



DISTRIBUTION AND ABUNDANCE OF SPOTTED OWLS IN
ZION NATIONAL PARK

Dr. R. J. Gutiérrez
Douglas Call
Sarah E. Rinkevich
Department of Wildlife
Humboldt State University
Arcata, CA

Objectives

The main objective of this study is to estimate the distribution, habitat use, and reproductive status of Mexican spotted owls (*Strix occidentalis lucida*) in Zion National Park. This information will allow managers to coordinate park activities that potentially conflict with nest sites, roost sites, or brood rearing habitats. Other objectives of this study are to estimate spotted owl food habits and fledgling success, and to compare these findings with other North American spotted owl populations.

Methods

We used vocal imitations to locate owls during cruise, point and walk-in surveys (Forsman 1983, Franklin et al. 1990). Sex of owls was determined by voice (Forsman 1983). Most surveys were conducted between 2000 hours and 0600 hours (Mountain Standard Time) unless the areas were too dangerous to traverse at night. We monitored inaccessible areas using an 45.7 cm diameter plastic parabolic dish for 3-9 hour periods between 2000 hrs and 0500 hrs (MST). During these latter monitoring periods we called for 10 continuous minutes each hour and listened for responses during the remaining 50 minutes. We conducted several surveys at historic sites, allowing at least four days between these surveys. We also conducted additional walk-in surveys in inaccessible areas that contained potential spotted owl habitat.

Owls were captured using a noosepole (Forsman 1983), and marked with an aluminum U. S. Fish and Wildlife Service leg band on one leg and a color-band on the other. A blood sample was drawn from each adult for later electrophoretic examination. Age was categorized as adult or subadult following Forsman (1983). Each owl sighting or area was

visually classified to habitat type and the location plotted on a 1:24,000 topographic map.

Results

We conducted 109 surveys of which 46% were in areas of historic sightings (Table 1). We spent approximately 1,950 person hours over 70 days performing owl surveys. Three hundred nineteen km of trail and 157 km offtrail areas were surveyed in addition to those areas accessible by vehicle. We surveyed approximately 50 percent of the available habitat in the park. Fifty-five owl pellets were collected from two pairs of owls.

We located a pair of spotted owls with two juveniles in Echo Canyon and captured both adults and one juvenile. We captured an adult male in the upper portion of Pine Creek. A second pair and two juveniles were detected in Kolob Creek, 1.5 km north of the park boundary. These owls were located using a parabolic dish but were inaccessible for capture. Other responses included a pair of owls in Oak Creek; a male in Willis Creek and a male in Refrigerator Canyon. A single spotted owl in Camp Creek in June and a single owl in South Fork Taylor Creek in July were detected by L. Hays (pers. comm.).

Discussion

The low number of owl responses may indicate a low density of owls in Zion National Park. However, it may have been a poor year for spotted owl responses in general. No owls were detected on the Dixie National Forest (north of Zion) after a three month survey (A. L. Shafer, pers. comm.) D. Leslie (pers. comm.) reported only six owls sighted in southwestern Colorado after a three month survey. Few sightings were reported from the north Kaibab area of northern Arizona after extensive surveys (J. Goodwin, pers. comm.). Responses by owls in southern California, where known nest sites were being monitored, were poor following unseasonably hot spring weather (W. LaHaye, pers. comm.). J. Ganey reported 70 responses on the Coconino National Forest (pers. comm.). Ganey's sightings occurred south of the Colorado River. In general, owl responses were greater in southern Arizona and New Mexico (J. Goodwin, pers. comm.).

The low number of spotted owl responses on the Colorado Plateau could also have been related to detectability problems

Table 1. Location and number of spotted owl surveys conducted between 16 May - 20 August 1989, Zion National Park, Utah.

Location	Number of Surveys	Results
Beartrap Canyon	2	No response
Camp Creek	1	1 owl ¹ sex unknown
Canyon Overlook Trail ²	2	No response
Canyon Rim Trail	3	No response
Corral Hollow	1	No response
Court of Patriarchs	1	No response
Echo Canyon ²	4	Captured pair and one of two juveniles
Emerald Pools	1	No response
Gifford Canyon ²	4	No response
Great West Canyon (top)	1	No response
Heaps Canyon ² (top)	1	No response
Hepworth ²	1	No response
Hidden Canyon ²	4	No response
Highway 9 call route, 10 stations	2	No response
Kolob Arch Canyon	2	No response
La Verkin Creek	2	No response
La Verkin Creek tributary	2	No response
Lava Point ²	5	No response
MIA Road	4	1 pair, 2 juv, Kolob Canyon

Table 1. Continued.

Location	Number of Surveys	Results
Middle Fork Taylor Creek	1	No response
North Fork Taylor Creek	1	No response
Oak Creek ² paired	10	2 owls - social status unknown, suspect
Pine Creek ²	7	Captured 1 adult male, social status unknown
Phantom Canyon (top)	1	No response
Potato Hollow ² , and top of Imlay Canyon	5	No response
Refrigerator Canyon ²	6	1 male
Right Fork North Ck (top)	1	No response
Sleepy Hollow	4	No response
South Fork Taylor Creek	2	1 owl ¹ sex unknown
Telephone Canyon	4	No response
Wildcat Canyon Trail	1	No response
Willis Creek	3	1 male, status unknown
Zion Canyon Road call route, 5 stations	1	call Refrigerator Canyon
Canyon 1 (3273E, 41215N) ³	1	No response
Canyon 4 (3293E, 41205N)	1	No response
Canyon 5 (3299E, 41209N)	2	No response
Canyon 6 (3301E, 41211N)	1	No response

Table 1. Continued.

Location	Number of Surveys	Results
Canyon 7 (3305E, 41214N)	1	No response
Canyon 8 (3312E, 41213N)	1	No response
Canyon 9 (3314E, 41215N)	1	No response
Canyon 10 (3314E, 41224N)	1	No response
Canyon 11 (3327E, 41217N)	1	No response
Canyon 13 (3327E, 41213N)	1	No response
Canyon 14 (3316E, 41210N)	1	No response
Canyon 15 (3308E, 41209N)	1	No response
Canyon 16 (3299E, 41203N)	1	No response
Canyon 17 (3288E, 41202N)	1	No response
Canyon 21 (3272E, 41222)	1	No response
Canyon 22 (3318E, 41185N)	1	No response
Canyon 23 ² (3265E, 41284N)	2	No response

¹ L. Hays, Resource Officer, Zion National Park.

² The approximate historic sighting location.

³ Universal transverse mercator coordinates represent location at the mouth of the given canyon.

(i.e., owls were more difficult to hear in the canyon country), reproductive activity (non reproductive owls may respond at a lower rate), owl behavior (owls on the Colorado Plateau may have different response patterns than other spotted owl populations, or weather (owl response rates are often lower in hot weather) (pers. observation). Our use of parabolu dishes will help ameliorate detectability problems. Comparison of reproductive and non-reproductive owl response rates will require larger sample sizes and continued monitoring. However, the effect of hot whether on calling response can be tested by beginning our 1990 surveys in the early spring (1 April). This will also be a partial test of the behavioral response hypothesis. If spotted owls call more readily early in the year we can reject the behavior hypothesis. Earlier surveys will also allow more adequate nest site surveys.

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Personal Communications

Ganey, J., Dept. Biology, Northern Arizona Univ., Flagstaff, AZ 86011.

Goodwin, J., Habitat Div., Arizona Game and Fish, Flagstaff, AZ 86001.

LaHaye, W., Dept. Wildlife, Humboldt State Univ., Arcata, CA 95521.

Leslie, D., Dept. Wildlife Biology, Colorado State Univ. Ft. Collins, CO 80521.

Shafer, A. L., Dixie National Forest, 82 N. 100 E., Cedar City, UT 84720.