



## FINAL REPORT:

# RESULTS OF THE 1991 MEXICAN SPOTTED OWL POPULATION SURVEY

Grand Canyon National Park



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**FINAL: THE 1991 GRAND CANYON NATIONAL PARK  
SOUTH RIM MEXICAN SPOTTED OWL SURVEY**

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## ABSTRACT

The 1991 Grand Canyon South Rim mexican spotted owl (*Strix occidentalis*) population survey found no owls of any species in either the proposed Grand Canyon Village development areas or the Grandview Point area. The procedure and methods used are discussed and critiqued; several recommendations for the future are included as well. Appended is a GIS map of suitable South Rim habitat and a copy of the Forest Service Protocol to be used as a guide and reference.

## AREA, PROCEDURES, AND METHODS

The 1991 Grand Canyon National Park (GRCA) South Rim mexican spotted owl (*Strix occidentalis*) survey was conducted by Paul Feinberg with John Ray present as an observer during the 07/11 hooting session. The survey was conducted between 07/08/91 and 07/16/91 with hooting sessions occurring on the nights of 07/09, 07/11, and 07/16/91. Two areas were targeted: the proposed South Rim village development areas (Figures 1 and 2) and the rim area between Grandview Point lookout and the first turnout to the west (Figure 3). This last area was chosen on the basis of a GIS map (Appendix 1) prepared by Carolyn Dunn (GRCA) using appropriate habitat parameters as outlined by Ganey (1991). These parameters are steep ( $\geq 15\%$ ) (north facing) slopes with a dense mixed conifer or Ponderosa Pine (*Pinus Ponderosa*) cover type. In addition, Nelson (pers. comm.) has found owls nesting in narrow canyons. The owls choose these cooler nesting locations possibly due to their inability to dissipate body heat (Ganey 1991).

Feinberg received brief training in hooting and survey techniques by Noel Walsh (USFS-Tusayan Ranger District) and John Nelson (and crew) (Dave Wiley's Environmental Consulting Company). A tape recording of several species' calls was provided by Katy Schmidt (Grand Canyon National Park-North Rim Administration).

The protocol employed was adapted from the current United States Forest Service (1990) inventory protocol (Appendix 2) which should be followed in future surveys. Hooting points

for the development area survey were set up prior to the hooting sessions. Stations were marked along existing roads at approximately 1/2 mi. intervals to afford maximum coverage of the development areas (Figure 4). The Grandview Point area was surveyed by walking along the rim and hooting from (identifiable) promontories using a compass and topographic map (This method, however, proved ineffective (see below Discussion section)). Hooting was carried out from approximately dusk until either all points were surveyed, the surveyor's hooting became ineffective, or the weather/wind turned unfavorable (i.e. If the wind became too strong the hooter's voice did not carry and consequently he could not be heard from any appreciable distance). The tape recording was not used to call owls as the surveyor thought it not loud enough.

The surveyor was at each station between 15 and 30 minutes, alternately hooting and listening. The primary call was the "spotted owl four note contact call," though alternate spotted owl calls and those of other species were employed as well (All calls used are recorded and identified on the owl call cassette.). If a spotted owl were to be located, a compass bearing would have been taken and an attempt made to call the owl within visual range of the surveyor so its presence could be visually confirmed (From Forest Service protocol).

## RESULTS

No owls of any species were heard or located in either the proposed development areas or the Grandview Point area (No spotted owls-though individuals of other species were located-were found during the North Rim survey (Ray, pers. comm.)).

## DISCUSSION

I believe that the established Forest Service (1990) protocol is an adequate and employable survey procedure. However, there were several inherent problems with this year's survey which could have contributed to the negative results. To begin, the surveyor was inexperienced at both hooting and owl identification, having only begun practicing a few weeks before the survey was initiated. It is therefore possible that owls in the area were not interested in the surveyor enough to make their presence known.

Another factor is the late starting date of the hooting sessions. Optimal dates for hooting surveys are between approximately 04/15 and 06/30, with 07/31 being the currently accepted absolute latest date for effective hooting surveys. After this date the owls are less responsive to the hooters because they have left (or are preparing to leave) the nest territories as the young have fledged (Forest Service 1990; Walsh pers. comm.).

A third factor which applies to the proposed development areas is that a majority of the habitat being reached by the surveyor's voice was pinon-juniper with minimal slope; this habitat does not lie within Ganey's (1991) and Nelson's parameters. There are also limited nesting holes for the owls in pinon/juniper trees and no suitable nesting cliffs/canyons exist in the development areas.

Another problem facing the surveyor in the Grandview Point area was the lack of roads or identifiable landmarks associated with the rim hooting stations. In this area it is necessary to set up hooting stations prior to the night time sessions; however, a reliable system for relocating these stations with the aid of only a headlamp must be devised for this to be a practicable and repeatable method. This year stations were not predetermined and because of the extreme darkness on 07/16 the rim contours could not be resolved. Therefore, if an owl had been located its precise location

could not have been determined. This problem, however, can be easily corrected by using the new GPS which is currently on order by Resource Management.

#### RECOMMENDATIONS

Future surveys should adhere closely to the Forest Service (1990) protocol, especially in reference to dates and complete survey requirements. Some other suggestions are:

--Surveyors need to be proficient at both hooting and owl identification. If an experienced hooter is not hired he/she should be sent a copy of the tape so he/she can practice prior to survey initiation. In addition, Walsh should be contacted so a brief lesson can be given (The calls are not easy to duplicate!).

--Two surveyors should be present for each hooting session, especially in areas where there are no roads or the stations are on or near the rim.

--A decision must be made concerning the priority given to the determination of nesting status. If an owl is found, a follow-up daytime survey and mousing should be conducted to determine nest location and status. A confirmed visual sighting of a single owl in an area tells us little about the population's status and dynamics.

--A cost estimate for surveying all suitable South Rim Mexican spotted owl habitat (Appendix 1 includes only the majority of the habitat which is concentrated around Grandview Point.) would assume \$0.50/acre with a total of 204 acres. The cost/acre is based on Dave Wiley's estimate. Since the estimate/survey is so low (\$102), Division of Resource Management will probably see fit to conduct the survey with its own personnel rather than hire a contractor.

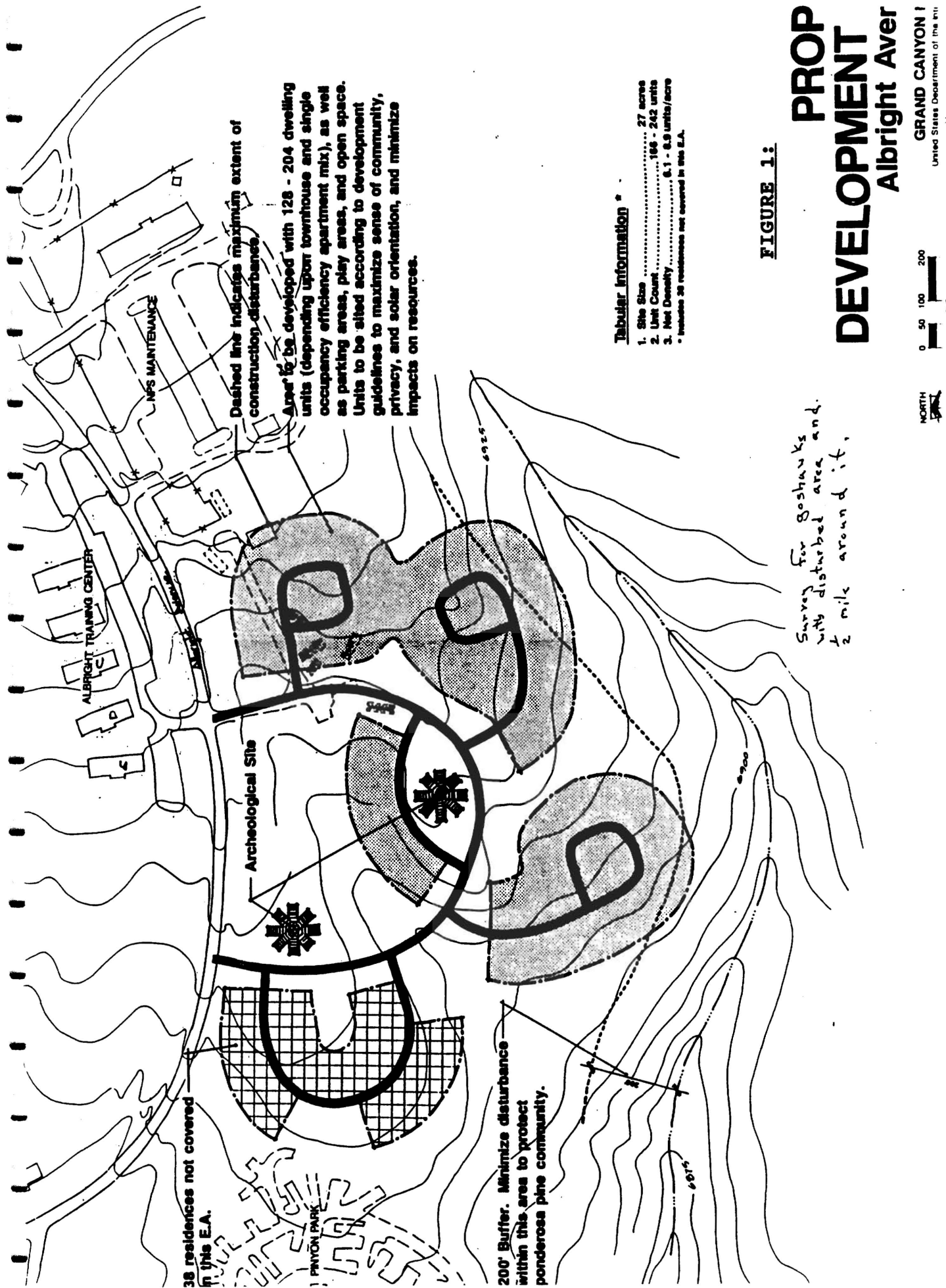
#### LITERATURE CITED

Ganey, J.L. 1991. PhD. Thesis: Developing and testing a predictive model for Mexican Spotted Owl habitat. Northern Arizona University. 116 pp.

United States Forest Service. 1990. Mexican Spotted Owl Inventory Protocol. R3 ID No. 2. 9 pp.

#### APPENDIX

1. GIS map of suitable mexican spotted owl habitat based on Ganey's (1991) classification (Produced by Carolyn Dunn, Division of Resource Management, Grand Canyon National Park).
2. 1990 Forest Service Mexican Spotted Owl Inventory Protocol.



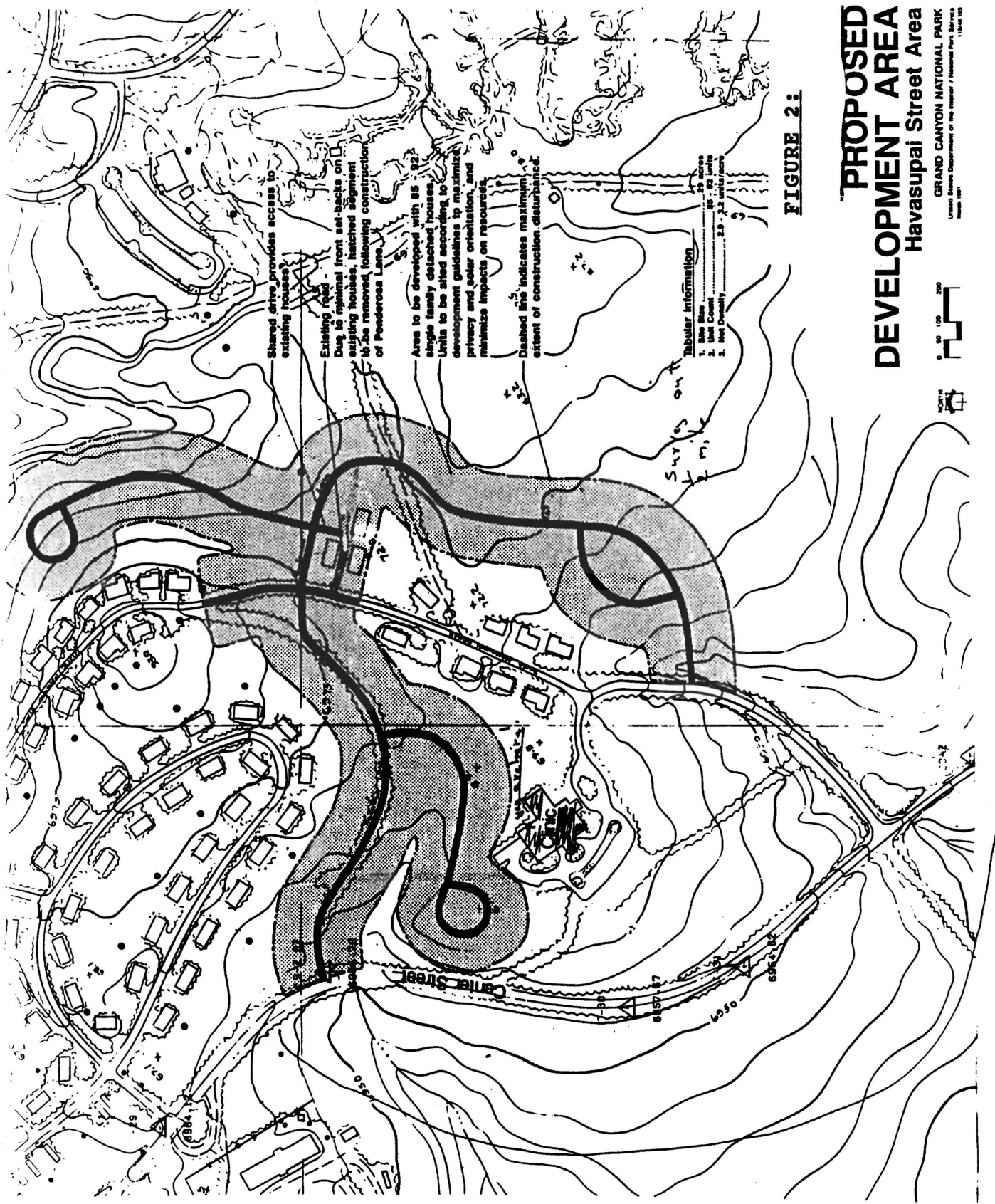


**FIGURE 2:**

# **PROPOSED DEVELOPMENT AREA** Havasupai Street Area

GRAND CANYON NATIONAL PARK  
United States Department of the Interior / National Park Service  
March 1992

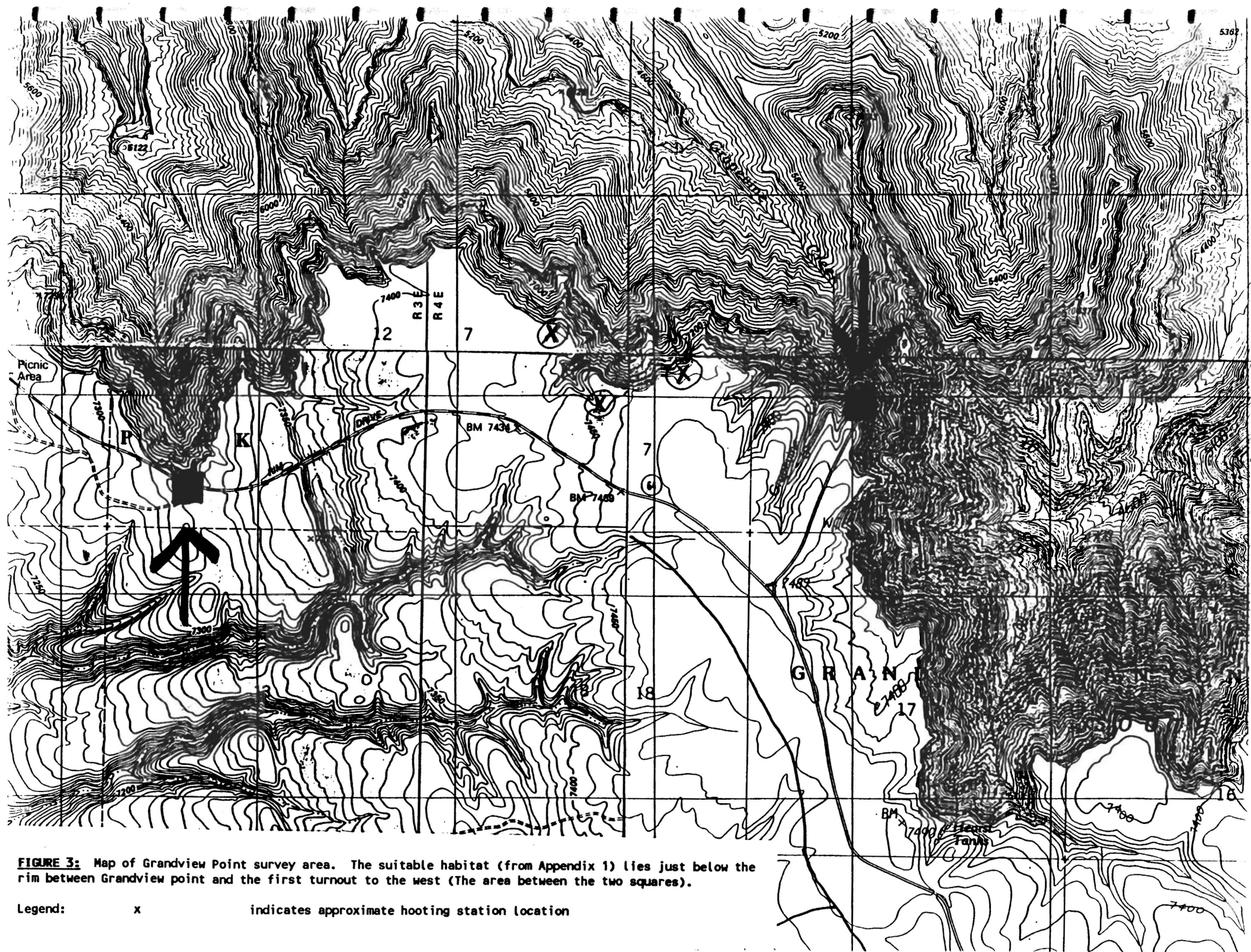


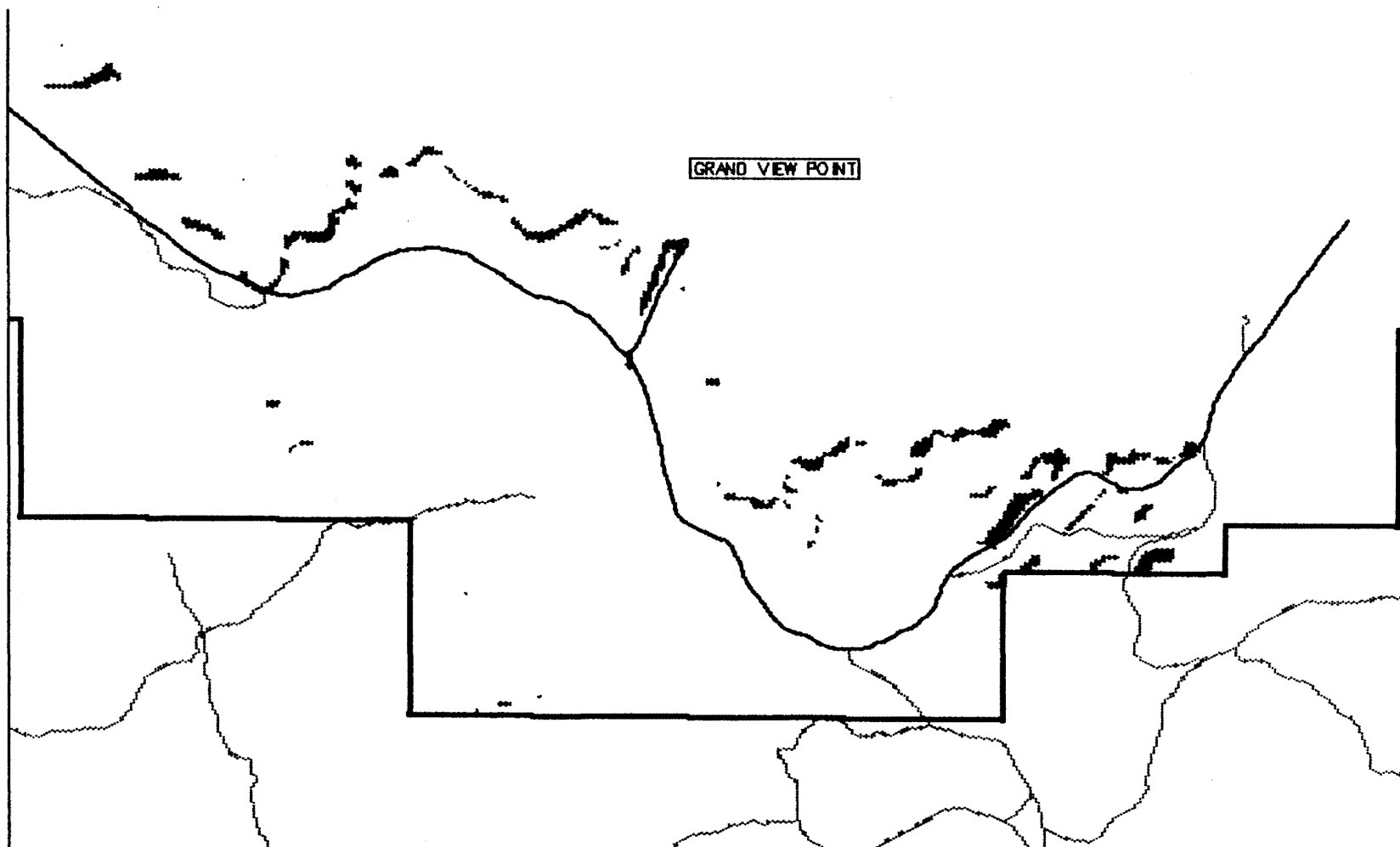
**FIGURE 3:** Map of Grandview Point survey area. The suitable habitat (from Appendix 1) lies just below the rim between Grandview point and the first turnout to the west (The area between the two squares).

Legend: x indicates approximate hooting station location



**APPENDIX**

Appendix 1: GIS map of the Grandview Point vicinity showing suitable mexican spotted owl habitat based upon Ganey's (1991) classification of  $\geq 15\%$  slope and cover type of dense mixed conifer Ponderosa Pine or broadleaved forest.



SCALE: 1 : 53557

WINDOW: 405510.00

3996000.00

417000.00

3979020.00

boundary (john)

paved (john)

road3 (cjd)

**APPENDIX 2:** The Forest Service 1990 Mexican Spotted Owl  
Inventory Protocol

Use the following methodology when conducting spotted owl inventories. All persons conducting inventory work under these protocols will meet training standard requirements found at FSM 2676.2 item 6.a.(4).

1. Survey Design.

a. Design daytime and nighttime calling routes to insure complete coverage of the survey area.

b. Ensure calling points are no more than .5 miles apart, straight line distance. Occasionally, this distance may be increased to .75 miles, but less than 5 percent of a survey area should have more than .5 miles between calling points. Include reasons for exceeding .5 miles between calling points in the documentation of your biological evaluation.

c. Use nighttime field outings for all calling routes unless ~~safety~~ dictates a daytime field outing be used for all or a portion of a calling route.

d. Locate the calling routes in a survey area so that all suitable habitat within the survey area would be called, that calls given by the person conducting the field outing would be heard by a spotted owl, and that the caller would hear an owl's response.

e. Consider the size of the survey area when designing the calling routes.

f. Ensure you have sufficient callers to attain a complete survey within the ~~7-day time limit~~, based on the number of field outings and types of methods to be used for this area.

g. Fixed calling points are not necessary, but consistency in obtaining complete coverage is.

h. Include considerations for survey cost and efficiency while still obtaining complete coverage when designing routes.

2. Survey Method.

a. Select the best survey method for the situation and/or terrain when designing for complete coverage. It will likely take combinations of methods to obtain complete coverage of an area.

3. Complete Survey.

a. A complete survey may be a combination of daytime and nighttime field outings for a given survey area.

b. Complete all field outings of a survey area within 7 consecutive days to attain a complete survey.

c. Allow a ~~minimum of 5~~ and maximum of 21 days between complete surveys.

d. In remote areas you may conduct two complete surveys during one trip into the area. If this option is used, allow a minimum of two days between complete surveys. Conduct all field outings required for a complete survey prior to repeating any route for the second survey. Wait a minimum of 15 and maximum of 30 days before starting the next two surveys.

e. Conduct at least ~~four~~ complete surveys of the survey area during the field season. You may conduct additional surveys in an area if you have reason to believe owls are there, but you have not found them. Note this on the inventory form.

f. Count no more than ~~one~~ complete survey prior to April 15.

g. Conduct the ~~first~~ complete survey prior to June 30.

h. Finish at least ~~three~~ complete surveys ~~prior to July 31~~.

i. Consider vocal or visual locations of owls outside of this time interval as historical information.

j. Apply the following in situations where the first complete survey occurs during the period of July 31 to August 31: Management Territories are established for owls found prior to September 1; negative surveys do not contribute towards the 2 year survey requirement.

k. The preferred calling time is at night.

l. Conduct a field outing only when conditions will likely allow for completion of an effective one. Do not conduct field outings during existing or predicted windy or stormy weather, nor when there are access problems due to road conditions or snow.

m. Discontinue field outings in a given area when it is evident the entire area being searched is occupied by one or more Management Territories having a single or pair present. Use professional judgment and such factors as terrain, size of the area being inventoried, and so forth, when making this determination.

n. Conduct at least two complete surveys prior to making a determination to discontinue field outings because the entire area is occupied by owls. Use the remainder of the time you would have used doing the last two complete surveys to conduct daytime follow-up visits to find a day roost or the nest tree.

Note: Between March 1 and May 1, use people already on board, bring on temporaries in an intermittent status for the days (nights) field outings are to be conducted, or include these dates in your contracts to allow

4 complete surveys = Inventory

preferably all 4 done by June 30

contractors to begin early. Do not bring on temporaries in a full time status unless you already have other work for them to do during the time they are not able to call and you are able to adjust their work schedule accordingly, from night to day and back again.

4. Calling.

- a. Spend 15 minutes at each calling point.
- b. Alternate calling and listening, giving a call or series of calls about every minute and listening between calls.
- c. Use recorded calls of the Mexican spotted owl, vocal imitations of these calls, or combinations of both when doing surveys.
- d. Use the four hoot call as the primary call.
- e. Use other calls individually or in combinations to provide a good mix of calls.
- f. Continue calling but proceed with caution if predators, such as a great-horned owl, are detected in areas where the presence of spotted owls is undetermined.
- g. Discontinue calling at any point a predator is detected in an area where spotted owls are known. Wait at least 30 minutes and call again to determine if the predator is still in the area. If the predator continues to respond after waiting 30 or more minutes, move 1/2 or more miles along the calling route and continue calling. Discontinue calling this route and go to another route if time permits if the predator follows you.
- h. Use intermediate calling points when weather or other factors increase the probability of not getting complete coverage.
- i. Alternate calling and listening for 2 to 3 minutes at each intermediate point.

5. Once an Owl is Heard.

- a. Take a bearing from your calling location to where the owl responded from and record it and your calling location on the map and forms. Attempt to get two bearings on an owl by using a calling location a short distance from where the first response was heard.
- b. Provide the best location you can of where you think the owl was located without chasing after the owl.
- c. Locate this on the map.
- d. Record the type of call you gave and the type of call the response was.

e. Identify the sex of the owl(s) responding to your call when possible.

f. Go to next station and continue the field outing.

g. If it becomes evident an owl is following you, stop calling and move on to the next station, or a distance of about one-half mile.

h. Note the location and bearing of all other species of raptors heard, the same as you would for a spotted owl.

#### 6. Daytime Follow-up Visits.

a. Conduct daytime follow-up visits in all areas where presence was heard during a field outing to attempt to confirm a single or pair occupancy and to locate nest or roost sites.

b. Use mousing to locate a pair of owls, nest or roost area if desirable.

c. Complete a daytime follow-up visit within 48 hours after a single is inferred, but the follow-up visit should be completed as soon as possible after presence was detected. Obtaining a second location prior to conducting a daytime follow-up visit may be desirable, especially when you are not sure of the location of the first nighttime response.

d. Conduct daytime follow-up visits in the morning or late afternoon/early evening whenever possible.

e. Discontinue calling if a predator, such as a great-horned owl, red-tailed hawk or goshawk responds to your calls, or is seen in the area.

f. Continue your visual search effort.

g. Begin calling again only when you believe the predator has left the area.

h. Proceed with caution!

i. If you are not able to continue calling and feel the search effort was not satisfactory because of this, conduct another daytime follow-up visit as soon as possible.

#### 7. Record Keeping.

a. Record all survey activities on prescribed inventory or daytime follow-up forms.

b. Attach field maps to the appropriate form.

c. Complete a final map that summarizes all of the field maps.

8. At the End of the Field Season.

a. Establish a Management Territory as identified in FSM 2676.2, items 6.b. and 7.

b. Determine all portions of the survey area where no portion of a Management Territory was established.

c. Conduct a second year of inventory following the same procedures in any portion of the survey area where no Management Territory was established during the initial spotted owl inventory of this survey area.

9. Definitions. Use this list of standard terms and definitions when referring to spotted owl inventory activities to reduce potential misunderstandings and provide greater consistency throughout the Region.

a. Breeding Season. February 1 through July 31.

b. Calling Locations. Locations distributed throughout an area to attain complete coverage of the survey area being inventoried for spotted owls.

(1) Fixed Area. Similar to fixed points in that the area is identified on the map, but there is no specific location within the area to be used each field outing. Complete coverage dictates the actual calling spot used.

(2) Fixed Points. Specified points located on the ground, which will be used to call from during each complete survey and in future years. Primarily used in formal monitoring.

(3) Intermediate Points. Calling locations between identified points or areas to attain complete coverage when conditions require it. Used to improve coverage. Not required to be established prior to the field outing used.

c. Calling Route. An established route in a survey area where vocal imitations or recorded calls of spotted owls are used to elicit a response from all spotted owls that will respond. Calling routes may include fixed points, fixed areas or intermediate points, but they often use continuous calling or leap-frog methods.

d. Complete Coverage. The intent of obtaining complete coverage is to elicit a response from all owls in the survey area that will respond to a spotted owl call and have the person conducting the field outing hear and locate their response.

e. Complete Survey. One or more field outings in a survey area that attains complete coverage of the survey area. The objective is to detect spotted owls.

f. Daytime Follow-up Visit. A daytime follow-up visit is a four person hour or longer walk-through search within a minimum of a one-quarter and maximum of one-half mile radius around the location where at least presence has been established.

g. Field Outing. Any calling inventory activity being conducted under the protocols. Each trip is a field outing.

(1) Daytime Field Outing. Calling done during the day (between sunrise and sunset) because nighttime field outings would not be safe in the particular area.

(2) Nighttime Field Outings. Calling done between sunset and sunrise.

h. Field Season. March 1 through August 31.

i. Fledgling. An owl of the year that is out of the nest. It is considered fledged when it is fully feathered and capable of flying.

j. Habitat Classifications.

(1) Suitable Habitat. Habitat that is currently usable for nesting, roosting, and feeding by spotted owls. Suitable nesting, roosting and primary foraging habitat characteristics include, but are not limited to:

(a) Moderately closed to closed canopy; generally greater than 70 percent closure.

(b) Multi-storied stands containing several canopy layers.

(c) Mixed conifer, Douglas-fir/white fir, or Ponderosa pine with a dense Gambel oak or other hardwood understory.

(d) A component of large trees, often old remnants in younger stands or mature or overmature stands.

(e) Shaded, cool, moist canyon sites and mountain slopes often with rock outcrops, cliffs, or talus.

(f) Standing dead, and down woody material.

(g) Diverse stands with a mix of small openings, not of uniform density throughout.

Suitable foraging habitat is often as in 1a through 1g above, but it may have a more open canopy. It may also include pinyon-juniper, rocky slopes, and small openings.

(2) Capable Habitat. Habitat that does not currently provide the characteristics of suitable habitat, is not occupied by spotted owls, but has the capability of attaining the characteristics of suitable habitat at some time in the future through standard, prescribed management treatments or natural processes.

(3) Unsuitable Habitat. Habitat that does not currently provide the characteristics of suitable habitat, is not occupied by spotted owls, and does not have the capability of attaining the characteristics of suitable habitat at any time in the future through standard, prescribed management treatments or natural processes.

(k) Juvenile. An owl less than 2 years old. Identified by pointed tail-feathers that have a whitish terminal band. The point and terminal band tend to wear off as the owl ages making it difficult to distinguish a juvenile owl from an adult during its second year.

1. Mousing. Feeding mice to owls. The most efficient way to locate nests, females or young. The assumption is that an adult male owl will take a mouse to a female on the nest, or to a female for her to feed the young, or to the young itself, thus locating the nest, mate and/or young.

m. Nest. A spotted owl nest is determined when one of the following occurs within substrate suitable for nesting:

- (1) copulation is observed;
- (2) female is seen nesting;
- (3) young are seen in the nest or on an adjacent branch;
- (4) male is seen taking mouse to the female or young on the nest;
- (5) female is heard whistling from nest when male ~~is in the area~~, but was not seen taking food to the nest.
- (6) Suitable nest substrate includes: broken topped trees, old raptor nests, witches broom, rock outcrops, caves, or cliff ledges.

n. Nestling. An owl of the year that is still in the nest.

o. Observer/surveyor/caller. Used interchangeably in this document. These terms refer to the person doing spotted owl inventories.

p. Occupancy Classification.

(1) Absence. Assumed when no response is recorded after inventory protocol is completed in a defined area.

(2) Presence. An auditory or visual location of one or more spotted owls.

(3) Single Inferred. Auditory responses heard during two or more, separate nighttime field outings with no visual observation of a spotted owl.  
daytime heard

MW

(4) Single Confirmed. A single spotted owl located during a daytime field outing, daytime follow-up visit, or a nighttime observation by a Forest Service Biologist or person authorized by the Forest Service to conduct inventories.

(5) Pair Inferred. A pair of owls is inferred when one of the following are observed:

(a) Vocalizations of young are heard; but no adults are seen or heard;

(b) Male and female owls are vocalizing with each other within a 10 minute time period within 200 yards of each other during a nighttime field outing, but a daytime follow-up visit confirms only one bird and vocalizations of the mate are not heard;

(c) Male and female owls are vocalizing back and forth to each other within a 10 minute time period during two nighttime field outings, they are within 200 yards of each other, but daytime follow-up visits do not find any owls present.

(6) Pair Confirmed. A pair(s) of owls is confirmed if any of the following are observed:

(a) One spotted owl is observed roosting within 200 yards of its mate;

(b) A male is observed and female is still on the nest;

(c) Young spotted owls are observed;

(d) A vocalization by one owl and the visual observation of another within 200 yards of each other during a 10 minute time period during either the daytime or nighttime;

(e) Male and female owls are vocalizing back and forth within 200 yards of each other during a 10 minute time period during the daytime.

g. Preditor. Mexican spotted owl predators include the following: great-horned owl, goshawk, red-tailed hawk. Bald and golden eagles, peregrine falcons, and other avian predators may be, but should not generally be considered as such.

r. Remote Site. Any survey area which requires more than 4 hours of travel time by vehicle and/or foot during good road, trail and weather conditions (good for the road or trail in question) to reach from the District Office.

s. Roost. A spotted owl roost is the location a spotted owl uses during the day. It may be in a tree or rock ledge, and it is often found in understory trees that are generally smaller in height and diameter than the dominant and co-dominant trees in the stand. Pellets, white-wash and other evidence identifying it as a spotted owl's roost are often present. Roost trees are often used several to many times, and several roost trees may be located in a grove.

t. Survey Area. The area around the proposed management activity in which a spotted owl inventory will be conducted.

u. Survey Methods. Methods used in spotted owl inventories.

(1) Continuous Calling. Call at regular or irregular intervals along an established route. Listen for a response for a short period of time.

(2) Leap Frog. The leapfrog method is very useful when driveable roads allow coverage of all or a portion of the survey area. It requires two people, but nighttime inventories is best accomplished by two people from a safety standpoint. One caller begins the inventory while the other person drives the vehicle to a predetermined point, usually about a half mile ahead, leaving the vehicle for the first person, and they continue on down the road like this. It often involves continuous calling.

(3) Point Calling. Using either the fixed area or fixed point location, call for a specified period of time at each location and then move to the next point or area.

v. Training standards. Standards established for all persons doing spotted owl inventory work to ensure they recognize spotted owls, their predators and understand the protocol. See FSM 2676.2, item 6 for details.

w. Travel Time. The time it takes to travel from the District office to the starting point of the closest route in a survey area.

x. Young. Alive or dead owlets that are out of the nest.