General

Threatened and Endangered Species Surveys and Habitat Management at Los Alamos National Laboratory

(National Environmental Research Park)

David C. Keller
James R. Biggs
Terrell H. Johnson

7/18/96

LA-UR-96-3444

Mexican Spotted Owl

*David C. Keller**

*Ecology Group, Los Alamos National Laboratory

Abstract

During the 1994, 1995, and 1996 field seasons, three primary areas at Los Alamos National Laboratory were surveyed for the Mexican spotted owl (*Strix occidentalis lucida*). The surveys revealed a nesting pair of owls that subsequently fledged a pair of young during two of the years.

1.0 Introduction

The Mexican Spotted owl was designated a federally threatened species on April 15, 1993. Mexican spotted owls are between 41 to 48 cm (16 to 19 in.) in length with white spots on the head and back and white horizontal stripes on the chest and no ear tuffs. This owl is one of two species, the other being the flammulated owl (*Otus flammeolus*), in the southwest that has completely dark eyes (National Geographic Society 1983).

The Mexican spotted owl inhabits mixed-conifer and ponderosa pine-Gambel oak forests in mountains and canyons in the southwestern United States and northern Mexico. High canopy closure, high stand diversity, multilayered canopy resulting from an uneven-aged stand, large, mature trees, downed logs, snags, and stand decadence as indicated by the presence of mistletoe are characteristic of Mexican spotted owl habitat. This owl requires approximately 800 ha (2000 acres) of suitable habitat to insure reproductive success. In addition, spotted owls favor narrow, steep canyons where there is little light penetration and cool temperatures. They tend to prefer north-facing slopes and to nest in trees, crevices, or small caves (USDI Fish and Wildlife Service 1995, Travis 1992).

During the 1994, 1995, and 1996 breeding seasons, I surveyed the canyons in the western portion of Los Alamos National Laboratory (LANL) as part of the mitigation measures for the construction of the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility and as part of the development of the Threatened and Endangered Species Habitat Management Plan. During the course of these surveys, a pair of Mexican spotted owls was located in 1995 and in 1996. In both years, nests were found, each with two young that ultimately fledged. Based on the proximity of each nest location, it is reasonable to assume that this is the same pair of owls. They continue to be the only pair utilizing LANL lands for breeding.

Terrell Johnson (1994), a recognized spotted owl authority, developed a topographic model of potential spotted owl habitat in New Mexico and is in the process of developing a similar model to be used for LANL. Results from initial modeling indicate three areas within Laboratory boundaries that could have potential owl habitat. All of the areas indicated in this model have been monitored for at least two years and occupied habitat will continue to be monitored on a yearly basis.

2.0 Methodology

Surveying for the Mexican spotted owl follows the USDA Forest Service protocol. Once an area of potential habitat is identified based on habitat type, a survey route is planned. A route is designed to cover all of the available habitat within 0.8 km (0.5 mi) of the calling route. From approximately 2 AM until sunrise, surveys are performed by broadcasting the call of the spotted owl and waiting for an owl to respond. The surveyor will walk a canyon edge or bottom and play the call to cover the habitat in the area of the survey. The area is covered completely in one survey outing. Once an owl is found, the preliminary surveys can be discontinued and more intensive nest location surveys can begin. All owl species detected during the survey are recorded. Table 1 shows the results of the surveys conducted in 1994, 1995, and 1996. The biologist records the time, species, and the location of each owl detected.

Once a Mexican spotted owl is located, the next step is to discover if there is a pair of owls and if they have a nest in the location of interest. The owl, after detected during a night survey, is usually followed until dawn, and a physical description of the area where the owl quit calling and the location are recorded. The area where the owl is near dawn is the most likely roost location. If a pair has young, the owl is usually near the nest location. Once a roost location is suspected, the next day the biologist searches the area for any evidence of nests or a pair of owls. Droppings, pellets, and the remains of dead prey can be a clue to the nest location. The next step is for the biologist to give the owl under surveillance a mouse. In the mousing process one or both owls are given a mouse and the biologist follows an owl to determine the fate of the mouse. Only male mice are used to ensure that a non-native mouse species is not introduced to the study area. When the female owl is given a mouse, she will then usually take this mouse to a nest, revealing its location. The male owl will often give the mouse to the female and the nest can be located. If the mouse is consumed or stored by the owl, nesting might not be taking place but further mousing is conducted to confirm that the pair is not nesting. Once several mousing attempts, noting male and female owl behavior, result in no nest being located, it is reasonable to assume that a pair is not nesting. If an area is surveyed and no owls are found, a series of 4 or more surveys per breeding season is required for two years before a site can be cleared for disturbance activities during the spotted owl breeding season.

3.0 Results

During the 1994, 1995, and 1996 field seasons, 22 regular call broadcast surveys were conducted at LANL. Of these surveys, 7 of them resulted in the detection of a Mexican spotted owl. All of these located endangered owls were in or near the same canyon complex. Following the identification of the roosting locations, two or three additional field outings were required to locate the owl pair and the nestlings. The first and second trip to the nest area revealed a pair of adult owls and chicks on the nest. The third visit revealed the adult owl pair and two chicks out on a tree away from the nest. Once the nest location was confirmed, physical measurements were established as to the makeup of the nest location. Castings, owl pellets, are collected at the site to determine the prey abundance and characteristics of the owls diet.

Date of Survey	Location of Survey	Result of Survey
6/30/94	Study Site (SS) 1	None
7/18/94	SS 1	None
8/3/94	SS 1	None
8/23/94	SS 1	None
5/10/95	SS 2	Great Horned Owl (4) Flammulated Owl (1)
5/16/95	SS 2	Mexican Spotted Owl (1) Great Horned Owl (1)
5/18/95	SS 3	Mexican Spotted Owl (2) Great horned Owl (2) Flammulated Owl (1)
5/23/95	SS 2	Flammulated Owl (1)
5/25/95	SS 3	Flammulated Owl (1) Great horned Owl (1)
6/2/95	SS 2	Great Horned Owl (2) Flammulated Owl (1)
6/8/95	SS 3	Mexican Spotted Owl (2)
6/15/95	SS 3	Northern Pygmy-Owl (1) Mexican Spotted Owl (1) Great Horned Owl (1)
6/22/95	SS 1	Great Horned Owl (1)
7/6/95	SS 1	None
7/27/95	SS 1	None
8/9/95	SS 1	None
4/26/96	SS 3	Great Horned Owl (2) Mexican Spotted Owl (1)
5/1/96	SS 2	Northern Pygmy-Owl (1)
5/7/96	SS 3	Great Horned Owl (1) Mexican Spotted Owl (1) Northern Pygmy-Owl (1)
5/17/96	SS 2	None
6/5/96	SS 2	Northern Pygmy-Owl (1)
6/25/96	SS 2	Mexican Spotted Owl (1)

Table 1. Results of the three years of Mexican spotted owl surveys.

4.0 Conclusions

For the second year in a row a pair of Mexican spotted owls at LANL have successfully reared and fledged a pair of chicks. The environment is currently protected from major disturbance and continued protection of this environment will ensure that LANL will play a role in the conservation and recovery of the Mexican spotted owl. The lands of LANL are capable of supporting more than one pair of Mexican spotted and an aggressive monitoring program will ensure that biologists know the location of nesting birds and are able to assist in the planning of projects that could be impacted by the location of these birds. The continued monitoring of owl nest locations will be a valuable tool to planners to ensure that owls and the mission of the Laboratory can coexist.

Acknowledgments

I wanted to thank Rhonda Robinson, Saul Cross, Kathy Bennett, Dan Dunham, and Terry Foxx for getting up early and stumbling around in the dark to see if we could hear some owls.

References

Travis 1992: J. Travis, "Atlas of the Breeding Birds of Los Alamos County, New Mexico," Los Alamos National Laboratory report LA-12206 (October 1992).

National Geographic Society 1983: *Field Guide to the Birds of North America*, 2nd ed., S.L. Scott, Ed., (National Geographic Society, Washington, D.C. 1983).

Johnson 1994: T.H. Johnson, "Status of the Spotted Owl in the Jemez Mountains—1993," unpublished report (1994).

USDI Fish and Wildlife Service 1995: USDI FWS, "Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*)" Vol. 1, Albuquerque, NM.

Southwestern Willow Flycatcher

*David C. Keller**

*Ecology Group, Los Alamos National Laboratory

Abstract

During the 1995 and 1996 field seasons, two primary areas were surveyed for the southwestern willow flycatcher (*Empidonax traillii extimus*). The areas searched were Pajarito Canyon and the Rio Grande near Buckman Crossing. The southwestern willow flycatcher was not found.

1.0 Introduction

The southwestern willow flycatcher is listed as federally and state endangered, making the federal list on March 29, 1995. This species has experienced extensive loss and modification of its habitat and is also endangered by nest parasitism by the brown-headed cowbird (*Molothrus ater*).

The southwestern willow flycatcher is a small insectivorous bird, approximately 15 cm (5.75 in.) long. It has a grayish-green back and wings, whitish throat, light gray-olive breast, and light yellowish belly. Two wingbars are visible and an eye ring is faint or absent. The upper beak is dark and the lower is light. The song is a wheezy "fitz-bew" or "fit-za-bew," the call a repeated "whitt."

The breeding range of the southwestern willow flycatcher includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, and northern Mexico. The southwestern willow flycatcher winters in Mexico, Central America, and northern South America.

The nest is a compact cup of bark and grass with feathers on the rim lined with a layer of grass or silky plant material. It is located in a fork or on a horizontal tree branch 1 to 4.5 m (3.2 to 15 ft) above ground in a medium-sized bush or small tree, with dense vegetation all around the nest.

Southwestern willow flycatchers inhabit areas near water with 4- to 7-m- (13- to 23-ft-) high thickets of willow (*Salix* spp.), buttonbush (*Cephalanthus occidentalis* var. *pubescens*), seepwillow (*Baccharis glutinosa*), and tamarisk (*Tamarix pentandra*) (Tibbitts et al. 1994). There is occasionally a sparse overstory of cottonwoods (*Populus* spp.) associated with this species. At some nest sites surface water may be present early in the breeding season but only damp soil is present by late June or early July. Habitat patches as small as 0.5 ha (1.2 ac) can support one or two nesting pairs. This species has not previously been found on Los Alamos National Laboratory (LANL) property or Los Alamos County. Areas in lower Pajarito Canyon near Pajarito wetlands contain marginal southwestern willow flycatcher habitat.

The southwestern willow flycatcher is present and singing on breeding territories by mid-May. This flycatcher builds nests and lays eggs in late May and early June and fledges young in early to mid-July. During the 1995 and 1996 breeding seasons, monitoring of the potential southwestern willow flycatcher habitat did not reveal the presence of any of this protected species. To date, in two consecutive years of surveys, this flycatcher has not been found on LANL lands.

2.0 Methodology

The following steps are taken in a southwestern willow flycatcher survey. Once an area of potential habitat is identified, a survey route is planned. A route is designed to cover all of the available habitat. The survey for the southwestern willow flycatcher begins at dawn and continues until the survey area is completed. Surveys are performed by broadcasting the call of this flycatcher and waiting for it to respond. The surveyor walks a wetland area and plays the call enough to cover the habitat in the area of the survey. Preliminary surveys can be discontinued once a flycatcher is found. More intensive nest location surveys can then begin. The physical description of the site and the nest location are recorded but the nest site is not disturbed.

If an area is surveyed and no flycatchers are found, a series of 4 or more surveys per breeding season is required. Only then is a site cleared for disturbance activities during the breeding season.

3.0 Results

During the 1995 and 1996 field seasons, 10 regular call broadcast surveys were conducted at LANL and adjacent lands. Of these surveys none of them resulted in the location of a southwestern willow flycatcher. Table 1 shows the results of the surveys conducted in 1995 and 1996.

4.0 Conclusions

For the second year in row no southwestern willow flycatchers were located at LANL. Although the existing habitat at LANL is marginal at best, I believe it should be periodically monitored for future colonization by this species. The land cover mapping will provide a tool to define potential habitat (Koch et al. 1996). Once habitat is established on a map, any potential conflicts between LANL activities and endangered species can be dealt with very early in the planning stages of a habitat disturbing activity.

Date of Survey	Location of Survey	Result of Survey
6/14/95	Pajarito Canyon	None
6/22/95	Rio Grande	None
7/13/95	Pajarito Canyon	None
7/19/95	Rio Grande	None
5/30/96	Pajarito Canyon	None
5/31/96	Rio Grande	None
6/13/96	Rio Grande	None
6/14/96	Pajarito Canyon	None
7/17/96	Pajarito Canyon	None
7/18/96	Rio Grande	None

Table 1. Results of 1995 and 1996 southwestern willow flycatcher surveys.

Acknowledgments

I wanted to thank Rhonda Robinson, Saul Cross, Dan Dunham, and John Huchton for getting up early and battling the mosquitoes to try and find this bird.

References:

Tibbitts 1994: T.J. Tibbitts, M.K. Sogge, and S.J. Sferra, "A Survey Protocol for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*)," National Park Service, Technical Report NPS/NAUCPRS/NRTR-94/04 (1994).

Koch 1996: S.W. Koch, T.K. Budge, S.G. Ferran, L.F. Sandoval, M.A. Mullen, and K.D. Bennett, "Los Alamos National Laboratory Land Cover Map," Los Alamos National Laboratory report LA-UR-96-3362.

Goat Peak Pika, Black-Footed Ferret, and New Mexico Meadow Jumping Mouse

*James R. Biggs**

*Ecology Group, Los Alamos National Laboratory

Abstract

Potentially endangered mammal species of concern for Los Alamos National Laboratory (LANL) include Goat Peak pika (*Ochotona princeps nigrescens*), black-footed ferret (*Mustela nigripes*), and New Mexico meadow jumping mouse (*Zapus hudsonius*). Pikas commonly occur within the Jemez Mountains including Frijoles Canyon, the Cerro Grande, and Pajarito Mountain. This species is more common in this area than previously recognized. New activities by the Laboratory are expected to result in a low potential for impact to suitable habitat for this species. Meadow jumping mice are found close to permanent water and wet meadows. Suitable habitat for this species is limited on LANL property. Several surveys have been conducted since 1990 with no specimens having been captured to date. Black-footed ferrets usually inhabit large prairie dog towns which serve as a food source. However, no expansive prairie dog towns have been found on LANL property, therefore, the potential for this species to occur here is low. Suitable habitat on LANL property for Goat Peak pika and meadow jumping mouse will need to be evaluated following the development of a detailed vegetation map of this area. Appropriate surveys can then be conducted to determine presence/absence.

1.0 Introduction

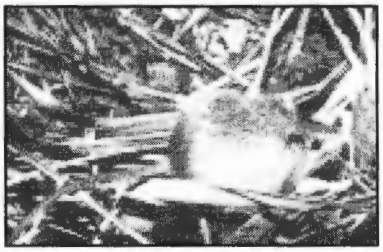
Other than some bat species, three species of mammals listed as threatened, endangered, or species of concern (SOC) may occur in habitats in the Los Alamos National Laboratory (LANL) area or in the east Jemez Mountains. These species are the Goat Peak pika (*Ochotona princeps nigrescens*), black-footed ferret (*Mustela nigripes*), and New Mexico meadow jumping mouse (*Zapus hudsonius*).

1.1 Goat Peak Pika (SOC)

The Goat Peak pika is generally nocturnal. Pikas occur commonly within the Jemez Mountains on patches of large talus slopes on higher peaks, small rocky areas at the head of Frijoles Canyon, older talus slopes of Cerro Grande, and exposed ski slopes of Pajarito Mountain (Swickard et al., 1971; Hafner, pers. obs.). Areas most heavily populated by pikas are the Tschicoma Mountain and eastern rim of the Valles Caldera, Rabbit Mountain, Redondo Peak, and Cerros del Abrigo. Disturbance activities exposing talus such as logging and ski slope construction have also produced suitable habitat for pikas.

1.2 New Mexico Meadow Jumping Mouse (SOC, State Threatened)

Known populations of meadow jumping mouse in New Mexico have been found close to permanent free-flowing water, in riparian zones of streams and ditches, and in wet meadows near cattail marshes associated with major rivers (Morrison 1990, 1992). Dry higher ground near waterways that provide locations for nesting and hibernation are typical of habitat where jumping mice have been found.



1.3 Black-Footed Ferret (Federal Endangered)

Black-footed ferrets are most commonly associated with prairie dog towns (*Cynomys* spp.) in the western U.S. Prairie dogs serve as the main food source for black-footed ferrets. During winter months black-footed ferrets move from burrow to burrow feeding on hibernating prairie dogs. Prairie dog towns, none of which have been found within or near LANL, vary in size but are usually found in relatively open terrain where vegetation does not hinder the line of sight to predators.

2.0 Methodology

2.1 Goat Peak Pika

No formal surveys have been conducted on LANL property for the Goat Peak pika. However, numerous surveys in the Jemez Mountains, including the eastern portion, have revealed localized high numbers of this species (Hafner, pers. com.; Hafner 1993, 1994, 1995; Swickard et al. 1971). Specific methodology for surveying this species will be based on evaluations of cover and community types at LANL. Once suitable habitat has been identified, a site evaluation will be made and, if deemed necessary, formal surveys for this species will be performed. The need to perform surveys and the type of survey used for Goat Peak pikas will depend on the presence and extent of suitable open talus and rocky areas on LANL property. This information will be obtained from land cover maps that will be produced during the FY '97 scope of work.

2.2 New Mexico Meadow Jumping Mouse

The major activity period for meadow jumping mice in the Jemez Mountains-Espanola area is June through September, with breeding occurring between May and September (NMDGF 1988). Since 1990, areas of potential habitat have been surveyed using a snap trap protocol developed by Morrison (1990). These surveys took place at locations that were evaluated as being the most suitable habitat available on LANL property. A minimum of four consecutive nights of snaptrapping was used. Traps were spaced at 10-m (33-ft) intervals with three traps per station along a stream channel or within other appropriate habitat. Aluminum

Sherman live traps with the dimensions 22.5 x 7.5 x 30 cm (9 x 3 x 12 in.) and baited with sweet feed were also used. Traps were baited in late afternoon and set on a level surface under cover for protection from exposure to heat and precipitation. Traps were left open overnight to capture animals, then checked early the next morning.

2.3 Black-Footed Ferret

No surveys have been conducted on LANL property for black-footed ferrets due to an apparent lack of suitable habitat. Preliminary surveys will be conducted to determine if prairie dog towns exist on or adjacent to LANL property. Formal surveys for black-footed ferrets are conducted on towns that are greater than 80 acres in size or a complex of towns greater than 80 total acres that are less than 5 miles apart from one another (WCFW 1988). Survey methodology differs from warmer months to cooler months. During periods of snow cover, surveys consist of daytime surveys where tracks, scat, and burrowing activity are the primary focus of search. Burrows have a distinct formation unique to this species. During periods of non-snow cover, a series of surveys are conducted over three consecutive nights. The surveys consist of a complete check of the prairie dog town by use of spotlighting and burrow checks. Activities resulting in disturbance of any part of a prairie dog town, or any part of a complex of towns, will require an indepth survey.

3.0 Results

3.1 Goat Peak Pika

This is a common species within its desired habitat and is more common than previously recognized for this area (Hafner, pers. comm.). Loss of appropriate habitat can occur by increasing moisture in dry areas which promotes invasion of vegetation that fills the talus slopes. If new activities around the Laboratory result in disturbance of presently undisturbed ground, there will likely be a low potential for impact to habitat to this species.

3.2 New Mexico Meadow Jumping Mouse

Meadow jumping mouse surveys were conducted in habitat on LANL property evaluated to likely support this species. Although no individuals were found to date, more extensive and thorough evaluation of potential habitat will be conducted following the development of a detailed land cover map.

3.3 Black-Footed Ferret

The presence of the black-footed ferret has not been reported in New Mexico since 1934. During various vegetation surveys performed in and around LANL property over the last 20 years, no prairie dog towns have been observed. No formal surveys for the presence of prairie dogs have been conducted on LANL property. If prairie dog towns are identified, a more extensive survey will be done.

4.0 Conclusions

Three of the threatened, endangered, or SOC mammal species identified as potentially occurring in the LANL area, the Goat Peak pika, meadow jumping mouse, and black-footed ferret have not been found on LANL property. However, the Goat Peak pika and the meadow jumping mouse are known to inhabit this region in habitats similar to what is found on or around LANL property. Additional surveys will be needed to determine presence/absence of these species on LANL property. The black-footed ferret is extremely rare and likely does not occur in this area, however, surveys will be necessary to determine if extensive prairie dog towns (>80 acres) occur in or near LANL. If so, more extensive surveys will need to be conducted to determine presence/absence of this species.

Surveys for any of these species will not be conducted until completion of the land cover map. This map will aid in identifying and delineating the extent of potential habitat that could support these species.

References

Hafner 1993: D.J. Hafner, "North American Pika (*Ochotona princeps*) as a Late Quaternary Biogeographic Indicator Species," *Quaternary Research*, 39:373–380 (1993).

Hafner 1994: D.J. Hafner, "Pikas and Permafrost: Post-Wisconsin Historical Zoogeography of *Ochotona* in the Southern Rocky Mountains," *U.S.A. Arctic and Alpine Research*, 26:375–382 (1994).

Hafner 1995: D.J. Hafner, "Historical and Ecological Biogeography of Nearctic Pikas (Lagomorpha: Octhotonidae)," *J. of Mammalogy*, 76:302–321 (1995).

Swickard 1971: M. Swickard, G.E. Haas, and R.P. Martin, "Notes on Small Mammals Infrequently Recorded from the Jemez Mountains, New Mexico," *Bulletin of the New Mexico Academy of Sciences*," 12:10–14 (1971).

Morrison 1992: J.L. Morrison, "Persistence of the Meadow Jumping Mouse, *Zapus Hudsonius Luteus*, in New Mexico," pp. 308–311, *The Southwest Naturalist* V. 37, No.3, (September 1992).

Morrison 1990: J.L. Morrison, "The Meadow Jumping Mouse in New Mexico: Habitat Preferences and Management Recommendations," pp. 136–143, *Managing Wildlife in the Southwest* [Ed. by P Krausman and N. Smith. The Wildlife Society, Phoenix] (1990).

NMDGF 1988: New Mexico Department of Game and Fish, "Handbook of Species Endangered in New Mexico," *New Mexico Department of Game and Fish,* Santa Fe, NM, G-217:1–2, (1988).

WCFW 1988: Wyoming Cooperative Fishery and Wildlife Unit, "Black-Footed Ferret Survey Techniques," (1988).

Bald Eagle Habitat Management in the Los Alamos National Environmental Research Park

*Terrell H. Johnson**

*Consultant

Abstract

Bald eagles *(Haliaeetus leucocephalus)* winter along the Rio Grande but are not known to nest in the area. Most wintering bald eagles congregate downstream from the Los Alamos National Environmental Research Park (LA/NERP), but the LA/NERP contains winter foraging and roosting habitat and potential nesting habitat. As bald eagles become more numerous and the river delta above Cochiti Lake expands, bald eagle use of LA/NERP is expected to increase. Potential nest and roost trees in White Rock Canyon have been mapped and will be monitored annually for signs of use. Sensitive zones around these trees have been mapped to trigger review of potentially disturbing activities. Interagency coordination will increase the effectiveness of bald eagle habitat management in the area.

1.0 Introduction

The bald eagle is federally listed as threatened throughout the lower 48 states and equivalently listed by the state of New Mexico as endangered (group 2). Bald eagles winter along the Rio Grande, including Department of Energy (DOE) land in and around White Rock Canyon, and several dozen often congregate downstream near Cochiti Lake. Some are resident from November through March, but others move about, and peak numbers usually occur in January or early February. Bald eagles forage for fish and waterfowl along the river and lake and for carrion and rabbits over land. While they forage most often in the vicinity of Cochiti Lake, they use all of White Rock Canyon regularly and the entire Pajarito Plateau occasionally. Bald eagles roost overnight in canyons that offer weather protection, security, and convenience to foraging areas, usually in tall ponderosa pines in lower portions of tributary canyons. Bald eagles around Cochiti Lake behave as if they are hunted, weaving and dodging in flight to avoid people. Evacuation of foraging and roosting areas in response to human presence within 200 to 800 meters (660 to 2640 ft) is typical behavior. Because few bald eagles nest in New Mexico, their nesting habitat is not well characterized, but a secure tree or cliff nest site near suitable aquatic habitat is probably required.

Several agencies have funded or conducted studies of bald eagles in this area. Johnson (1993) has monitored bald eagle winter population and diet near Cochiti Lake since 1979, funded by the National Park Service, US Army Corps of Engineers (COE), US Forest Service (USFS), and US Bureau of Reclamation. The USFS funded a study of bald eagles by Dodd (1979) in White Rock Canyon, and Public Service Company of New Mexico funded a study by Stahlecker (EES 1986) in the upper portion of White Rock Canyon. The New Mexico Department of Game and Fish has performed mid-winter fixed-wing aerial counts of bald eagles almost every year since 1978, and the COE has performed helicopter counts most years since 1984. LANL funded a survey for roosting and potential nesting habitat on the LA/NERP in 1992.

2.0 Methodology

Roosting counts provide the most effective way to census wintering bald eagles, which tend to congregate at regular roosts (Johnson 1993). Late afternoon and early morning counts along flyways to and from roosts are more effective than counts of eagles at roosts, where growing darkness and the distance required to avoid disturbance limit visibility. Aerial counts cover more ground and sample aquatic foraging areas, but tend to detect relatively fewer immature eagles. Collection of castings and other prey remains under roost trees provide the most comprehensive picture of diet, but underrepresent the absolute proportion of fish in the diet. Late winter surveys of suitable roost trees for accumulated castings, feathers, and droppings have proven to be the most efficient method of documenting occasional use of trees for roosting and perching.

3.0 Results

Winter roosting counts of bald eagles in the Cochiti area have generally increased over the years (Johnson 1993), as have the statewide aerial counts (S.O. Williams III, pers. comm.). Since 1979, average winter counts near Cochiti have doubled (Figure 1). As total counts have increased, the number of bald eagles using areas farther upstream has also increased. Over the same period, the wetland habitat of the delta above Cochiti Lake has expanded to about 12 km (7.2 mi) of delta between Frijoles Canyon and the lake in the 20 years since the lake was filled. This delta provides diverse aquatic and wetland habitat for fish, wintering waterfowl, and bald eagles (Allen 1993). Castings indicate that wintering bald eagles consume fish, waterfowl, and significant amounts of carrion, especially deer and elk. Water management may affect bald eagle habitat (Johnson 1988), especially that of the delta wetlands.

A survey of potential roost trees near the mouths of Water, Ancho, and Chaquehui Canyons in March 1992, indicated occasional bald eagle use of trees near the mouth of Water and Chaquehui Canyons, as droppings but no castings or feathers were found. The same habitat has potential for nesting. Bald eagle use of the Pajarito Plateau is too sparse to study or to attract much attention, but a detailed report of an immature bald eagle in Los Alamos Canyon above the Omega reactor (A. Kron, pers. comm.) and a number of reports of bald eagles seen along State Highway 4 west of the Bandelier entrance illustrate that use does occur.

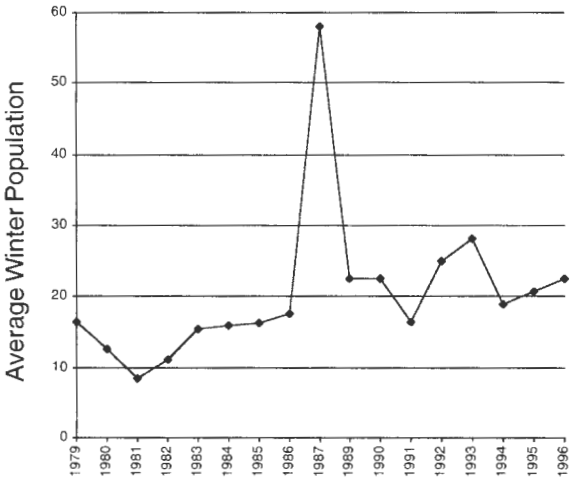


Figure 1. Average numbers of bald eagles roosting near Cochiti Lake during the winters of 1979–1996. An increasing trend underlies annual variations, which are dependent on water management and weather (Johnson 1993).

Fifteen suitable roost and five potential nest trees in the lower tributary canyons and sensitive zones extending up to 1700 m (5610 ft) from roost and 900 m (2970 ft) from potential nest trees were mapped in 1992 (Johnson 1992). Sensitive zones indicate an area in which LANL activities should be reviewed for potential impact on roosting (November 1 – March 31) or nesting (January 1 – July 31) bald eagles, and outside of which no effect is anticipated.

4.0 Conclusions

Bald eagle use of DOE land in White Rock Canyon should increase as the Cochiti Lake delta continues to expand upstream and numbers of wintering eagles increase. Indications of bald eagle use on DOE land in White Rock Canyon in 1992 were too slight to justify direct bald eagle counts, but annual surveys for signs of use is an appropriate method to monitor and document bald eagle winter use there. Infrequent and scattered use of terrestrial areas does not justify direct survey for bald eagles in terrestrial areas, but management planning should recognize that it does occur at low levels, and may be associated with elk or deer carrion. Likewise, bald eagle nesting in White Rock Canyon or adjacent areas is a possibility that should not be discounted.

Sensitive zones should be used to flag review of LANL activities to prevent disturbance of roosting or nesting bald eagles. Potentially disturbing activities should be scheduled outside of the sensitive season, unless non-occupancy has been determined at that time. These zones are mainly undeveloped and should remain so. LANL land-use planning should also recognize the contribution of terrestrial foraging areas, and cluster future developments to maintain large blocks of open land, especially near White Rock Canyon. Water management agencies have increasingly involved land and wildlife management agencies in water management decisions, and an interagency group has developed an ecological framework for managing the Cochiti delta wetlands (Allen 1993). The DOE and LANL should continue to participate in the Cochiti Lake Advisory Committee, which is now being organized to provide ongoing input into river and reservoir management.

Acknowledgments

S.O. Williams III of the New Mexico Department of Game and Fish has kindly provided summaries of mid-winter counts of bald eagles throughout New Mexico.

References

Allen 1993: C.D. Allen, B. Hanson, and C. Mullins, "Cochiti Reservoir Reregulation Interagency Biological Report," US Bureau of Reclamation unpublished report (June 1993).

Dodd 1979: N.L. Dodd, "Wintering Bald Eagle Habitat and Ecology on the Santa Fe National Forest, New Mexico," US Forest Service unpublished report (April 1979).

EES 1986: Eagle Ecological Services, "The Biological Assessment on Public Service Company of New Mexico's Proposed Ojo Line Extension 345 kV Project and Three Federally Endangered Species," US Bureau of Indian Affairs unpublished report (January 1986).

Johnson 1988: T.H. Johnson, "Effects of Reservoir Habitat Changes on Wintering Bald Eagles at Cochiti Reservoir, Northern New Mexico," in R. Glinski et al., eds., Proceedings of the Southwest Raptor Management Symposium and Workshop, National Wildlife Federation, Washington, D.C., pp. 182–187 (1988).

Johnson 1991: T.H. Johnson, "White Rock Canyon Eagle Habitat Management," memo to Terry Foxx (December 6, 1991).

Johnson 1992: T.H. Johnson, "White Rock Canyon Raptor Habitat Management," memo to Terry Foxx (March 18, 1992).

Johnson 1993: T.H. Johnson, "Bald Eagles Wintering near Cochiti Reservoir, 1979–1993," US Forest Service, US Army Corps of Engineers, and US Bureau of Reclamation unpublished report (1993).

Golden Eagle Habitat Management in the Los Alamos National Environmental Research Park

*Terrell H. Johnson**

*Consultant

Abstract

Golden eagles *(Aquila chrysaetos)* regularly breed in White Rock Canyon and have nested in the Los Alamos National Environmental Research Park (LA/NERP). A sensitive zone around an historic nesting cliff has been mapped to trigger review of potentially disturbing activities.

1.0 Introduction

The golden eagle is not federally or state listed but is uncommon in the area and is protected under the Bald Eagle Act, as amended in 1962. The Los Alamos breeding bird atlas acknowledged historic records of golden eagles breeding in Los Alamos County, but found none breeding during 1984–88 (POS 1992). Golden eagles are usually present in White Rock Canyon during the breeding season, which begins in early February and extends through the end of July and sometimes during the rest of the year. They forage primarily for small mammals such as rabbits and occasionally larger mammals or waterfowl. Golden eagles usually build stick nests on cliffs, sheltered by an overhang, and generally lay eggs in early March and fledge one young in late June. The narrow part of White Rock Canyon above the mouth of Frijoles Canyon appears to be a center of breeding activity, where nests have been found on two different cliffs, one of which was located in the LA/NERP in 1979 (Johnson 1991). A breeding territory will typically contain several nest sites that are used periodically, but breeding does not occur every year.

2.0 Methodology

Observation of suitable nesting cliffs during the breeding season is the most effective way to determine use by golden eagles. Observation at a range of about 400 m (1320 ft) early in the season, especially early in the morning, provides the best opportunity of detecting activity at a cliff, which does not always lead to nesting. Scanning stick nests on cliffs with a powerful spotting scope from a high vantage point is an efficient method of discovering nesting eagles later in the season, but concluding that a nesting cliff is vacant requires observation at close range.

3.0 Results

Golden eagles have not been found breeding in the LA/NERP since 1979, but no consistent monitoring has occurred. The LA/NERP historic nesting cliff was checked but not found to be occupied in 1994. However, golden eagle use of the area continues, as an adult and immature golden eagle were seen separately in the area in August 1996 (B. Foy, pers. comm.).

A sensitive zone extending up to 900 m (2970 ft) from the historic nesting cliff was mapped in 1992 (Johnson 1992). The sensitive zone indicates an area in which LANL activities should be reviewed for potential impact on nesting golden eagles from February 1 – July 31, and outside of which no effect is anticipated.

4.0 Conclusions

Golden eagle use of Department of Energy land near White Rock Canyon can be expected to continue, with occasional nesting in the LA/NERP. Annual surveys for signs of use is an appropriate method to monitor and document golden eagle nesting. The sensitive zone should be used to flag review of LANL activities to prevent disturbance of nesting golden eagles. Potentially disturbing activities should be scheduled outside of the sensitive season, unless non-occupancy has been determined at that time. This zone is mainly undeveloped and should remain so. LANL land-use planning should also recognize the contribution of terrestrial foraging areas and cluster future developments to maintain large blocks of open land, especially near White Rock Canyon.

References

Johnson 1991: T.H. Johnson, "White Rock Canyon Eagle Habitat Management," memo to Terry Foxx (December 6, 1991).

Johnson 1992: T.H. Johnson, "White Rock Canyon Raptor Habitat Management," memo to Terry Foxx (March 18, 1992).

POS 1992: Pajarito Ornithological Survey, "Atlas of the Breeding Birds of Los Alamos County, New Mexico," Los Alamos National Laboratory report LA-12206 (October 1992).

Peregrine Falcon Habitat Management in the Los Alamos National Environmental Research Park

*Terrell H. Johnson**

*Consultant

Abstract

Suitable breeding habitat for the American peregrine falcon *(Falco peregrinus anatum)* is located in and around the Los Alamos National Environmental Research Park (LA/NERP), and the entire area is foraging habitat. Statewide, the peregrine population is increasing, but has experienced a recent decline in reproduction, which threatens to reverse this population trend. If peregrine falcons continue to increase in New Mexico, peregrine use of the LA/NERP is expected to increase. Suitable breeding areas in and around the LA/NERP have been identified, and the most important sensitive zones have been mapped to trigger review of potentially disturbing activities. A habitat management plan has been drafted for some suitable breeding habitat, which will require interagency cooperation to complete.

1.0 Introduction

The American peregrine falcon is federally and state listed as endangered. Peregrine falcons nest on cliffs with defensible and protected nest ledges that are in good foraging habitat. Peregrine breeding habitat occurs throughout the mountains of New Mexico, including lands in and around the Los Alamos National Environmental Research Park (LA/NERP). Peregrine falcons forage up to 20 km (12 mi) from nesting areas, almost entirely for birds, which are attacked and caught in the air. Avian prey is vulnerable when it is without cover, which may occur in a large gulf of air, as found over a canyon or over large grasslands or bodies of water. They are resident from early March through mid October. Breeding peregrine falcons have been increasing in New Mexico for more than a decade, but pesticides evidently continue to impair reproduction, and occupancy of breeding territories remains below recovery levels (Johnson 1995).

By agreement among the wildlife and major land management agencies in New Mexico, all suitable peregrine habitat is managed as if occupied, in the absence of a current determination of vacancy. Suitable habitat has been identified throughout much of the state, based on an objective evaluation of historic habitat. The suitable habitat approach has proven to be the most efficient and effective management strategy because it maintains the distinction between the relative permanence of habitat and transience of habitat use by individuals of the species. It maintains habitat for population expansion and protects peregrines wherever they may breed. At the same time, it permits coordination of other activities in a predictable manner. Attempts to coordinate activities based on occupancy in any given year have proven complicated and inefficient, and have usually disappointed expectations and resulted in more disclosure than predetermined habitat management.

Observations have shown how peregrines respond to human activity (Johnson 1988). Disturbance can prevent birds from occupying habitat or cause mortality of young by interrupting essential parental care. Nesting areas in New Mexico with frequent human activity are generally occupied irregularly, and peregrines in areas with occasional disturbance suffer reproductive failure more often than those in undisturbed areas (Johnson 1994a). While pesticide impacts on reproduction result from national or international factors, local management of peregrine habitat focuses on minimizing disturbance and maintaining habitat quality. Preserving the confidentiality of nesting areas is essential to minimizing disturbance because the peregrine has such notoriety that disclosure inevitably results in disturbance.

In cooperation with the US Fish and Wildlife Service and federal land management agencies, the New Mexico Department of Game and Fish takes the lead in monitoring and compiling information on peregrine falcons in New Mexico. LANL has been coordinating peregrine habitat management with state and federal wildlife agencies for two decades, supporting habitat monitoring and ensuring that activities do not impact habitat, individuals, or the species.

2.0 Methodology

Suitable nesting areas are monitored for occupancy and nesting activity by observing with binoculars and spotting scope from a distance of typically 450 meters (495 yds). This allows complete aural and visual observation of nesting activity and resolution of individual plumage characteristics with minimal disturbance (Johnson 1988b). Nesting areas are visited at least twice every year, but as often as necessary to determine occupancy and reproduction. Results have been standardized by having four highly experienced observers do nearly all the peregrine monitoring in the state. Individual plumages can be used to determine identity, and are recorded whenever possible.

Habitat identification is based on analysis of foraging and nesting topography and cliff characteristics associated with peregrine falcon breeding areas (Johnson 1993). Factors of elevation and slope model prey abundance, diversity, and vulnerability to index the suitability of breeding territories, and factors of cliff size, structure, position, and temperature index the suitability of nesting cliffs. Four sensitive zones around each suitable nesting area have been defined relative to peregrine responses to disturbance and extend from 900 m (990 yd) up to 3400 m (3740 yd) from suitable nesting cliffs (Johnson 1983). These zones are used to evaluate and schedule activities occurring in the zones, to prevent disturbance (Johnson 1994).

3.0 Results

Sensitivity of the information precludes disclosure of local monitoring data, which are not statistically significant by themselves but are consistent with statewide data. Occupancy of breeding habitat in New Mexico has increased since 1980, but reproduction has declined since 1988 (Figure 1). Recent reproduction has been just above the level required to maintain the population, and if it continues to decline, the population will soon begin to decline (Johnson 1995).

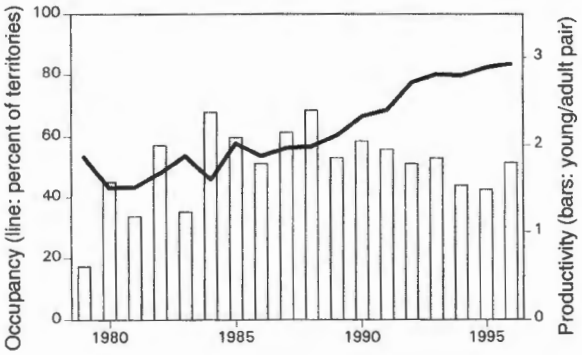


Figure 1. Occupancy of historic breeding territories by any peregrine (line) and reproduction by adult pairs (bars) in New Mexico during 1979–1996. Occupancy represents population, and has been increasing, but the trend depends on prior reproduction, which has recently declined close to the minimum maintenance level (Johnson 1995).

Habitat identification in and around the LA/NERP began in 1979 and has continued as habitat criteria have been refined since. A number of suitable breeding areas have been identified in and around the LA/NERP, all of which involve shared responsibility with other land management agencies. The Department of Energy (DOE) has primary federal responsibility for some of these areas, but needs only to ensure that LANL activities do not impact others. Sensitive zones and a habitat management plan were drafted for one suitable nesting area in 1992, and a sensitive zone was delineated in 1992 where LANL activities within the LA/NERP are most likely to have an effect on nearby habitat. The entire LA/NERP is peregrine foraging habitat.

4.0 Conclusions

Peregrine falcon breeding activity in and around the LA/NERP should increase if the peregrine population continues to increase. Annual monitoring of habitat for which the DOE has primary responsibility provides useful management information and should continue. Revision and expansion of the draft habitat management plan to cover all habitat for which the DOE has primary federal responsibility should be completed, which will require careful cooperation with other agencies. Sensitive zones should be used to flag review of LANL activities to prevent disturbance of breeding peregrine falcons in or near the LA/NERP. As a rule, all potentially disturbing activities should be scheduled outside of the breeding season, but biological monitoring information may be used to evaluate critical activities within the breeding season. LANL land-use planning should also recognize the contribution of terrestrial

foraging areas and cluster future developments to maintain large blocks of open land. Cooperation with adjacent land management and wildlife agencies is essential to the successful habitat management for this species.

Acknowledgments

S.O. Williams III of the New Mexico Department of Game and Fish has kindly provided data summarizing the status of the peregrine falcon throughout New Mexico.

References

Johnson 1983: T.H. Johnson, "Response Thresholds of Breeding Peregrines," US Forest Service unpublished report (1983).

Johnson 1988a: T.H. Johnson, "Responses of Breeding Peregrine Falcons to Human Stimuli," in R. Glinski et al., eds., Proceedings of the Southwest Raptor Management Symposium and Workshop, National Wildlife Federation, Washington, D.C., pp. 301–305 (1988).

Johnson 1988b: T.H. Johnson, "Turnover and Movement of New Mexico Peregrine Falcons Identified by Plumage," in R. Glinski et al., eds., Proceedings of the Southwest Raptor Management Symposium and Workshop, National Wildlife Federation, Washington, D.C., pp. 153–156 (1988).

Johnson 1992: T.H. Johnson, "Topographic Model of Potential Peregrine Falcon Breeding Habitat," US Forest Service unpublished report (1992).

Johnson 1994: T.H. Johnson, "Peregrine Falcon Habitat Management in National Forests of New Mexico," US Forest Service unpublished report (1994).

Johnson 1995: T.H. Johnson, "The Peregrine Falcon in New Mexico—1995," New Mexico Department of Game and Fish unpublished report (1995).