

**BOREAL OWL (Aegolius funereus) SURVEYS
ON THE SAWTOOTH AND BOISE NATIONAL FORESTS**

BY

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ABSTRACT

During March and April 1988, portions of the Boise and Sawtooth National Forests (NF) were surveyed for boreal owls. Surveys were conducted by playing tape-recorded songs of boreal owls in potentially suitable habitat and listening for an elicited response to the tape. Eight sites on the Boise NF and seven sites on the Sawtooth NF were surveyed. Three species of owls were heard during the surveys: great horned owl, northern saw-whet owl, and boreal owl. No boreal owls were located on the Sawtooth NF; boreal owls were heard at two sites (Deadwood Summit and Thunder Mountain Road) on the Boise NF.

INTRODUCTION

As a result of Greg Hayward's discovery of nesting boreal owls in the Frank Church River of No Return Wilderness (Hayward and Garton 1983), several national forests in Idaho began surveys for boreal owls in 1984. Since these surveys began, boreal have been located at approximately 25 different sites (Idaho Natural Heritage Program database) on seven national forests (Caribou, Targhee, Salmon, Boise, Payette, Clearwater, and Kaniksu). Because of the apparent rarity of the species in Idaho, as well as its habitat restrictions, it has been classified as an Idaho Department of Fish and Game (IDFG) Species of Special Concern, a Bureau of Land Management Sensitive Species, and a Sensitive Species in Region 1 (northern Idaho) of the U.S. Forest Service (USFS).

Prior to 1988, no surveys for boreal owls had been conducted on the Sawtooth National Forest (NF), and only a small portion of the Boise NF was surveyed in 1984 and 1985. The purpose of this report is to summarize the results of the boreal owl surveys conducted on these two forests by the Natural Heritage Program during March and April of 1988.

METHODS

I surveyed for boreal owls by playing tape-recorded calls of singing male boreal owls and listening for an elicited response. Surveys were conducted from approximately 0.5 hr after sunset until midnight at the latest. Depending upon the location of the surveys travel was by snowmobile, cross-country skis, or 4-WD truck. Tapes were played on a portable cassette tape player which was wired to a Portapage Megaphone. Along any given survey route, tapes were played at stations located either 0.25 or 0.50 mi apart. At each station, a series of boreal owl calls was played for 2 min followed by 2 or more minutes of listening for a response. This process was repeated at least once at each station. The cassette tape and suggestions for survey methods were provided by Greg Hayward who has been studying boreal owls in Chamberlain Basin (Payette NF) for the last 8 years (see Appendix A for owl calling packet). Prior to and during the surveys, I consulted with Greg about survey procedures. In addition, I spent a week during June 1987 in Chamberlain Basin observing boreal owls and their habitat.

In previous surveys for boreal owls in the northern Rockies, owls were heard calling in forest habitats from 1285-3050 m in elevation and consisting primarily of mature subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*) and western hemlock (*Tsuga heterophylla*) habitat types (Hayward et al. 1987a). Thus, in planning these surveys on the Boise and Sawtooth National Forests, I wanted to restrict them primarily to higher elevation subalpine fir habitats. I reviewed the 1964 timber inventory maps on the Boise NF and located several potential survey areas with subalpine fir habitat (Table 1). Although numerous mountain and ridge tops on the timber inventory maps contained subalpine fir, the areas listed in Table 1 were those where subalpine fir habitat appeared to be extensive, covering at least a Section or 640 ac of either continuous or discontinuous habitat.

I conferred with foresters on the Stanley, Ketchum, and Fairfield Ranger Districts in the selection of survey routes on the Sawtooth NF. (Table 2). Areas to be surveyed were selected not only for their habitat type, but also for accessibility via snowmobile or skis.

Table 1. Areas of subalpine fir and/or spruce habitat on the Boise National Forest.

<u>Location</u>	<u>Surveyed for owls</u>
Trinity Lakes	Yes
Pilot Peak/Sunset Mountain	Yes
Jackson Peak/headwaters Bear River/ Graham Peak	No
Scott Mountain	Yes
Red Mountain/headwaters of Warm Springs Creek	No
West Mountains	Yes
Rice Lake/Deadwood Summit/Bernard Lake	Partial
Bear Valley Mountain	No
Monumental Peak/headwaters South Fork Salmon River	No
Big Creek Summit	Yes
Warm Lake Summit/Buck Mountain	Partial
Headwaters N. Fork Gold Fork River	No
Headwaters N. Fork and S.F. Sand Creek	No
Rainbow Lake/Wardenhoff Meadow	No
Meadow Creek/Riordan Lake/Trapper Flat/Chilcoot Peak/Little Baldy	Partial

Table 2. Areas of subalpine fir and/or spruce habitat on the Sawtooth National Forest which were suggested for boreal owl surveys by Sawtooth NF personnel.

<u>Location</u>	<u>Surveyed for owls</u>
Sprout Mountain/Grouse Butte/headwaters Grouse Creek	No
Couch Summit	Yes
Wells Summit	No
Rough Creek	No
Casino Creek	No
Fourth of July Creek	Yes
Pole Creek	Yes
Alturas Lake Creek	Partial
Beaver Creek	Partial
Galena Summit	Yes
Baker Creek/Norton Lake	No
North Fork Big Wood River	No
Trail Creek Summit	Yes
Deer Creek	No

RESULTS AND DISCUSSION

Eight of fifteen areas on the Boise NF and seven of 14 areas on Sawtooth NF were partially or entirely surveyed for boreal owls (Tables 1 and 2). Each area was surveyed on a single night. Exact locations of survey routes are shown in Appendix B. Three species of owls were heard during the surveys (Table 3): great horned owl (Bubo virginianus), northern saw-whet owl (Aegolius acadicus), and boreal owl (Aegolius funereus). Boreal owls were heard (but not seen) at two locations on the Boise NF: Thunder Mountain Road near Trapper Flat and Deadwood Summit. A possible, but unconfirmed, boreal owl was heard in the upper Fourth of July Creek drainage on the Sawtooth NF.

The two locations where boreal owls were heard on the Boise NF, Thunder Mountain Road and Deadwood Summit, are relatively high in elevation (2316 m and 2133 m, respectively) and are dominated by subalpine fir. The Thunder Mountain site consists of montane meadows and hillsides with patches of subalpine fir, Engelmann spruce, and lodgepole pine (Pinus contorta). The Deadwood Summit site is similar although spruce is lacking and the trees are smaller in diameter. Two fires have also occurred in the vicinity of Deadwood Summit, one during the summer of 1987 (Sulphur Creek) and one during June 1988 (Tyndall Meadows). Both the elevation and habitat of these two Boise NF sites are consistent with sites where boreal owls have been located on other national forests in the northern Rockies (Hayward et al. 1987a, O'Connell 1987) and in Colorado (Ryder et al. 1987).

Table 3. Dates and locations of owls heard calling during the 1988 boreal owl surveys on the Sawtooth and Boise National Forests.

<u>Date</u>	<u>Owl Species</u>	<u>(# Heard)</u>	<u>Location (TRS)</u>	<u>Forest</u>
3-14	saw-whet	(1)	Scott Mtn. Raod (T9NR6ES15)	Boise
3-27	boreal ??	(1)	Fourth of July Creek (T8NR15ES3)	Sawtooth
3-29	great horned	(1)	Couch Summit (T2NR15ES5,6)	Sawthooth
3-29	saw-whet	(1)	Owens Creek (T2NR15ES21)	Sawtooth
3-30	great horned	(1)	Couch Summit (T2NR15ES5,6)	Sawtooth
3-30	saw-whet	(1)	Little Smoky Creek (T3NR14ES30)	Sawtooth
3-31	great horned	(1)	Trinity Lakes (T4NR9ES9)	Boise
4-4	saw-whet	(1)	Big Creek Summit (T15NR6ES17)	Boise
4-6	great horned	(1)	Anderson Creek Rd. (T14NR3ES29)	Boise
4-8	saw-whet	(1)	Deadwood Summit (T14NR7S23)	Boise
4-8	boreal	(1)	Deadwood Summit (T14NR7ES13)	Boise
4-8	boreal	(1)	Tyndall Meadows (T14NR7ES12)	Boise
4-9	boreal	(1)	Thunder Mountain Rd. (T17NR8ES13)	Boise
4-12	saw-whet	(1)	Trail Creek Summit (T6NR18ES25)	Sawtooth
4-12	great horned	(1)	Trail Creek Summit (T6NR18ES36)	Sawtooth

In 1984, Mark Collie reported locating boreal owls at four sites on or adjacent to Boise NF lands: 1) Deep Creek (T14NR5ES6), 2) Big Creek (T15NR5ES27), 3) Cabarton Bridge (T13NR4ES31), and 4) Fawn Creek (Snowbank Mt. Road) (T12NR3ES2) (Idaho Natural Heritage Program database). In 1985, Jeff Marks re-surveyed these sites for boreal owls. Although he was unable to locate owls at any of these sites, he did hear a single boreal owl on Big Creek Summit (T15NR5ES13), near Site #2. In 1988, I surveyed all of these sites except Cabarton bridge and did not locate any boreal owls. Although it is possible that M. Collie did hear boreal owls at these four sites, the habitat at the Deep Creek, Cabarton bridge, and Fawn Creek sites is atypical of boreal owls.

Surveys for boreal owls in Idaho can be conducted most successfully from the last week of February to mid-April, the time during which potentially breeding males are calling (G. Hayward, pers. comm.). Because decisions on allocations of Challenge Grant money were not made until early March, I was unable to begin surveys till mid-March. This late start severely hampered the 1988 surveys. Snowpack on the Boise NF and particularly the Sawtooth NF was well below normal during the winter of 1988. The late start combined with below average snow levels made surveying by snowmobile and skis difficult and, at times, dangerous due to avalanche conditions. On the Sawtooth NF, I only partially surveyed or was unable to survey upper Grouse Creek, Wells Summit, Baker Creek, Deer Creek, Alturas Lake Creek, and Beaver Creek (Table 2) due to poor snow conditions. On the Boise NF, a shortage of time prevented me from surveying several areas (Table 1). In the future, every effort should be made to begin these surveys at the end of February.

Due to the difficulties in surveying discussed above, it would be premature to conclude that boreal owls do not occur on the Sawtooth NF. A possible boreal owl was heard by one of

two surveyors in upper Fourth of July Creek, but a second attempt to survey the drainage and confirm the presence of boreal owls failed due to poor snow conditions.

The only boreal owls located during this survey occurred on the northern reaches of the Boise NF where the landscape is heavily timbered. On the southern parts of the Boise NF and throughout the Sawtooth NF, stands of timber are patchy in distribution and numerous drainages contain aspects with no timber. The preliminary results from this first year of surveys hint at the possibility that boreal owls may require more extensive stands of timber and wetter habitats than are found on the southern part of the Boise NF and the Sawtooth NF. However, this is only a hypothesis with little data at the present to support or reject it.

Hayward et al.'s (1987b) study of boreal owls in Chamberlain Basin has located numerous nests. The majority of the nests were located in aspen (Populus tremuloides), Ponderosa pine (Pinus ponderosa), and Douglas fir (Pseudotsuga menziesii) trees in habitats lower in elevation and drier than the spruce-fir zone. Yet surveys for boreal owls on other national forests in Idaho have located owls primarily in spruce-fir habitat (Hayward et al. 1987a). Several of my survey routes passed through elevational gradients containing Douglas fir, Ponderosa pine, and/or aspen at lower elevations (Trinity Lakes, Pilot Peak, Scott Mountain, West Mountains, Big Creek Summit, Meadow Creek, Galena Summit, Fourth of July Creek, Pole Creek, Couch Summit - see maps in Appendix B), but no boreal owls were detected outside of spruce-fir habitat.

The fact that owls did not respond during many surveys should not be regarded as evidence that owls do not occupy those sites. Breeding in 1988 began quite early (G. Hayward, pers. comm.). By the dates of my surveys, many boreals could have already formed pairs and reduced their calling. Even during the height of calling, one survey on a site may not reveal

owls inhabiting the area. Numerous surveys per site are needed to determine whether owls are using a site in a particular year.

It is possible that by concentrating surveys on the higher elevational spruce-fir habitats, owls occupying these lower elevational habitats are not being detected. Future survey routes should continue to concentrate on spruce-fir habitats, but should also include lower elevational habitats. Surveying in this manner should help us better understand the habitat requirements of the boreal owl throughout Idaho.

Nest Boxes

During June and July 1988, I placed 19 boreal owl boxes on trees at three locations on the Boise NF (see Appendix C for nest. box locations). Boreal owls had been heard calling during April 1988 at or near each of these three sites. Five boxes were placed approximately .3-.4 mi apart along the upper Rice Creek Rd. Eight boxes were placed in pairs along the Thunder Mountain Road near Trapper Flat; six boxes were placed in a cluster at Deadwood Summit. The purpose of placing nest boxes on trees is to determine whether they can be used to monitor boreal owl population trends, nesting productivity, and food habits on the Boise NF. Although many more boxes would actually be needed for this process, these initial boxes should give us some indications as to whether owls will use them. Greg Hayward (pers. comm.) is also currently testing the use of nest boxes for monitoring boreal owl populations on the Payette and Kaniksu NFs.

MANAGEMENT CONSIDERATIONS

1. The Region 4 forests are currently initiating an animal Sensitive Species Program. The Boise NF should consider listing the boreal owl as a Sensitive Species due to its restricted habitat and occurrence on the forest.
2. More surveys are needed on both the Boise and Sawtooth NFs, but particularly on the latter. For reasons previously discussed, it is essential that these surveys begin the last week of February. On the Sawtooth NF, Fourth of July Creek and Trail Creek Summit need to be surveyed again. Areas that were not surveyed or only partially surveyed and should be surveyed in 1989 include Sprout Mountain, Wells Summit, Casino Creek, Alturas Lake Creek, Beaver Creek, Baker Creek, and Deer Creek (see Table 2).
3. On the Boise NF, I recommend re-surveying Pilot Peak, Scott Mountain, West Mountains, and Big Creek Summit. More extensive surveys are needed in the Rice Lake, Warm Lake Summit, and Meadow Creek areas (see Table 1). New surveys are needed at Bear Valley Mountain, Red Mountain, Jackson Peak, Sand Creek, and Monumental Peak.
4. If boreal owls are located on the Sawtooth NF, consideration should be given to initiating an ecological study of boreal owls. Because the habitat on the Sawtooth NF is considerably different than that of Chamberlain Basin where boreals have previously been studied, the habitat requirements of any boreals there are likely to be quite different.
5. On the Boise NF, areas where owls are located should be extensively surveyed to obtain an estimate of the number of breeding territories. Depending upon the results of the preliminary nest box program, a more extensive nest box project should be considered. A study of boreal owls on the Boise NF is not recommended since most of the results of the Chamberlain Basin study should be applicable to boreal owls on the Boise NF.
6. Timber sales in the northern portion of the Boise NF within the spruce fir zone should be closely evaluated. Snags greater than 15' dbh should be protected by a patch of timber which has not been logged. Any large snags with pileated nest cavities should be retained.

ACKNOWLEDGMENTS

These surveys were partially funded by Challenge Cost Share grants from the Boise and Sawtooth National Forests. The help of numerous people made these surveys possible. Jenny Carson and John Erickson of the Sawtooth and Boise NFs, respectively, were instrumental in getting these surveys initiated. Several personnel from IDFG assisted in the surveys either by lending equipment, helping in the field, or both. My thanks for their efforts goes to Ed Bottom,

Gary Gadwa, Roger Olson, Clay Cummins, Chuck Harris, and Jean Spinazola. Vicki Marks and Brett Coleman provided assistance on the Boise NF surveys. I particularly wish to thank Susan Bernatas for her field assistance and patience with snowmobiles in trying circumstances. Finally, I need thank Greg and Pat Hayward for the information on boreal owl biology and advice on surveys, which they have given me over the last few years. Their work in Chamberlain Basin has been the impetus for owl surveys throughout the northern Rockies.

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APPENDIX A

Owl Calling Packet

Contents of Owl Calling Packet

- 1 cassette tape of owl calls
- 1 sheet listing contents of cassette tape - 2 sheets on Methodology
- Data form - Boreal Owl Search Record
- Data form - Boreal Owl Location Record

Methodology

Choosing Survey Routes:

Boreal owls will most likely inhabit forest communities within the Hudsonian (or Canadian) life zone and possibly as low as the upper Transition Life Zone. In Colorado, Dr. Ron Ryder found boreal owls in spruce-fir communities near timberline. In Idaho, we found the birds used islands of successional Ponderosa pine and Douglas-fir on Douglas-fir/pinegrass habitats in a region dominated by lodgepole pine. The ponderosa were overmature (+25" dbh) with co-dominant Douglas fir and Douglas fir regeneration. The owls foraged within this forest cover but also along the edges of sage bunchgrass forest openings. We feel that these habitats represent the lower extent of Life Zones used by boreal owls. In Canada, Bond up-Nielson noted some association between boreal owls and both forest openings and aspen groves.

Because so little is known of boreal owl habitat preferences and we are interested in the entire range of habitats used by the owls, we would rather not restrict the surveys to specific habitats but suggest surveying any habitat within the Hudsonian life zone. The most likely areas, however, will be forest with an open stand structure or many forest openings for foraging with trees large enough for flicker or pleated woodpecker cavities (boreal owls are relatively large cavity nesters). One basic rule of thumb is that all survey routes will be well above the low elevation snow line in March and April.

The more varied the habitats which survey routes traverse, the better. Do not restrict surveys to stream courses and valley bottoms - avoid unfrozen streams whose noise will interfere with the survey.

Because this is an inventory rather than census, repeated sampling isn't necessary and a route need not be repeated on several nights. The number of routes surveyed on a District will depend on available time. Survey different routes until all accessible routes within suitable habitat are completed. We encourage one survey a week in March (or 2 excursions if larger multiple day trips are organized), and surveys in April as time permits.

If travel is by truck or snowmobile, we suggest a 10-15 mile survey with a full stop every mile and a short stop to listen every one-half mile (if your tape player doesn't have high volume, play the calls every mile).

If traveling on skis, terrain and snow conditions will determine the length of a survey. We stop about every one-fourth to one mile to play the owl tapes during skiing surveys.

Methodology, Continued.

Conducting Surveys:

Begin boreal owl surveys no earlier than about ½ hour after sunset. The first 2-3 hours after dark seem to be the most vocal period. When skiing, we often ski out during daylight, and survey on the return trip unless a loop trip is available. At each station one-fourth to one mile on skis, ½ to 1 mile for auto-snowmobile) begin by listening for two minutes. Play a series of boreal owl calls (--2 min.), listen for 2 minutes, play the calls again and listen once more. Broadcast the calls to both sides of the trail or road.

If you have a portable loudspeaker, play the owl calls about twice the volume you'd expect from an owl. (Play the call slightly softer than this for the first series at a station.) If you do not have a loudspeaker, play the calls as loud as your tape-player will allow without extreme distortion. We suggest carrying the tape player under your jacket (on a cord, around your neck) between stations to keep the player warm. Cold tape players often play slow. The tape is set up with boreal owl calls filling side A. This way, you may not need to rewind the tape at all during a night of boreal owl surveying.

If a boreal owl is located - fill out the data form. If an owl is heard from a distance, move in closer. Boreal owls will often call for 20 minutes or more allowing you to move in for more positive identification and more exact location. Triangulate on the sound but avoid shining a flashlight on the bird unless you aren't sure of its identity from the call.

If an owl stops calling before you are sure of its identity or location, wait a minute and then play a boreal owl tape sequence and listen. Repeat 3-4 times in an attempt to stimulate the owl to call.

What to Expect:

A lot of silence. At the high elevations inhabited by boreal owls, owl density, among all species, is relatively low. Pygmy, saw-whet, (maybe screech), barred, long-eared, great-grey, and great-horned owls may also be heard at this time of year depending on the region and habitats. Many nights the only response we've heard was the echo of our call off a nearby hillside or a coyote chiming in. Guess it only makes the successful night that much more rewarding. Getting out on a crisp, starry night is its own reward; the owl calls add a delightful bonus. Good luck and THANKS for your time and effort:

Equipment Needed:

Portable cassette tape player

Portable loudspeaker (if possible) - purchase from Cabella's Sporting Catalog or a Portapage Megaphone from: Photo & Sound Co. 1205 M. 45th St. Batteries Seattle, WA 98103

Headlamp or flashlight (spare bulb)

Skis or snowshoes

Warm clothing and winter safety equipment (water, pocket cigarette lighter, etc.)

BOREAL OWL TAPE

Hayward
(208) 885-6434

This cassette tape should allow biologists to survey owls with a minimum amount of tape player "button-pushing" and provide flexibility in the length of any calling sequence. Side A contains a continuous series of boreal owl calls so it will not be necessary to rewind the tape frequently during a night of playback surveys. These boreal calls represent owls from 3 regions and were recorded in Alberta, Russia, and a location unknown to me but supplied by Cornell University. Because quality recordings of boreal owl calls for our region are not available, we will use the recordings from these three regions. Any, or possibly all, of these dialects may be effective in stimulating the owls in the northern Rockies.

The beginning of Side B contains calls for the western screech owl. These calls should be studied to avoid confusion with boreal owl calls. Note that the cadence of the screech owl call is reminiscent of a bouncing ball beginning with a slow staccato and ending in a rapid series of notes. Boreal and screech owl calls can easily be confused; however, expect to find screech owls mainly along deciduous riparian zones (cottonwood bottoms) rather than the higher elevation forests used by boreal owls.

Next on Side B is a sequence of the typical saw-whet call. These small owls likely will be the most common owl heard on many Forests and are rather easy to stimulate with the taped calls. The final portion of Side B contains calls of great-horned, great-grey, long-eared, saw-whet, boreal, and flaamiulated owls prepared by Cornell University.

APPENDIX B

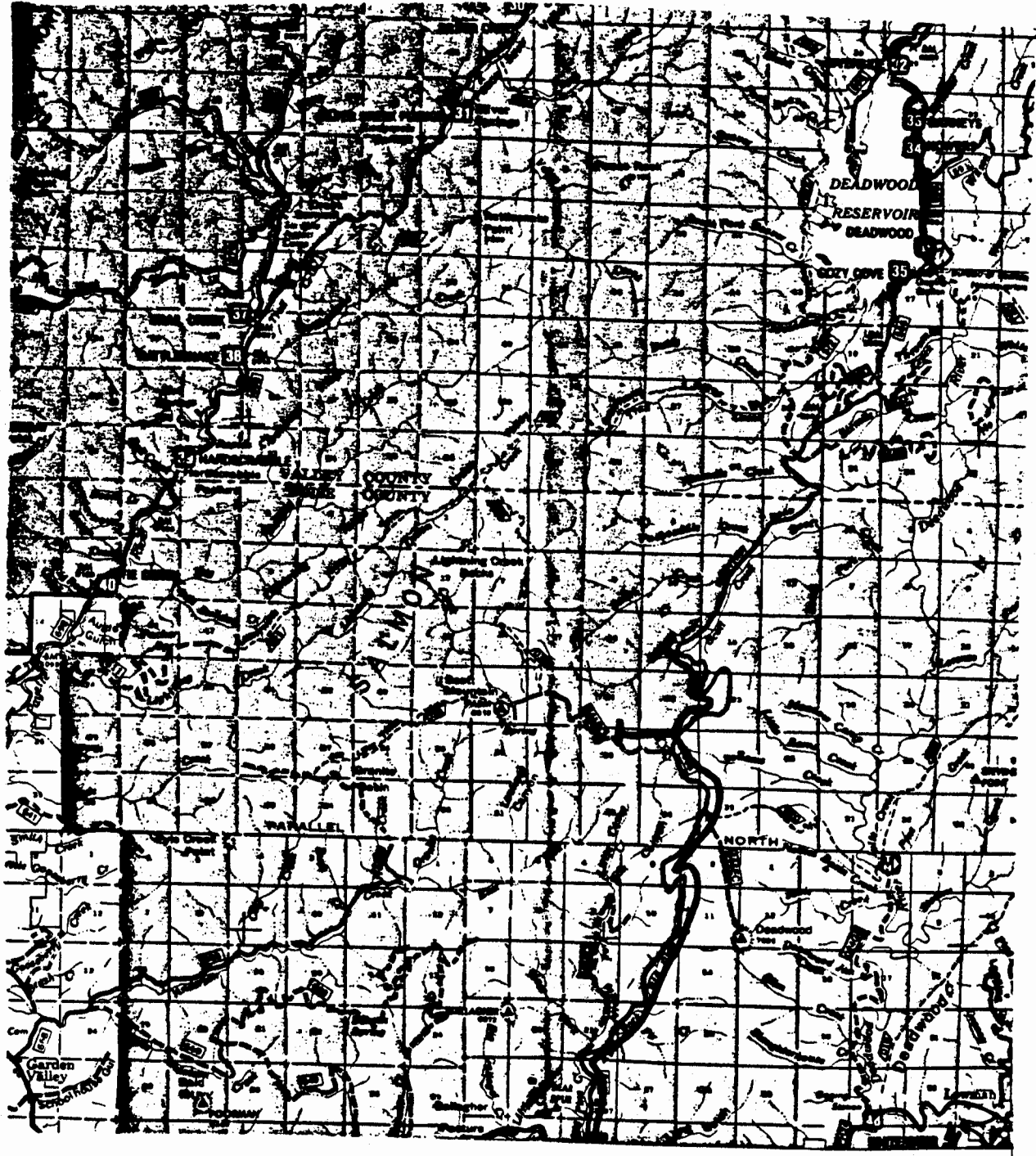
Mapped Locations of Owl Survey Routes



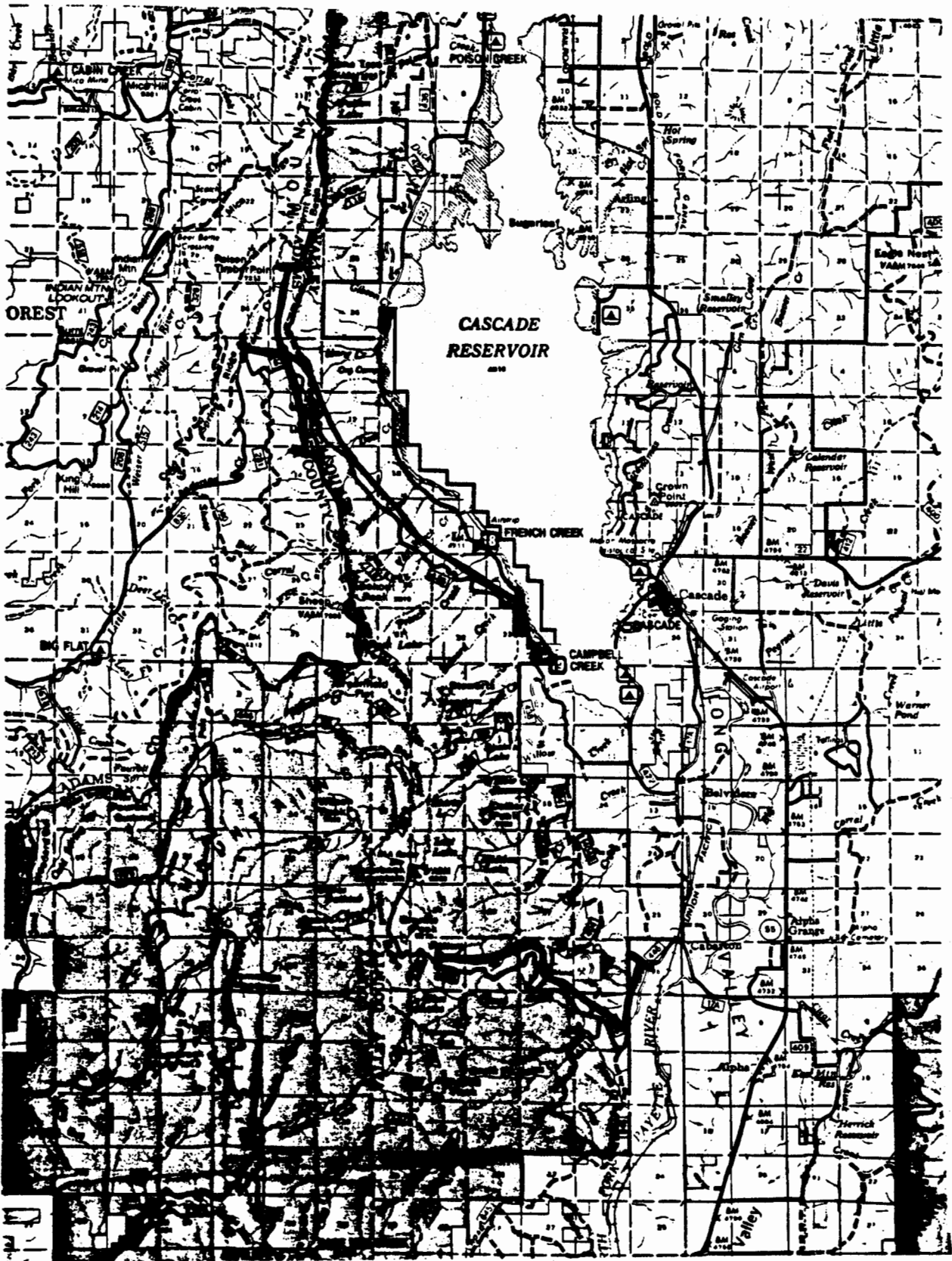
Trinity Lakes Route



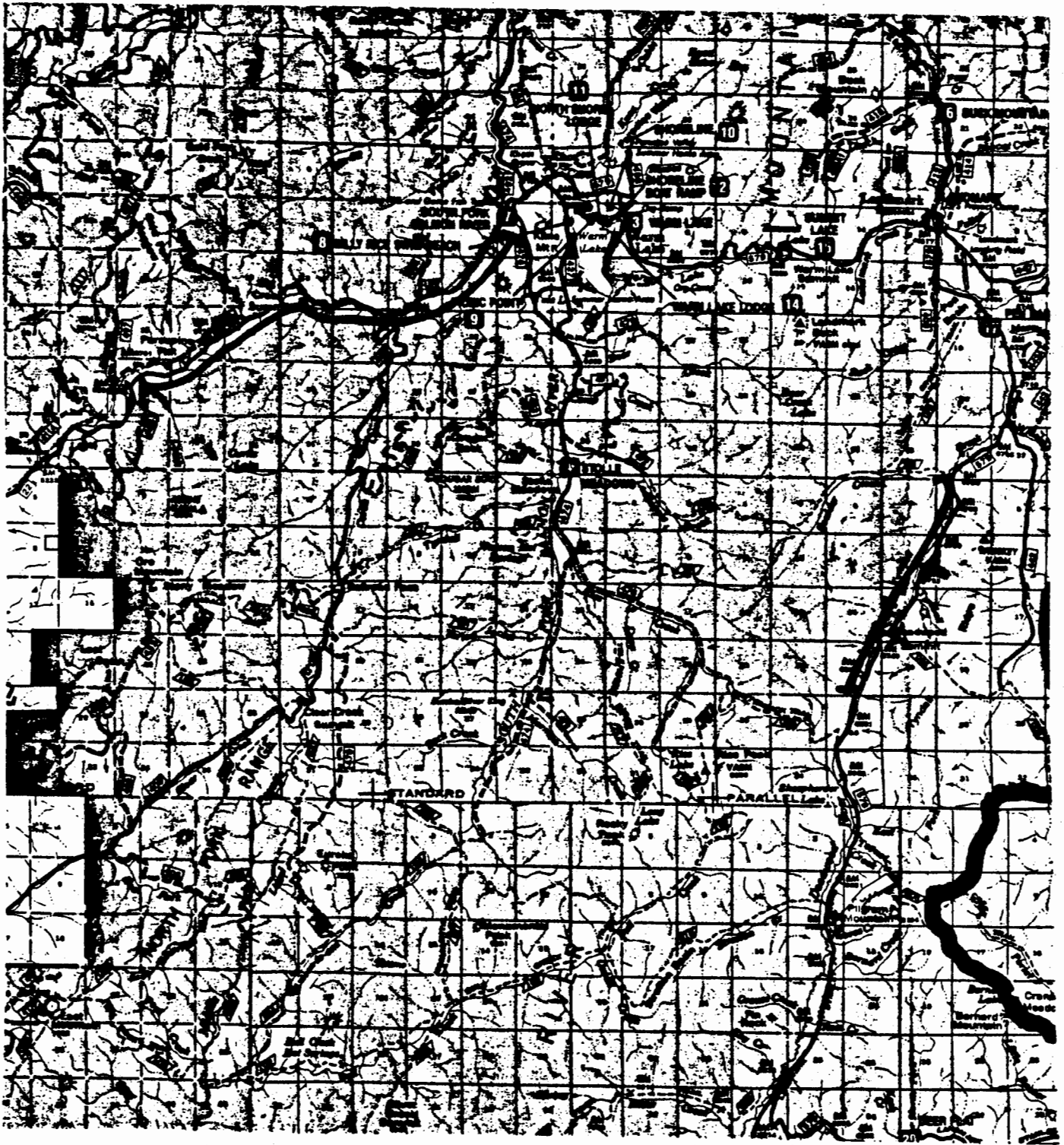
Lowman-Mores Creek Summit Route
Pilot Peak/Mores Mountain Route



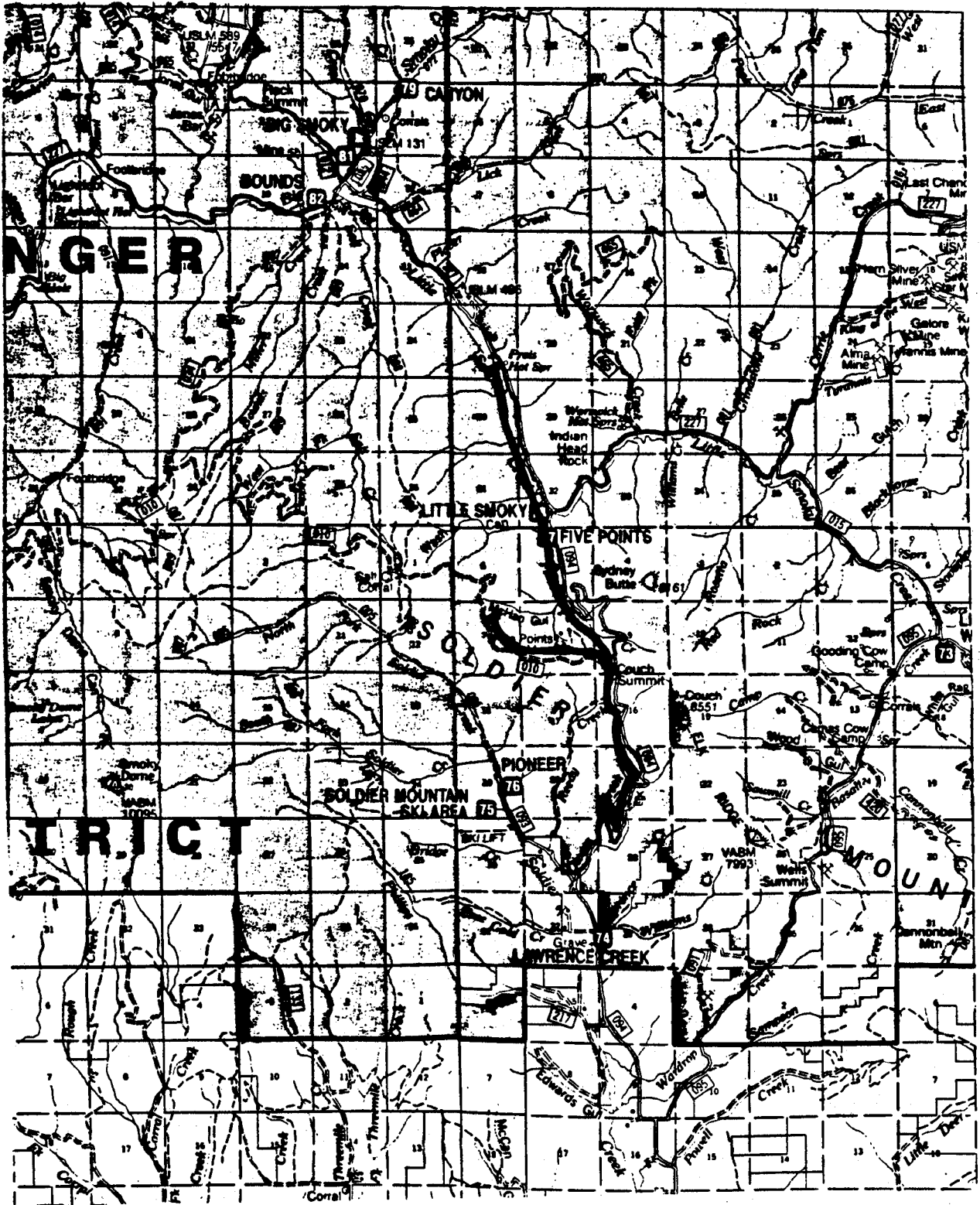
Scott Mountain Route



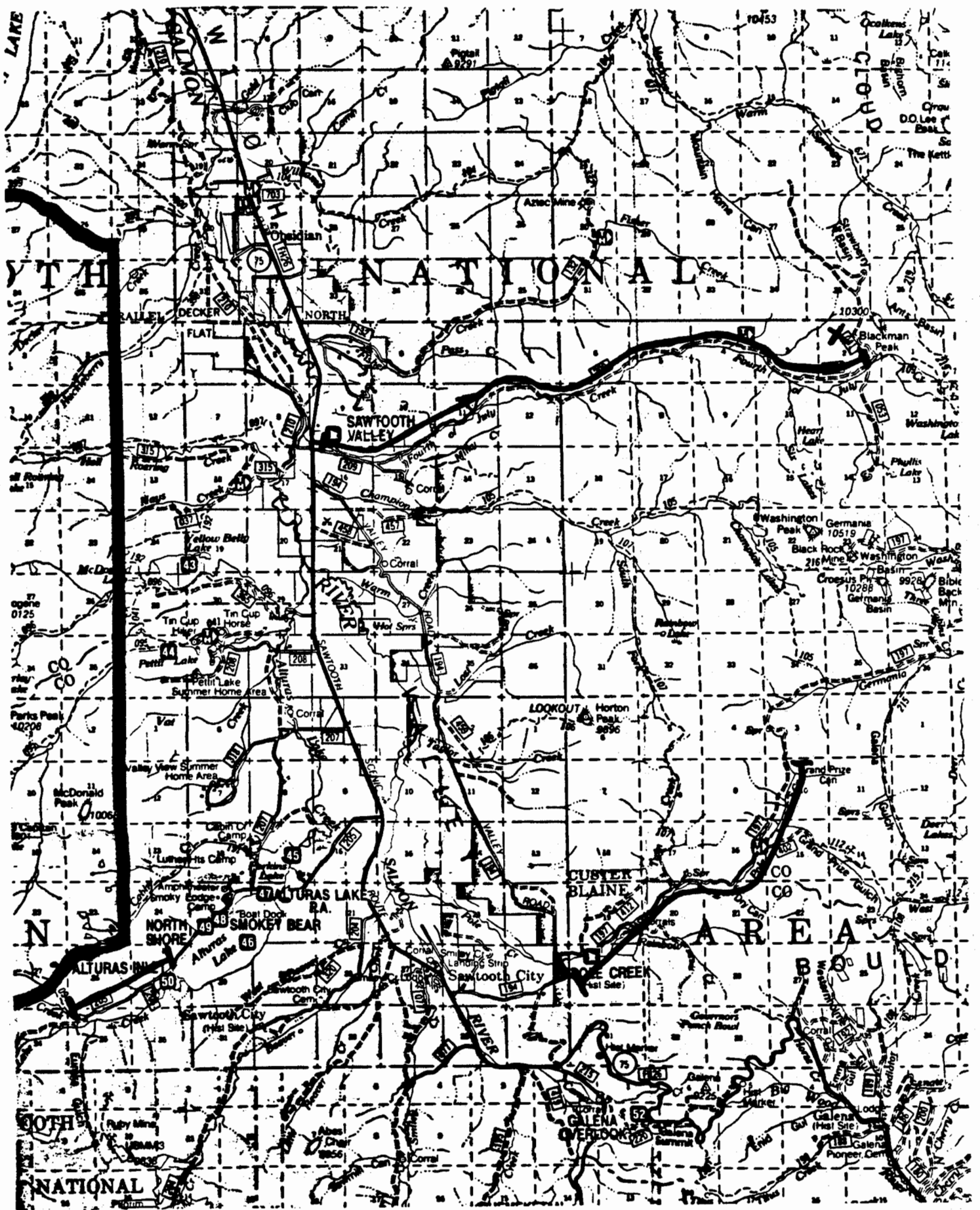
West Mountains Route



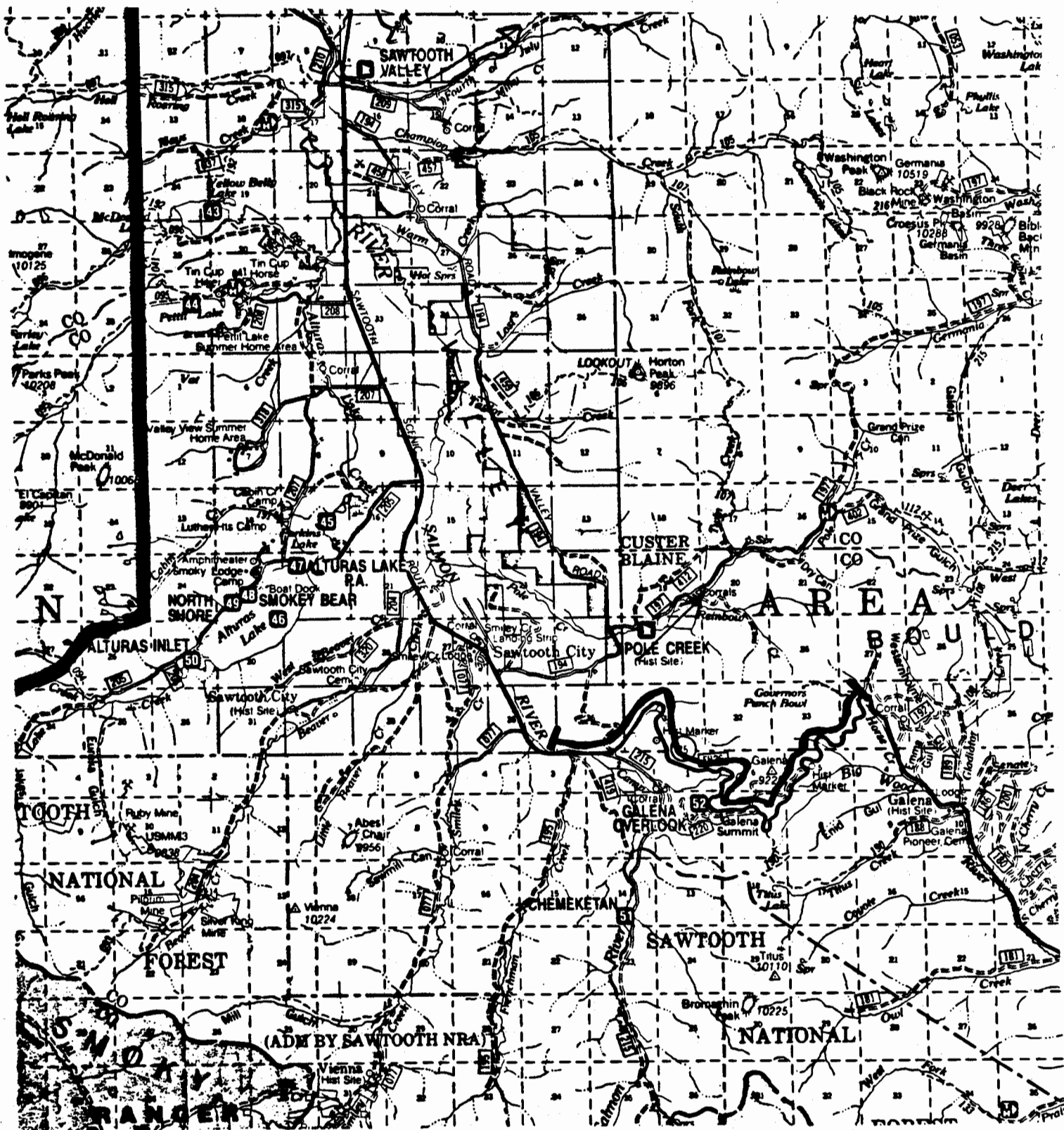
Deadwood Summit Route
Big Creek Summit Route
X = Boreal Owl Location



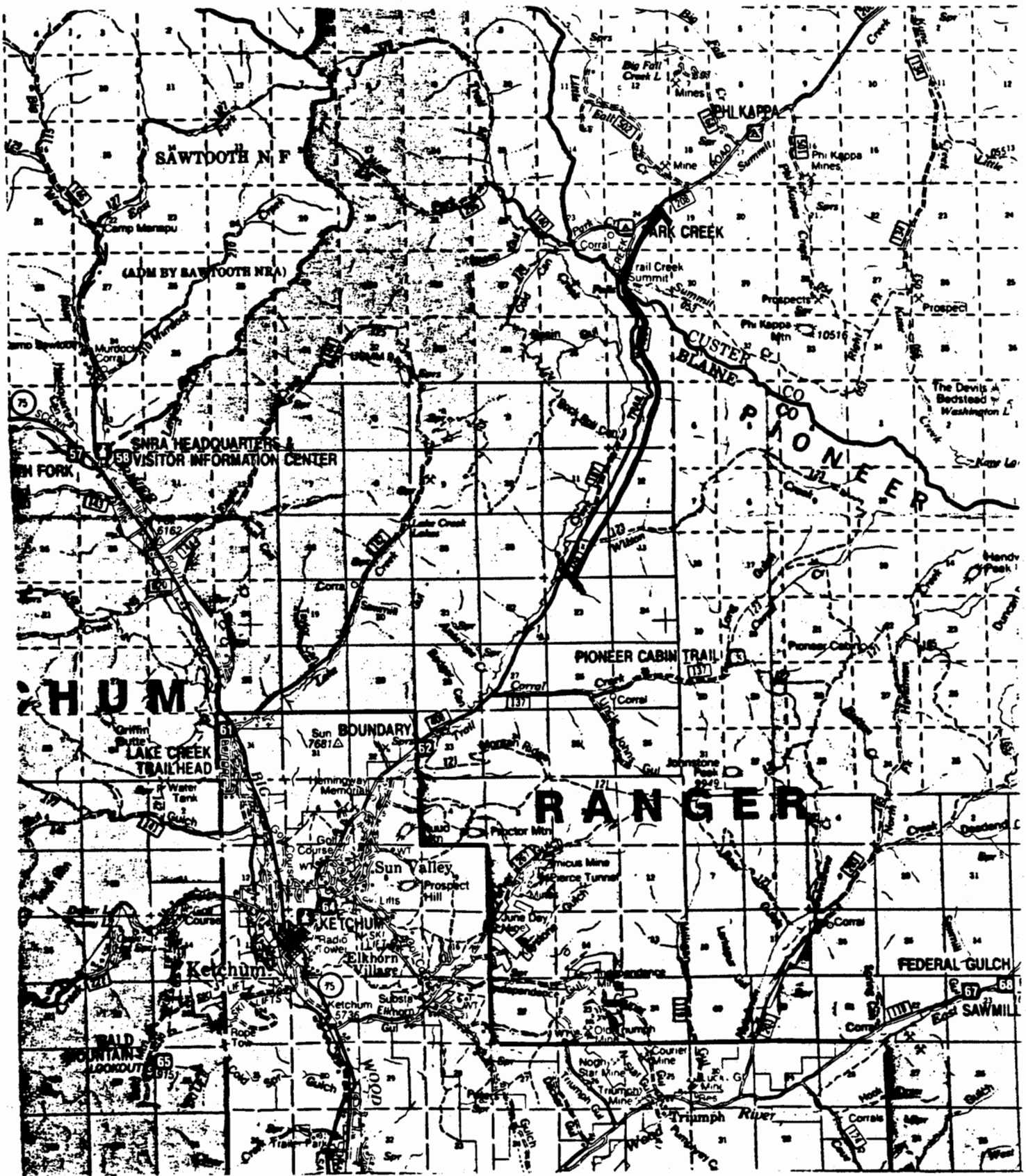
Cough Summit Route



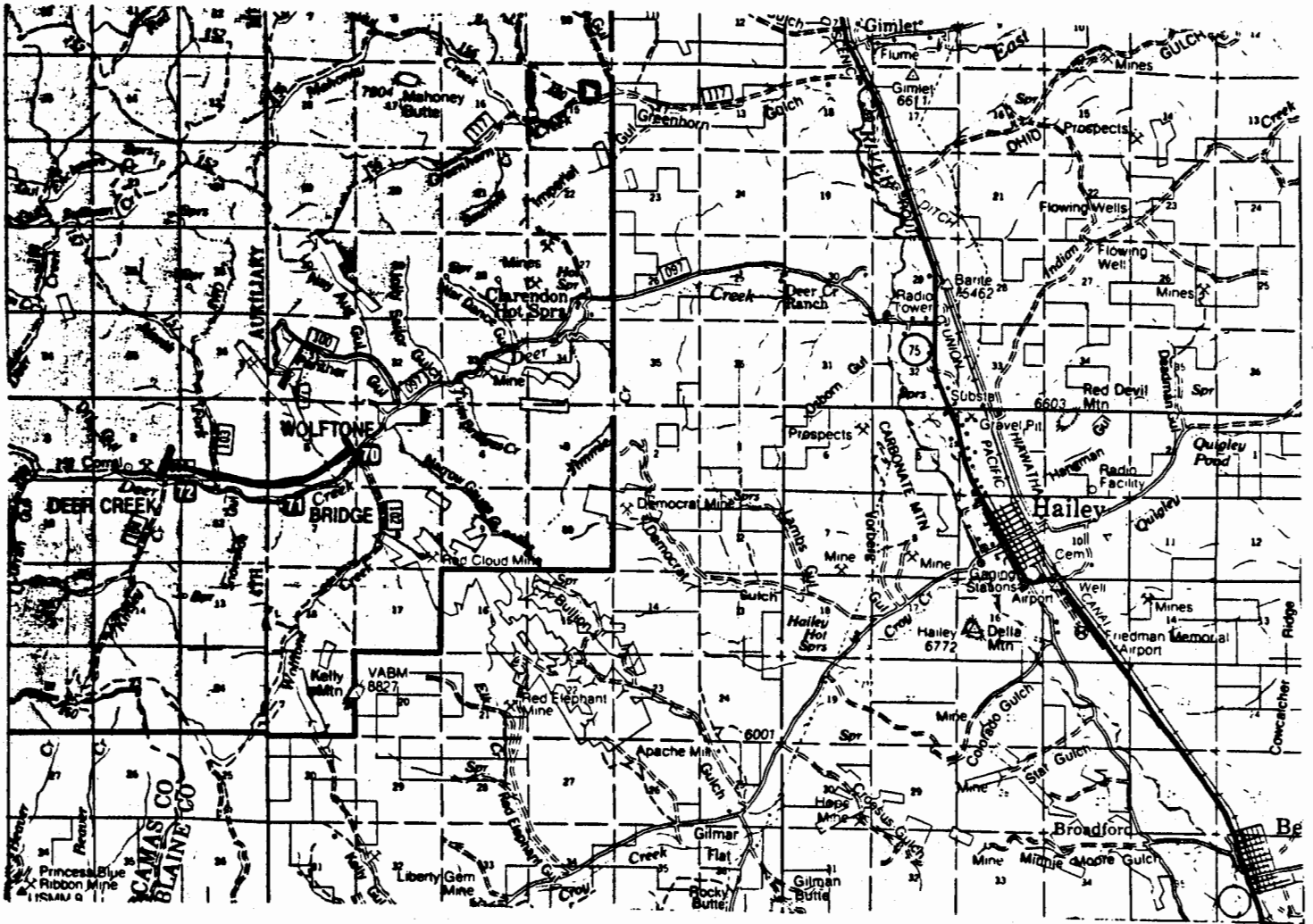
Fourth of July Route
 Pole Creek Route
 Alturas Lake Route



Galena Summit Route



Trail Creek Route



Deer Creek Route

APPENDIX C

Nest Box Locations

