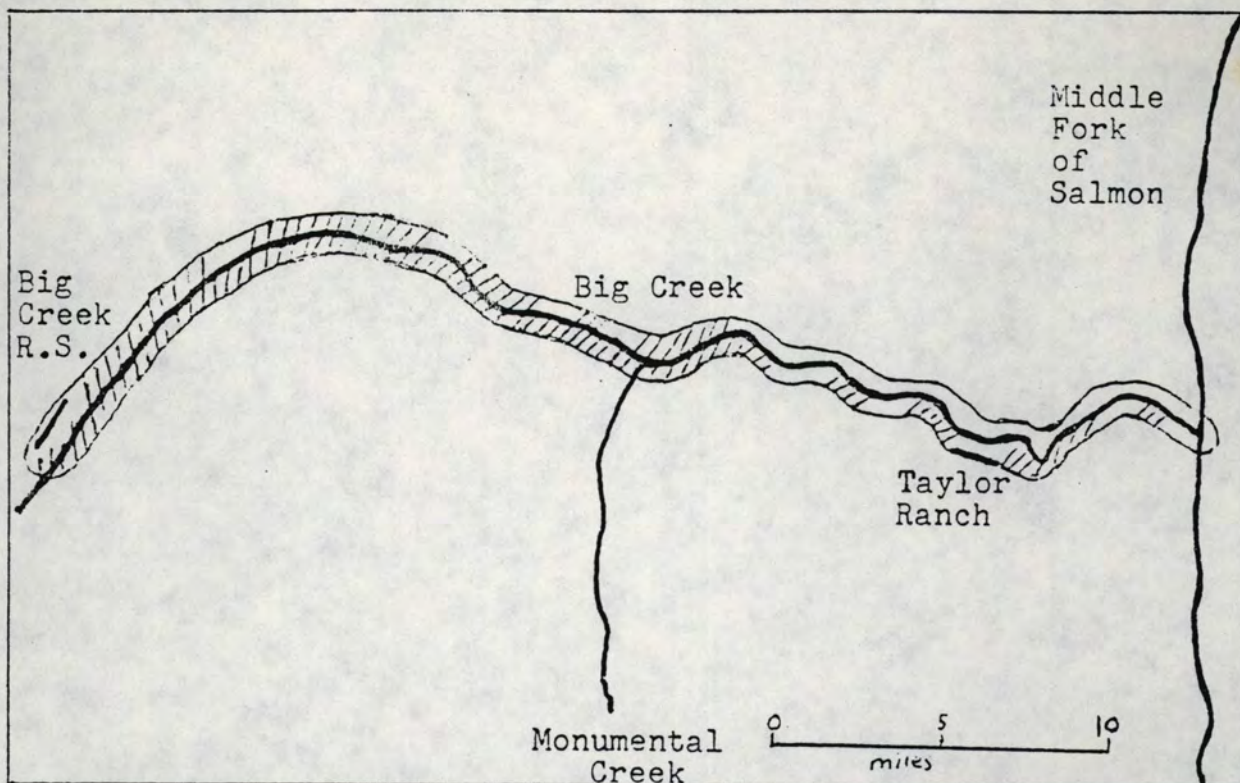




Fig. 2. A general habitat distribution map along the Big Creek study area. Forested habitat= Grassland habitat=,

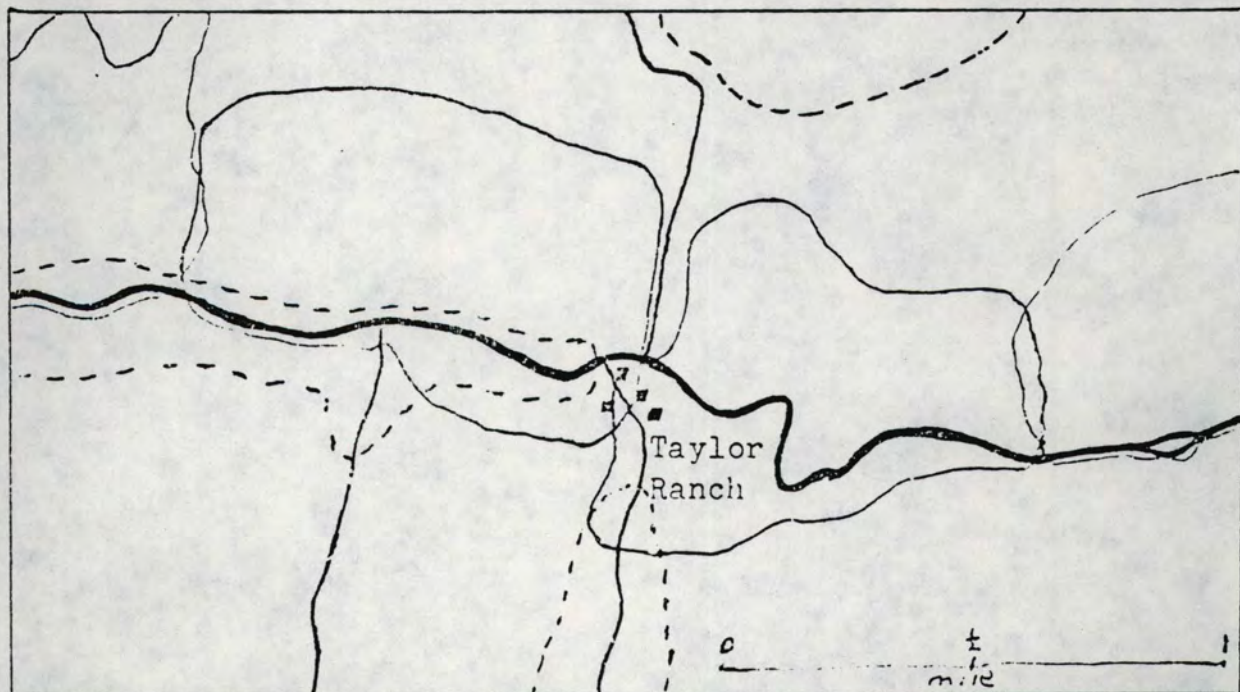


Fig. 3. Nesting ranges of the Kestrel (solid-lined enclosures) and Sharp-shinned Hawk (broken-lined enclosures) on a portion of the study area.

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