TECHNICAL BULLETIN NO. 97-15 IDAHO BUREAU OF LAND MANAGEMENT September 1997

1996 Raptor Survey of the Lower Salmon and Snake Rivers and Summary of Raptor Surveys Conducted 1993-1996

by
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1996 RAPTOR SURVEY OF THE LOWER SALMON AND SNAKE RIVERS

AND SUMMARY OF RAPTOR SURVEYS CONDUCTED 1993-1996

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ABSTRACT

Six raptor species were identified at 20 survey points on the lower Salmon and Snake Rivers between 29 March and 7 April 1996. Golden eagles (*Aquila chrysateos*) were the most frequently observed raptor (0.73 birds/hour) followed by red-tailed hawks (*Buteo jamaicensis*) (0.52 birds/hour), and American kestrels (*Falco sparverius*) (0.36 birds/hour). Prairie falcons (*Falco mexicanus*), northern harriers (*Circus cyaneus*), and bald eagles (*Haliaeetus leucocephalus*) were less frequently observed. No peregrine falcons (*Falco peregrinus*) were observed.

Eleven species of diurnal and 2 species of nocturnal raptors have been documented in the 3 years this survey has been conducted (1993, 1994, and 1996). In addition to the 6 species observed in 1996, raptors observed in previous years include: turkey vultures (*Cathartes aura*), osprey (*Pandion halliaetus*), sharp-shinned hawk (*Accipiter striatus*), Coopers hawk (*A. cooperii*), northern goshawk (*A. gentilis*), great-horned owl (*Bubo virginianus*), and western screech owl (*Otus kennicotti*).

Golden eagles were the most common and red-tailed hawks the second most common species every year. In 1993 and 1996, American kestrels were the third and northern harriers the fourth most frequently observed species. In 1994, northern harriers were more common than American kestrels. In 1993, 1994, and 1996, overall raptor abundance tended to be highest in the upper portion of the survey area, from Hammer Creek to Cougar Canyon on the Salmon River. Observation rates were more variable among points than among years. Therefore, conducting the survey either annually or for several consecutive years at 5-year intervals may increase likelihood of detecting changes in relative abundance of common raptor species as compared to conducting the survey once every 2-5 years.

No peregrine falcons have been detected during the 3 years of the survey. Mapping historical and potential nesting habitat and conducting ground-based surveys focused on peregrine falcons during April and/or June for several years is recommended to increase likelihood of detecting this species. We recommend conducting the multi-species survey again for 3 consecutive years starting in 1999. If variability is similar to that observed 1993-1996, the following changes in relative abundance could be detected: golden eagles $\pm$ 14%, red-tailed hawks $\pm$ 62%, American kestrels $\pm$ 112%.

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INTRODUCTION

This survey continues a project started in 1993 to monitor the relative abundance of raptors along the lower Salmon and Snake Rivers. The survey is also designed to search for peregrine falcons. Peregrine falcons have been recently released into historically used adjacent habitat (Fisher 1978, Heinrich 1986, 1987, 1988, 1989, 1990, 1991, 1992). This report summarizes the 1996 survey and compares results to surveys conducted in 1993 and 1994 (Bradford 1994, Bradford and Cassirer 1994).

STUDY AREA

The survey area covered approximately 94.5 km of the lower Salmon and Snake River canyons in west-central Idaho. This included 83.3 km on the lower Salmon River, from the Hammer Creek boat launch (RM 53) to the mouth; and 11.2 km on the Snake River from the mouth of the Salmon River to Cottonwood Creek (RM 181.2) (Fig.1).

The lower Salmon and Snake River canyons are characterized by steeply dissected, tiered grasslands and dry forest communities intermingled with vertical rock cliffs. The lower Salmon River has been recommended for designation under the Wild and Scenic Rivers Act and is a Bureau of Land Management (BLM) Area of Critical Environmental Concern. The Snake River is a scenic river within the survey area. The east bank of the Snake River within the survey area is managed primarily by the BLM and the Idaho Department of Fish and Game, the west bank is in the Wallowa-Whitman National Forest, Hells Canyon National Recreation Area.

Previous raptor surveys of the same general area using various methods were conducted in the late 1970's (Asherin and Claar 1976, Kochert 1977, Fisher 1978).

METHODS

Survey dates were 29 March to 7 April 1996. This is during the peregrine falcon courtship and egg-laying period and is considered optimal for peregrine falcon observation. Golden eagles are incubating, red-tailed hawks are laying and incubating, and prairie falcons are laying (Kochert et al. 1991). Surveys were conducted at 20 observation points established in 1993: 17 on the Snake River and 3 on the lower Salmon River (Bradford 1994, Bradford and Cassirer 1994). A raft was used to travel between observation points. Observation points were chosen to maximize observation of cliff habitat and to distribute the effort over the entire survey area. Survey points were generally located 0-15 m from the river except point 14 which was located 2.5 km from the river on Skeleton Creek in order to observe vertical cliffs in the area. The survey was conducted during morning or late afternoon hours of full daylight and during relatively calm periods with little or no precipitation. Three observers spent approximately 2 hours at each point, as permitted by weather conditions and logistics.

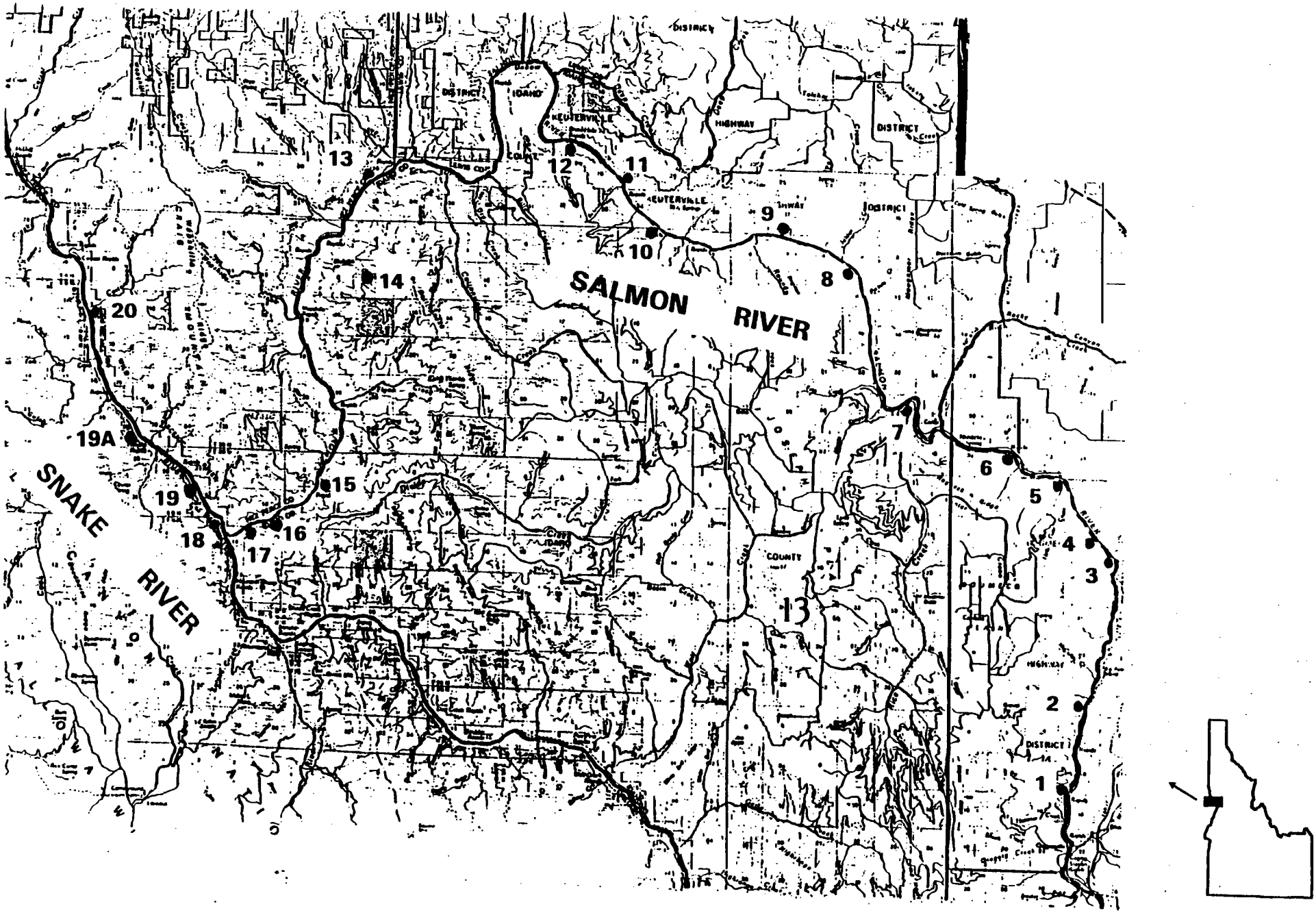

Figure 1. Lower Salmon and Snake River raptor survey area and observation points (from Bradford 1994).

Observers recorded the number and behavior of all raptors observed on a standard survey form (Appendix A).

RESULTS AND DISCUSSION

Six raptor species were identified during the 1996 survey: golden eagle, red-tailed hawk, American kestrel, northern harrier, prairie falcon, and bald eagle (Table 1). The most commonly observed raptor was golden eagle (0.73 birds/hour, n=29) followed by red-tailed hawk (0.52 birds/hour, n=20), American kestrel (0.36 birds/hour, n=14), northern harrier (0.15 birds/hour, n=6), prairie falcon (0.09 birds/hour, n=4), and bald eagle (0.03 birds/hour, n=1). Seven unidentified raptors were observed; 4 were classified as falcons, 1 as an accipiter, and 2 were large (buteo or eagle). A mean of 4.05 raptors were observed per observation point (2.06 birds/hour, n=81 raptors) (Table 1). Several raptors were also observed incidentally between observation points (Table 2). No peregrine falcons were observed.

Although golden eagles were slightly more abundant than red-tailed hawks, this was not significant ($P > 0.05$). However, golden eagles were more widespread: they were observed at 14 of 20 points (70%), whereas red-tailed hawks were observed at 8 points (40%). American kestrels were observed at 7 points (35%) (Table 1).

The greatest number of raptors was observed at point 4 on the Salmon River, about 1.2 km below Shorts Bar. This was also the the location where northern harriers were most common. Golden eagles and red-tailed hawks were most common at Pine Bar (points 5 and 6) and bald eagles were only observed in this area (point 5) and near Shorts Bar (point 3). American kestrels were most common at point 19, Snake River north of First Creek. Prairie falcons were only observed at point 14, Skeleton Creek, Salmon River (Table 1, Fig. 2).

Comparison of Survey Results Among Years

Eleven diurnal and 2 nocturnal raptor species have been observed during the 3 years this survey was conducted. The highest number of species (12) was observed in 1993. Nine species were observed in 1994. In addition to the 6 species observed in all 3 years; turkey vultures, osprey, sharp-shinned hawk, Coopers hawk, northern goshawk, great-horned owl, and western screech owl were observed in 1993 and/or 1994 but not in 1996.

Total raptor abundance was highest (although not significantly) in the upstream part of the survey area, from Hammer Creek to Cougar Canyon on the Salmon River (Fig. 2, Table 4). Some individual points also had relatively high or consistent numbers of particular raptor species. Golden eagles were consistently abundant at point 12 (Snowhole), and a golden eagle nest was observed there in 1993 and 1994. Golden eagles were also relatively abundant at points 8 (Cougar Canyon) and 18 (Snake River confluence), although golden eagles were not seen at these points every year (Table 3). Distribution of red-tailed hawk observations was not very consistent, but points with higher counts included point 5, (Pine Bar) and point 15 (Slide Rapid). A red-tailed hawk nest was observed at Pine Bar in 1993 and 1994. American

Table 1. Raptor observation rates (birds/hr) on the lower Salmon and Snake Rivers, 29 March to 7 April, 1996.

Point	Hours observed	All raptors	Golden eagle	Red-tailed hawk	American kestrel	Northern harrier	Prairie falcon	Bald eagle	Unknown
1	2.00	3.00	1.50	1.00	0.00	0.00	0.00	0.00	0.50
2	2.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50
3	2.00	2.00	0.50	1.50	0.00	0.00	0.00	0.00	0.00
4	1.92	4.17	0.52	0.52	1.04	1.56	0.00	0.00	0.52
5	1.75	2.86	0.00	2.29	0.00	0.00	0.00	0.57	0.00
6	1.83	1.09	1.09	0.00	0.00	0.00	0.00	0.00	0.00
7	1.50	3.33	2.00	0.00	0.67	0.00	0.00	0.00	0.67
8	2.00	2.50	1.50	0.00	0.00	0.00	0.00	0.00	1.00
9	2.00	2.00	1.50	0.00	0.00	0.00	0.00	0.00	0.50
10	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	2.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
12	2.50	2.40	1.20	0.00	0.00	0.40	0.80	0.00	0.00
13	2.50	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00
14	2.00	2.50	0.50	0.00	0.00	1.00	1.00	0.00	0.00
15	1.50	0.67	0.00	0.00	0.67	0.00	0.00	0.00	0.00
16	2.25	1.33	0.00	0.00	1.33	0.00	0.00	0.00	0.00
17	2.00	2.50	1.00	1.50	0.00	0.00	0.00	0.00	0.00
18	2.00	2.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
19	2.00	3.50	1.00	2.00	0.50	0.00	0.00	0.00	0.00
20	2.00	3.00	0.50	0.50	2.00	0.00	0.00	0.00	0.00
Mean	1.99	2.06	0.73	0.52	0.36	0.15	0.09	0.03	0.18
S.D.	0.24	1.10	0.61	0.74	0.57	0.40	0.27	0.12	0.30
Median	2.00	2.20	0.66	0.00	0.00	0.00	0.00	0.00	0.00
Min.	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max.	2.50	4.17	2.00	2.29	2.00	1.56	1.00	0.57	1.00

Table 2. Incidental raptor observations, lower Salmon and Snake Rivers, 29 March - 7 April 1996.

Species and number	Location
1 bald eagle (adult)	on route to point 3; upriver from Shorts Bar
2 northern harriers	between river and point 14; near RM 24
3 golden eagles (1 ad., 2 unk.)	between points 12 and 13; point 19
4 red-tailed hawks	between river and point 14
1 prairie falcon	mouth of Skeleton Creek
1 American kestrel	on route to point 7

kestrels were observed most consistently at point 4 (below Shorts Bar), point 15 (Slide Rapid) and point 19 (Snake River below First Creek). Bald eagles were only observed at point 5 (Pine Bar) and above Shorts Bar (Tables 2 and 3).

The relative abundance of the most common raptors in the survey area was similar among the 3 years of the survey. In all 3 years, golden eagles were the most commonly observed species, followed by red-tailed hawks. In 1993 and 1996, American kestrels were third and northern harriers fourth in abundance (Table 3). Northern harriers were more common than American kestrels in 1994. Observation rates of individual species have also been similar among years. There is no significant difference in observation rates by species among years. This is due both to similar numbers of raptors observed, and to variation in number of raptors among points resulting in standard errors of up to 29% of the annual mean (Table 3). This high level of variability among points within the study area, combined with fairly low observation rates, means that, at a 95% confidence level, the survey could only statistically detect relatively large changes in annual abundance (golden eagles: 64% - 100%; red-tailed hawks: 100 - 128% American kestrels: 92 - 142%, Table 3). However, because the survey has been conducted for 3 years, and annual variation is fairly low, it would be possible to detect smaller changes for common species by combining average observation rates for all 3 years. If the survey was conducted again for 3 years, and variability was similar among years, minimum detectable changes at a 95% confidence level would be 14% for golden eagles, 62% for red-tailed hawks, and 112% for American kestrels (Table 4). It would also be possible to increase the power of these tests, (the ability to detect changes of lesser magnitude), by increasing the number of surveys (>3 years), or reducing the alpha level to less than 95% (Cohen 1977).

RECOMMENDATIONS

This 3-year project has provided an estimate of the relative abundance of raptors on the lower Salmon and the Snake River during early April, and has detected patterns of species

Table 3. Observation rates of 6 raptor species (birds/hr) at lower Salmon and Snake River survey points 1993, 1994, and 1996.

Point	Observation time (hrs)			Golden Eagle			Red-tailed Hawk			American Kestrel			Bald Eagle			Prairie Falcon			Northern Harrier		
	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996	1993	1994	1996
1	2	2	2	1.00	0.50	1.50	2.00	0.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.50	2.00	0.00
2	2	2	2	1.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
3	2	2	2	1.50	1.00	0.50	0.00	0.25	1.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.50	1.50	0.00
4	2	2	1.92	1.00	1.50	0.52	0.00	1.00	0.52	0.50	0.50	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	1.56
5	7	2	1.75	0.57	0.50	0.00	0.57	1.00	2.29	0.00	0.00	0.00	0.14	0.00	0.57	0.00	0.00	0.00	0.14	0.00	0.00
6	1	2	1.83	1.00	0.50	1.09	2.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
7	1	2	1.5	1.00	0.00	2.00	2.00	1.00	0.00	1.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.5	2	2	2.67	0.00	1.50	0.00	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00
9	1.5	2	2	0.67	0.00	1.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
10	1.5	2	2	0.67	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	3	2	2	0.67	0.50	1.00	1.33	0.00	0.00	0.33	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
12	3	2	2.5	1.33	1.50	1.20	0.67	1.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.40
13	3	2	2.5	0.33	1.00	0.80	0.33	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
14	1.5	2	2	0.00	0.00	0.50	1.33	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00
15	1.5	2	1.5	0.00	0.50	0.00	2.67	1.00	0.00	0.67	0.50	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	4	2	2.25	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
17	1.5	ns[a]	2	0.67	ns	1.00	0.00	ns	1.50	0.67	ns	0.00	0.00	ns	0.00	0.00	ns	0.00	0.00	ns	0.00
18	1	2	2	1.00	3.50	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
19	2	2	2	0.50	0.50	1.00	0.00	0.00	2.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19A	ns	2	ns	ns	1.50	ns	ns	0.00	ns	ns	0.50	ns	ns	0.00	ns	ns	0.00	ns	ns	0.00	ns
20	9	2	2	0.11	1.00	0.50	0.11	0.50	0.50	0.22	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average	2.55	2	1.99	0.81	0.73	0.73	0.68	0.39	0.52	0.39	0.13	0.36	0.01	0.00	0.03	0.13	0.10	0.09	0.17	0.28	0.15
S.D.	2.04	0	0.25	0.60	0.83	0.62	0.88	0.45	0.76	0.41	0.22	0.58	0.03	0.00	0.13	0.32	0.31	0.28	0.24	0.55	0.41
No. Points	20	20	20	18	14	14	11	10	8	12	4	7	1	0	1	3	2	2	8	6	3

[a] not surveyed.

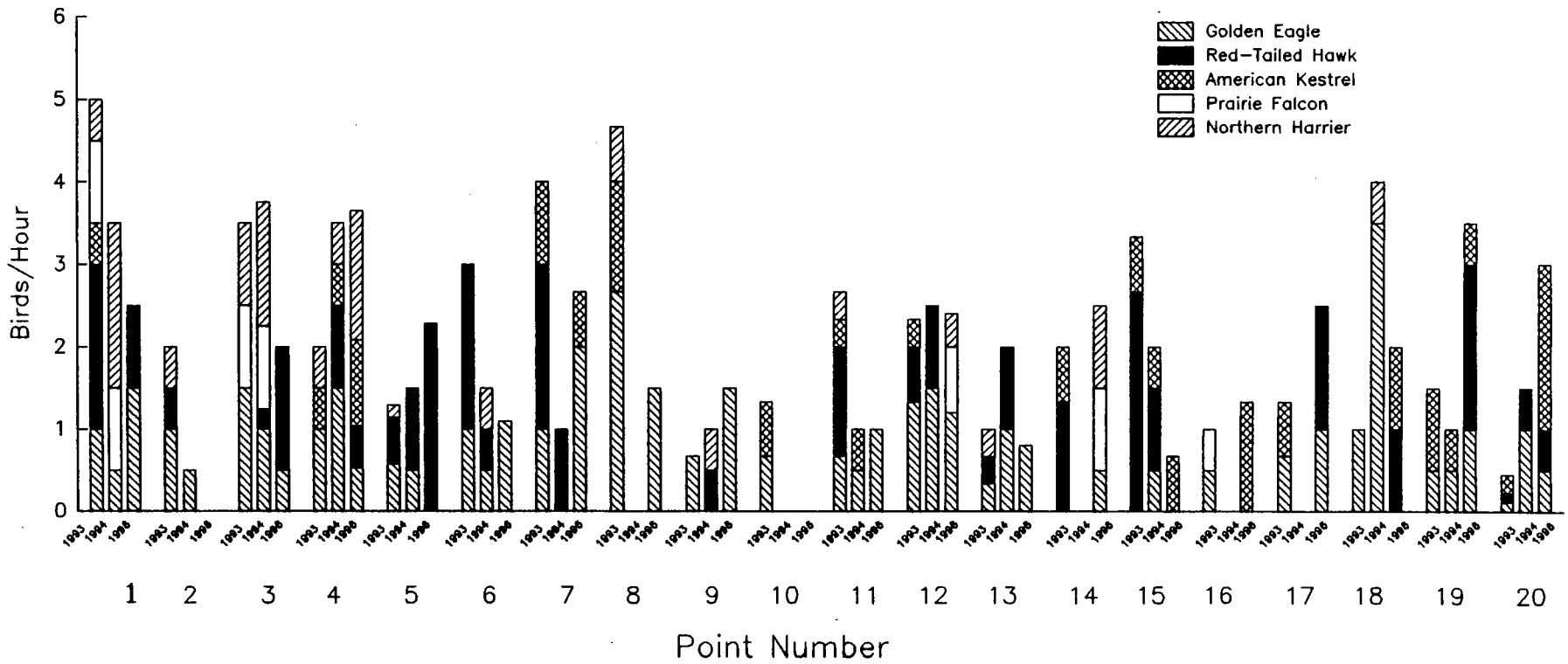

Figure 2. Raptor observation rates, lower Salmon and Snake River 1993,1994, and 1996.

Table 4. Mean number (SD) of raptors observed/hour in 1993, 1994, 1996.

Point No.	Golden Eagle	Red-Tailed Hawk	American Kestrel	Prairie Falcon	Northern Harrier	Other	Total Raptors
1	1.00 (0.50)	1.00 (1.00)	0.17 (0.29)	0.67 (0.58)	0.83 (1.04)	0.17 (0.29)	3.83 (1.04)
2	0.50 (0.50)	0.17 (0.29)	0 (0)	0 (0)	0.17 (0.29)	0.17 (0.29)	1.33 (0.76)
3	1.00 (0.50)	0.50 (0.87)	0 (0)	0.67 (0.58)	0.83 (0.76)	0 (0)	3.17 (1.04)
4	1.01 (0.49)	0.50 (0.50)	0.68 (0.31)	0 (0)	0.85 (0.61)	0.34 (0.29)	3.72 (0.63)
5	0.36 (0.31)	1.29 (0.89)	0 (0)	0 (0)	0.05 (0.08)	0 (0)	2.26 (0.74)
6	0.86 (0.32)	0.83 (1.04)	0 (0)	0 (0)	0.17 (0.29)	0.85 (1.03)	2.71 (1.98)
7	1.00 (1.00)	1.00 (1.00)	0.56 (0.51)	0 (0)	0 (0)	0.22 (0.38)	2.78 (1.58)
8	1.39 (1.37)	0 (0)	0.44 (0.77)	0 (0)	0.22 (0.38)	0.72 (0.25)	3.44 (3.51)
9	0.72 (0.75)	0.17 (0.29)	0 (0)	0 (0)	0.17 (0.29)	0.17 (0.29)	1.22 (0.69)
10	0.22 (0.38)	0 (0)	0.22 (0.38)	0 (0)	0 (0)	0 (0)	1.33 (2.31)
11	0.72 (0.25)	0.44 (0.77)	0.28 (0.25)	0 (0)	0.11 (0.19)	0.17 (0.29)	1.94 (1.23)
12	1.34 (0.15)	0.56 (0.51)	0.11 (0.19)	0.27 (0.46)	0.13 (0.23)	0.40 (0.69)	2.92 (0.59)
13	0.71 (0.34)	0.44 (0.51)	0 (0)	0 (0)	0.11 (0.19)	0 (0)	1.38 (0.60)
14	0.16 (0.29)	0.44 (0.77)	0.22 (0.38)	0.33 (0.58)	0.33 (0.58)	0.17 (0.29)	1.89 (1.64)
15	0.17 (0.29)	1.22 (1.35)	0.61 (010)	0 (0)	0 (0)	0 (0)	2.00 (1.33)
16	0.17 (0.29)	0 (0)	0.44 (0.77)	0.17 (0.29)	0 (0)	0 (0)	0.94 (0.42)
17	0.83 (0.24)	0.75 (1.06)	0.33 (0.47)	0 (0)	0 (0)	0 (0)	1.92 (0.82)
18	1.50 (1.80)	0.33 (0.58)	0.33 (0.58)	0 (0)	0.17 (0.29)	0 (0)	2.33 (1.53)
19	0.67 (0.29)	0.67 (1.15)	0.67 (0.29)	0 (0)	0 (0)	0 (0)	2.00 (1.32)
20	0.54 (0.45)	0.37 (0.22)	0.74 (1.10)	0 (0)	0 (0)	0 (0)	1.69 (1.23)
All Pts.	0.74 (0.41)	0.53 (0.39)	0.29 (0.26)	0.11 (0.22)	0.21 (0.29)	0.17 (0.24)	2.24 (0.85)

abundance and distribution. The multi-species approach has enabled collection of information on all or most of the raptor species using the river canyon during the spring. The data collected 1993-1996 can be considered a baseline for long-term monitoring. No changes in raptor abundance were detected during the 3-year survey. In the future, the frequency of this multi-species survey might be reduced to every 2 to 5 years, or conducted for 3 or more consecutive years after a several year hiatus. Based on the data collected 1993-1996, this latter

technique would be more likely to detect changes in common species. The survey could also be split into shorter sections, to be surveyed annually. This would not improve the ability to detect changes, but shorter surveys could reduce potential problems with weather and observer variability. Current levels of funding do not allow hiring several people to conduct the entire river survey. Instead, observers and boat drivers assist as they are available. This means that a number of people conduct different sections of the survey every year. Shorter surveys would mean that fewer observers would be needed each year, and might reduce the variability among observers. No matter how the survey is conducted in the future, the establishment of experience or training level standards for survey participants are recommended to ensure that surveyors are limited to those with expertise in identifying raptors.

While this survey has been successful at providing information about the lower Salmon and Snake River raptor community, no peregrine falcons have been documented. Lack of peregrine falcon observations may be due to their absence, or perhaps only to their extreme rarity. Future augmentation or replacement of the 10-day river survey with ground-based surveys focusing on peregrine falcons could increase the likelihood of detecting peregrines if they are present. Historic nest sites and areas of suitable habitat could be mapped and then surveyed during the pair formation and egg-laying period in early April and/or after hatching in June.

ACKNOWLEDGMENTS

Thanks to Carol Bradford and Dick Walker, river guides\observers; Russell Richards, Gregg Servheen, Jay Crenshaw, and Ed Schriever, Idaho Department of Fish and Game, Clearwater Region; and Craig Johnson, Bureau of Land Management, Cottonwood Resource Area.

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Appendix A

1996 Raptor Survey Form

RAPTOR SURVEY FORM

POINT NUMBER: RIVER MILE: UTM'S:

AREA DESCRIPTION:

DATE: TIME: Start _____ Finish _____ Total _____

OBSERVERS:

WEATHER CONDITIONS:

OBSERVABILITY (amount of noise, sight limitations):

OBS. #	SPECIES	NO.	TIME	AGE	SEX	BEHAVIOR CODE, NEST LOCATION, COMMENTS
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

OTHER SPECIES OBSERVED (bird, mammal, etc...):

BEHAVIOR CODE: 0=UNKNOWN
1=TERRITORY
2=COURTSHIP
3=INCUBATION
4=NESTLINGS
5=FLEDGLINGS

NEST LOCATION: General Description of Area and Nest, Description of Nest Site Location if Possible (UTM's, River Mile, Azimuth from known point)

ADDITIONAL OBSERVATIONS, COMMENTS:

Appendix B

Raptors Observations on the Lower Salmon and Snake Rivers, 29 March to 7 April 1996.

Appendix B, Table 1. Raptor observations on the lower Salmon and Snake Rivers, 29 March to 7 April 1996.

Point No.	Location	UTM	Date	Hours Obs.	Observations
1	Lower Salmon RM 51.8	552700 E 5069100 N	3/29/96	2:00	2 red-tailed hawks (pair) 3 golden eagles (1 subadult) 1 accipiter (unidentified)
2	Lower Salmon Lyons Bar RM 49.6	553300 E 5072450 N	3/29/96	2:00	1 falcon (unidentified)
3	Lower Salmon Shorts Bar RM 45.3	554600 E 5078450 N	3/30/96	2:00	3 red-tailed hawks (1 pair) 1 golden eagle (adult)
4	Lower Salmon RM 44.6	553800 E 5079200 N	3/30/96	1:55	2 American kestrels (copulating) 3 northern harriers 1 golden eagle (not aged) 1 red-tailed hawk 1 falcon (unidentified)
5	Lower Salmon Pine Bar RM 42.8	552050 E 5081700 N	3/31/96	1:45	4 red-tailed hawks 1 bald eagle (subadult)
6	Lower Salmon Pine Bar RM 41.1	549900 E 5082600 N	3/31/96	1:50	2 golden eagles (pair)
7	Lower Salmon RM 37	545400 E 5084500 N	3/31/96	1:30	1 American kestrel (adult male) 3 golden eagles (adults) 1 falcon (unidentified)
8	Lower Salmon Cougar Canyon RM 32.5	542950 E 5090000 N	4/1/96	2:00	3 golden eagles (1 subadult) 2 unknown (large)
9	Lower Salmon Cougar Canyon RM 30.6	540300 E 5091200 N	4/1/96	2:00	1 falcon (unidentified) 3 golden eagles (1 subadult)
10	Lower Salmon RM 26.7	534400 E 5091400 N	4/2/96	2:00	no raptors observed

Appendix B, Table 1, cont. Raptor observations on the lower Salmon and Snake Rivers, 29 March to 7 April 1996.

Point No.	Location	UTM	Date	Hours Obs.	Observations
11	Lower Salmon RM 25.3	533050 E 5093100 N	4/2/96	2:00	1 golden eagle (adult) 1 golden eagle (not aged)
12	Lower Salmon Snow Hole Rapid RM 23.2	530700 E 5094800 N	4/3/96	2:30	1 northern harrier 3 golden eagles (2 adults; 1 not aged) 2 prairie falcons (copulating)
13	Lower Salmon Eagle Creek RM 12.7	522200 E 5093000 N	4/4/96	2:30	2 golden eagles (pair)
14	Lower Salmon Skeleton Creek RM 9.7	522000 E 5089200 N	4/5/96	2:00	2 northern harriers (pair) 1 golden eagle 2 prairie falcons (copulating)
15	Lower Salmon Slide Rapid RM 3.7	520100 E 5080700 N	4/5/96	1:30	1 American kestrel
16	Lower Salmon RM 1.3	517900 E 5078500 N	4/6/96	2:15	3 American kestrels (pair)
17	Lower Salmon Eye of the Needle RM 0.6	517050 E 5078200 N	4/6/96	2:00	2 golden eagles (1subadult, 1 adult) 3 red-tailed hawks (1 territorial pair)
18	Snake River Confluence RM 187.8	515850 E 5078400 N	4/6/96	2:00	2 American kestrels (pair) 2 red-tailed hawks (pair)
19	Snake River Cave RM 186.8	514800 E 5079700 N	4/7/96	2:00	4 red-tailed hawks 2 golden eagles 1 American kestrel
20	Snake River Cottonwood Cr. RM 181.2	510100 E 5087000 N	4/7/96	2:00	4 American kestrels (2 pair) 1 red-tailed hawk 1 golden eagle (not aged)

Submitted by: Charles E. Harris

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Tom Reinecker

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