

GREAT GRAY OWL (STRIX NEBULOSA)
SURVEYS ON THE CARIBOU NATIONAL FOREST

by

Ed Levine
Conservation Data Center
Nongame and Endangered Wildlife Program

October 1992

Idaho Department of Fish and Game
600 S. Walnut St. Box 25
Boise, Idaho 83707
Jerry N. Conley, Director

Cooperative Challenge Cost Share Project
Idaho Department of Fish and Game
Caribou National Forest



TABLE OF CONTENTS

TABLE OF CONTENTS i
LIST OF TABLES ii
ABSTRACT iii
INTRODUCTION 1
METHODS 1
RESULTS 3
DISCUSSION 5
MANAGEMENT RECOMMENDATIONS 6
ACKNOWLEDGMENTS 8
LITERATURE CITED 9
APPENDIX A 18
APPENDIX B 26
APPENDIX C 28
APPENDIX D 35
APPENDIX E 37

LIST OF TABLES

PAGE

1. Great gray owl sightings on the Caribou National Forest prior to 1992 surveys.	11
2. Routes surveyed for great gray owls on the Caribou National Forest, Soda Springs District, using nocturnal tape playback, March - June 1992.	12
3. Routes surveyed for great gray owls on the Caribou National Forest, Montpelier District, using nocturnal tape playback, March - June 1992.	13
4. Calling routes surveyed for great gray owls within proposed timber and/or mining sale areas on the Caribou National Forest, 1992.	14
5. Locations where great gray owls were observed or heard calling during great gray owl surveys on the Caribou National Forest, 1992.	15
6. Dates and locations where other owl species were heard calling during great gray owl surveys on the Soda Springs District of the Caribou National Forest, 1992.	16
7. Dates and locations where other owl species were heard calling during great gray owl surveys on the Montpelier District of the Caribou National Forest, 1992.	17

ABSTRACT

Surveys for great gray owls (Strix nebulosa) were conducted on 35 separate survey routes from 18 March through 13 June 1992 on the Soda Springs and Montpelier Ranger Districts of the Caribou National Forest. Recorded great gray owl calls were played nocturnally at 0.8 km (0.5 mi) intervals along 182 km (113 mi) of roads and trails within the Forest. Survey routes were located either within proposed timber and/or mining sale areas or near locations of past great gray owl sightings. Great gray owls were heard responding to played calls at three locations. Six other owl species responded to played calls. Nest searches were conducted at locations where great gray owls were heard responding. No nests or evidence of nesting was found. One family group and two individual great gray owls were observed by U.S. Forest Service employees working in the study area. Habitat information was collected at the three locations where great gray owls were heard responding. Average elevation at these locations was 2276 m (7467 ft) in old or mature stands dominated by lodgepole pine (Pinus contorta) either untreated or old partial cut. Average canopy cover in these areas was 80% as measured with a densiometer. Current and historical information indicates a population of great gray owls has existed on these districts of the Caribou National Forest for a minimum of 15 years. The most suitable great gray owl habitat on these two districts appears patchy and limited. Management recommendations for maintaining great gray owl populations on the Caribou National Forest include preserving limited habitats, which satisfy nesting and foraging requirements. Also, nesting surveys should continue while initiating base population studies to better assess and understand this population. This study was conducted by the Caribou National Forest and the Idaho Department of Fish and Game funded under the U.S.D.A. Forest Service Cooperative Cost Share Program.

INTRODUCTION

The great gray owl (Strix nebulosa) is a large forest owl with a worldwide circumboreal distribution. Its range in North America is limited to some parts of Canada, Alaska, and the northern Midwest States with local populations in Yosemite National Park, south-central and northeastern Oregon, southeastern Idaho, and northwestern Wyoming (Bull and Henjum, 1990). Being uncommon throughout much of its range, and due to its secretive and nocturnal habits, relatively little is known about the population within Idaho. Recent Idaho surveys indicate a wider distribution than was previously suspected (Groves and Zehntner 1990, Atkinson 1989). Still, information is lacking on distribution and population status throughout much of the state.

Because of this lack of knowledge and because of the possibility that these owls may have specific habitat requirements for breeding, the Idaho Department of Fish and Game (IDFG) has designated this species a Species of Special Concern (Moseley and Groves 1992). The U.S. Forest Service has listed them as a Sensitive Species in Region 4 for similar reasons (Moseley and Groves 1992).

These designations make it desirable and necessary to determine distribution and population parameters for great gray owls on National Forest lands throughout Idaho. This becomes particularly significant in areas slated to be logged because of the possibility that great gray owls may require unlogged coniferous habitats for successful breeding (Johnsgard 1988, Bull and Henjum 1990).

The Caribou National Forest (CNF), in conjunction with the IDFG, conducted great gray owl surveys on portions of the CNF in southeastern Idaho. Recent proposed timber and mining sale areas were surveyed.

METHODS

Calling Surveys

Calling surveys for great gray owls were conducted on the Soda Springs and Montpelier Ranger Districts of the CNF in southeastern Idaho from March through June of 1992. Nest site and family group searches were conducted during June, July and August of 1992.

Surveys were conducted primarily within proposed timber and mining sale areas designated for sale from 1993-1995. Survey routes were located along established Forest Service roads and trails within the proposed timber and mining sale areas. Calling surveys were also conducted in areas of recent great gray owl sightings.

Information on these recent sightings was obtained from IDFG's Conservation Data Center (CDC), CNF, and personal communications with local IDFG and National Forest Service employees (Table 1).

Calling surveys were conducted from dusk to approximately 2400 hours, traveling by foot, snowshoes, snowmobiles, ATV's or 4-wheel drive truck. Procedures for these surveys were developed from the U.S. Forest Service's suggested Forest Owl Inventory Protocol for the Forest Service's Northern Region (Appendix A).

Taped calls of great gray owls were played at 0.8 km (0.5 mi) intervals along a survey route. Actual interval distances varied from -500 m to 1.5 km depending upon topography. Calling locations were selected in open and/or prominent areas, when possible, for better projection of the vocalizations. The 6-12 low hooting notes of the male great gray owl were played repeatedly from tapes through a "Johnny Stewart Game Caller" with an 8 inch megaphone for approximately 30 to 60 seconds facing the megaphone alternately in all four cardinal directions. The surveyors then listened intently in silence for approximately two minutes and recorded all responses heard. When possible, responses were identified and directions and distances were recorded. After waiting two minutes the tape playing and listening sequence was repeated at least one more time (at some locations the sequence was repeated 3 or 4 times). All calling locations where great gray owls were heard responding were flagged with plastic fluorescent orange tape. After calling was completed and data were recorded the observers moved on to the next calling location.

Data recorded at each calling location included: 1) station number, location, starting and ending time and number of play sequences; 2) identification, by species, of distinctive territorial male songs (miscellaneous call notes including squeaks, mews, squeals, barks, etc. were recorded as unidentified owl species); 3) locations of calls based upon compass bearing and best estimated distance. Wind speed, noise interference, cloud cover, moon phase, snow cover class, and estimated temperatures were recorded periodically along each survey route (Appendix A).

The following day all survey routes and great gray owl responses were plotted on 7.5' USGS quadrangle maps (Scale 1:24,000). Field data were transcribed onto 8.5" by 11" sheets headlined with transect name, number, date, location, observers and mode of travel. Transect routes were then described using information from U.S.D.A. Forest Service, CNF, Montpelier and Soda Springs Ranger District Visitor Maps, 1988 (Scale 1:126,720) (Appendix B).

Nest Searches

All locations where great gray owls were heard responding to played calls were later searched for individual owls, family groups, nests or evidence of nesting attempts. These searches were conducted in

June, July and August during daylight hours. Searchers returned to the flagged calling location where great gray owls were heard. A search was conducted in a circular area with a minimum radius of 500 m centered on the estimated location of the calling owls. Tops of broken snags, stick nests, and mistletoe (Arceuthobium 82n) brooms were investigated as well as areas on the ground below these for evidence of use. Areas adjacent to recent sightings were also searched in this same manner.

Habitat Information

Habitat data were collected at each location where great gray owls responded to played calls. Data were also collected at sites where great gray owl sightings were reported for 1992 and also at a sample of past sighting locations.

Information collected at these sites included elevation, topographic position, aspect, dominant tree cover, dominant understory, silvicultural treatment, stand age, and percent canopy cover (Appendix D).

RESULTS

Calling Surveys,

Thirty-five calling routes were surveyed from 18 March to 13 June on the Soda Springs and Montpelier Ranger Districts of the CNF (Appendix C). Twenty-nine of these routes were surveyed from 18 March to 19 April and six routes were surveyed from 9 June to 13 June. One hundred and eighty-two kilometers (113 mi) of forest service roads and trails were surveyed using 260 calling locations (Tables 2 and 3). Average survey route length was 5.2 km (3.2 mi). Survey routes were located within the boundaries of 13 proposed timber and mining sale areas (Table 4). Limited routes were also surveyed in areas of recent great gray owl sightings on the CNF (Table 1).

Seven owl species were identified responding to recorded owl calls, these included great gray owl, great horned owl (Bubo virginianus), short-eared owl (Asio flammeus), long-eared owl (Asio otus), boreal owl (Aegolius funereus), northern saw-whet owl (Aegolius acadicus), and northern pygmy owl (Glaucidium gnoma) (Tables 5, 6, and 7).

Great gray owls were heard responding at three calling locations, two on the Soda Springs District and one on the Montpelier District (Table 5). Calling locations where great gray owls were heard responding were marked by tying orange fluorescent plastic tape on the nearest tree. Distance and direction of the responses were estimated and recorded.

Northern saw-whet owls were heard responding on 24 survey routes at 104 calling locations. Great horned owls were heard responding on 15 survey routes at 35 calling locations. Long-eared owls were heard responding on three survey routes at four calling locations. Boreal owls were heard responding on three survey routes at three calling locations (boreal owls responded to played boreal calls). Short-eared owls were heard responding on one survey route at one calling location. Northern pygmy owls were heard responding on one survey route at one calling location (Tables 6 and 7). All species, except boreal owls, responded to played great gray owl calls or were calling before the tapes were played.

Nest Searches,

Nest searches were conducted at all three calling locations where great gray owls were heard responding. These searches were conducted on 10 June in the Pritchert Spring area east of Summit View campground, 11 June on Diamond Creek, and 14 June in White Canyon. Although there were numerous brooms of mistletoe and broken off snags in each of these areas, no great gray owls or evidence of great gray owl nesting attempts were found. On 13 & 14 July, Andrea and Larry Hiavaty, Soda Springs, ID, reported sighting and photographing two adult and three young great gray owls on Diamond Creek near Lone Pine Spring (Table 5). This area is approximately 1.2 km north of the calling location where a great gray owl was heard responding on 20 March (Table 5).

On 12 June a nest/owl search was conducted in the Brockman firewood sale area (T3SR43ES2) where a sighting of an adult great gray owl was reported by C. Pearson and others on 3 June (Table 5). No great gray owls were observed, but a molted great gray owl wing feather was found in a clearcut near to where the sighting was reported.

On 13 June nest searches were conducted in the Meadow Spring area (T9SR43ES25SE1/4), and at two sites south of Ephraim Valley (T11SR46ES7&8). All are areas of previously reported great gray owl sightings. No great gray owls or evidence of nesting attempts were observed at any of these locations.

Habitat Information

From the habitat information collected at the three locations where great gray owls were heard responding to played calls the average elevation was 2276 m (7467 ft) . Average canopy cover measured with a densiometer was 80%. All three locations were within old or mature mixed stands dominated by lodgepole pine (Pinus contorta) either untreated or old partial cut. Two locations were adjacent to natural riparian meadows and one location was adjacent to a natural spring and a several-year-old clearcut. All were on lower or middle slopes with northern aspects (Appendix E).

DISCUSSION

During calling surveys on the CNF great gray owls were heard responding to played calls in three locations. Owls were also sighted at three other locations. One of these sightings was of a family group of two adults and three fledged young in the Diamond Creek drainage close to one of the calling response locations. These data indicate great gray owls are using and successfully nesting in areas of the CNF.

Sighting and response locations were widely distributed across the Forest. Because of this scattered distribution it is possible great gray owls are using much of the suitable habitat available on the CNF. The habitat types being utilized are similar to those described in other studies throughout Idaho and parts of Oregon (Groves and Zehntner 1991, Bull and Henjum 1990, Atkinson 1989). Great gray owls sighted and/or heard on the CNF were at an average elevation of 2276 m (7467 ft) in areas of mature to old stands of lodgepole pine or Douglas fir adjacent to natural openings such as meadows or riparian areas, or adjacent to clearcuts, usually several years old (Appendix B).

Nesting requirements for great gray owls include available nesting platforms such as broken off snags of sufficient diameter, old stick nests of other raptors such as goshawks, or large brooms of mistletoe (Bull and Henjum 1990, Johnsgard 1988). Preferred nest locations are within dense stands of mature timber adjacent to openings. Canopy cover in these stands usually exceeds 60% while the understory remains fairly open (Bull and Henjum 1990). Downed trees and leaning snags also appear important for the young during the early weeks of fledging (Bull and Henjum 1990, Johnsgard 1988). Foraging requirements include open areas with suitable hunting perches and sufficient numbers of available small mammals such as voles and northern pocket gophers (Bull and Henjum 1990, Franklin 1988, Johnsgard 1988). Habitats meeting combined nesting and foraging requirements appeared patchy on the two districts of the CNF surveyed in this study.

Because the calling routes were limited and not random, it is not possible to accurately assess great gray owl population numbers or densities on the CNF from these data. It does appear that the great gray owl population is dispersed and has been present for a number of years. Repeated sightings over the past 10 years substantiate this (Table 1). A more comprehensive study would be required to accurately assess population parameters and habitat requirements of great gray owls in this area.

Due to the low winter snow depth and warm spring conditions, great gray owls may have nested earlier on the Caribou in 1992 than in an average snow year. Onset of nesting is influenced by snow depth (Bull and Henjum 1990, Johnsgard 1988), and this may have reduced the effectiveness of the calling surveys. Great grays respond to

taped calls more readily prior to incubation (Bull and Henjum 1990, Atkinson 1989). No great gray owls were heard responding to calls after 26 March. To increase calling survey effectiveness, surveys should begin in late February or early March at the latest, particularly in years of low snow depth.

Low snow depth and deteriorating snow conditions created by the mild spring temperatures caused access problems during early surveys. The colder weather of late February and early March would make snow travel easier and thus more areas would be accessible for survey. All three great gray owls were heard responding while using snowmobiles to travel the survey routes.

Nest searches were unsuccessful, again perhaps due to the fact that nesting occurred earlier in the spring of 1992. By the time nest searches were conducted in early June the young may have already left the nests. The fact that a family group of great grays was observed 1 km from where a great gray owl responded to calls earlier and where subsequent nest searches were unsuccessful appears to substantiate this. Mid to late May might be a more productive time period for nest searches on the CNF, particularly after mild winters and/or warm springs.

The population of great gray owls on the CNF is unique in that it occurs on the southern end of the population range for great gray owls within the Rocky Mountain States (Bull and Henjum 1990, Franklin 1988). Recent and historical data indicate that great gray owls have been present in this portion of southeastern Idaho for at least 15 years and continue to exist (Table 1)(R. Walters pers. commun. 1992) Little is known about this population and further study is needed to accurately understand its distribution, status and habitat requirements. This knowledge would enable managers to make informed recommendations regarding maintenance of this unique species of forest owl.

MANAGEMENT RECOMMENDATIONS

To maintain or increase great gray owl populations on the CNF managers should provide the best habitat possible, which includes adequate nest sites with sufficient cover and adequate foraging areas (Bull and Henjum 1990).

1. Provide natural nest sites, large-diameter (> 50cm d.b.h.) dead trees with broken tops, large-diameter trees with mistletoe, and any tree with a large stick nest. These trees should be left standing with a dense stand left around the nest tree for protection of fledgling young (Bull and Henjum 1990).
2. At all nests and potential nest trees, dead and downed material and leaning trees should be left for fledged juveniles as escape cover from predators (Bull and Henjum 1990).

3. Artificial nest platforms may be provided in suitable areas. See Ecology of the Great Gray Owl (Bull and Henjum, 1990) or Nest Platforms for Great Gray Owls (Bull et. al. 1987) for details.
4. Provide hunting perches in suitable areas such as clearcuts. Perches need to be a minimum of 3 m high and spaced every 20 m (Bull and Henjum 1990). Great gray owls forage more along the edges of openings so a larger percentage area in smaller clearcuts would be used (Bull and Henjum 1990).
5. Leaving slash piles and other debris in clearcuts would enhance vole and other small mammal populations, which would benefit owls.
6. Limit disturbances at identified nest sites during critical nesting periods, approximately late March thru June on the CNF.
7. Continue surveys for, and initiate basic ecology studies of great gray owls on the CNF so that informed management decisions can be made regarding this species.

ACKNOWLEDGEMENTS

I wish to give a special thank you to the following Caribou National Forest Service employees: Robert Brassfield, Don Lurhson, Jay King, Scott Feltis, Ron Walters, Julie King, and Brett Parker for their invaluable assistance with equipment, logistics, housing, and calling surveys. Also, thank you to volunteers Monte Steele and Chad Allred for assisting with surveys and to Andrea Hlavaty for survey assistance and for finding great gray owls. Thank you to Idaho Dept. of Fish and Game employees Daryl Meints and Julie Mulholland for assistance with surveys, and Larry Hlavaty for assistance with surveys, loan of equipment and valuable guidance and direction. Thank you to Craig Groves for assistance with project design, planning, equipment and implementation.

This project was funded by the Caribou National Forest and the Idaho Department of Fish and Game, Conservation Data Center, Nongame and Endangered Wildlife Program under the USDA Forest Service Cost Share Program.

LITERATURE CITED

- Atkinson, E. 1989. Great gray owl (Strix nebulosa) surveys on the Payette National Forest. Idaho Department of Fish and Game, Natural Heritage Section. Nongame and Endangered wildlife Program. Boise, ID. 58pp.
- Bull, E.L., M.G. Henjum, and R.G. Anderson. 1987. Nest platforms for great gray owls. In *Biology and Conservation of Northern Forest Owls*. General Technical Report RM-142, U.S. Forest Service, Ft. Collins, CO.
- Bull, E.L., M.G. Henjum, and R.S. Rohweder. 1988. Home range and dispersal of great gray owls in northeastern Oregon. *J. of Raptor Res.* 22:101-106.
- . 1988. Nesting and foraging habitat of great gray owls. *J. of Raptor Res.* 52:107-115.
- . 1989. Diet and optimal foraging of great gray owls. *J. of Raptor Res.* 53:47-50.
- Bull, E.L., M.G. Henjum. 1990. Ecology of the great gray owl. Gen. Tech. Rep. PNW-GTR-265. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 39pp.
- Franklin, A.H. 1987. Breeding biology of the great gray owl in southeastern Idaho and northwestern Wyoming. M.S. thesis, Humbolt State University, Arcata, CA. 82pp.
- . 1988. Breeding biology of the great gray owl in southeastern Idaho and northwestern Wyoming. *Condor* 90: 689-696.
- Groves, C. and Zehntner, E. 1990. Distribution and status of great gray owls (Strix nebulosa) on the Targhee National Forest, 1989. Idaho Department of Fish and Game, Natural Heritage Section. Nongame and Endangered Wildlife Program. Boise, ID. 31pp.
- Johnsgard, P.A. 1988. North American owls: biology and natural history. Smithsonian Institution Press, Washington D.C. 295pp.
- Moore, T.L. and Frederick, G.P. 1991. Distribution and habitat of flammulated owls (Otus flammeolus) in west-central Idaho. Idaho Department of Fish and Game, Conservation Data Center. Nongame and Endangered Wildlife Program. Boise, ID. 27pp.

Moseley, R. and Groves, C. 1992. Rare, threatened and endangered plants and animals of Idaho. Conservation Data Center, Nongame and Endangered Wildlife Program, Idaho Department of Fish and Game. Boise, ID. 38pp.

U.S.D.A. Forest Service. 1991. Forest Owl Inventory Protocol. Northern Region. Missoula, MT. Unpublished Report. 7pp.

Table 1. Great gray owl sightings on the Caribou National Forest prior to 1992 surveys.

<u>Location</u>	<u>TRS</u>	<u>Date</u>	<u>Observed</u>	<u>Source</u>
Big Basin*	6S43ES35SW4	7/28/1991	1-owl	Caribou NF
Meadow Spr*	35S44ES22NW4	7/31/1991	1-Adult	J.King Caribou NF
Tincup Hwy (34)	Id/Wy border	Jun-91	1-Adult twice	L.Hlavaty IDFG
Diamond Creek*	7S44ES25SE4	10/9/1990	1-owl	Caribou NF
Rasmussen Valley	6S43ES35SW4	10/30/1990	1-owl	Caribou NF
Caribou Basin*	3S44ES22NW4	11/19/1990	1-owl	Caribou NF
Georgetown	11S43ES11?	6/8/1989	1Ad/2yg Nest	IDFG/CDC
Lead Draw	8S35ES15,9,10	7/25/1989	1Ad/2yg	IDFG/CDC
Deer Creek	6S46ES18?	Sep-89	1-owl	B.Saban/IDFG
Stump Creek	Near Mill Pond Wyoming	10/4/1989	1-owl	J.King Caribou NF
King Creek	3S46ES32?	Sep-88	2-owls	B.Saban/IDFG
Summit View Cmpg*	10S44ES15NE4	Sep-88	2-owls	IDFG/CDC
Caribou Hills	11345E38,17	1988	1-owl	Caribou NF
Summit View Cmpg*	10344E315	5, 6, 7/87 Sep-87	1-owl 2-owl	IDFG/CDC
Caribou Basin*	3S44ES26NW4	1984 1982	1-owl 1Ad/2yg	Caribou NF
Preuss Creek	12S46ES9NW4	1984	Young in nest	R.Walters Caribou NF

* = Areas where nest searches were conducted.

Table 2. Routes surveyed for great gray owls on the Caribou National Forest, Soda Springs District, using nocturnal taps playback. March-June 1992.

Date	Area	Routes	
		From	To
3/18/1992	Summit View Cmpgrd	T1OSR44ES10	T1OSR44ES8
3/19/1992	Smokey Canyon Rd.(110)	T8SR45ES28	T8SR46ES24
3/19/1992	Diamond Cr. Rd.(102)	T8SR45ES28	T9SR45ES4
3/20/1992	Diamond Cr. Rd.(102)	T8SR45ES28	T9SR45ES10
3/20/1992	Kendall Canyon Rd.(027)	T7SR44ES26	T7SR44ES35
3/21/1992	Summit View Cmpgrd	T1OSR44ES8	T1OSR44ES5
3/21/1992	Slug Cr. Rd.(095)	T1OSR44ES10	T9SR44ES27
3/22/1992	Reservoir Canyon(382)	T5SR43ES27	T5SR43ES20
3/22/1992	Cutoff Rd. (355)	T5SR43ES27	T5SR43ES32
3/22/1992	Gravel Cr. Rd.(191)	T5SR43ES26	T58R43ES35
3/23/1992	Midnight Spr.(192)	T6SR44ES17	T6SR43ES13
4/6/1992	Diamond Cr.(102)	T8SR45ES28	T8SR45ES6
4/7/1992	Cold Spr. Cr.(100)	T9SR44ES35	T1OSR44ES3
4/8/1992	McCoy Cr. Rd.(087)	T3SR46ES6	T3SR45ES17
4/9/1992	McCoy Cr. Rd.(087)	T3SR43ES21	T3SR43ES24
4/9/1992	Tincup Hwy.(34)	T5SR44ES22	T5SR44ES13
6/9/1992	Caribou City Rd.(165)	T4SR44ES2	T3SR44ES23
6/9/1992	Caribou Basin (077)	T38R44ES17	T3SR44ES7
6/10/1992	Big Basin (128&097)	T9SR43ES36	T1OSR44ES5
6/11/1992	Webster Ridge (219)	T8SR45ES23	T8SR45ES35

(#) = U.S. Forest Service road and trail numbers taken from USDA Forest Service visitors map, Caribou National Forest, Soda Springs and Montpelier Ranger District, 1988.

Table 3. Routes surveyed for great gray owls on the Caribou National Forest, Montpelier District, using nocturnal tape playback, March-June 1992.

<u>Date</u>	<u>Area</u>	<u>Routes</u>	
		<u>From</u>	<u>To</u>
3/24/1992	Bloomington Canyon	T14SR42ES30	T14SR42ES23
3/25/1992	Franklin Basin (406)	T15SR41ES25	T16SR42ES30
3/26/1992	Franklin Basin (303)	T16SR41ES24	T16SR42ES19
3/26/1992	Franklin Basin (450)	T16SR41ES14	T16SR42ES18
3/26/1992	Cub River (406)	T15SR41ES11	T15SR41ES9
4/1/1992	Green Canyon (411)	T15SR42ES35	T15SR43ES29
4/1/1992	Green Canyon (413)	T15SR42ES36	T15SR42ES36
4/2/1992	Co-op Cr. (985)	T11SR42ES23	T11SR42BS14
4/2/1992	Skinner Cr. (403)	T11SR42ES11	T11SR42ES13
4/3/1992	Big Canyon (129)	T10SR43ES14	T10SR44ES7
4/4/1992	Cheatback Basin (402)	T11SR42ES19	T10SR42ES29
6/11/1992	Freeman Pass (311)	T9SR45ES12	T9SR45ES15
6/13/1992	Rattlesnake Canyon(097)	T10SR44ES7	T10SR44ES6

(#) = U.S. Forest Service road and trail numbers taken from U.S.D.A. Forest Service Visitors Map, Caribou National Forest, Soda Springs and Montpelier Ranger District, 1988.

Table 4. Calling routes surveyed for great gray owls within proposed timber and/or mining sale areas on the Caribou National Forest, 1992.

Proposed Sale Area	Route	Length
<u>Soda Springs Ranger District</u>		
1. Harrington Peak	11.6km	(7.2mi)
2. Smokey Canyon	19km	(11.8mi)
3. Diamond Creek	13km	(8mi)
4. Gray's Range	11.3km	(7mi)
5. Midnight Springs	8.8km	(5.5mi)
6. Cold Spring Creek	7.2km	(4.5mi)
7. Kendall Canyon	3.2km	(2mi)
<u>Montpelier Ranger District</u>		
1. Bloomington Canyon	8km	(5mi)
2. Franklin Basin	19.3km	(12mi)
3. Green Canyon	9.6km	(6mi)
4. Co-op	6.4km	(4mi)
5. Middle Cheatback	11.3km	(7mi)
6. Rattlesnake Basin	4.8km	(3mi)

Table 5. Locations where great gray owls were observed or heard calling during great gray owl surveys on the Caribou National Forest, 1992.

Date	Location	TRS	Source/Heard or Obsvd
3-18	Pritchert Spr	10S44ES9SE1/4	E.Levine/Heard
3-20	Diamond Creek	9S45ES4SW1/4	E.Levine/Heard
3-26	White Canyon	16S42ES19SW1/4	E.Levine/Heard
6-3	Clear Creek	3S43ES2NW1/4	C.Pearson/Obsvd
7-13	Diamond Creek	8S45ES33SW1/4	L&A Hlavaty/Obsvd
7-14	Deer Creek	5S46E30?	D. Woody/Obsvd

Table 6. Dates and locations where other owl species were heard calling during great gray owl surveys on the Soda Springs District of the Caribou National Forest, 1992 (SW=northern saw-whet owl, GH=great horned owl, LE=long-eared owl, SE=short-eared owl, PG=northern pygmy owl, B=boreal owl).

Date	Species	Location,	Routes	
			From	To
3-19	1-SW	Smokey Canyon(110)	T8SR45E828	T9SR45ES4
3-20	2-GH,1-LE	Diamond Cr. Rd.(102)	T8SR45E828	T9SR45ES10
3-21	1-SW	Slug Cr. Rd.(095)	T10SR44ES10	T9SR44ES27
3-22	2-SW	Cutoff Rd. (355)	T5SR43ES27	T5SR43ES32
3-22	3-SW,1-GH	Gravel Cr. Rd.(191)	T5SR43BS26	T5SR43ES35
3-23	3-SW,1-B	Midnight Spr.(192)	T6SR44ES17	T6SR43ES13
4-6	6-SW,1-GH	Diamond Cr.(102)	T8SR45ES28	T8SR45ES6
4-7	14-SW,2-GH	Cold Spr.Cr.(100)	T9SR44ES35	T10SR44ES3
4-8	1-SW,4-GH	McCoy Cr. Rd.(087)	T3SR46ES6	T3SR45ES17
4-9	2-SW,2-LB	Tincup Hwy.(34)	T5SR44ES22	T5SR44ES13
6-9	3-SW,5-GH,1-SE	Caribou City Rd.(165)	T4SR44ES2	T3SR44ES23
6-9	4-SW,2-GH	Caribou Basin (077)	T3SR44ES17	T3SR44ES7
6-10	3-SW	Big Basin (128&097)	T9SR43ES36	T10SR44ES5

(#) = U.S. Forest Service road and trail numbers taken from U.S.D.A. Forest Service visitors Map, Caribou National Forest, Soda Springs and Montpelier Ranger District, 1988.

Table 7. Dates and locations where other owl species were heard calling during great gray owl surveys on the Montpelier District of the Caribou National Forest, 1992 (SW=northern saw-whet owl, GH=great horned owl, LE=long-eared owl, SE=short-eared owl, PG=northern pygmy owl, B=boreal owl).

Date	Species	Location	Routes	
			From	To
3-24	5-SW,1-GH	Bloomington Canyon	T14SR42ES30	T14SR42ES23
3-25	6-SW,2-GH	Franklin Basin (406)	T15SR41ES25	T16SR42ES30
3-26	1-GH	Franklin Basin (303)	T16SR41ES24	T16SR42ES19
3-26	1-SW	Franklin Basin (450)	T16SR41ES14	T16SR42ES18
3-26	2-SW,1-B	Hillyard Canyon (406)	T15SR41ES24	T15SR41ES11
3-26	2-SW	Cub River (406)	T15SR41ES11	T15SR41ES9
4-1	9-SW,1-GH	Green Canyon (411)	T15SR42ES35	T15SR43ES29
4-1	1-SW	Green Canyon (413)	T15SR42ES36	T15SR42ES36
4-2	1-SW,2-GH	Co-op Cr. (985)	T11SR42ES23	T11SR42ES14
4-2	2-SW	Skinner Cr. (403)	T11SR42ES11	T11SR42ES13
4-3	8-SW,2-GH	Big Canyon (129)	T10SR43ES14	T10SR44ES7
4-4	23SW,7GH,1LE,1PG	Cheatback Basin (402)	T11SR42ES19	T10SR42ES29
6-13	1-SW,2GH	R.Snake Canyon (097)	T10SR44ES7	T10SR44ES6

(#) = U.S. Forest Service road and trail numbers taken from U.S.D.A. Forest Service visitors Map, Caribou National Forest, Soda Springs and Montpelier Ranger District, 1988.

APPENDIX A

Forest Owl Inventory Protocol from U.S.D.A. Forest Service,
Region 1, P.O. Box 7669, Missoula, MT, 1991.
Unpublished Report

Appendix A. Forest Owl Inventory Protocol from U.S.D.A. Forest Service.

**FOREST OWL INVENTORY
PROTOCOL**

INTRODUCTION

The purpose of this effort is to provide a standardized owl inventory protocol for use in the Northern Region. The method described has been developed and refined by many individuals working on the forests of the Region. Acknowledgement is due Milo Burcham, Kent Miller, Denver Holt and Mike Hillis and Greg Hayward for their initial work which is the basis of this information. Greg Hayward and Denver Holt provided critical review and corrections of this work. The inventory method described is used for gathering information on presence of the species. If a bird is heard calling or seen its presence is conclusive. The absence of a bird is never conclusive though such a determination can be strengthened through repeated visits to the same area. Hayward (pers. comm.) suggests at least 3 visits to the same area in a season and 3 years of surveys to enhance the confidence of one's data. Because absence cannot be determined, assuming potential occurrence if the species' habitat exists is appropriate. This is particularly pertinent when addressing project level effects analysis.

Collection of data on the occurrence of boreal and flammulated owls over varying habitats and elevations is a priority in the Region. It is recommended that inventories be conducted over a broad geographic range, inventorying different habitats and elevations during these initial years. In this situation rather than repeating transacts the probability of new occurrence *information* increases by inventorying new areas. Information on population/metapopulation structure of the flammulated and boreal owl is vital in assessing population viability. Therefore, species presence data from isolated ranges such as the Little Belt Mts. or along the periphery of known ranges is valuable.

The objective of using a standardized method region-wide is crucial in our attainment of species information and ultimately proper management. If you find this method or the forms do not work for you please provide that feedback to Mary Maj, P.O. Box 7669, Missoula MT. 59007

METHOD OP INVENTORY

Transect Design

Calling stations should be set at 0.5 miles apart. One's ability to hear distant calling owls over 0.5 miles away is greatly reduced. Prominent geographic features such as points and switchbacks, or open areas overlooking basins or drainages are Good locations for projecting calls. If the option exists, relative to the mode of travel, conduct a daylight pre-run along the transect. This will allow familiarization and, final selection of calling stations. This also allows for estimating the time needed to conduct the survey.

A record of the layout of the calling transect should be marked on a map (1 inch = 1 mile as well as on 7.5/ USGS quadrangel maps (1:24,000). The location of calling stations can be recorded and numbered on these maps. It is important to maintain records of survey locations and effort (dates and time spent) made even if a particular survey is not successful in documenting species occurrence. A sample of a Survey Report is included.

Calling

Broadcast tape-recorded call surveys result in significantly more bird contacts than can be achieved through listening or observation surveys for owls (Kochert. 1986). The method works on the premise that male owls vocalize as a way to attract a mate and denote their occupied territory. One cannot assume however, that a vocalizin^g bird implies a pair on a territory. As an example, unpaired male flammulated owls are thought to call more during the breeding season. This same situation occurs with boreals during the pre-breeding season

(Lundberg, 1978). This technique does provide information on presence of specific owl species. It has not been validated for assessing population trends or relative densities. Many factors influence the calling rate of forest owls and the relative importance of each is not understood. Therefore, the relationship between playback response and population size may not be a good meter for monitoring trends abundance.

Calling may start 1/2 hour after dusk, or when the stars are visible, and continue throughout the evening/early morning. There is little information on "best" nighttime hours to solicit calling, though the period immediately following nightfall appears to be an active period for many species. Conditions for calling must be calm (wind less than 5 mph) without heavy precipitation. Surveys should be postponed if these conditions cannot be met.

Upon arriving at each new station, the observer should first listen for calling owls for 2 minutes. This should be done in complete silence, away from snowmobiles and without talking. One should wear hearing protection if using snowmobiles, this will help the "ringing" caused by the noise of the snowmobile engine. An owl call is played for 20-30 seconds followed by intervals of silence (30-60 seconds). This sequence of calling and listening is repeated for up to 10 minutes total. Obviously, if a bird is heard vocalizing the listening period would be extended to meet the need to determine species and location. Again, each sample should last about 10 minutes per station, which allows for about 4 calling/listening sequences. When calling small and large owls at the same station broadcast the smaller owl's call first. Broadcasting the vocalizations and listening should be made in all 4 cardinal directions.

It has been recommended that the great horned owl not be

called in by playing their vocalization. Because great horned owls prey upon smaller owls, one should not even continue to call a smaller owl if a great horned owl has been heard at the same station (pers. comm. S. Soultz). This may reduce the potential of enticing predation.

Recording Owl Locations

Positive owl locations are only recorded after hearing the distinctive territorial calls. Miscellaneous call notes (squeaks, mews, squeals, etc.) should be recorded as unidentified owl species. Unless simultaneously heard, each call should be recorded as an individual owl. The location of each call should be described based on a compass bearing and estimated distance to the recorder. Be aware that owl calls may be much further away than they seem. Two people are used on each transect, one to operate the calling equipment, the other recording data.

The following information recorded at each calling station: transect name, station number, date, starting and ending time, temperature, wind speed, cloud cover, moon phase, snow coverage class (complete, partial tree welling, tree welling, patchy), % snow coverage, snow depth, and snow condition (powder, wet, crusted). The following information on the owl response should be recorded: species, call that solicited the response, bearing and distance of vocalization. Space is available for additional comments, which are encouraged. Observation forms are included. If time is limited, mapping and determination of precise owl locations should be secondary to filling out owl observation forms adequately.

Owl locations can be plotted on 7.5' USGS quadrangle maps (1:24,000). An "X" is used to denote the most precise locations (owls heard well) while an "O" is used to denote less precise

locations (distant owls or those heard faintly). Owl locations can then be digitized on a Geographic Information System (GIS). Individual records can be coded specifying: species (BA=barred, BO=boreal, GG=great, GH=great horned, PY=northern pygmy, SW=northern saw-whet, WS=western screech, FL=flammulated, LE=long-eared owl, date (year-two digits, month-two digits, day-two digits), location quality (g=good, b=bad) that it be based upon confidence in knowing the actual location, maybe good = >75% confident, poor = <75%, and survey type (t=all-owl transect).

Example: B0910317BT represents a boreal owl heard on 17 March, 1991, the location is not precise, and the location is from an all-owl transect.

CUME4E8ECU

Summary of Owl species Inventory Information

<u>Species</u>	<u>Survey Dates</u>	<u>General Habitats</u>
Boreal Owl	mid-Feb thru April	Mature spruce/subalpine fir. Cavity nest.
Saw-Whet Owl	mid-Feb thru April	Cottonwood, mixed ponderosa pine. Cavity nest.
W. Screech Owl	Feb to May	Low elev., mature riparian, deciduous forest. DF zone and lower to stands of cottonwood and aspen. Cavity nest.
Flammulated Owl	May to end June	Mature ponderosa pine, aspen. Cavity nest.

N. Pygmy Owl	April to May & Sept. to Nov.	Mixed spruce/fir and fir/ponderosa pine zones. Cavity nest.
Long-eared Owl	end Feb to April	Unclear. Check a variety of areas. Not expected in continuous coniferous forests. Stick nest.
Barred Owl	end Feb. to April	Lower end of DF zone into subalpine fir zone. Heart is in grand fir zone. Larch. Cavity or stick nest.
Great Horned Owl	Feb to April	Across all habitats. Stick nest.
Great Gray Owl	Feb. to April	Lodgepole/DF zone on east side of divide. Spruce bog on west side. Broken top tree or stick nest.

REFERENCES

- Burcham, Milo and Kent Miller. 1991. All Owl-Transects Final Report. Flathead National Forest Report. Hayward. Greg D. 1991, Personal communications. Research Biologist, Colorado State University, Colorado.
- Hayward, Greg D. 1991. Personal communications. Research Biologist, Colorado State Univeristy, Colorado.
- Hayward, G.D., R.K. Steinhorst, and P.H. Hayward. in Press. Monitoring boreal owl populations with nest boxes: samle size and cost. J. Wildl. Manage.
- Holt. Denver and Mike Hillis. 1987. Current Status and Habitat AssociA tions of Forest Owls. Pp. 81-288 in R. Nero et. al. (eds), Western Montana in Bioloav and Conservation of Northern Forest Owls Proceedings.
- Johnsaard, Paul. 1989. Owls of North America
- Kochert Michael N. 1986. Raptors. Po. 313-349 in A. Cooperrider et. al. (eds), Inventory and Monitoring of Wildlife Habitat.
- Lundberg. A. 1978. Census methods for the Ural owl *Strix uralensis* and the Tenamalm's owl *Aegolis funereus*. Anser. Supolemen 3:171-175.
- Nero, Robt. W. et. al. 1987. Biology and Conservation of Northern Forest Owls. 309 pp.
- Soult, Scott. 1992. Personal communications. Wildlife Biologist, Mt Hood National Forest. Oregon.

APPENDIX D

SAMPLE OF TRANSCRIBED CALLING SURVEY DATA

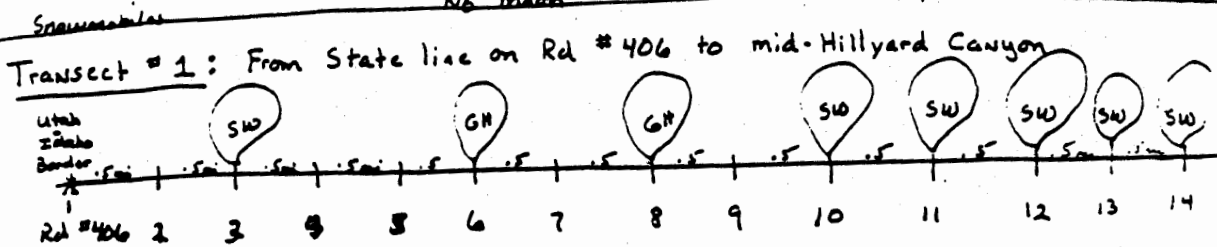
Great Gray Owl Survey
Caribou NF - Montpelier District

3/25/92

Area: Franklin Basin: Rd # 406

Surveyors: EB - Brett Perc.

All completed on snow machines

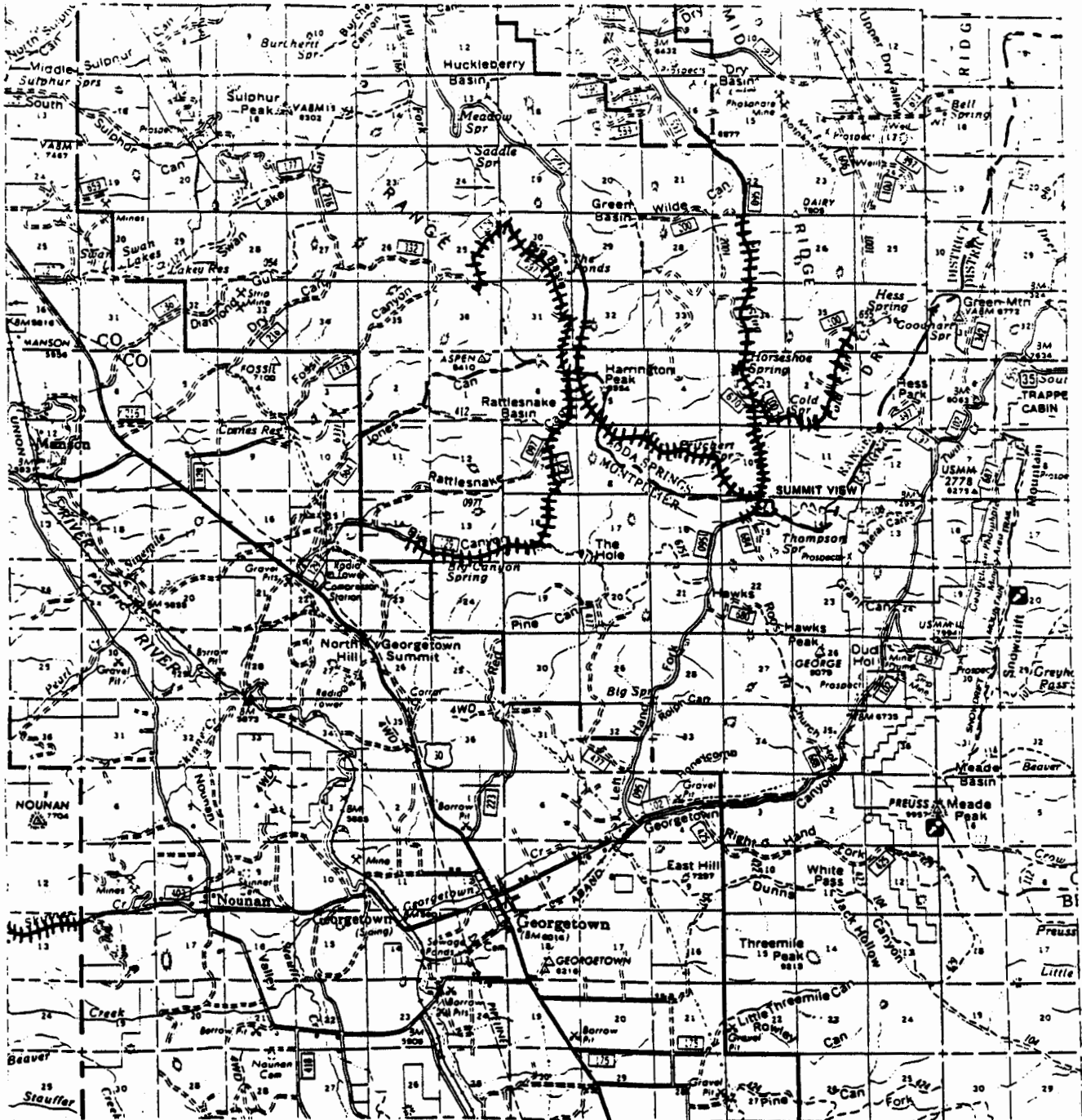


1. State line on Rd # 406: 1954: 2 G.G. plays: No response: clear, complete snow
2. .5 mi N on Rd # 406: 2005: 2 G.G. plays. No response. clear, cooling, calm ~28°F
- ✓ 3. .5 mi N on Rd # 406: 2015: 2 G.G. plays. SW calling west across the creek.
4. .5 mi N on Rd # 406: 2026: 2 G.G. plays - 1 ♀ play: No response
5. .5 mi N on Rd # 406: 2035: 2 G.G. plays: No response: ~25°F - complete snow cover. slight
- ✓ 6. .5 mi N on Rd # 406: 2050: 2 G.G. plays: GH responded twice to N; very close ~100 m.
7. .5 mi N on Rd # 406: 2100: 2 G.G. plays: No response: clear, calm, quiet - no moon
- ✓ 8. .5 mi N on Rd # 406: 2110: 2 G.G. plays: At least one; maybe two GH's responding to the south. Very cold ~20°F.
9. .5 mi N on Rd # 406: 2120: 2 G.G. plays: No response. Breeze picking up from the south
- ✓ 10. .5 mi N on Rd # 406: 2128: 2 G.G. plays: SW singing to the N ~500 m.
- ✓ 11. .5 mi N on Rd # 406: 2139: 2 G.G. plays: SW singing to the East. Cold ~18°F.
- ✓ 12. .5 mi N on # 406: 2152: 2 G.G. plays: SW singing to the West a very cold, clear, no moon
- ✓ 13. .5 mi N on # 406: 2202: 2 G.G. plays: SW singing NW ~500 m
14. .5 mi N on # 406: 2217: Just past Franklin Basin 1 mi or sign at mouth of canyon.
2 G.G. plays. SW singing to SE; loud ♀ ~200 m
15. .5 mi N on # 406: 2226: Down in Canyon: 2 G.G. plays - No response: Wind very loud in canyon

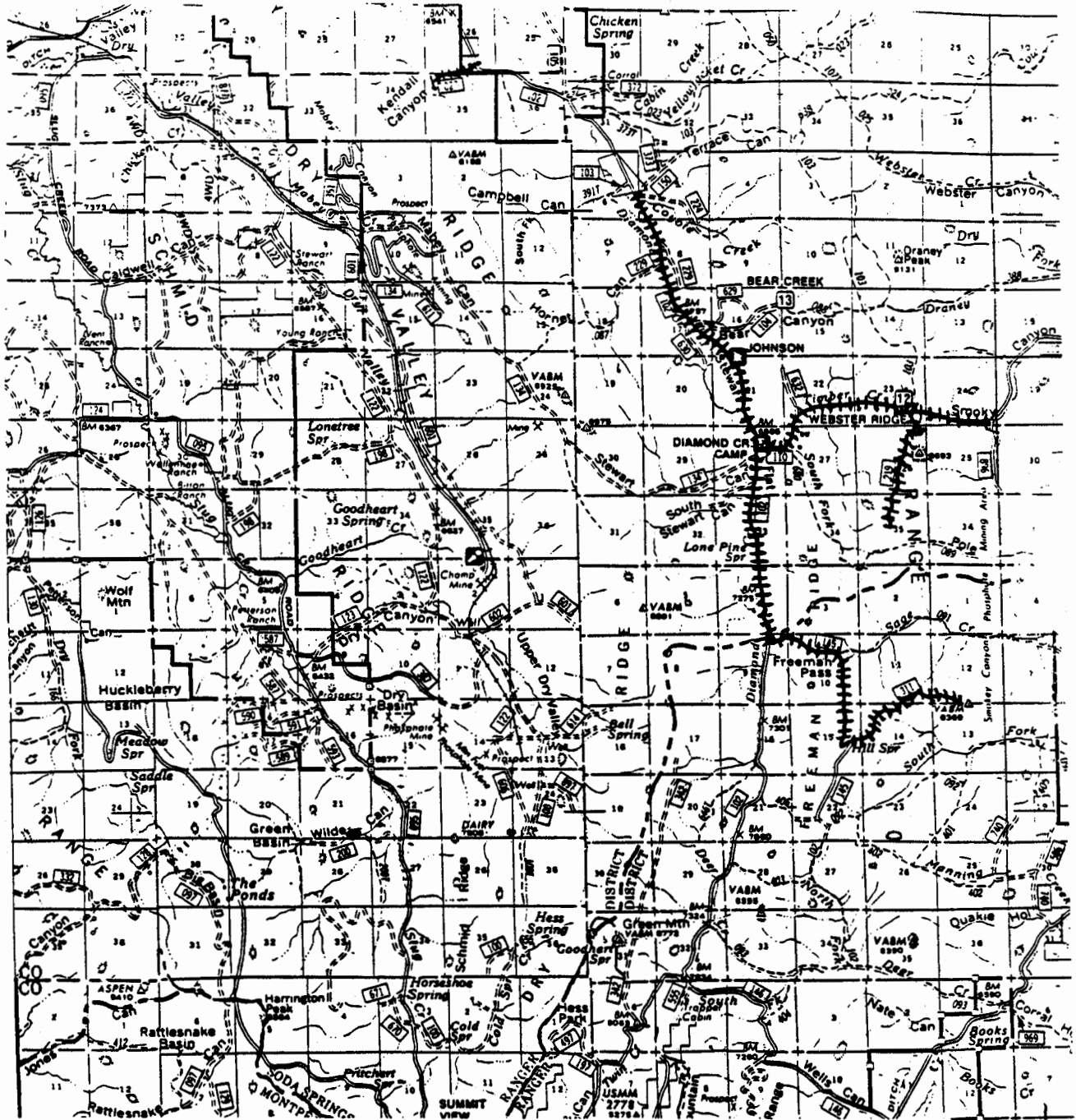
APPENDIX C

Calling Routes Plotted on U.S.D.A. Forest Service Visitor Maps
(Scale 1:126,720)

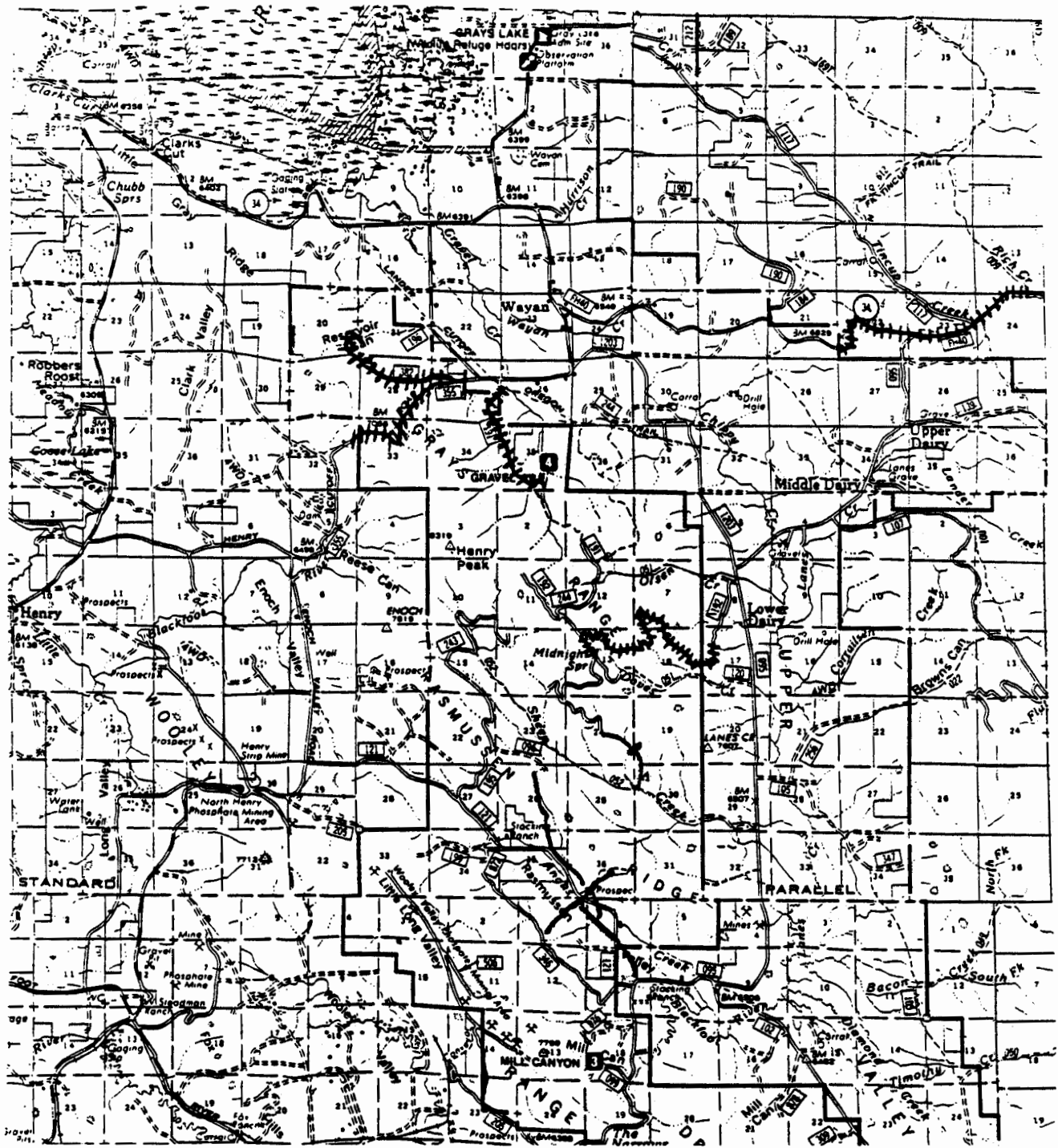
Appendix C: Calling routes plotted on U.S.D.A. Forest Service Visitor Maps, Caribou National Forest, Soda Springs and Montpelier Ranger Districts, 1988 (Scale 1:126,720).



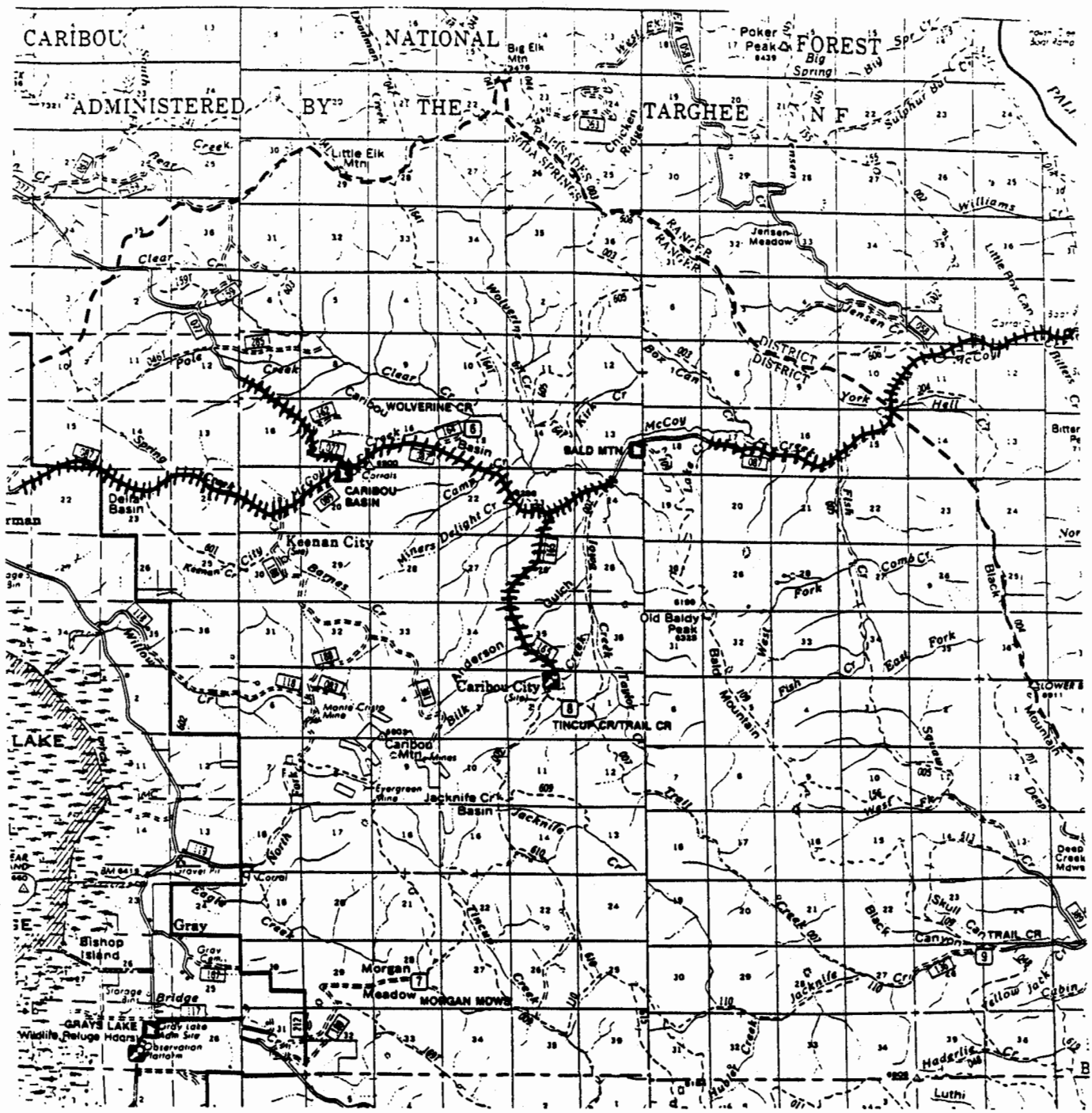
Map 1. Harrington Peak/Slug Creek Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: Summit View Campground, Slug Creek, Cold Spring Creek, Big Canyon, Rattlesnake Canyon, and Big Basin.



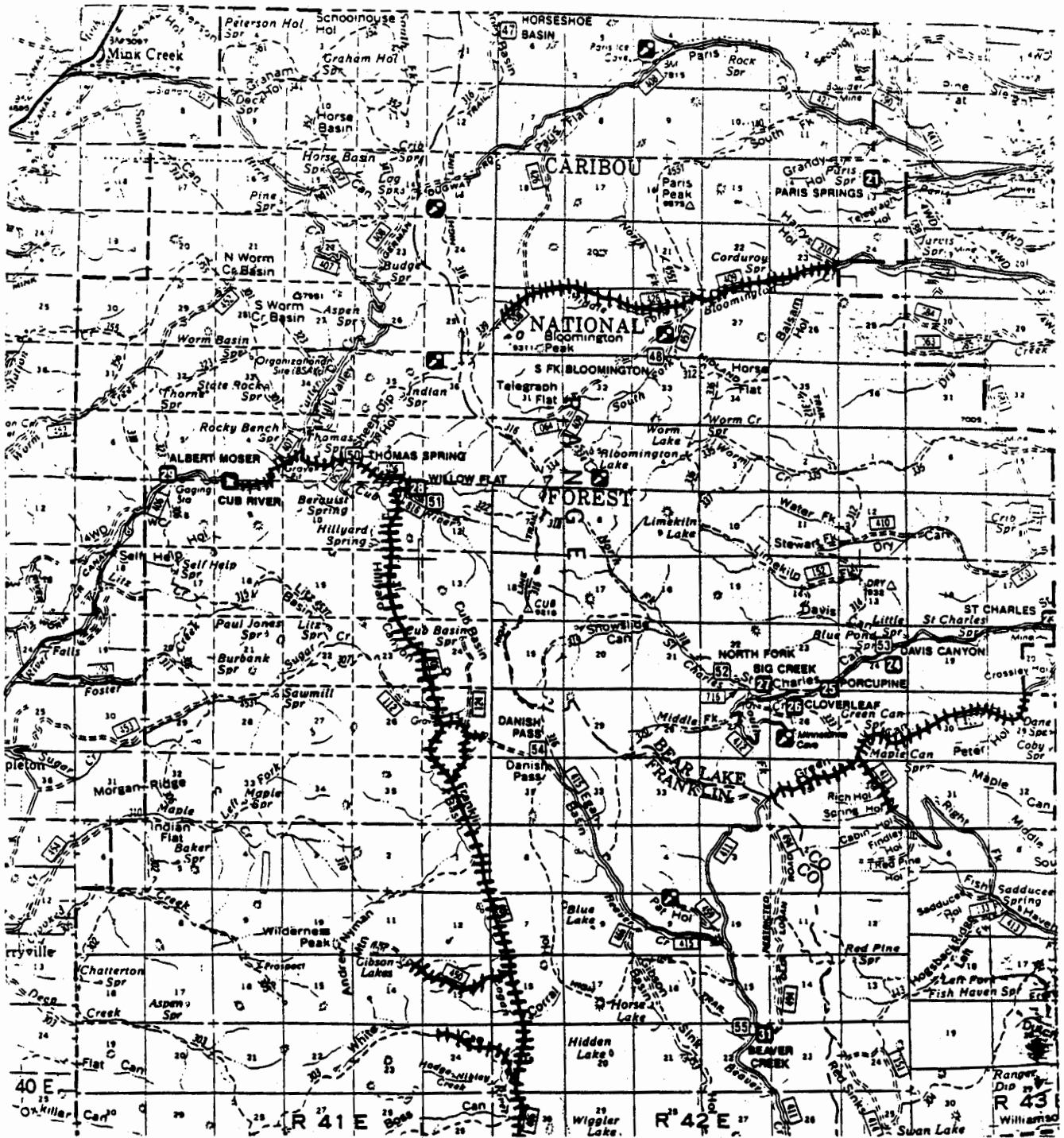
Map 2. Diamond Creek Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: Diamond Creek, Kendall Canyon, Smokey Canyon, Webster Ridge, and Freeman Pass.



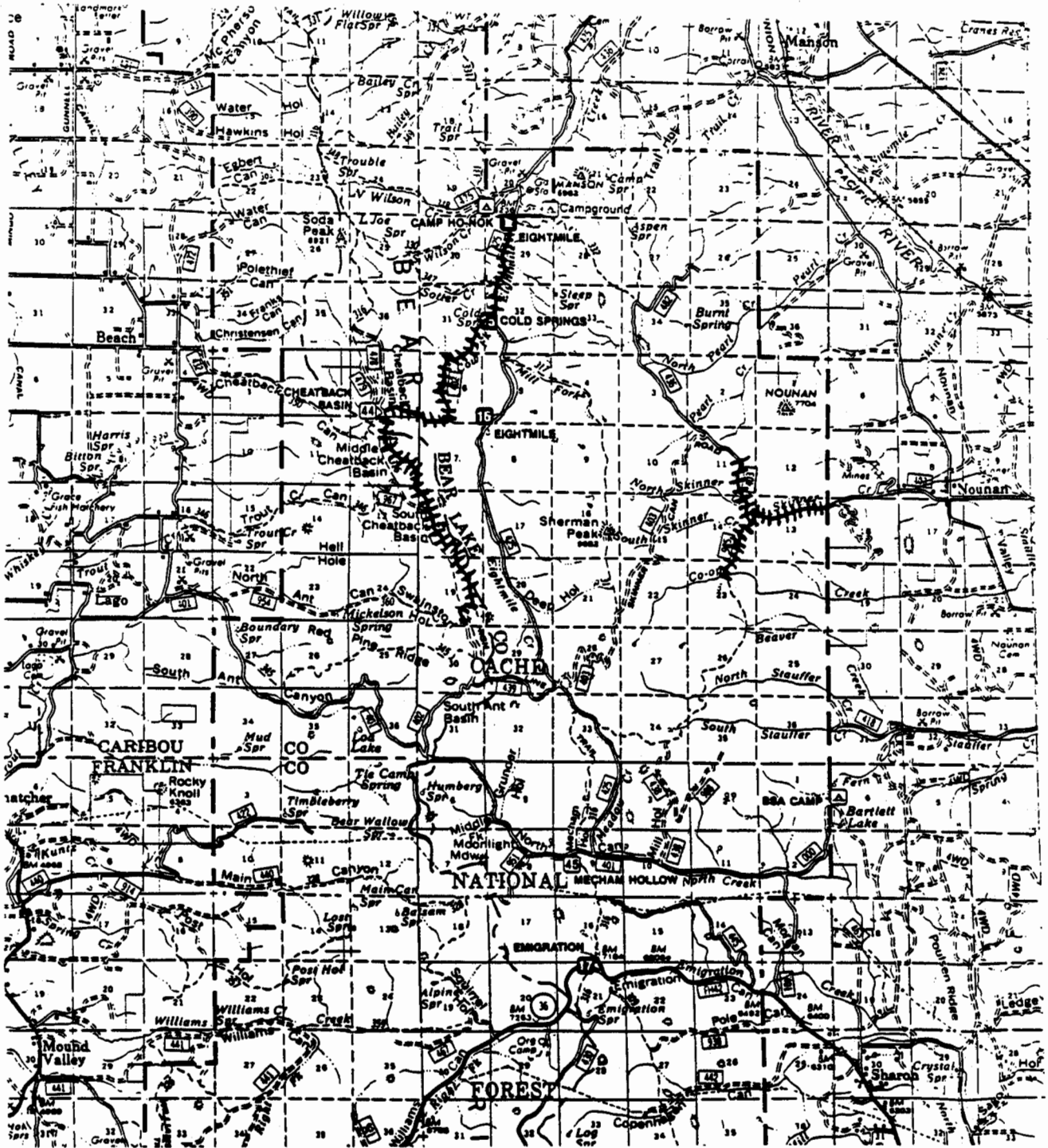
Map 3. Grays Range Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: Reservoir Canyon, Cutoff Road, Gravel Creek Road, and Tincup Hwy #34.



Map 4. McCoy Creek Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: McCoy Creek Road, Caribou City Road, and Caribou Basin.



Map 5. Franklin Basin Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: Franklin Canyon, Cub River, Green Canyon, and Bloomington Canyon.



Map 6. Cheatback Basin Area. Portions of Caribou National Forest, Visitor Maps containing calling survey routes: Cheatback Basin, Co-op Creek, and Skinner Creek.

APPENDIX D

Definitions of Habitat Measurements From Moore and Frederick
(1991)

Appendix D: Definitions of measurements taken on plots centered on estimated great gray owl locations (Moore and Frederick 1991).

Elevation: in meters above sea level from estimated locations of great gray owls using USGS topographic maps with feet in parenthesis.

Topographic position: ridgeline, upperslope, midslope, lowerslope, valley bottom.

Aspect: in degrees

Dominant tree cover: tree species visually estimated to dominate cover; indicated both species if co-dominate.

Dominant understory: vegetation species visually estimated to dominate cover.

Silvicultural treatment: partial cut (few trees removed, often old), Dartia cut (many trees removed, such as shelterwood o ed tree, thin, or clearcut).

Stand age: immature (trees not cone bearing), immature/mature (mix of immature and mature trees), mature (trees cone bearing, but not yet "old"), old (multiple canopy layers, large snags abundant, and trees with dbh generally greater than 64cm).

Percent canopy cover: using a densiometer.

APPENDIX E

Habitat Measurements

Appendix E: Measurements recorded at centers of estimated locations where great gray owls responded to played calls during surveys of the Caribou National Forest, 1992.

1. Location: Harrington Pk/Summit View Campground

T10SR44ES9SW1/4 Elevation: 2255m (7400ft)

Topographic position: midslope

Aspect: 28 degrees N

Dominant tree cover: lodgepole pine (Pinus contorta) Dominant understory: mixed grasses and forbes

Silvicultural treatment: none in stand but small stand is bordered by a clearcut.

Stand Age: mature

Percent canopy cover: 70%

2. Location: Diamond Creek T9SR45E-SW1/4 of SE1/4 of

S4 Elevation: 2194m (7200ft)

Topographic position: lower slope

Aspect: 66 degrees NE

Dominant tree cover: lodgepole pine (Pinus contorta) Dominant understory: mixed forbes and young fir trees Silvicultural treatment: old partial cut

Stand Age: old

Percent canopy cover: 90%

3. Location: Franklin Basin/White Canyon

T16SR42ESW1/4ofNW1/4ofS19 Elevation: 2378m (7800ft)

Topographic position: midslope

Aspect: 320 degrees NW

Dominant tree cover: lodgepole pine (Pinus contorta)

Dominant understory: mixed grasses and fir trees(-15cm

dbh) Silvicultural treatment: none

Stand Age: old

Percent canopy cover: 80%

Submitted by: Ed Levine

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Tom Reinecker
Tom Reinecker, Chief
Bureau of Wildlife

Wayne Melquist 12/10/92
Wayne Melquist
State Nongame Wildlife Manager &
Endangered Species Coordinator