REGIONAL ECOSYSTEM OFFICE

P.O. Box 3623
Portland, Oregon 97208
(503) 326-6265
FAX: (503) 326-6282

MEMORANDUM

DATE: April 28, 1995

TO: **Regional Interagency Executive Committee Members**
John E. Lowe, Regional Forester, R-6, Forest Service
Elaine Y. Zielinski, State Director, Oregon, Bureau of Land Management
California Federal Executives
Ed Hastey, State Director, California, Bureau of Land Management
G. Lynn Sprague, Regional Forester, R-5, Forest Service

FROM: Donald R. Knowles, Executive Director

SUBJECT: Approval of Great Gray Owl Survey Protocol and Study Request

Enclosed are two memorandums for your review and approval:

1. A transmittal memo to the field for an initial protocol consistent with the requirements of the Northwest Forest Plan (NWFP) with respect to development and implementation of a standardized protocol for the survey of Great Gray Owl (GGO) nest sites; and

2. A request for a study regarding the appropriateness of the initial protocol and the protection measures identified in the *Standards and Guidelines* (*S&Gs)*.

The following information is provided to document the basis for your interagency decisions, to facilitate implementation of the protocol, and to ensure consistent interpretation of the protection required by the *S&Gs*.

SPECIES STATUS

The GGO is not a federally listed or a candidate species under the Endangered Species Act. It is listed by the State of California as endangered and has a Natural Heritage Global ranking of G5 (demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery). The GGO has been identified as a Forest Service sensitive species in Region 5 (Southwest Region); it does not occur on other Forest Service or Bureau of Land Management sensitive species lists within the range of the northern spotted owl.

In the *Forest Ecosystem Management Assessment Team* (*FEMAT*) *Report*, the great gray owl received an assessment rating under Option 9 of 83 percent likelihood of Outcome A (habitat of sufficient quality, distribution, and abundance to allow the species population to stabilize; well distributed across federal lands). Under this option, protection buffers were assumed to be in

effect. In contrast, no protection buffer for the GGO was provided in Option 7, and scheduled timber harvest was authorized on 35 percent more land base than under Option 9. Despite these differences, Option 7 received an assessment rating of 80 percent likelihood of Outcome A.

IMPLEMENTATION SCHEDULE

As indicated on page C-21 of the *S&Gs*, a standard protocol is to be implemented within 1 year of the signing of the *Record of Decision* (*ROD*) (rather than within a certain timeframe relative to the survey season of the owl). It is recognized that a protocol issued at this point in time is issued late in the 1995 field survey season, and that the first full field season for implementation of the protocol will be in 1996. Given this situation, we reviewed the possible effects of the implementation schedule. The phase-in approach will result in minimal risk; i.e., the percent likelihood of Outcome A (see Species Status, above) using the phase-in approach will be only fractionally different from the 83 percent likelihood under Option 9.

PROTOCOL STATUS AND MONITORING

The enclosed protocol meets the requirement in the *S&Gs* with respect to a standardized protocol for the survey of GGO. The enclosed protocol has also been reviewed by a number of research scientists and found to rely on an acceptable survey methodology. Evaluation of the data collected under the protocol will enable verification of the likelihood with which the protocol locates nest sites. Therefore, the data will be reviewed by the Research and Monitoring Committee (RMC) at appropriate points during protocol implementation. Consistent with adaptive management principles, this review may generate information leading to modification of the initial protocol.

The RMC will also coordinate a review of the GGO situation and, in concert with other agencies, develop a plan for addressing GGO issues. As part of this effort, the status and conservation requirements for the GGO will be evaluated to facilitate determinations regarding the need for protocol implementation and various protection measures. Issues to be addressed include whether there is sufficient information to warrant removing the survey requirement from the *S&Gs* given the level of protection for GGO under the NWFP as a whole, whether the *S&Gs* should be modified to provide for protection of the owl within Managed Late-Successional Areas, and whether other actions would be appropriate.

APPROVAL AND DISTRIBUTION PROCESS

We ask that you indicate your concurrence with the enclosed policy by May 5, 1995. To expedite the signature process, please provide Laurie Ystad, our secretary, with written approval to use your signature on both memorandums. You may FAX your response to Laurie at 503-326-6282. She will combine signatures and forward the approved documents to each agency for distribution to field offices. Alternatively, if you feel there is a fatal flaw in either document, please advise your REO representative as soon as possible. If you have questions or need additional information, please feel free to contact me at 503-326-6265.

Enclosures: Memorandums (2) for Signature; Initial GGO Survey Protocol

cc:
REO Reps 368/ly

USDA Forest Service	USDI Bureau of Land Management	USDI Fish & Wildlife Service	USDI Bureau of Indian Affairs	National Park Service	National Marine Fisheries Service	Environmental Protection Agency

Date: May 12, 1995

To: (See Attached Agency Distribution List)

From: **Regional Interagency Executive Committee Members**
John E. Lowe, Regional Forester, R-6, Forest Service
Elaine Y. Zielinski, State Director, Oregon, Bureau of Land Management
California Federal Executives
Ed Hastey, State Director, California, Bureau of Land Management
G. Lynn Sprague, Regional Forester, R-5, Forest Service

Subject: Great Gray Owl Survey Protocol

This memorandum transmits coordinated direction to the Forest Service and Bureau of Land Management regarding implementation of the requirements for survey and protection of the Great Gray Owl (GGO), as described on page C-21 in the *Standards and Guidelines* (*S&Gs*) of the Northwest Forest Plan. The enclosed standardized protocol is provided for field use in meeting those requirements.

Implementation Schedule
It is recognized that this protocol is issued late in the 1995 GGO survey season. Surveys which are ongoing under other protocol may be completed using that other protocol. New surveys initiated during the remainder of the 1995 survey season are to use the enclosed protocol.

Implementation of the protocol will be phased in over several years as shown in Table 1 Implementation Schedule. (Note: the table and the following narrative refer to timber sales, however, the direction applies to all ground disturbing activities planned in areas meeting the survey criteria.) The following points identify how the enclosed protocol will be phased in:

1. Protocol implementation during the remainder of the 1995 field survey season:
   a. Complete ongoing GGO surveys as appropriate using existing protocol.
   b. Initiate implementation of the enclosed protocol.
      1) Focus on areas planned for FY 96 sales.
      2) Complete the number of field visits possible (up to the six visits specified by the enclosed protocol) during the remainder of the survey season.

2. Protocol implementation during the 1996 field survey season:
   a. Focus on areas where sales are planned during the second half of FY 96.
   b. Focus on areas planned for FY 97 sales (FY 97 sales offered prior to June 30, 1997, may be offered with less than two field seasons of survey; FY 97 sales offered after June 30, 1997, must have had two full field seasons of surveys completed; i.e., in 1996 and in 1997).
   c. Focus on areas planned for FY 98 sales.

3. Protocol implementation during the 1997 field survey season:
   a. Focus on areas where sales are planned after June 30, 1997.
   b. Sales offered after June 30, 1997, must have had two full surveys completed.

TABLE 1
IMPLEMENTATION SCHEDULE

<table>
<tr><td colspan="12">MONTH SCALE: (Based on Calendar Year)
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D</td></tr>
<tr><td colspan="12">CALENDAR YEARS:</td></tr>
<tr><td colspan="4">1995</td><td colspan="4">1996</td><td colspan="4">1997</td></tr>
<tr><td colspan="12">FISCAL YEARS:</td></tr>
<tr><td colspan="3">FY 95</td><td colspan="3">FY 96</td><td colspan="3">FY 97</td><td colspan="3">FY 98</td></tr>
<tr><td colspan="12">NESTING SURVEYS:</td></tr>
<tr><td>none</td><td>Survey Season, March 15 - June 30</td><td>none</td><td>none</td><td>Survey Season, March 15 - June 30</td><td>none</td><td>none</td><td>Survey Season, March 15 - June 30</td><td colspan="4">none</td></tr>
<tr><td colspan="12">IMPLEMENTATION :</td></tr>
<tr><td colspan="4">Sales* in FY 95 and FY 96 (through March 14, 1996), may proceed without surveys. Surveys will be initiated in FY 95 on an opportunistic basis, beginning upon transmittal of the protocol and continuing through the end of the survey season, and will target FY 96 planned sales.</td><td colspan="5">Sales* offered from March 15, 1995 to June 30, 1996 should be surveyed to the degree possible. For sales offered after June 30, 1996 and through June 30, 1997, the goal is to complete at least one season of survey.</td><td colspan="3">Sales* offered after June 30, 1997 are to be surveyed to protocol (two full seasons).</td></tr>
</table>

* The table references timber sales, however, the direction applies to all ground disturbing activities planned in areas meeting the survey criteria.

It is recognized that using this approach, some sales will be offered in FY 95 and FY 96 without having been surveyed for GGO under the enclosed protocol, and sales offered in FY 96 through June 30, 1997, will be sold with less than two full seasons of survey. The survey cycle is to be incorporated into the sale planning process so that sales offered following the 1997 survey season, and which meet the following survey criteria, will have been surveyed for two full, consecutive seasons.

Criteria for Selecting Survey Areas
The GGO survey protocol will be applied to habitat meeting specific criteria. Surveys are required where ground disturbing activities are proposed in areas which have the following set of characteristics:

1. Within the range of the northern spotted owl.
2. At elevations above 3,000 feet.
3. Within mature stands (80+ years) with greater than 60% canopy cover.
4. Within 1,000 feet of a natural meadow larger than 10 acres.

If there is significant evidence that the GGO may be nesting at lower elevations, or within habitat different from that described above, surveys in those additional areas should be considered.

GGO Protection Measures
Protection measures for this species are required and will be applied as described on page C-21 of the *S&Gs*: "Specific mitigation measures for the great gray owl, within the range of the northern spotted owl, include the following: provide a no-harvest buffer of 300 feet around meadows and natural openings and establish 1/4 mile protection zones around known nest sites."

Protection zones for this species are approximately 1/4 mile in radius around known nest sites. The zones are not necessarily circular; they should be delineated to provide security for the nest. Once established, the protection zones become unmapped Late-Successional Reserves (LSRs) which are subject to the *S&Gs* for LSRs.

A tape of GGO calls is being provided under separate cover. Questions regarding this direction should be addressed to the appropriate Bureau of Land Management State Office or Forest Service Regional Office identified below.

JOHN E. LOWE
Regional Forester, R-6
USDA Forest Service

ELAINE Y. ZIELINSKI
Oregon State Director OR/WA
USDI Bureau of Land Management

G. LYNN SPRAGUE
Regional Forester, R-5
USDA Forest Service

ED HASTEY
California State Director
USDI Bureau of Land Management

Enclosure: Survey Protocol for the Great Gray Owl, Great Grey Owl Nest Records

cc: REO Reps, RIEC, IAC 368/ly

USDA Forest Service	USDI Bureau of Land Management	USDI Fish & Wildlife Service	USDI Bureau of Indian Affairs	National Park Service	National Marine Fisheries Service	Environmental Protection Agency

Date: June 2, 1995

To: Charles W. Philpot, Station Director
Pacific Northwest Research Station, Forest Service
James C. Space, Station Director
Pacific Southwest Forest and Range Experiment Station, Forest Service
Michael E. Collopy, Director
Forest and Rangeland Ecosystem Science Center
National Biological Service

From: **Regional Interagency Executive Committee Members**
John E. Lowe, Regional Forester, R-6, Forest Service
Elaine Y. Zielinski, State Director, Oregon, Bureau of Land Management
California Federal Executives
Ed Hastey, State Director, California, Bureau of Land Management
G. Lynn Sprague, Regional Forester, R-5, Forest Service

Subject: Request for Great Gray Owl Protocol Study

We recently transmitted coordinated direction to the Bureau of Land Management and Forest Service regarding implementation of the requirements for survey and protection of the Great Gray Owl (GGO), as described on page C-21 of the *Standards and Guidelines* (*S&Gs*) of the Northwest Forest Plan. A copy of the initial protocol is enclosed for your information. In developing and evaluating this protocol, we found that there is a general lack of information regarding the GGO. During our efforts, we reviewed the status of the species and discovered information relative to that status which brings into question the need for such an intensive protocol, the need to apply the protocol (using the specified survey area criteria) throughout the range of the northern spotted owl, and the need for the specific protection measures listed in the *S&Gs*.

We want to ensure that the protocol is effective in locating GGO, and that the survey area criteria takes into account provincial variation in habitat suitability. We also want to ensure that our efforts are appropriate and well justified given the limited resources available, the large number of species requiring attention, and the ecosystem context within which our activities occur. We therefore request your assistance in evaluating the status of the GGO and the initial protocol in the context of the Northwest Forest Plan.

The enclosed protocol has been reviewed by a number of research scientists and has been found to rely on an acceptable survey methodology. Evaluation of the data collected under the protocol will enable verification of the likelihood with which the protocol locates nest sites. Consistent with adaptive management principles, such an evaluation may also generate information leading to modification of the initial protocol. In addition, the status and conservation requirements for the GGO require evaluation to facilitate determinations regarding the need for protocol implementation and the appropriateness of the specific protection measures described in the *S&Gs*.

We have asked the Research and Monitoring Committee (RMC) to coordinate a review of the current GGO situation and to develop a plan for addressing the issues. This effort should focus on: 1) short term requirements for establishing a standard protocol for GGO; 2) GGO status; and 3) GGO survey, conservation, and protection requirements. In particular, the effort should yield information regarding whether or not the *S&G* requirements with respect to the GGO are appropriate given the status of the species. Recommendations regarding any changes needed in the *S&Gs* should also be developed.

To the extent feasible, the planning process should include agency representation from affected forests and districts, and the resultant plan should address recommended tasks, levels of effort, and schedules. Schedules should be designed to produce a flow of information over time, with updates at least following each GGO survey season.

Please contact Dan McKenzie (503-326-6250) of the RMC with the name of the individual who will be your agency point of contact on this matter. Additional questions regarding this request may be addressed to the appropriate Bureau of Land Management State Office or Forest Service Regional Office identified below, or to Don Knowles, Executive Director of the Regional Ecosystem Office (503-326-6265).

JOHN E. LOWE
Regional Forester, R-6
USDA Forest Service

ELAINE Y. ZIELINSKI
Oregon State Director OR/WA
USDI Bureau of Land Management

G. LYNN SPRAGUE
Regional Forester, R-5
USDA Forest Service

ED HASTEY
California State Director
USDI Bureau of Land Management

Enclosure: Initial GGO Survey Protocol

cc:
REO Reps
RIEC
IAC

SURVEY PROTOCOL FOR THE GREAT GRAY OWL (*Strix nebulosa*)

April 1995

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SURVEY PROTOCOL FOR THE GREAT GRAY OWL
(Strix nebulosa)
April 1995

I. INTRODUCTION

Before a survey protocol can be developed or understood, a basic understanding of the species range, biology, and behavior are required. The following section summarizes what is known about the great gray owl.

A. Range

The great gray owl (Strix nebulosa) is a circumpolar species, found in Europe and Asia, and in North America, from Alaska south to the Sierra Nevadas in California, and east to Ontario and Maine (Fig. 1). They are known to occur within the range of the northern spotted owl (Strix occidentalis caurina). Winter range is similar to the breeding range except for a species tendency to wander irregularly south in winter (Bull and Duncan 1993).

B. Biology and Habitat Requirements

The great gray owl is one of the largest of the North American owls. Like the majority of owls, they exhibit sexual dimorphism where the male is smaller than the female. Lacking ear tufts and having bright yellow eyes, its coloring tends to be a dusky gray to sooty overall plumage, with white mottling over the crown, nape, back, rump, and shoulders with streaked underparts (Duncan and Hayward 1994).

Data on breeding great gray owl populations within the range of the northern spotted owl are limited, and are drawn from localized studies and anecdotal descriptions (Duncan and Hayward 1994, Verner 1994, Bull and Henjum 1990). The species is listed as a sensitive species by the Forest Service in Region 5 (Pacific Southwest).

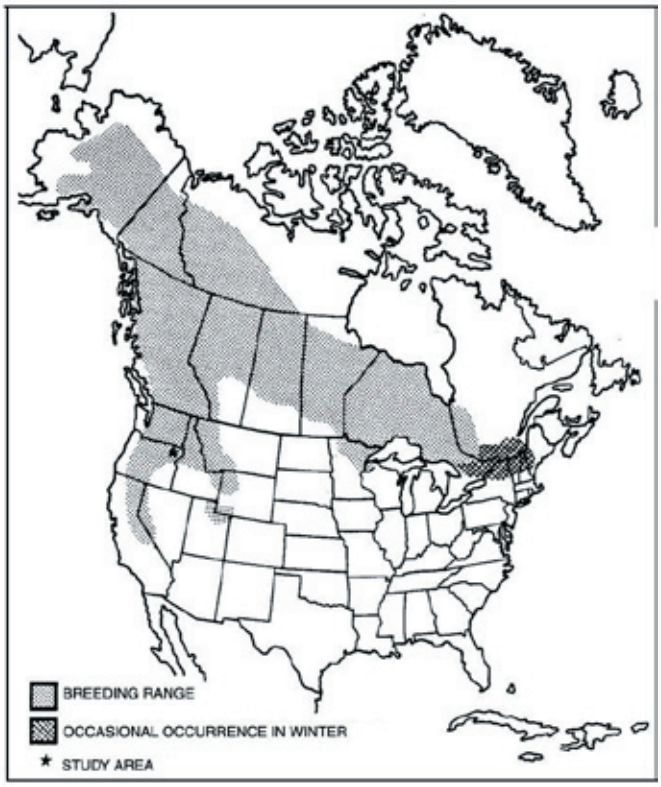

Figure 1. Great Gray Owl Range Map, reprinted from Bull and Henjum (1990).

Great grays can be found in a wide variety of habitat types, wherever forests can meet their life needs (Habeck 1994, Duncan and Hayward 1994). Example forest types include one or more of the following: ponderosa pine, lodgepole pine, tamarack, Douglas-fir, grand fir, aspen, or other deciduous tree types. Most nests are located near natural meadows or man-made openings. Platt and Goggins (1991) found great gray nests on the Willamette National Forest in mature and remnant old-growth Douglas-fir and mixed-conifer forest. Bryan and Forsman (1987) found nests in south central Oregon to be less than 980 feet (ft.) (300 m) from the nearest meadow opening. Platt and Goggins (1991) found nests within 660 ft. (200 m) of a timber harvest opening.

Elevations of occupied sites within the range of the northern spotted owl are not well documented, but Bull and Henjum (1990) found them occurring from 4500 ft. (1380 m) to 4900 ft. (1500 m) in eastern Oregon. Locations of great grays on the Willamette National Forest ranged from 3100 ft. (942 m) to 4080 ft. (1240 m) (Platt and Goggins 1991). In general, they can be found in deciduous or coniferous forests up to 9200 ft. (2800 m) in elevation (Bull and Duncan 1993). Elevation within these ranges appears to be less of a concern as long as key habitat components are present.

Courtship generally begins in late February or early March. They do not build their own nests, instead relying on abandoned raven, northern goshawk, or red-tail hawk nests, broken-top snags or live trees, or mistletoe brooms which are large enough to accommodate the species and provide a natural depression. They will use artificial nest platforms (Bull et al. 1987, Bull and Henjum 1990). They tend to select nest sites in forests near meadows or other openings that have sufficient prey numbers. Bull and Henjum (1990) found that great grays tended to nest in unlogged, mature or older stands, with a fairly open understory and dense overstory (60% or greater canopy closure). Leaning trees and dense cover are important habitat components for fledglings. Since they leave the nest before being able to fly, leaning trees enable the owlets to climb above the ground, making them less susceptible to predation (Bull et al. 1988). They are also documented using alternate nest sites, and may nest more than 1/2 mile from the previous year's nest (Bull and Henjum 1990). Great gray owls will also nest in close proximity (within 0.25-0.30 miles or 430 m) to other great gray owls, (Bull and Henjum 1990).

Their main prey items in the western U.S. are primarily voles and pocket gophers. Great grays tend to forage in meadows or other openings, though males in northeastern Oregon are known to forage in forest stands with 11-59% canopy closure (Bull and Henjum 1990). Home ranges for breeding adults in northeastern Oregon averaged 1112 acres (449 ha) and ranged from 324 to 1606 acres (131-649 ha), though they have been observed foraging up to 2 miles (3.2 km) (Bull and Henjum 1990).

Due to changes in small mammal populations, substantial year-to-year fluctuations in great gray numbers have been reported elsewhere in North America and Europe. Initial findings in the Pacific Northwest suggest that great gray numbers may be more stable. However, year-to-year fluctuations may occur in some areas.

Great grays are not very territorial, usually only defending and hooting from the immediate nest site (E. Bull, pers. commun., D. Johnson, pers. commun.). Single owls will also hoot and establish a territory. Pairs will aggressively defend the nest site, and are known to pursue and attack people, ravens, red-tail hawks, even coyotes (Bull and Henjum 1990). Eggs, nestlings, and fledglings are preyed upon by a variety of predators, but principally ravens,

northern goshawk, and great horned owls (D. Johnson, pers. commun., Bull and Duncan 1993).

Breeding and egg laying may take place as early as late March or as late as late May (E. Bull, pers. commun., Platt and Goggins 1991), and egg-laying may be delayed in areas with heavier snows or lows in the prey cycle (D. Johnson, pers. commun.). Clutch size varies from one to four eggs, and females incubate the eggs and the male will feed the female (Bull and Henjum 1990). Incubation takes about 30 days. Franklin (1988) found in his study of 11 nests in southeast Idaho and northwest Wyoming that eggs hatched about 5 May, with a range of 10 days on either side of that date.

Fledglings leave the nest between 3 and 4 weeks of age. Both male and female feed the young, with the female staying close in order to protect them. After another 3 to 6 weeks, the adult females tend to leave the care of the young with the male, and will leave the site. Males will continue to feed the young for up to 3 months after the young leave the nest (Bull and Henjum 1990).

C. Key Habitat Characteristics

Great gray owls will nest in a wide variety of habitat types as long as the following habitat characteristics exist. This list serves as a summary; there may be other characteristics that are key, but have not been documented or mentioned here. For further explanations of these characteristics, refer to the literature cited list for further reading.

1. Stick nests built by other raptors or ravens large enough to accommodate a great gray, or large broken top trees or snags. Bull et al. (1988) found that nest trees in northeastern Oregon varied from 23 to 31 inches (in.) (58-79 cm) dbh. Platt and Goggins (1991) found that on the Willamette National Forest, mean dbh was 42 in. (108 cm).

2. Near (i.e., within 985 ft. (<300 m)) a natural meadow or man-made opening (Bryan and Forsman 1987, Bull and Henjum 1990).

3. In mature or old growth conifer forests, or forests with remnants older trees or snags.

4. Nest stand typically has >60% canopy closure with an open understory.

5. Surrounding forest may serve as foraging habitat if there is an open understory and when canopy closure ranges from 11-59%.

6. Within the nest stand there are a number of leaning trees and lots of dead and down material.

D. Threats to the Species

Although many forests report the presence of great gray owls, there is little information on population or habitat trends (Verner 1994). It has been given special management status by Idaho, Montana, and California primarily because of low numbers and a lack of trend data. Its population is believed to be declining within the range of the northern spotted owl (Thomas et al. 1993).

Habitat loss or modification is believed to pose a long-term threat to the species and may be the reason for a decline. Forestry practices that reduce or remove diseased trees, large trees, and open up the canopy may reduce the number of current or potential nesting sites. The primary factor influencing great gray population is believed to be prey (Duncan and Hayward 1994, D. Johnson, pers. commun.). Forests with sufficient amounts of down logs and meadows tend to have larger populations of small mammals. Forestry practices such as salvage of down logs, or poisoning of pocket gophers in clearcuts, can be expected to have an adverse impact on the species.

E. Protocol Objectives

There has been an ongoing controversy for several years as to how to manage late-successional and old-growth forests occurring on Forest Service (FS) and Bureau of Land Management (BLM) lands. The debate initially centered around the northern spotted owl (Strix occidentalis caurina), but was expanded to include other species, such as the great gray owl (Strix nebulosa), which are dependent on this type of habitat.

Several documents have been developed in response to legal challenges and court rulings, culminating in the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (*FSEIS*; USDA and DOI, 1994). Within this document and the *Record of Decision* (*ROD*; USDA and DOI, 1994) are standards and guidelines for management of habitat and species occurring on FS and BLM lands.

The *ROD* for the *FSEIS* determined that species viability would be assured through implementation of the standards and guidelines. However, given that there is little known about the great gray, and the species can be considered rare, it was considered important to protect occupied locations outside reserves in upland forest matrix. For rare and locally endemic species, "Protocols for surveys will be developed that will ensure a high likelihood of locating these occupied sites, and such surveys will be conducted prior to ground-disturbing activities within the known or suspected ranges and within the habitat types or vegetation communities occupied by these species, ..." (*ROD*, pg. C-19).

With the great gray owl specifically, "...establish 1/4-mile protection zones around known nest sites. Within 1 year of the signing of the ROD for these standards and guidelines, develop and implement a standardized protocol for surveys; survey for nest locations using the protocol. Protect all future discovered nest sites as previously described." (*ROD*, pg. C-21).

F. Triggers for Protocol

Within the range of the northern spotted owl, the following areas will require great gray owl surveys:

1. Where there are proposed ground disturbing activities above 3000 ft. elevations.

2. These activities are proposed within mature stands (80 years plus) with greater than 60% canopy cover.

3. These activities are proposed within 1000 ft. of a natural meadow larger than 10 acres.

II. METHODOLOGY

The great gray owl has several key characteristics to consider when conducting surveys. Both males and females have a very soft hoot. They tend to only respond from the immediate nest site area. They often don't accept prey when offered by a surveyor. They are much shyer than spotted owls, making it more difficult to detect them visually.

This protocol has been designed with these characteristics in mind, in order to achieve a high likelihood of detecting owls and locating nest sites.

Read the entire methodology section before initiating any phase of the survey. The protocol guidelines are a step-by-step process. Though the protocol may resemble the northern spotted owl protocol, there are important differences. The protocol is designed primarily for field biologists.

Spotted owl surveys can be conducted concurrently with great gray owl surveys since neither species are known to compete, intimidate, or prey upon each other.

Do **NOT** use the term "resident single" when referring to great gray owls. This implies the single remains in the area year-round, and it probably does not. However, habitat conditions are such that a pair may eventually nest in the area, and should be monitored.

A. Definitions

Activity Center
The activity center is the point that best describes the focal area of use by territorial owls. This can be based on locations of adults, nests, roosts, or young. The priority for determining the activity center should be based on:

1. A nest location.
2. Location of great gray owlets.
3. Location of a pair seen or heard together during the nesting season.
4. A day location of an adult female.
5. A day location of an adult male.
6. A night location of an adult female.
7. A night location of an adult male.

** NOTE: An activity center and a nest site may not necessarily be the same thing. A single territorial owl does not occupy a nest site and therefore does not receive a 1/4-mile buffer around its activity center (*ROD*, pg. C-21). A nest location requires a 1/4-mile protection zone.

Complete Survey
The survey area has been surveyed to protocol standards, which is a minimum of six survey visits each year for two consecutive years.

Complete Visit
A nighttime survey of the entire survey area is conducted in one night. If a surveyor gets an owl response at night, then the surveyor will conduct a daytime follow-up visit, and the combination of the night outing and the follow-up visit would be counted as one complete

visit. If a surveyor goes out at night and does not get a response, a follow-up visit would not be necessary, so the night outing alone would be considered as one complete visit.

If the survey area cannot be completely surveyed in one night, then the remaining survey area must be surveyed in a second field outing. Complete the outing on consecutive days if possible, weather permitting. If it is discovered that the survey area is too large to be covered within 7 days, it should be divided into smaller survey areas based on available habitat, topography, drainages, and other physical characteristics.

Field Forms
Forms used to record data collected during survey and follow-up visits.

Field Season
March 15 - May 15 (4 surveys)
May 15 - June 30 (2 surveys)

Follow-up Survey
The objective of the follow-up survey is to locate great gray owls during the day by conducting an intensive search (1 to 4 hours) around the original night response location. The follow-up survey should be completed as soon as possible (weather permitting) after an owl is detected, preferably the next day. A follow-up survey is part of a complete visit.

Historical or Known Pair (used interchangeably)
An existing pair of great gray owls that have a known nest site or activity center.

Mousing
The act of feeding domestic mice, gerbils, or hamsters to adult male and female owls by a surveyor.

Nest
The actual substrate eggs are laid upon.

Nest Site
The tree/snag a nest is located in and the immediate area surrounding it.

Survey Area
The area within a 1/4-mile (400 m) distance outside of the perimeter of all planned ground-disturbing activities.

Survey Repetitions
A minimum of six complete visits per survey season within the survey area. Survey visits should be 7 days apart.

Survey Timing
Sunset-to-sunrise (for night searches)
Sunrise-to-sunset (for day searches)

Territorial Single
A great gray owl that is not paired with a mate. Singles may establish a territory during a breeding season.

Verified Unoccupied Habitat
A complete survey of the area has been conducted and there were no detections of great gray owls.

Young
Alive or dead great gray owlets.

B. Survey Period

Since the objective of this protocol is to locate great gray owl nest sites, the timing of surveys is scheduled to coincide with their nesting season and when you would likely find young, which will help in locating a nest tree. Depending on elevation and snow depths, great grays will nest anytime from late March through May.

1. Field Season

March 15 - May 15 (four complete survey visits must occur within this timeframe, with each visit a minimum of 7 days apart).

May 15 - June 30 (two complete survey visits must occur within this timeframe, with each visit a minimum of 7 days apart).

2. Survey Timing

Sunset-to-sunrise (for night searches)
Sunrise-to-sunset (for day searches)

** NOTE: Great grays will respond to calls throughout the evening and early morning hours, but most responses are 3 to 4 hours after sunset.

C. Survey Procedures

1. Survey Plan

A survey plan is recommended for documenting survey efforts. Such a plan should include:

a. A brief narrative describing the survey area(s).
b. A map showing boundaries of the survey area(s), great gray owl habitat, delineated survey areas, un-callable areas (areas that cannot be accessed to call for owls), survey routes, and calling stations.
c. Estimates of time, number of personnel needed, and costs to complete.
d. Acreages of great gray owl habitat in callable and un-callable areas.

2. Mapping the Habitat to Survey

Delineate a 1/4-mile (400 m) survey boundary beyond the proposed ground disturbing activity and delineate the likely habitat on a photograph, topographic map, or other suitable map. The area delineated will be the survey area.

If available, GIS can be used to locate great gray owl nesting, roosting, foraging habitat, or mature/old growth habitat, and any historical/known sites of great grays. Great grays will nest and forage in younger stands if there are residual large trees, snags, or other nesting structures (such as an artificial platform or red-tail hawk or goshawk nest), and an open understory with a number of down logs.

While the great gray can inhabit a variety of habitats, and sightings and occupied nest sites are found throughout the range of the northern spotted owl, survey effort should be concentrated in forest/meadow interfaces, particularly lodgepole and/or ponderosa pine-meadow associations. Survey any stands with appropriate nest structures. Nests can be found in forested islands in clearcuts or meadows, or forests adjacent to clearcuts or meadows, in stand interiors, or in mid-structure stands with mistletoe infections. Use the Triggers for Protocol, historical information (known sites), and the following table to help guide where surveys should occur.

Table 1. Types of habitats used by great gray owls for nesting, roosting, and foraging: drawn from various sources (see References section).

	ECOLOGICAL FUNCTION		
HABITAT STRUCTURE	**NESTING**	**ROOSTING**	**FORAGING**
Old Forest	X	X	X
Mature	X	X	X
Selective Harvest-Light	X	X	X
Selective Harvest-Heavy			X
Meadows			X
Grass/Forb/shrub			X
Clearcut (<10 years)			X

Large areas should be divided into smaller survey areas to ensure that a visit can be completed in 7 days. Consider any known owl locations, habitat, and topography in making this decision. Delineate boundaries to reduce the possibility of singles and pairs being counted more than once in the management activity area (i.e., ensure that each subdivision is not too small or too narrow relative to the other subdivisions of the management activity area).

3. Establish Calling Stations and Survey Routes

Establish calling stations and survey routes within the survey area to achieve complete coverage of great gray owl habitat. The intent is for the owls to hear the surveyor and for the surveyor to be able to hear responding owls. If more than one transect or route is required, establish transect or travel lines about 1/4-mile (400 m) apart. Along each transect, space fixed calling stations every 0.10 mile (160 m) from each other. Vary distances between transect and calling stations depending on local topography and habitat.

In general, the greater the variation in topography, the closer is the spacing between transect and calling stations.

The reason for close transect and calling stations is that great grays are only territorial in the immediate vicinity of the nest site, and their calls are soft. Mark each established station on an aerial photograph and/or topographic map (standard is 1:24,000), and assign route and station numbers.

a. Nighttime Survey Using Roads. Survey areas that have accessible roads for establishing stations to cover the survey area should be called at night.

b. Nighttime Survey Using Trails. In habitat without roads, nighttime calling stations will only be established in survey areas that can be traversed safely. Calling stations may be established on well maintained trails where there is virtually no danger to a caller equipped with only a flashlight or headlamp. Fixed calling stations along trails should also be spaced no more than a straight-line distance of 0.10 mile apart from each other.

c. Daytime Surveys. Survey areas that cannot be effectively and safely surveyed from the roads or trails at night will be surveyed during the daytime. Fixed calling stations along trails should also be spaced no more than a straight-line distance of 0.10 mile apart from each other.

** NOTE: Great grays may not call or respond to calls during the day, so calling may be ineffective. Be cognizant of stick nests, whitewash, movements by birds, and mobbing behavior by ravens, crows, jays, and small birds. These signs may help in locating a great gray owl. Once an owl has responded, and after walking into the general area, it is often helpful to softly broadcast a call with the megaphone pointed toward the area from which the observer came, or toward the ground, in order to make the call softer and more diffuse.

4. Considerations.

The following items should be considered when establishing calling routes:

a. It may be necessary to conduct some `pre-survey' work to assist in establishing calling routes and stations.

b. Consider the physical characteristics of the survey area:

- Sound travels in a straight line-but not around bends or over ridges.
- Establish calling stations that directly face each drainage.

c. Avoid establishing a calling station near loud noise sources, like loud creeks and well-used roads.

d. Whenever possible, establish stations at useful physiographic features such as prominent ridge points, saddles, and openings in the vegetation to ensure complete coverage of the survey area.

e. An option to marking trails every 0.10 mile is to do a continuous walking transect where the surveyor walks along at a normal pace and calls, then listens for a minute, while walking, then repeat. Make sure the survey route is marked on a map and/or aerial photo, and has a pre-determined compass bearing for the surveyor to follow.

5. Surveying

The following two survey procedures should be used to prioritize how a nest is located. First, consider any historical or known sites to determine if parts of the project area will just require daytime visits (see the next section). Second, survey using protocol standards. The following calls are to be used in conducting the surveys.

a. Preliminary Survey Using Historical or Known Site Information

Some historical or known locations or nest sites may be located more efficiently by going directly to their activity center during the day than by standard survey procedures using established routes and calling stations. If it is possible to locate pairs or singles without doing station visits, time and effort may be saved. Use your knowledge of the area in deciding if this will be beneficial.

1. Identify the centers of activity of the known pairs and singles in the survey area on a map or aerial photo.

2. Go to the activity center during the day. Use whatever techniques are appropriate to locate the pair or territorial single (calling, nest searching).

3. If the pair or single is located, record the information on a field form (Appendix 1). If the nest tree is located, record the information on a nest tree form (Appendix 2).

4. If occupancy cannot be determined by a pair or single owl during a day visit, use night calling in the general area of the activity center. Great grays will use alternate nest sites a 1/2 mile or more away from a previously used site.

5. If the historic or known pair or single owl cannot be located, then commence with standard protocol procedures.

b. Calls

Two types of calls are utilized in this protocol. Early in the nesting season there may be better response to the male territorial call than there would be after incubation. After owlets have fledged, it is likely that there would be better response to a juvenile begging call (Evie Bull, conversation 4/25/95). These two calls will be provided on an audio tape to be utilized in these surveys.

March 15-May 15

1. The great gray male territorial call on tape or CD (which will be distributed to field units) is the most common call and is made up of three sequences of about 8-12 low hoots. Each hoot sequence is about 11 seconds long. Each hoot sequence is separated by a 30-second pause. Play the tape or CD, or use

voice calling only if the surveyor can imitate it well and consistently. Use some type of amplifying device so the call will carry at least 0.10 mile.

2. Listen for 30 seconds.

3. Repeat "1" and "2" above two additional times (total of three sets of call and listen). It is expected that it will take 3 to 5 minutes to complete each transect station.

4. Continue to the remaining stations until the visit is complete or there is a response.

** NOTE: The survey visit is complete if there are no responses from great gray owls along the survey route, and the survey area has been covered in 7 days time.

May 15-June 30

1. Use juvenile begging call plus male territorial call within 2 hours on both sides of sunset or of dawn. Give 10 juvenile begging calls at 10-20 second intervals followed in 2 minutes by one male territorial call.

2. Listen for 30 seconds for a juvenile begging call response or a male response.

3. Continue to the remaining stations until the visit is complete or there is a response. It is expected that it will take 3 to 6 minutes to complete each transect station.

c. Survey Procedures for a Complete Visit Using Stations

These procedures would be the same whether surveying along roads or trails, at night or day. See survey procedure "II. C. 5. d." if doing a continuous calling walk-through.

Use the survey form in Appendix 1. It is based on the spotted owl form. Record results the same as one would for spotted owls, including other owl responses besides great grays. Surveying for spotted owls could occur concurrently since the two species are not known to act aggressively toward each other. It is recommended that one would call first for great grays, then for spotted owls. The transect and calling could be set up to call for great grays at each station (every 0.10 mile), and every third or fourth station for spotted owls (every 3 or 4 tenths).

1. If a response to the calls is received, estimate the owl's location by getting a compass bearing and estimating the distance from the station to the response. In order to get a better location, use triangulation by taking compass bearings from 2-3 locations along the survey route. Make sure the compass bearings are taken as soon as possible after a response.

2. Record the location and compass bearing(s) on a map or aerial photo and the field visit form. Attach a map to the field visit form, and include the compass bearing(s) and estimated distance from the station to the response.

3. Flag the response location and start point for the follow-up.

4. Move to next calling station and repeat above steps. Do not skip stations.

5. Once occupancy status is determined (see sections II. D & II. E), calling stations within 500 ft. of an activity center may be dropped on subsequent visits.

6. Do a follow-up visit within 48 hours of the response. The night survey visit and follow-up visit will be considered a complete visit.

d. Survey Procedures for Continuous Calling Walk-Through

Use this procedure when going across country in areas where there are no trails or roads, or when following trails that are not marked with stations.

1. Use a pre-determined compass bearing to determine the survey route if walking across country, or if following established trails, walk at a normal pace and use the caller and follow the same sequence of calling (refer to section II. C. 5. b. steps 1-4) to solicit a response. Stop at points along the route, play a call, listen for 30 seconds for a response. Then call again, listen, call again, listen; move onward to the next point.

** NOTE: The survey visit is complete if there are no responses from great gray owls along the survey route, and the entire survey area has been covered within 7-days time.

2. If you receive a response, estimate the owl's location and get a compass bearing and an estimate as to the distance from the station to the response. In order to get a better location, use triangulation by taking compass bearings from 2-3 locations along the survey route. Make sure the compass bearings are taken as soon as possible after a response.

3. Record your location, compass bearing(s), and the owl's approximate location on a map or aerial photo and on the field visit form. Attach a map to the field visit form, and include the compass bearing(s) and estimated distance from the station to the response.

4. Flag the response location and start point for the follow-up.

5. Continue calling and listening along the survey route.

6. Once occupancy status is determined (see sections II. D. and II. E.), calling stations within 500 ft. of an activity center may be dropped on subsequent visits.

7. Do a follow-up survey within 48 hours of the response. The night survey visit and follow-up survey will be considered a complete visit.

e. Follow-up Surveys

The goal of a follow-up survey is to visually confirm or infer the presence of a pair of great gray owls and to locate a nest tree. Use the field form to record results in locating a pair or single owl. Use the nest tree form to record a located nest tree.

1. Starting from the station where a response was heard, and using compass bearing(s) obtained when a response was noted, begin a search by moving toward the approximate response location. Bull and Henjum (1990) and Platt and Goggins (1991) found that most nests were within 820 ft. (250 m) of response sites. Do a systematic search, looking for:

    a) Broken-top snags or live trees;
    b) Old goshawk, raven, or red-tail hawk stick nests;
    c) Whitewash and/or pellets around the base of possible nest and/or roost sites (E. Bull, pers. commun.);
    d) Movement in the canopy.

** NOTE: Whitewash and pellets are often found near nest sites, but not actually under the nest until a week before young leave the nest. Whitewash and pellets are generally associated with roost sites.

2. Keep the original location of the owl response in mind, and try to visually locate them. Great grays tend to fly away from intruders; search for other visual clues as suggested above. Calling may help to elicit responses from great grays, but they may not respond to calls during the day. A technique that may be helpful is to play the tape softly and point the megaphone downward when calling to avoid startling the owl as one walks in the direction of the night response.

3. If no owl is located after 4 hours of effort, note the results on the field form, and the visit is complete.

4. If an owl is located, allow up to 2 hours to establish pair status. Use visual observation to help determine status. Observe and note behavior. Make note of agitated calls, continuous responses (males often look toward the nest area), movements, roosting, preening, or other behavior. This will help in analyzing the data and determining activity centers.

5. Great grays are shy and the surveyor may only get within 30 yards or so of an adult.

** NOTE: Do not call or stimulate owls any more than is necessary to determine status. By stimulating owls to move around during the day, one may increase their risk of predation. Be cognizant of predators in the area. For example, calling may attract ravens. Great gray chicks and fledglings are very susceptible to avian and mammalian predation. If predators are attracted, leave the area and try a follow-up at another time.

** NOTE: Caution should be used when approaching the nest tree or young. Great gray owls (particularly females) aggressively defend the nest area, usually within a 100-foot radius.

6. If the owl is located, but is observed roosting/sleeping and there are no other signs indicating a nest site, the follow-up visit is over.

6. Considerations

a. The follow-up survey may take up to 6 hours: 4 hours searching for an owl and 2 hours trying to determine pair status. Additional time may be used as the time constraints are minimums.

b. Complete a field visit form for all outings, regardless if an owl was detected or not.

c. It is recommended that the surveyor use a great gray owl calling tape or CD, a tape or CD player, and a sound amplification device (e.g., a hand-held megaphone or loudspeaker). Surveyors must be outside their vehicle, and use a projection device or have a tape or CD player that can project the call so it can be heard at least 0.10 mile.

d. Do not survey under inclement weather conditions, such as high winds (> 10 mph), moderate to heavy rain, or high noise levels (e.g., stream noise, machinery) which would prevent one from hearing a response that would be heard under better conditions. Also, owls are not likely to respond to calls during inclement weather.

e. The responsiveness of owls depends on many factors, which may include:

1. Time of day. Great gray owls are more likely to be detected at night, near sunrise, and after sunset. During the middle of the day they are relatively inactive and less likely to respond.

2. Temperature. Air temperature will affect an owl's responsiveness. In hot weather, owls may be less likely to respond.

3. Individual variation. Individual owls appear to have individual "comfort" radii. Sometimes they will respond from a hundred yards away, but not respond as the caller draws nearer.

f. When appropriate, record similar information for other avian predators (e.g., goshawk, great horned owl, ravens) that are detected while surveying for great gray owls.

g. Additional visits should be conducted in areas in which pair and single status could not be determined, even though an owl was detected, and it is judged that the site may be occupied by a pair or territorial single. Only the general area where the owl was detected should be searched. There is no time limit or minimum number of visits in conducting additional visits.

h. While conducting surveys throughout the breeding and nesting season, listen for the female begging call. This is a soft, two-note ascending "who-oop." It is made by the female usually from the nest as she begs for the male to deliver food. She may call at any time of day or night, but usually between 5:00 p.m. and 11:00 a.m. (Evie Bull conversation 4/25/95). Record the locations of such calls and search for the nest as described for surveys using the male territorial call.

D. Determining Occupancy Status

1. Pair Status is determined by any of the following:

   a. A male and female are heard and/or observed in proximity (within 0.10 mile) to each other on the same outing during the day.

   ** NOTE: Males are smaller than females, but have a deeper voice.

   b. A male takes prey to a female.

   c. A female is seen on a nest.

   d. Young is observed.

   e. A male and female are heard and/or observed in proximity (within 0.10 mile) to each other on two separate outings at night within a 2-year timeframe.

   ** NOTE: Once pair status is determined, it is considered an activity center (historical information). Adjust the area to be surveyed for the remaining complete visits during a given survey year so you do not pick up this pair again, since no additional survey effort is required to locate birds in this area. The only survey required after determining pair status is to locate the nest.

2. Territorial Single Status is determined by:

   a. The presence or response of a single owl within the same general area on three or more visits within a single breeding season, with no visual observation or response by an owl of the opposite sex after a complete survey.

   b. The presence or response of a single owl within the same general area in three or more visits during the breeding season in 2 or more years.

   ** NOTE: Once territorial status is determined, it is considered an activity center (historical information). It may be desirable to conduct additional visits to determine pair status for a more defined activity center.

   ** NOTE: The sex should be positively identified by call. If the sex of an individual is uncertain, it is considered an unknown sex great gray single.

3. Status Unknown (single owl) is determined by the response of a male and/or female which does not meet the pair or resident single requirements.

4. Verified Unoccupied Habitat is determined when a complete survey (six complete visits conducted each year for 2 consecutive years) has been conducted in a survey area, with no owls detected.

E. Determining Activity Centers

An activity center is that area that describes the focal area of use by territorial owls. This can be based on locations of adults, nests, roosts, or young. The priority for determining the activity center should be based on:

1. A nest location occupied by great gray owls.

2. Location of great gray owlets.

3. Location of a pair seen or heard together during the nesting season.

4. A day location of an adult female.

5. A day location of an adult male.

6. A night location of an adult female.

7. A night location of an adult male.

** NOTE: An activity center and a nest site may not necessarily be the same thing. A single territorial owl does not occupy a nest site and therefore does not receive a 1/4-mile protection zone around its activity center (*ROD*, pg. C-21). Item 1 would receive a protection zone, but items 2 through 7 may not, depending on protection provided by individual forests or districts.

Locate a 1/4-mile radius late-successional reserve protection zone around each great gray owl nest. Provide a location to at least the 1/16th of a section or preferable to the second of latitude and longitude or to a UTM coordinate. Place the location on a topographic map or aerial photo, as well as in GIS in order to track the location.

F. Protocol Testing and Refinement

This protocol was designed to achieve the "high likelihood" standard mentioned on page C-19 of the *ROD*. Any protocol developed for a species needs to be based on the biology, behavior, and habitat characteristics of that species. Those who contributed to the great gray owl protocol were individuals familiar with the great gray and how to develop a protocol.

This protocol requires six (6) survey visits each year for 2 years, with stations 0.10 mile apart, and transects 1/4 mile apart. It is felt that such frequent surveying is appropriate because the species is somewhat nomadic, they hoot very quietly, and they generally respond to calling only 40-60% of the time, which increases the odds of missing them (E. Forsman, pers. commun., D. Johnson, pers. commun., T. Kaminski, pers. commun.).

This protocol should be re-evaluated and adjusted as necessary after the protocol has been implemented and there have been an adequate number of surveys conducted to determine if more or less effort is required.

In order to keep track of information obtained through surveying, and to make adjustments to the protocol where necessary, the following procedure must take place. All field units should maintain hard copies of survey plans, field and nest forms, and maps and aerial photos used during the surveys. Field units may also maintain their own computer databases. FS data

should be stored in the WILDOBS database. BLM Districts should maintain paper files until FY 1996, after which a database will be identified.

III. TRAINING

The protocol is designed for field biologists who will be conducting great gray owl surveys on federal land within the range of the northern spotted owl. "Field biologist" is defined as those currently employed as professional biologists, biological technicians, or volunteers that are supervised by a professional biologist.

Professional judgement is involved in interpreting owl survey, behavior, and habitat use. The following qualifications are provided as requirements for personnel involved in the identification and designation of great gray owl nests and associated late-successional reserves.

The minimum requirements are:

- a bachelor's degree in wildlife biology or related field and/or qualifies as a GS-486-9/11; and

- at least 2 years of field experience with surveying for spotted owls or other owl species.

It is desirable that personnel not meeting the minimum requirements above be supervised by someone who does meet the requirements.

Surveyors should be familiar with project layout in establishing stations and compass bearings including triangulation, and be able to identify by visual observation and calls all the owl species that occur in their area, as well as potential predator species such as the northern goshawk, ravens, and red-tailed hawk, and species that may sound similar to a great gray owl such as blue grouse and great horned owls. They also must be able to locate, describe, and interpret visual signs of owl nesting, occupancy, and behavior. In addition, since great grays can be very difficult to hear, a standard hearing exam is recommended for personnel surveying for the great gray owl. Anyone that has hearing falling within the normal limits should be able to hear the species.

It is assumed that most field biologists who work within the range of the northern spotted owl are familiar with the procedures for surveying for spotted owls, and the calls of the various species of owls that occur within its range. The great gray owl protocol is somewhat different than that for the spotted owl, but not so much that a field biologist would not become rapidly familiar with it and be able to implement it. Biologists who are planning to train and supervise seasonal and volunteer personnel to do spotted owl surveys should train the crews in great gray surveys at the same time. Both species can be surveyed at the same time.

IV. APPENDICES

The field form and definitions for great gray owl surveys follow on the next several pages. They are based on the spotted owl field form, but have been updated for use in great gray owl surveys. Use the forms to document great gray owl survey results for all ground-disturbing activities. Use the owl nest tree form to document great gray owl nest trees found during the course of survey activities.

APPENDIX 1. GREAT GRAY OWL FIELD VISIT FORM

(1) Forest/ District	(2) Planning Area Name	(3) Area	(4) Area Type	(5) % Area Callable	(6) Type of Visit & No.	(7) Outing Number	(8) Date Mth/Day/Yr	(9) Time 24 HR-PST
								Start
								End

(10) Day/ Night	(11) Survey Time	(12) Observer Name	(13) Route ID	(14) Method	(15) Wind	(16) Cloud Cover	(17) Ppt..	(18) % Area Called	(19) Comply Y/N

(20) Species	(21) Detection Type	(22) No. of Owls & Sex	(23) Time of Response	(24) Location of Detection					(25) Elevation	(26) Habitat of Response	(27) Response Number	(28) Station Number
				T	R	S						
				¼	¼	¼						
				T	R	S						
				¼	¼	¼						

FIELD DEFINITIONS FOR GREAT GRAY OWL FIELD VISIT FORM

Attach a copy of the monitoring plan map for this site showing route and stop locations.

1. **Forest or BLM District, and RD or RA** - Name of Forest/BLM District (use 3 letter acronym for FS; 3 number code for BLM), and name of RD or RA.

2. **Planning Area Name** - Name or other identifier of the site.

3. **Area Number** - The number assigned to that site.

4. **Area (site) Type** - Record code "6" or "10"

   6 - General Survey/Timber Sale work/Other project work
   10 - Late Successional Reserve Inventory

5. **% of the area that can be safely Surveyed/Monitored/Inventoried**. For example, if 20% of a defined area is a sheer cliff and cannot be safely covered, then record 80%. This would indicate that 80% of the defined area is capable of being covered.

6. **Type of visit and number of visit**

   HV = a Preliminary Survey Using Historic Information

   SV = a Survey Visit only. A Survey Visit includes:

   - Nighttime Survey Using Roads
   - Nighttime Survey Using Trails
   - Daytime Survey Using Trails
   - General survey work that does not include stations

   FO = a Follow-up Visit only

   SF = a Survey Visit and a Follow-up Visit conducted in the same field outing.

   Record the visit number after the 2 letter visit type code. For example, the second survey visit would be "SV 2".

7. **Outing Number** - During surveying, it may not always be possible to conduct a complete visit in one field trip. Several "outings" may be necessary to conduct a complete visit. This variable is to be used to track the number of "outings" needed to complete a visit.

8. **Date** - A six-digit entry for month, day, and year. (For example, May 28, 1988 enter as 05/28/88.)

9. **Time** - A four-digit number (24 hour clock) for the time of day of the start and stop time of the survey period; i.e., 1300 for 1:00 p.m. Note, the time recorded here does not include the time to and from the survey area, it is only the time actually on the survey route.

10. **Day/Night outing**

    D = day outing
    N = night outing
    B = both day and night outing

11. **Survey Time** - Record the total amount of effective "response" time (hours & minutes) spent on the survey. For example, the start time was 0800 and the stop time was 1300, resulting in 5 hours between start to finish.

    - If two people were working **together,** and walking between stations, then the total "response" hours would be 5.
    - If the two people were working **separately**, then the survey hours would be 10.
    - If only one person was working the route and was driving between stations, then figure the survey time as 10 minutes times the number of stations called.

    There are many examples that could be presented here. The basic intent for determining the number of survey hours is to determine the total amount of effective time spent calling and listening for a response.

12. **Observers Names** - Use the first initial and last name of observer.

13. **Route ID** - Route number from the survey site plan or station number(s) of the stations that were visited.

14. **Method**

1- Calling at fixed stations, driving between stations
2 - Calling at fixed stations, walking between stations
3 - Inventory, methods not fixed
4 - Unsolicited sighting/calling
5 - Continuous calling/searching
6 - Telemetry

15. **Wind**

C - calm (0-5 mph)
B - light breeze (5-10 mph)
W - windy (15+ mph)
G - gusty wind with alternating
M - moderate wind (10-15 mph) calm periods

16. **CLOUD COVER**

C - clear
O - overcast
S - scattered clouds
F - clear with valley/ground fog

17. **Precipitation**

D - Dry
R - Rain
F - Fog
H - Hail
M - Misty rain
S - Snow
W - Showers

18. **Percent of the Area Called** - Percent of the area that can be called that is called. If the entire defined area is called, record 100; if a response is detected on the first station, record 01%. If only 80% of the defined area can be called (see item 9 above), and the full 80% is covered, then record 100%.

19. **Visit Complete** - Record "Y" for yes, and "N" for no.

RESPONSE INFORMATION

20. **Species**

NONE - no owls detected
STNE - great gray owl
STOC - spotted owl
STVA - barred owl
BUVI - great horned owl

For additional species, use the first two letters of the genus and first two letters of the species.

21. **Detection Type** - A single character code for the type of observation made on this visit.

    C = calling only
    V = visual only
    B = both calling and visual
    N = female seen on nest
    Y = young observed

22. **Number of Owls and Sex of Owls Responding**

    F - females **M** - males **PR** - pairs
    U - unknown sex **Y** - young of the year **N** - nestlings (young in the nest).

    - Record 1F for one single adult female
    - 2F for two single adult
    - 1U for one owl heard - sex unknown
    - 1PR for 1 owl pair, etc.

    If an owl is found dead, record number and sex as above, plus record the fact that the owl was found dead. For example, if one young owl is found dead, record 1Y - Dead. Use the comment section to record any notes about why the owl is dead - hit by a vehicle, great horned owl suspected, etc.

23. **Time of Response** - Record the time of the owl response using a 24-hour clock.

24. **Location of Detection** - Legal location and UTM coordinates of the seen or heard owl.

    Legal location is required. Record the Township, Range, Section, quarter section, and 16th section if possible. Half Townships are recorded by adding the number 5. For example, T 6 S = T 06S, T 6 ½ S = T065S. An azimuth reading on the owl response location should be entered in the field notes. If possible, record the legal description to the 16th quarter Section. For example, if you detect an owl in the northwest portion of the southwest quarter of Section 10 of Range 7 West of Township 12 North, then record: T12N R07W Sec 10 1/4 SW 1/16 NW.

    UTM coordinates are required for all nest sites found and should also be recorded where great gray owls are seen or heard.

25. **Elevation** - Record elevation of detection location in feet.

26. **Habitat of Response**

    01 - Forested stand that is mature/old-growth (>20" dbh).
    02 - Forested stand that is less than mature/old-growth, but greater than pole size (8-20" dbh)
    03 - Forest stand that is pole-size (5-8" dbh)
    04 - Sapling size stand or smaller, or non-forested stand (less than 5" dbh)
    05 - Unknown what type of stand that the response came from.

These codes are very gross level and will only be used to indicate whether the response was from a forested stand or not. If the response was from a forested stand, then the type of forest will be identified through photo interpretation that will be done in a separate effort from the monitoring effort.

27. **Response Number** - Record the number of the detection in sequence. If on the first visit, you hear a great gray owl then enter the number "1". The next time that you detect a great gray, you would enter a number 2, etc. Include in the sequence the detections of predators and other owls when appropriate. The sequence numbers should correspond with the numbers used for the detection locations on the appropriate map.

28. **At Fixed Station** - This variable is applicable for "Survey Visits." For a Survey Visit, record the station number at which a response was heard/seen. Record **N** for a response heard/seen from between stations. If you are not conducting a Survey Visit, then record **NA** for not applicable.

COMMENTS: Record anything that you feel is pertinent to this visit or site. You may use the back of the form for long narratives. Attach a map directly to the form and label map with Forest/District, planning area name, type of visit and number, and date.

APPENDIX 2. OWL NEST TREE FORM

1. **Year** _____ 2. **Region** _____ 3. **State** _____

4. **County** _____ 5. **NF/DO** _____ 6. **RD/RA** _____

7. **Site #** _____ 8. **Site Name** _____

9. **Year Originally Found** _____

10. **Legal**: T_____ ____ R_____ ____ Sec_____ 1/4_____ 1/16_____

11. **UTM Coordinates**: _____ _____

12. **Health of Tree** (Live=1, Snag=2) _____

13. **Tree HT** _____ft 14. **Tree Species** _____ 15. **DBH** _____in

16. **Nest HT** _____ft 17. **Elevation** _____ft

18. **Nest Type** _____ (n=nest of other species, m=mistletoe platform, c=cavity, b=broken top, a=artificial platform, o=other).

If other, describe:

_____

19. **Aspect of nest entrance or platform** _____

20. **Habitat Type** _____ (OG=old growth/mature, I=immature, P=pole, H=hardwood, O=other) _____

21. **Distance from nest tree to the nearest opening** _____ ft.
(opening should be 10ac. or greater in size)

22. **Tree Description** (such as broken top, dead top, etc.) _____

_____

_____

_____

23. **Describe how to find the nest site**: _____

_____

_____

_____

APPENDIX 3. PHOTOS OF GREAT GRAY OWL AND GREAT HORNED OWL YOUNG

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