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## PRELIMINARY SURVEY OF RAPTOR SPECIES IN THE MANTI DIVISION, MANTI-LA SAL NATIONAL FOREST

Stephen G. Jones<sup>1</sup>

**ABSTRACT.**— A preliminary survey of raptor species and habitat in the Manti Division, Manti-LaSal National Forest, was conducted during May 1977. Eight species of raptors were recorded, the most common being the Golden Eagle (*Aquila chrysaetos*) and American Kestrel (*Falco sparverius*). Nine additional nesting and migratory species were reported by cooperating observers and based on habitat analysis another two species are expected. Eleven Golden Eagles, representing at least eight pairs, were observed and it is estimated that from 15 to 20 pairs of eagles inhabit the division. The Manti Division provides habitat for two endangered species, the Peregrine Falcon (*Falco peregrinus anatum*) and the Northern Bald Eagle (*Haliaeetus leucocephalus alascanus*). Further research is needed to ascertain the impact that current development activities in the division will have on the raptor community.

With the increased awareness of the critical role that raptors play in balanced ecosystems and the declining nature of many species, land management for the conservation of birds of prey has become an important consideration of governmental agencies administering public lands (White 1974, Olenдорff and Kochert 1975). Although U.S. Forest Service lands are administered under the multiple land use philosophy (Griswold, 1978) the conservation of habitat and the protection of areas critical to threatened or endangered species are of prime importance. Paramount to this goal is the identification of species inhabiting an area and assessment of available habitat for species suitability. The present study was conducted to identify the raptor species inhabiting the Manti Division, Manti-LaSal National Forest, and to assess the available habitat for suitability to raptors. This survey takes on added significance because this area is being impacted by the construction and operation of energy-operating facilities. Judgments on critical habitat and the impact of human activity in the division on the raptor community were made but are presented elsewhere (Jones 1977).

### STUDY AREA AND METHODS

The Manti Division is located in central Utah about 32 km west of Price and extends

southward for approximately 120 km (Fig. 1). Elevation ranges from 1,400 to 3,500 m above sea level. The east rim of the Wasatch Plateau forms the eastern boundary of the division. The predominant vegetation types are pinyon-juniper and sagebrush and, at higher elevations, aspen and spruce-fir. Approximately 8 percent of the division is under private ownership. Seven coal mines and four sawmills are operating in or near the national forest.

This study was conducted in the southeastern portion of the Manti Division, encompassing an area of about 960 sq. km. The major canyon systems, the intermittent and permanent streams, and the associated riparian areas provide the habitat used by raptors in the division and were the focal points of this study.

Field work was conducted from 1 May to 15 May 1977. Each of the canyon systems and areas shown in Figure 1 was examined at least once, and in most cases twice. Vehicle travel was possible in all areas except Upper Rocky and Muddy Creek canyons. Raptors were observed and cliff areas examined with 7 × 35 binoculars and a 20X spotting telescope. Data were collected on species seen, nests located, and the suitability of the available cliff, riparian, prey, and roosting habitats present. All nests were delineated on USGS 7½ minute topographic maps for use by Forest Service personnel.

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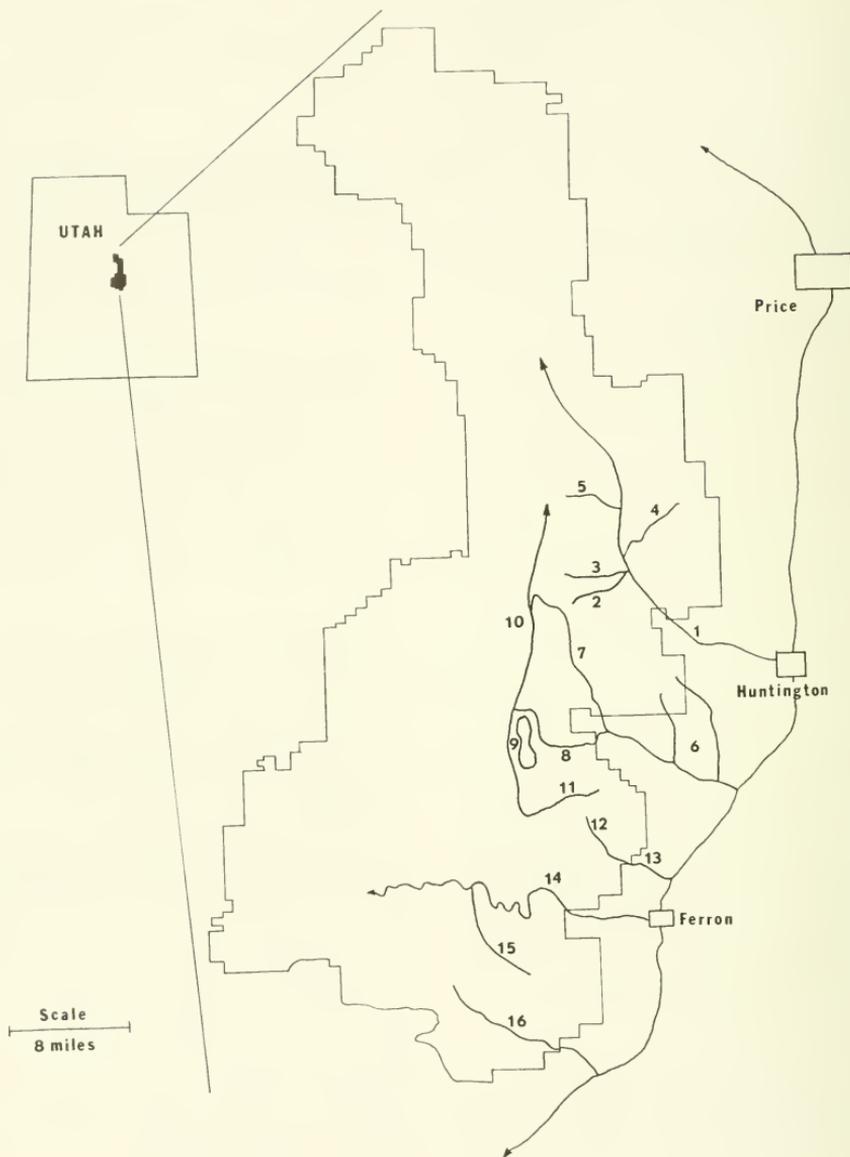


Fig. 1. Manti Division, Manti-LaSal National Forest. Numbered areas refer to canyon systems and areas surveyed for raptor species and habitat: 1. Huntington Canyon, 2. Rilda Canyon, 3. Mill Fork Canyon, 4. Tie Fork Canyon, 5. Crandall Canyon, 6. Grimes Wash and Danish Basin, 7. Cottonwood Canyon, 8. Straight canyon, 9. Lower Joes Valley and Lowry Canyon, 10. Upper Joes Valley, 11. North Horn Mountain, 12. Upper Rock Canyon, 13. Lower Rock Canyon including east rim, 14. Ferron Canyon and Bull Hollow, 15. Ferron Canyon overlook and Flagstaff Peak, 16. Muddy Creek Canyon.

The analysis of habitat suitability was based on actual sightings or the probability of use by raptors. Judgments on the probable use of an area were made according to the habitat preferences of each raptor species as described in McGahan (1968), Camenzind (1969), and Beecham and Kochert (1975) for the Golden Eagle (*Aquila chrysaetos*); Porter and White (1974) for the Prairie Falcon (*Falco mexicanus*) and Peregrine Falcon (*F. peregrinus anatum*); Smith and Murphy (1973) and Hayward et al. (1976) for hawks and owls in Utah; Jones (1978) for *Accipiter* hawks and Joseph (1977) for the Northern Bald Eagle (*Haliaeetus leucocephalus alascanus*) wintering in Utah. Judgments about prey habitat were made based on numbers and diversity of potential prey species seen. Special efforts were made to locate eagle nests, as the Golden Eagle is the most sensitive raptor to habitat destruction and disturbance nesting in the division.

## RESULTS

Table 1 presents a list of the eight species of raptor seen and an analysis of the habitat suitability for each of the areas visited. Most commonly seen were Golden Eagles and the American Kestrel (*F. sparverius*), with the Red-tailed Hawk (*Buteo jamaicensis*) and Cooper's Hawk (*Accipiter cooperii*) being seen on several occasions and a Goshawk (*A. gentilis*), Sharp-shinned Hawk (*A. striatus*), and Prairie Falcon each observed once. Great-horned Owl (*Bubo virginianus*) cavities were seen in five areas.

In addition to my sightings, cooperating observers recorded other species of raptors for the division. C. Jemmett, U.S. Forest Service, reports (pers. comm.) occasional Osprey (*Pandion haliaetus*), wintering Bald Eagles, and a Peregrine Falcon in the division. The Ferruginous Hawk (*B. regalis*), Swainson's Hawk (*B. swainsoni*), Turkey Vulture (*Cath-*

TABLE 1. Raptor species seen and habitat suitability in Manti Division, Manti-LaSal National Forest.

Areas surveyed	Species observed and expected <sup>1</sup>										Habitat <sup>1</sup>		
	Goshawk	Sharp-shinned	Cooper's	Red-tailed	Golden Eagle	Eagle nest	Prairie Falcon	Kestrel	Owl cavity <sup>2</sup>	Cliff	Riparian	Prey	Roosting <sup>4</sup>
1. Huntington C.	+	-	P	P	-	-	-	+	-	L,I	I	I	-
2. Rilda C.	P	P	-	-	-	-	-	-	-	I	I	I	-
3. Mill Fork C.	P	P	-	P	+	P	-	-	-	I,H	I	I	-
4. Tie Fork C.	P	P	-	P	-	-	-	-	-	I	I	I	-
5. Crandall C.	+	+	+	-	-	-	-	-	-	L	H	I	-
6. Grimes Wash, Danish Basin	-	-	-	-	+	P	-	P	-	L,I	-	H	-
7. Cottonwood C.	P	P	-	P	+	+	-	+	+	I,H	I,H	I,H	-
8. Straight C.	+	-	+	-	+	+	-	+	+	I,H	I,H	I	-
9. Lower Joes Valley, Lowry C.	-	+	-	+	+	+	+	+	+	I,H	I,H	H	H
10. Upper Joes Valley	P	-	-	P	+	P	-	P	-	-	I	H	-
11. North Horn Mtn.	-	-	-	-	+	-	-	+	-	-	-	H	-
12. Upper Rock C.	-	-	-	-	+	+	-	P	-	I,H	-	L,I	-
13. Lower Rock C., East Rim	-	-	-	-	+	-	-	-	+	L,I	-	L,I	-
14. Ferron C., Bull Hollow	-	-	P	-	+	P	-	+	-	L,I	I,H	I,H	H
15. Ferron C., Flagstaff Peak	P	-	-	+	-	-	-	P	+	L,I	-	I	-
16. Muddy Creek C.	-	-	+	-	-	-	-	P	-	L,I	I	I	-

1. Species and structures: + = Observed, - = Not observed, P = Probable occurrence.

2. Cavities assumed used by Great-horned Owls.

3. Habitat suitability: L = Low, I = Intermediate, H = High

4. Roosting habitat suitability judged with respect to wintering Bald Eagles.

*artes aura*), Marsh Hawk (*Circus cyaneus*), Saw-whet Owl (*Aegolius acadicus*), and Flammulated Owl (*Otus flammeolus*) have been recorded by Phil Wagner, Division of Wildlife Resources (pers. comm.). However, several of these species inhabit the division only during migration. Based on habitat analysis and distribution accounts in Behle and Perry (1975) and Hayward et al. (1976), another two species, the Screech Owl (*O. asio*) and Pygmy Owl (*Glaucidium gnoma*), should also occur in the Manti Division.

Eleven Golden Eagles, representing at least eight pairs, were seen within nine areas. The eagle sighted on North Horn Mountain is believed to nest in Upper Rock Canyon. Seven eagle nests were found within four areas; centers of these nesting areas were from 6.4 to 12.8 km apart. Approximate home range sizes for the eagles in the division can thus be calculated as 44 to 132 sq. km, assuming a roughly circular territory (see Smith and Murphy 1973).

Goshawks, Sharp-shinned, and Cooper's hawks appear to be rather common residents in the Manti Division. Suitable riparian habitat in most areas was occupied or suspected to be occupied by at least one of the three species. Typically, the Cooper's Hawk will select the lower elevations with more open habitat, with the Goshawk and Sharp-shinned Hawk nesting higher up and accepting steep canyons. Crandall Canyon supported all three species. Due to the secretive nature of these hawks, observations are uncommon even in areas where they are nesting.

Red-tailed Hawks should occur more commonly in the division than the few actual sightings would indicate. They are suspected of nesting on many of the same cliffs that the eagles were using. During winter the Red-tailed Hawk is the most commonly seen hawk in the division (P. Wagner, pers. comm.).

The sighting of the Prairie Falcon in Lower Joes Valley is the first record of this species for the division (C. Jemmett, pers. comm.). Suitable nesting areas for Prairie Falcons were found in Lower Joes Valley and Cottonwood Canyon. The individual sighted is believed to nest in the canyons west of Lower Joes Valley.

Where seen, Kestrels were numerous. In

Lower Joes Valley at least six pairs showed nesting activity during this study. The only habitats not supporting Kestrels were the dry sagebrush areas and the steep mountain canyons.

Cavities suspected of being used by Great-horned Owls were seen in five different areas. Great-horned Owls should be widely distributed in the Manti Division. Nesting cavities do not always show signs of usage, and crow or hawk nests are often used by owls. The other species of owls recorded or suspected are also thought to be widely distributed in the division.

A correlation from Table 1 of species presence and habitat availability is indicative of the rather restricted habitat preference of *Accipiter* hawks and the general preference of eagles, Red-tailed Hawks, and Kestrels. The dry mountainous habitat of the Manti Division will support a certain assemblage of breeding raptors, but other species will be restricted. Ultimately, habitat availability and climatic regimes are responsible for the avian species living in an area. In the Manti Division steep-sided canyons occupied by *Accipiter* hawks open into sloping sagebrush valleys or high aspen meadows that are utilized by eagles, Red-tailed Hawks, and Kestrels. Little falcon habitat is available, except in Lower Joes Valley. The higher elevations restrict such lower desert species as the Ferruginous Hawk.

#### DISCUSSION

The Manti Division supports a high diversity of raptors, with as many as 17 species utilizing the division during the breeding season and on migration. This study provides an estimation of the breeding raptors within the area surveyed. Wagner (unpubl. ms.) provides data on the raptors utilizing the division during migration. On 1-2 September 1977 a count of migrating raptors along the Manti Mountain-Skyline Drive yielded the following numbers for each species: Turkey Vulture—5, Goshawk—1, Cooper's Hawk—3, Sharp-shinned Hawk—1, Red-tailed Hawk—66, Swainson's Hawk—1, Ferruginous Hawk—1, Golden Eagle—4, Kestrel—43, Prairie Falcon—2 and Marsh Hawk—3 (total = 130). This list is similar to the breeding list with

the exception of the relative numbers of each species.

Wintering Bald Eagles will utilize Lower Joes Valley reservoir and should also be present in Ferron Canyon. C. Jemmett reports (pers. comm.) that Bald Eagles stay at Lower Joes Valley reservoir as long as waterfowl are present on the reservoir. In severe winters the reservoir and stream freeze over by January and are not used by wintering eagles. Important characteristics of areas used by wintering Bald Eagles are permanent streams which do not freeze over, riparian type vegetation with a high degree of exposure, and the presence of migrating waterfowl, rabbits, or an abundance of local fishes as prey species (Joseph 1977).

The density of nesting Golden Eagles found on the Manti Division is similar to that found in other western states. McGahan (1968) found the maximum area used by eagles in Montana was from 180 to 205 sq. km. Dixon (1937) reports the area used by 27 nesting pairs in the California foothills ranged from 52 to 160 sq. km. Assuming that eagles are distributed evenly over the entire Manti Division and using the value of 80 sq. km to represent their approximate habitat size requirements, the division should support from 15 to 20 pairs. Considering the number of eagles observed during this rather limited study, the above estimate seems conservative. Nesting densities of eagles in central Utah can, however, vary greatly between years, with cyclic fluctuations in prey densities (Camenzind 1969, Murphy 1975).

Analysis of habitat suitability for raptors shows that relatively few areas in the division provide habitat for all species, or complete habitat for any one species (Table 1). The notable exceptions to this are Crandall Canyon, Cottonwood Canyon, Lower Joes Valley, and Ferron Canyon; these areas provide both nesting and foraging habitat for three to six species. More typically, however, suitable nesting habitat is found in one area and foraging habitat in another area. For example, North Horn Mountain may be used for foraging by as many as three pairs of Golden Eagles, but on the mountain proper there is no eagle nesting habitat.

In addition to the utilization of the habitat within the division by an endangered species,

the Bald Eagle, and a sighting of a second endangered species, the Peregrine Falcon, several of the other resident raptors, are experiencing population declines in other areas of the United States. The need for protection of populations of these species is, therefore, critical. Important in this is an understanding of the ecology of each species of raptor involved, including its breeding requirements, nesting habits, and foraging and food habits. Further research on the raptors in the Manti Division is recommended so that current development activities do not threaten the species now utilizing the area. Murphy (1978) outlines management techniques for the western raptors which would be applicable for the Manti Division. Schamberger and Farner (1978) discuss the process of using habitat evaluations in project planning, which is also applicable. The raptors in the Manti Division represent a valuable natural resource, as important for ecological, scientific, and aesthetic reasons as energy resources and recreational potential are for economic reasons.

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