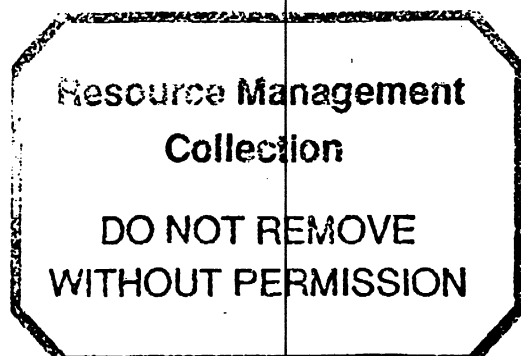


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PROPERTY OF WIND CAVE
NATIONAL PARK

A SURVEY OF RAPTORIAL AVIAN PREDATORS
IN WIND CAVE NATIONAL PARK

BY
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ABSTRACT

A survey of nesting and feeding raptorial birds in or near Wind Cave National Park was conducted between May 3 and August 4, 1988. Nests of the following species were found: red-tailed hawk (Buteo jamaicensis), American kestrel (Falco sparverius), merlin (Falco columbarius), prairie falcon (Falco mexicanus), great horned owl (Bubo virginianus), and burrowing owl (Athene cunicularia). In addition, the following species were seen hunting within the study area: northern harrier (Circus cyaneus), sharp-shinned hawk (Accipiter striatus), Cooper's hawk (Accipiter cooperii), northern goshawk (Accipiter gentilis), ferruginous hawk (Buteo regalis), golden eagle (Aquila chrysaetos), long-eared owl (Asio otus), and short-eared owl (Asio flammeus). Raptors were found to utilize all available ecosystems within the study area, both for hunting and nesting.

ACKNOWLEDGMENTS

I am grateful to the Wind Cave National Park Research Committee for giving approval to this project and to the United States National Park Service for funding it.

I also extend my appreciation to Rich Klukas, Wind Cave National Park Research Biologist, for suggesting this project and for his continual support and guidance throughout the project.

I also thank the following park personnel who took time to report their sightings of raptors to me: Rich Klukas, Rachel Benton, Wayne Schroeder, Mary Laycock, Jim Pisarowicz, Greg Nepstad, Darren Ressler and ~~Mark~~ Marshall.

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INTRODUCTION

Wind Cave National Park is not large enough to exist as a self-contained ecological unit. In such areas, a necessary part of any Resource Management Plan must occasionally entail adjustment of the population of one or more species. In order to formulate such a plan, it is important to determine the kinds and numbers of predators, including raptors (hawks, eagles, falcons and owls) utilizing the park.

No survey has ever been done of the raptorial birds which nest in Wind Cave National Park or utilize it as a feeding ground. This study was undertaken to remedy this lack by determining the kinds, numbers and locations of raptors nesting within or immediately adjacent to the park, or regularly using it for feeding purposes.

Birds are recognized as excellent indicators of the health of the environment; therefore it is advisable to monitor the population of birds. Changes in bird populations are detectable only if a baseline survey, such as this study, is available for comparison purposes.

The knowledge gained from this survey will also be useful to recreational bird-watchers, who use the park in steadily increasing numbers.

The results of this study will also be valuable for comparison purposes in other mixed-grass and /or ponderosa pine forest ecosystems.

The South Dakota Ornithologists' Union has recently begun a state-wide five-year survey of nesting birds. Wind Cave National

Park has been selected as one of several target areas to receive special emphasis. Since this survey depends heavily on volunteers, the results of the raptor survey will be invaluable to this SDOG study-- not only concerning raptors, but also other birds which are observed incidently to the raptors.

STUDY AREA

Wind Cave National Park is located in south-west South Dakota, 6 miles north of Hot Springs, on the south-east flank of the Black Hills. It consists of 28,260.3 acres, ranging in elevation from 3,846 to 5,013 feet. Approximately 75% of this is a prairie ecosystem-- a blend of short, medium, and tall grasses. The remaining 25% is ponderosa pine-forested hills. Winding through both of the above are several riparian drainages with associated hardwood trees and shrubs, and occasional limestone and sandstone cliffs.

Annual precipitation in the area averages 16.7", 70% of which falls between May 1 and September 30.

The land south and east of the park is mainly used for dry-land ranching. The area to the west is primarily Black Hills National Forest land interspersed with small ranches. Lands immediately north lie within Custer State Park. (U.S. Soil Conservation Service 1969; Wind Cave National Park 1984).

Because raptors range far from their nests while hunting, any nest or sighting of raptors within one-quarter mile of the park boundary was included in the results of this survey.

METHODS

Owl Calls

In order to locate nesting territories of owls, recorded owl calls were played at night, and responses listened for. The species whose calls were used were selected on basis of previous sightings in the area (Whitney, et.al. 1978), range maps and habitat preference (Eckert 1987), and suitable vocalization of the species (Kellogg 1959). Those selected were the saw-whet, screech, long-eared, barred, and great horned owls. Recordings used were from Kellogg, 1959.

The calls of each species were repeated 4-6 times, at 30-60 second calling intervals. A final silence of 1-2 minutes was allowed before playing the next species' call. The calls were played in the order listed above, so as not to intimidate any species by playing the call of a potential predator prior to playing its own call. Due to the potential danger from bison, which are found throughout the majority of the park, this activity was done only from the vicinity of a vehicle. Because of the likelihood that most owls had fledged before the study was initiated (May 3), it was decided that little of the time allotted for this study would be spent on this activity.

Selection of the areas from which to play the recordings was based on habitat type and availability of roads. The following areas were chosen:

- 1) the pull-out at the south entrance of the park, on US Highway 385

2. the pull-out 0.3 mile east of the west entrance to the park, on US Highway 385 (above Norbeck Basin)
3. the Beaver Creek pull-out on Highway 87, 0.6 mile north of the junction of Highway 385 and Highway 87
4. the "Pegmatite" interpretive sign pull-out on Highway 87, 2.3 miles north of the Highway 385-87 junction
5. the "East Meets West" interpretive sign pull-out on Highway 87, 3.9 miles north of the Highway 385-87 junction
6. the Rankin Ridge fire tower parking lot.

Investigator's Observations

Preferred Habitat

Many areas of the park were hiked, with preference being given to 18.5 miles of selected habitat.

Since several raptorial species frequently utilize cliffs for nesting, all areas with suitable cliffs were visited and observed for raptor evidence, including the birds themselves, nests, white-wash areas (excrement-stained), and castings of indigestible remains of consumed prey.

Black-tailed prairie dogs (Cynomys ludovicianus) are a potential food source for some raptors, and their burrows are frequently chosen for nesting by burrowing owls. Thus all

prairie dog colonies in the park were also given preference for investigation.

Former Nesting Areas

Areas where raptors were known to have nested in the past were investigated for current activity.

Park Personnel Observations

All personnel familiar with raptor identification who were likely to frequent the back country of the park were informed of this study and asked to record observations of raptors. These sightings were noted, and if the observation indicated the likelihood of a nesting area, the area was inspected.

RESULTS AND DISCUSSION

The study period began May 3, 1988 and ended September 4, 1988. One hundred seventy-four hours of field activity, 185 miles of foot travel and 300 miles of vehicle travel by the principal investigator resulted in 198 sighting of raptors. An additional eighteen sightings were reported by other park personnel. The combined 216 sightings are listed according to species in Table 1.

Thirteen active nests were found, representing six species, as shown in Table 1. Also recorded when possible was the total number of young observed in nests (Table 1).

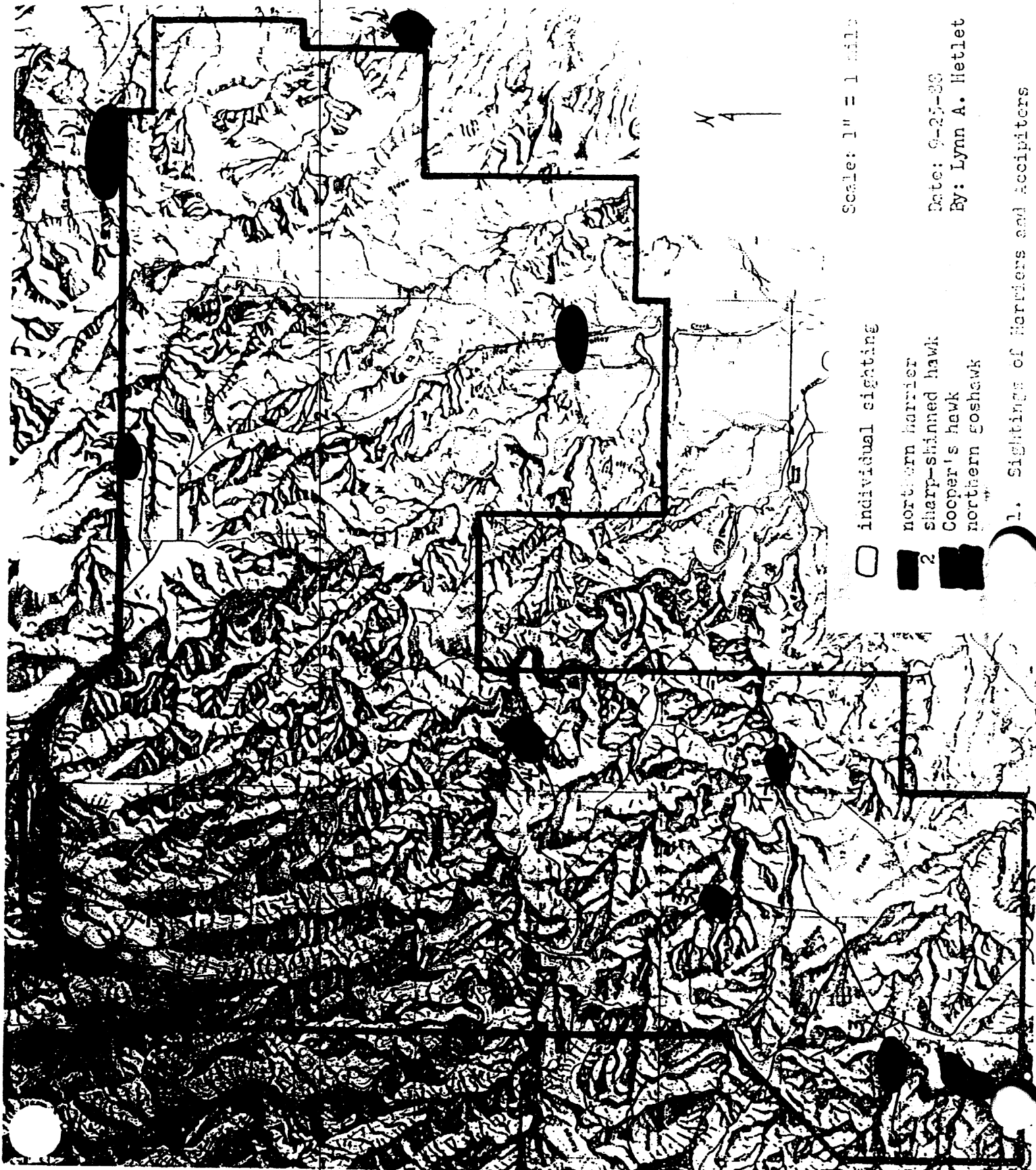
Maps 1-5 show the areas in which sightings occurred, and the locations of nests observed.

One great horned owl and two prairie falcon nests were located in openings in limestone cliffs. One great horned owl

Table 1. Raptor sightings, nests and young in Wind Cave National Park in summer 1988.

Species	Number of sightings	Number of nests	Number of fledglings
Northern harrier (<u>Circus cyaneus</u>)	4	-	-
Sharp-shinned hawk (<u>Accipiter striatus</u>)	1	-	-
Cooper's hawk (<u>Accipiter cooperii</u>)	4	-	-
Northern Goshawk (<u>Accipiter gentilis</u>)	1	-	-
Red-tailed hawk (<u>Buteo jamaicensis</u>)	37	3	7
Ferruginous hawk (<u>Buteo regalis</u>)	3	-	-
Golden eagle (<u>Aquila chrysaetos</u>)	27	-	-
American kestrel (<u>Falco sparverius</u>)	65	4	*
Merlin (<u>Falco columbarius</u>)	7	1	2
Prairie falcon (<u>Falco mexicanus</u>)	24	2	7
Great horned owl (<u>Bubo virginianus</u>)	18	2	2
Long-eared owl (<u>Asio otus</u>)	1	-	-
Short-eared owl (<u>Asio flammeus</u>)	1	-	-
Burrowing owl (<u>Athene cunicularia</u>)	23	1	2
Total	216	13	20

*Although these nests were known to contain young, the number of fledglings was not determined.



Scale: 1" = 1 mile

Date: 9-25-88

By: Lynn A. Mettlet

□ individual sighting

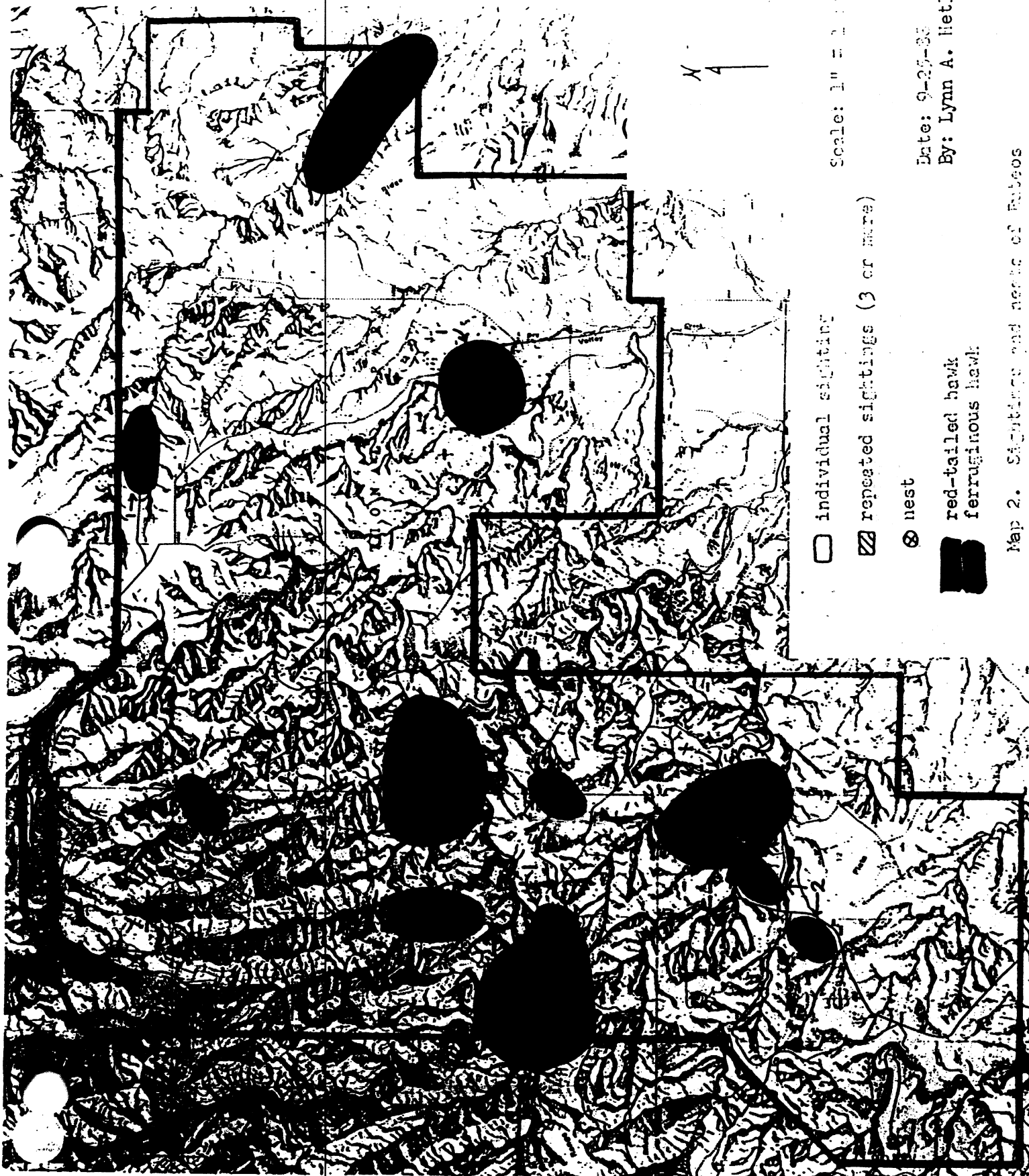
□ northern harrier

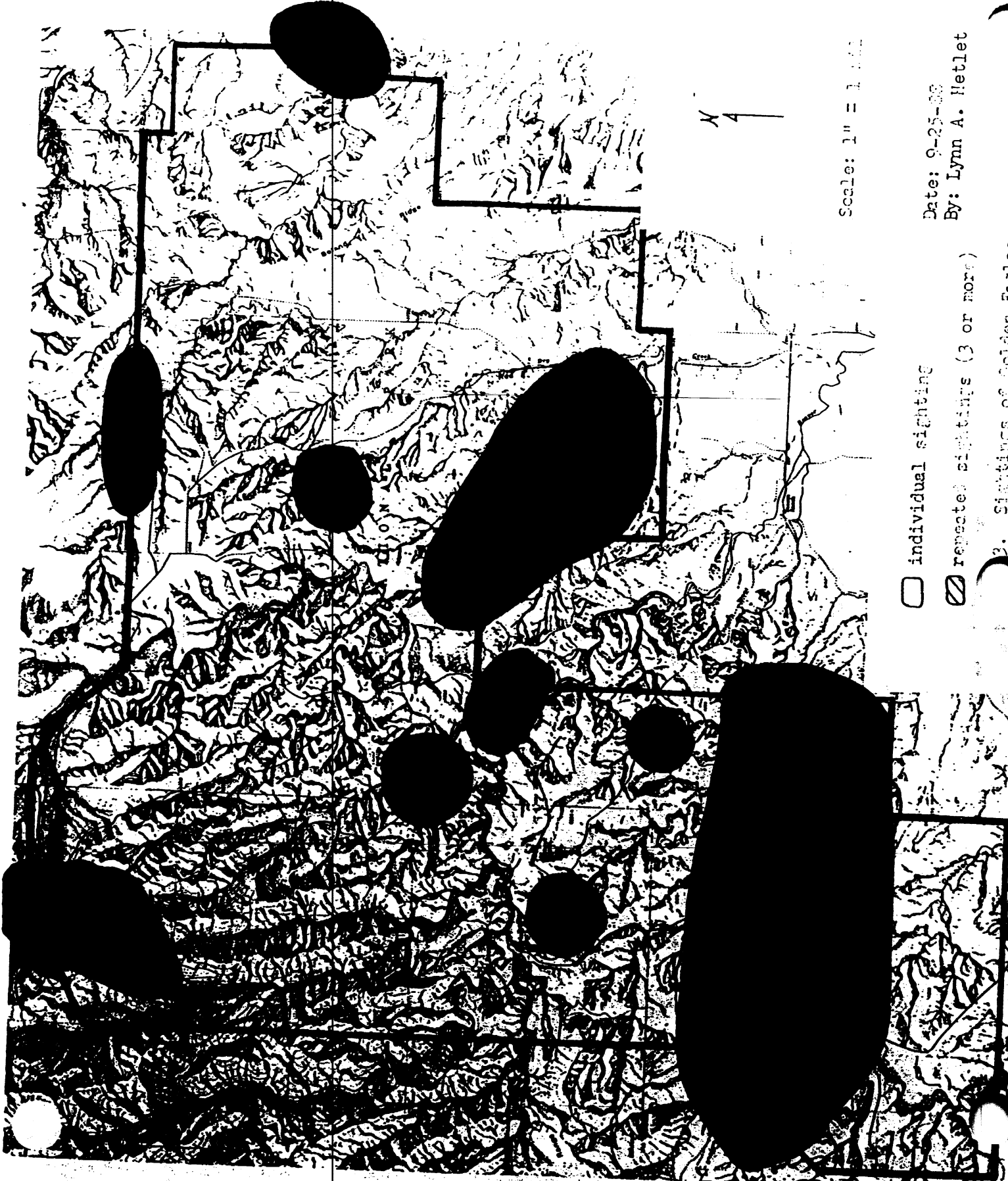
■ sharp-shinned hawk

■ Cooper's hawk

■ northern goshawk

1. Sightings of Harriers and Accipiters

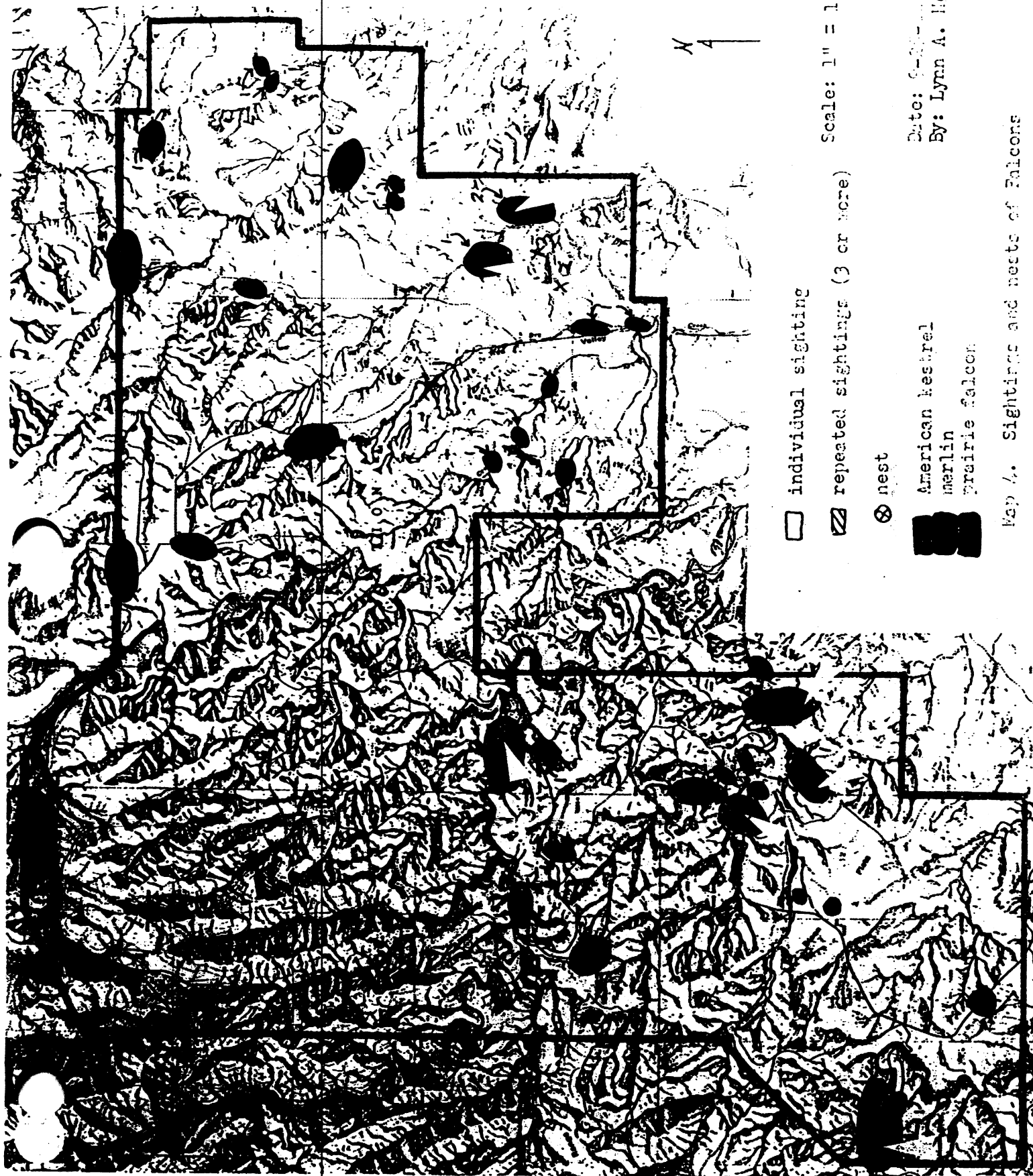




Scale: 1" = 1 mile

Date: 9-25-88
By: Lynn A. Hetlet

- ☐ individual sighting
- ☒ repeated sightings (3 or more)
- ☒ 3. Sightings of Golden Eagles



□ individual sighting

▨ repeated sightings (3 or more)

⊗ nest

■ American kestrel

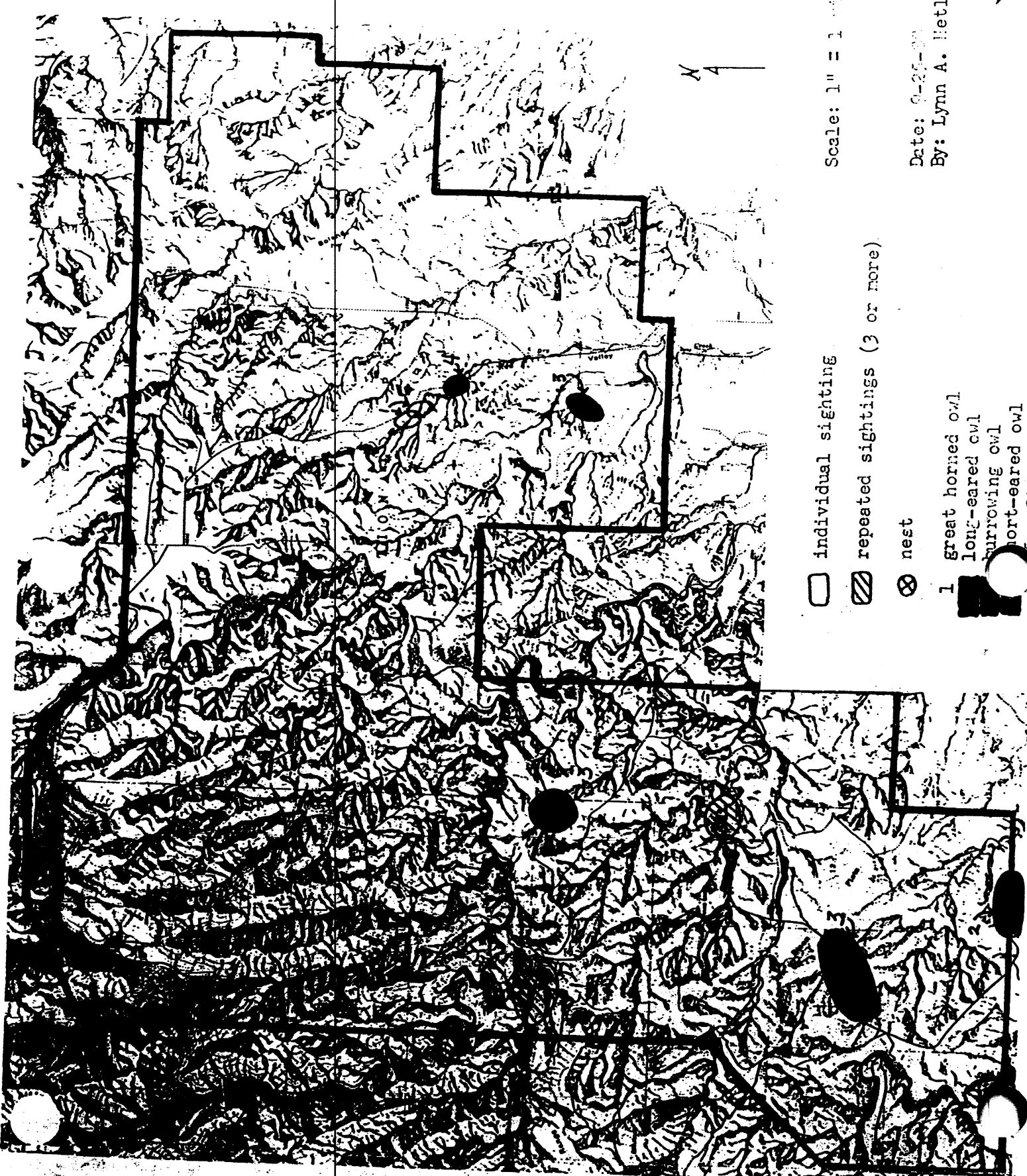
■ merlin

■ prairie falcon

Scale: 1" = 1 mile

Date: 9-20-61
By: Lynn A. Motlet

Map 4. Sightings and nests of Falcons



Scale: 1" = 1 mile

Date: 9-25-50
By: Lynn A. Hetlet

- ☐ individual sighting
 - ☒ repeated sightings (3 or more)
 - ☒ nest
 - 1 Great horned owl
 - long-eared owl
 - burrowing owl
 - short-eared owl
5. Sightings and nests of Owls

and one merlin nest were in small stands of ponderosa pine trees in relatively open areas. Three red-tailed hawk nests were in ponderosa pine trees in forested areas. Kestrel nests were in cavities of dead trees, varying from ponderosa pines in heavy stands, to a cottonwood standing isolated in the grassland.

Recorded owl calls were played on two occasions. On May 23, the only response elicited was from a great horned owl in the Norbeck Basin area, 0.3 mile east of the west entrance to the park on US Highway 385. Because of the hazard from bison, and the limited response to the recordings on the initial attempt, it was decided to allot the majority of the remaining field time to the diurnal activities, which had already proved to be more productive. However, the recordings were tried once more on August 28. Responses occurred only in the Norbeck Basin area, this time from one adult and one juvenile great horned owl.

No nests were found as a result of playing recorded owl calls, although responses were elicited in an area in which a great horned owl fledgling had already been located.

Of the thirteen nests found, three were found by examining areas known to be preferred habitat of some raptors. This included the burrowing owl nest, and the two prairie falcons nests, both of which were also in prior nesting areas.

Two nests were discovered based on sightings by other park personnel. These included one red-tailed hawk nest, and one great horned owl nest.

Four nests were found by examining known prior nesting areas. These include one great horned owl nest, one red-tailed hawk nest, and the two prairie falcon nests mentioned above.

The six nests unaccounted for above were found by investigating areas chosen for hiking in order to cover the majority of the study area not included in the examination of preferred habitat, prior nesting areas, or areas indicated by sightings of park personnel.

An additional eight species of raptors were sighted within the study area. No nests were found for these species.

CONCLUSIONS

A variety of raptors were found to be utilizing Wind Cave National Park for nesting and/or hunting. Raptors were found in grassland, forest and riparian habitats, in a proportion to be expected based on habitat preferences as given by Clark, 1987, Heintzelman, 1979, and Eckert, 1987. The majority of the park is open grasslands, and the majority of sightings were of raptors preferring open areas (golden eagle, red-tailed hawk, American kestrel and burrowing owl). Although forested areas do comprise 25% of the park, sightings of raptors common to such areas (accipiter and the long-eared owl) were limited. This is explained by the limited visibility in forested areas, and does not necessarily indicate disproportionately small populations of these species. Limited riparian habitat accounts for the limited presence of great horned owls.

At present the only prey species in the park whose population is closely monitored is the black-tailed prairie dog, which is routinely preyed upon by golden eagles, red-tailed hawks, ferruginous hawks and prairie falcons. If the prairie dog population were to vary considerably in the future, a repeat of this study would be recommended to determine if a correlated change in the raptor population would follow that of the prey species.

Repeating this survey periodically would give potentially valuable information concerning the health of the environment. The results of such studies would be made more meaningful by complementing them with studies to determine the populations of the common prey species utilized by the raptors of the park.

The three sightings of ferruginous hawks were all immature birds, presumably one individual which had immigrated into the park after fledging in the open prairies to the east.

The four sightings of northern harriers were unexpected, as ideal nesting sites for this species do not exist within or near the park.

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