Table 5. Known productivity at the Wolverine Creek bald eagle breeding territory since re-establishment of nesting pairs on the South Fork Snake River.[1]

YEAR	NESTING STATUS	NUMBER YOUNG FLEDGED	NEST NUMBER	COMMENT
1992	Active, Unsuccessful	0	Nest #1	Failed 4/14, no young seen.
1993	Active, Successful	2	Nest #2	Discovered 7/7
1994	Active, Successful	1	Nest #2	Banded 5/28

1 Productivity data from 1992-present from agency reports and reports compiled by M. Whitfield et. al.

We define Zone 1 from the responses of nesting adults during banding and observation attempts at nest #2. This pair does not react to human activity around nest #1.

Key Use Areas. A favored Wolverine pair foraging area is the river section opposite Rattlesnake Point. The Wolverine adults are often seen in Douglas-fir perches on the south side of the river in this reach, and prey captures have been seen here. Other frequently used perches include a large snag about 75 m upriver of the nest tree, and several snag and live Douglas fir perches downstream opposite Wolverine Creek. We have not tracked this pair enough to be aware of other key use areas.

Cress Creek (18-IS-12)

Breeding Area History. This territory was initially occupied in spring 1988. The adult pair caused some concern when it built and incubated on a cottonwood nest near the planned path of a new power line (B. Jones pers. comm.). The power line was subsequently shifted down river slightly from the planned line, and the pair has continued to occupy the same nest since 1988. This nest is highly visible from a road across the river, and is also near a popular area for bank fisherpersons (opposite bank). The pair is more tolerant of human activity than most pairs on the South Fork. The adult male of this pair is banded with a Fish and Wildlife Service band, but numbers have not been read because the band is tarnished.

This pair has typically begun to incubate relatively early, usually in late February or early March, as indicated by early season observations and estimated age of young at banding (Table 6). However, in 1993 and 1994, incubation started about one week later.

This pair was consistently successful at producing young from 1998 to 1992, usually two young each year (Table 6). However, the nest failed in 1993 and blew down with an unknown number of young in 1994.

This pair has produced 1 color morph nestling in 3 of 5 years since establishment of the territory. One of these color morph young, a 1990 male fledgling, was seen repeatedly in the company of an adult female near the Teton Creek nest in Teton Valley in spring, 1991. This nesting attempt did not advance beyond initial construction. Another, apparently the color morph banded in 1988, nested and produced young on the Upper Teton River Territory (18-IS-21) in 1994.

Occupied Nesting Zone, Zone 1. Our banding forays into the Cress Creek nest area allow us to define a zone of adult tolerance for human activity around the nest (figure 3).

Key Use Areas. We have monitored this pair for several extended periods since 1990, although observations total only about 40 hours. In these limited observations, the pair focused upon the river reaches from the railroad trestle to 1/2 km below the Heise Bridge. Highly used fishing perches were in the islands downriver of the nest,

Table 6. Estimated nesting chronology within the Cress Creek bald eagle breeding territory, South Fork Snake River, 1989 to 1994.

YEAR	APPROXIMATE DATES INITIATION OF INCUBATION	HATCHING	DATE YOUNG FIRST SEEN	DATE AND ESTIMATED AGE AT BANDING	COMMENTS
1989	03/01/89	04/02/89	04/16/89	06/02/89 8 weeks	
1990	03/01/90	04/02/90	04/18/90	05/28/90 7.5 weeks	
1991	02/24/91	03/29/91	04/05/91	05/25/91 8 weeks	
1992	02/27/92	04/02/92	04/14/92	05/17/92 6.5 weeks	
1993	03/09/93	04/13/93	Failed early		
1994	03/07/94	04/10/94	Young not seen	Blowdown 5/28	

Table 7. Known productivity at the Cress Creek bald eagle breeding territory since re-establishment of nesting pairs on the South Fork Snake River.[1]

YEAR	NESTING STATUS	NUMBER YOUNG FLEDGED	NEST NUMBER	COMMENT
1988	Active, Successful	2	Nest #1	New territory, banded, 1 color morph
1989	Active, Successful	1	Nest #1	Banded
1990	Active, Successful	2	Nest #1	Both banded, 1 color morph
1991	Active, Successful	2	Nest #1	Banded 1, 1 color morph not banded
1992	Active, Successful	2	Nest #1	Banded, no color morphs
1993	Active, Unsuccessful	0	Nest #1	Failed early
1994	Active, Unsuccessful	0	Nest #1	Nest blowdown, young killed.

[1] Productivity data from 1988-present from agency reports and reports compiled by M. Whitfield et. al.

particularly a cottonwood overlooking a north channel riffle about 200 m below the nest, and several cottonwoods near the nest tree. Sometimes these adults flew west of the river to unknown locations and returned to the nest with prey. They also flew to unknown locations downriver of the railroad trestle.

In recent years, there has been increased human activity in the vicinity of the Cress Creek nest early in the nesting period. Fishermen often park on the dike and fish near the nest. We have observed very noisy fishermen in the river near the nest during incubation. Since blowdown of the original nest in 1994, it would be surprising to see this pair build again in this area of focused disturbance.

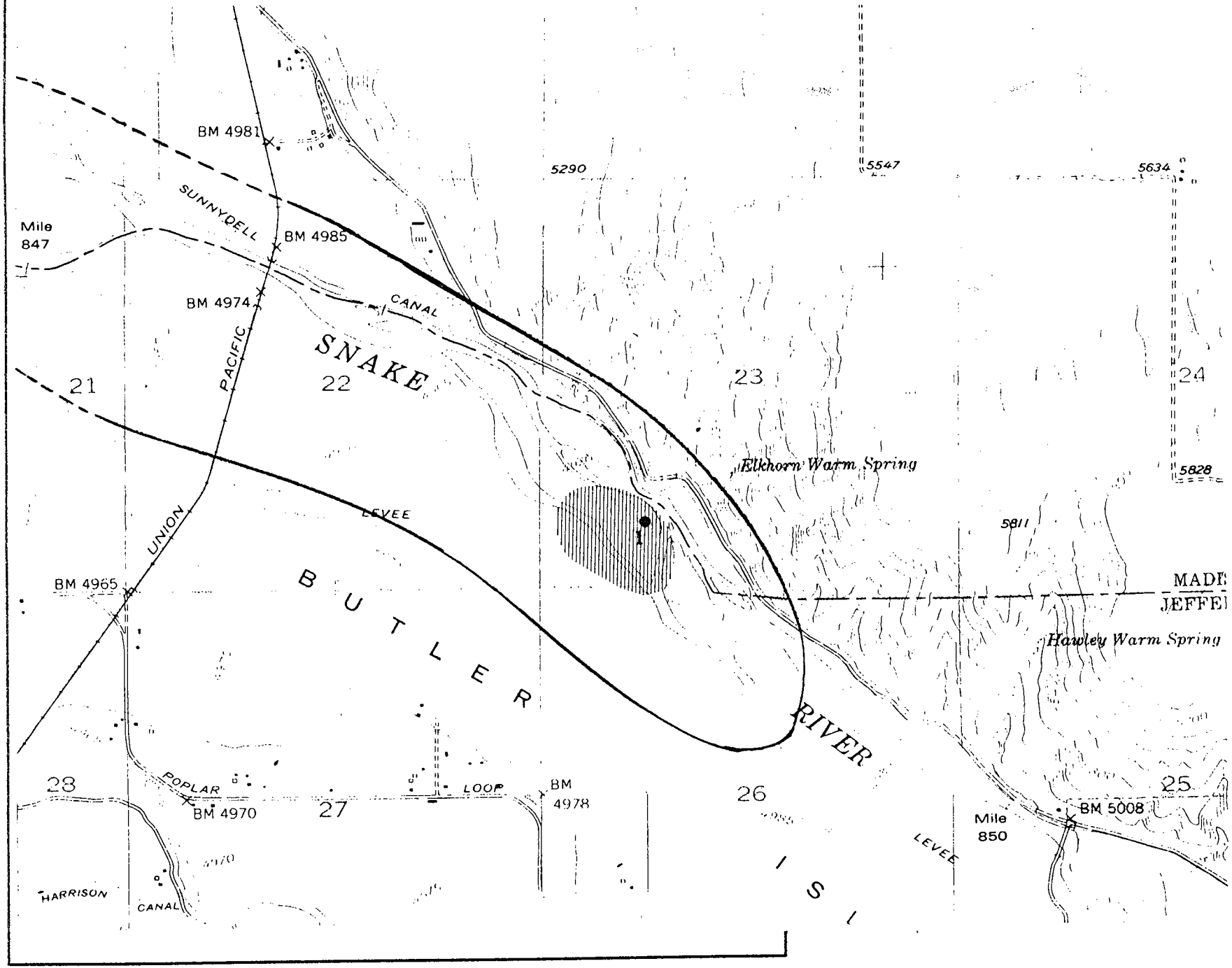

Figure 3. The Occupied Nesting Zone (Zone 1) and known key use areas within the Cress Creek Bald Eagle Breeding Territory, 1994. Intensive monitoring has not occurred at this breeding area, and the information portrayed is preliminary only. Numbers indicate known nests, lined area is Zone 1, and red line encloses PMP.

Confluence (18-IS-13)

Breeding Area History. The Idaho Department of Fish and Game first reported use of the Confluence nesting area in 1977 (Table 8). Many different nests have been used in subsequent years; the pattern of changing sites has made monitoring of this area confusing. In some years, it appears that use of nearby areas by other bald eagle pairs has been confused with Confluence pair activity. The first use of the Menan Buttes nest in 1990 was initially described as a Confluence pair alternate nest. We have not monitored adult turnover at this site, one factor that may lead to nest changes. Most nests built in this area have fallen after only a few years due to bank erosion or nest tree failure. All of the nests used have been in older cottonwoods, several in dead canopies.

Early season observations in this territory and nestling age at banding suggest that eagles in this vicinity typically initiate nesting around the first of March. For example, R. Jones noted an incubating adult on nest #3 on 3/2/83. J. Gardetto and K. Aslett saw an incubating adult on nest #7 on 3/2/94.

Occupied Nesting Zone, Zone 1. Our initial display of Zone 1 for the Confluence Territory (figure 4) is drawn around all known Confluence alternate nests used from 1979-1994 according to the GYE Bald Eagle Management Plan (1983) guidelines.

Key Use Areas. Although we have few actual observations of Confluence pair movements, we suggest that most key use areas for this pair are contained within the zone 1 boundary. Examination of prey remains suggests that these adults also use the pond and sage covered areas north of the river (figure 4). Prey remains at this nest have been among the most varied of those found at any southeast Idaho nest site, including hares, chubs, suckers, a wild turkey, and several waterfowl species.

Table 8. Known productivity at the Confluence bald eagle breeding area since re-establishment of nesting pairs on the South Fork Snake River.[1]

YEAR	NESTING STATUS	NUMBER YOUNG FLEDGED	NEST NUMBER	COMMENT
1977	Active, Unknown	?	Nest #1	New nest located at Confluence.
1978	Activity unknown	?	Nest #2	
1979	Active, Successful	1	Nest #2	New alternate, probably used in 1978
1980	Active, Successful	1	Nest #3	New nest on island upriver of 1979 nest
1981	Active, Successful	2	Nest #3	
1982	Active, Successful	1	Nest #3	
1983	Active, Successful	2	Nest #3	Banded 1 of 2 young, 1 flew from nest
1984	Occupied, Inactive	0	No nest	Previous nest blew down, no new nest
1985	Active, Successful	2	Nest #4	Nest too hazardous to climb
1986	Active, Successful	1	Nest #4	Nest blew down after fledging
1987	Active, Successful	3	Nest #5	Banded nestlings
1988	Active, Successful	2	Nest #5	Banded nestlings
1989	Active, Successful	1	Nest #5	Banded nestling
1990	Active, Unsuccessful	0	Nest #5	New Menan Buttes successful upriver
1991	Active, Successful	1	Nest #6	New alternate for the year, did not band
1992	Active, Unsuccessful	0	Nest #6	Incubation on 1991 nest
1993	Active, Unsuccessful	0	Nest #7	Adults at built-up redtail nest
1994	Active, Successful	1	Nest #7	New alternate for the year

1 Productivity data for 1977 from Idaho Department of Fish and Game, Region 6 files, and 1978-present from Bureau of Land Management and Id. F&G reports and reports compiled by M. Whitfield et. al.

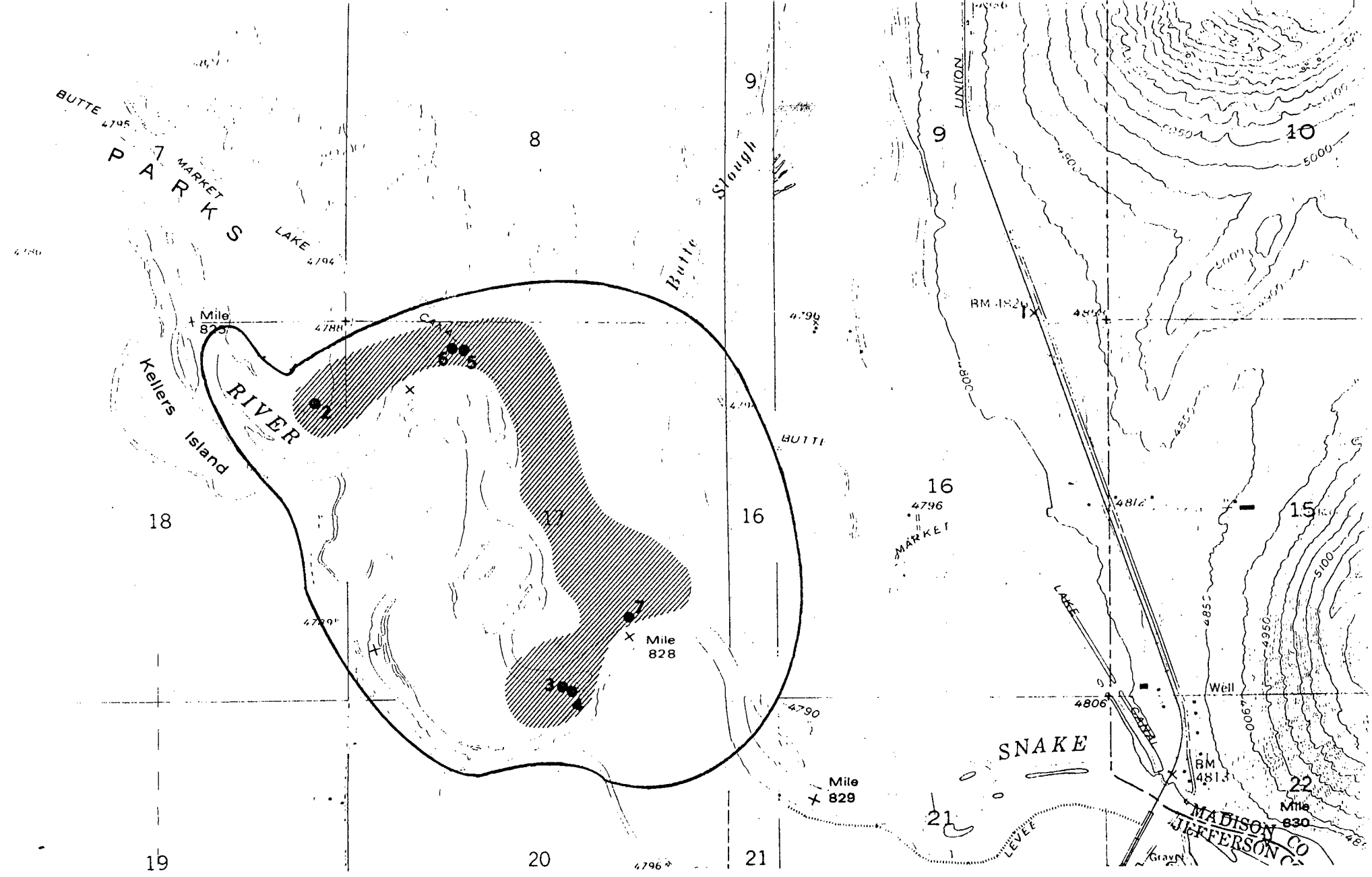

Figure 4. The Occupied Nesting Zone (Zone 1) and known key use areas within the Confluence Bald Eagle Breeding Territory, 1994. Intensive monitoring has not occurred at this breeding area, and the information portrayed is preliminary only. Numbers indicate known nests, lined area is Zone 1, and red line encloses PMP.

Raptor Detection

The primary intent of this project is to detect adult birds that are involved in reproductive behaviors such as territorial calling or defense. Despite years of interest and study, raptors remain difficult to survey (Fuller and Mosher 1981, 1987, Kochert 1986, Smith 1987, Mosher et al. 1990). This survey difficulty arises because raptors are relatively wide ranging, are highly mobile, occur at low densities, and, as is the case with many owls, can be solely nocturnal. Several raptorial species, such as accipiters, are secretive during certain phases of their nesting cycle.

Important summaries of monitoring and survey techniques have been presented (e.g. Call 1978, Fuller and Mosher 1981, 1987, Kochert 1986). Call (1978) focuses on the nesting habitat of raptors found in the Western United States. He describes the nesting habitat of common diurnal and nocturnal raptors and survey methods used, including species specific timing and survey precautions. Call concludes his species accounts with comments on specific behaviors and vocalizations one might encounter at nests.

Fuller and Mosher (1981, 1987) review the most common methods of detecting and counting raptors. They describe three primary applications for raptor surveys: 1) to determine species occurrence, 2) to estimate population numbers, and 3) for specific information on population demographics and reproductive status. The strengths and weaknesses of road and aerial counts, nest searches, roost and colony counts, Christmas Bird and migration counts, and trapping are presented. They encourage more effort in the development of efficient and reliable sampling techniques which can be applied to a diversity of raptors and their habitats. They discuss methods and examples of precision and accuracy for raptor surveys. With the recognition that monitoring resources are limited, they emphasize the need to pool and compare raptor studies.

Kochert (1986) starts with general information on monitoring methods and ends with species specific information on how, when and where to survey. Features of nesting, foraging and winter habitats for 44 Falconiform species are discussed with complete literature sources.

These major works reiterate the importance of knowing the biases associated with each survey method. They identify variables related to observers, working environments, and raptor species surveyed that affect survey reliability. Knowledge of a species' behavior, habitat, seasonal ecology, and highly developed identification skills are all identified as critical and controllable variables.

A number of authors present specific information on the application of individual methods. For example, Mosher et. al. (1990) and Johnson et. al. (1981) discuss broadcast of conspecific vocalizations in the detection of woodland raptors. Broadcast calling with recorded raptor vocalizations can increase the rate at which several species are detected when compared to land surveys (by walking or automobile) where the observer did not attempt to elicit calls (McGarigal and Fraser 1984, Rosenfield et al. 1985).

Nest boxes have been used to collect information on the population demographics of several cavity-nesting species such as kestrels and several of the smaller owls (e.g. see Hayward et. al. 1992 for information on use of nest boxes to learn demographic information on boreal owls).

We discuss species-specific detection methods in raptor species accounts below, and summarize this information in Appendix A, tables 2 and 3.

Raptor Occurrence, Presence or Absence

We individually sampled 16 quadrats within each of 19 randomly selected square mile sections (Table 9 and figure 5). Our sampling was incomplete at several sites because of access difficulties corrected late in the season; sampling in these areas must be completed in 1995. We report findings of these surveys in Appendix Table 5 and under the section headed Local Occurrence for each raptor species. We will revisit each of these sample areas in 1995 in combination with the new sample areas selected.

The 1994 presence/absence sampling revealed two prominent results that will be quantified in our more intensive sampling in 1995. First, much of the potential raptor habitat within the Snake River corridor, defined here as the area within one mile of the river, has been altered to the extent that its capacity to support raptors is low. For example, approximately 1/3 of the area is in cultivated cropland, and conversion of forest cover to cropland is ongoing (e.g Sec. 26 in the Cress Creek area). Secondly, raptor density appears to be lower in many areas than anticipated, and more clumped in others. This result may be further evidence of habitat alteration within the study area.

Table 9. Randomly selected sample areas for determination of raptor occurrence in 1994. All sample areas are mapped, legal, square mile sections. All 40 acre quadrats (1/4 of 1/4 sections) were sampled individually.

River Segment	Section	Comments
1	Sec. 7; T1S; R45E	Gravel pit and forest down river of dam
1	Sec. 27;T1N; R44E	Irwin cemetery
2	Sec. 11;T1N; R43E	Fall Creek campground area
2	Sec. 30;T2N; R43E	Conant Valley
2	Sec. 21;T2N; R43E	Pine Creek
3	Sec. 6; T2N; R43E	Upriver of Dry Canyon
3	Sec. 23; T3N; R42E	West of Lufkin bottom
3	Sec. 13; T3N; R42E	Black Canyon
4	Sec. 15; T3N; R41E	Clark Hill
5	Sec. 26; T4N; R40E	Cress Creek area
6	Sec. 35; T5N; R39E	Texas Slough
7	Sec. 13; T5N; R38E	Annis rookery area
7	Sec. 17; T5N; R38E	Confluence PMP area
7	Sec. 18; T5N; R38E	Keller's Island
8	Sec. 14; T5N; R37E	Downriver of Deer Parks
8	Sec. 22; T5N; R37E	Mile 821, downriver of Deer Parks
9	Sec. 35; T5N; R37E	Downriver of Big Six Canal area
11	Sec. 33; T7N; R39E	Warm Slough near Hibbard Bridge
11	Sec. 19; T7N; R40E	Downriver of old Ft. Henry

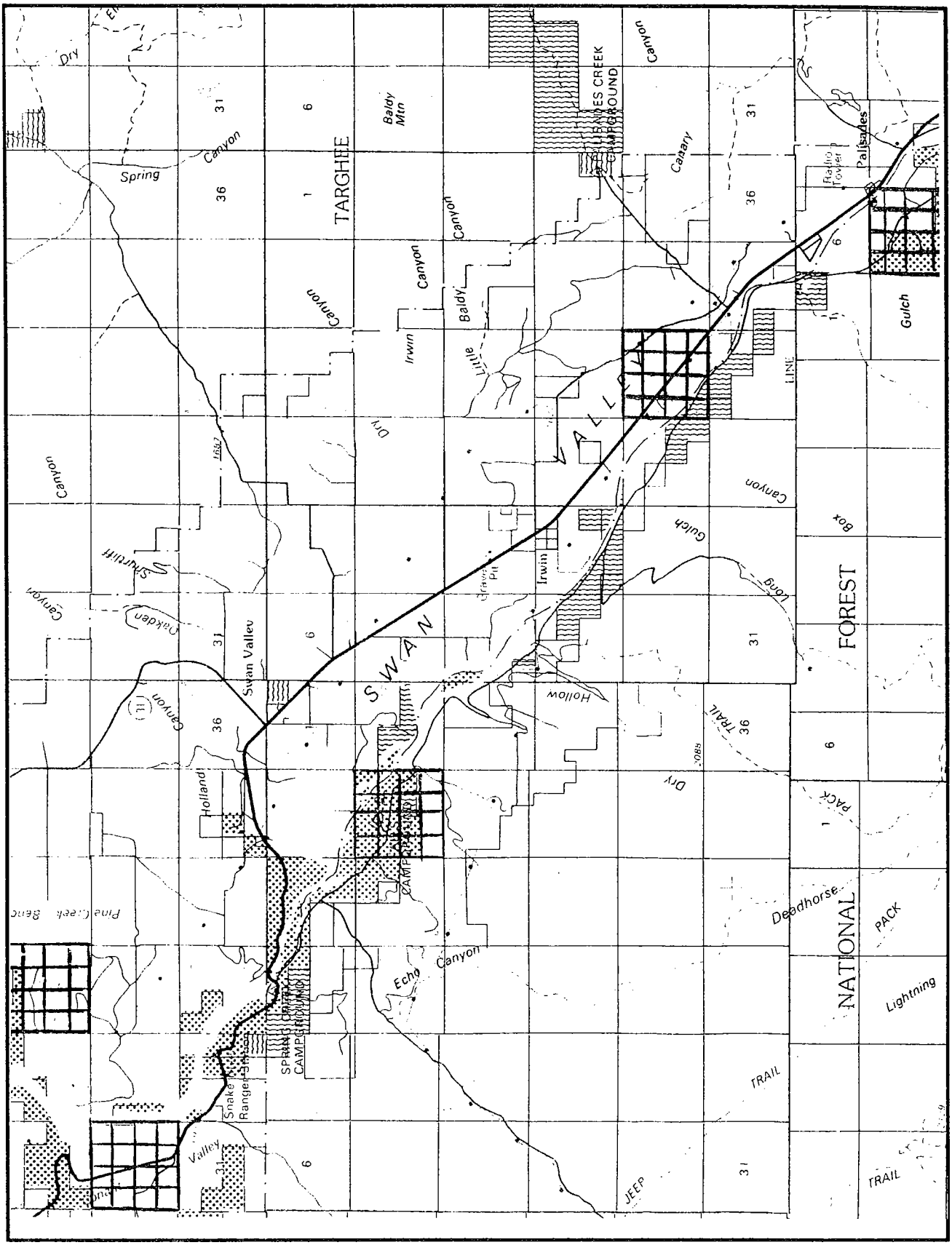

Figure 5a. Map of square mile sections sampled in Swan Valley area for raptor occurrence and vegetative cover types in 1994 (Scale 1:24,000).