United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Southwest Region
2800 Cottage Way, Suite W-2606
Sacramento, California 95825

IN REPLY REFER TO:
FWS:R8:ES

November 1, 2019

Helge Eng
Deputy Director, Resource Management
California Department of Forestry and Fire Protection
1416 9th Street
Sacramento, Ca
95814

Dear Mr. ~~Eng~~ HELGE:

The purpose of this letter is to transmit the U.S. Fish and Wildlife Service's (Service) latest revision of our Take Avoidance and Analysis and Guidance for Northern spotted owl (*Strix occidentalis caurina)*, commonly referred to as Attachments A and B. Through Attachments A and B, the Service recommends guidelines to avoid the incidental take of the federally listed as threatened Northern spotted owl (NSO), which may result from timber operations on private lands in California. Attachment A covers the range of the coast redwood (*Sequoia sempervirens*), and Attachment B applies to proposed inland timber operations that occur outside the range of coast redwood.

While the Service believes the revised guidelines represent effective measures to avoid take of NSO, they are not the only manner in which take can be avoided. These guidelines are to be used as recommended tools to avoid take for the public and implementing agencies, but are not required approaches imposed by the Service.

These documents apply to all timber operations within the range of the NSO in California, including but not limited to: Timber Harvest Plans (THPs), Non-industrial Timber Management Plans (NTMPs), and Working Forest Management Plans (WFMPs). This guidance replaces in full, all prior versions and remains in effect until replaced or voided by the Service.

Background on "No Take Guidance"

- On February 1, 2008, the Service provided guidance (including attachments A and B) to California Department of Forestry and Fire Protection. The intent of the guidance was to assist private landowners conducting timber harvest activities avoid unauthorized take of northern spotted owls. This guidance was general in nature and could be applied when site-specific data was not available.

- On May 22, 2008, the Service provided additional clarification explaining that

practitioners (private landowners as well as State agency personnel) should, when possible, apply a process similar to that which has been applied by the Service for evaluating proposed projects. Namely that a finer scale, site-specific evaluation for projects is more effective than coarse scale evaluations.

- On February 7, 2011, the Service released the revised 2011 Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owl.

- On January 9, 2012 the Service released another revision of the 2011 Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owl.

We encourage your staff to assess each THP in light of site specific conditions and under the broader context of the guidelines provided. Thank you for your continued cooperation and support for effective conservation and recovery of Northern spotted owl in California.

Questions regarding Attachment A (coast redwood) should be directed to our Arcata Fish and Wildlife Office at (707) 822-8411, and Attachment B (inlands) questions to our Yreka Fish and Wildlife Office at (530) 842-5763.

Sincerely,

Michael J. Senn
Deputy Assistant Regional Director, Ecological Services

Northern Spotted Owl Take Avoidance Analysis and Guidance for Private lands in California

Attachment A: Take Avoidance Analysis- Coast Redwood Region

I. Background

On February 7, 2011, the Service released the 2011 *Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls*. On January 9, 2012 the Service released a revision of the 2011 *Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls* (hereafter referred to as the Revised 2011 NSO Survey Protocol; Service 2012). The reader should consult the Revised 2011 NSO Survey Protocol for details regarding survey methods and interpretation of survey data.

This document provides guidance on the application of survey results to evaluate specific projects that may impact or incidentally take[1] Northern spotted owl (NSO). This document also provides recommendations on NSO habitat protection measures and operational procedures. This revision of Attachment A also includes the pertinent issues addressed in previous AFWO technical assistance, previous versions of Attachment A, and the Revised 2011 NSO Survey Protocol.

This document (Attachment A) dated November 1, 2019, replaces, in full, all prior versions of this guidance, and remains in effect until replaced or voided. The eastern portion of the California Department of Forestry and Fire Protection (CAL FIRE) Coast District is outside the range of the coast redwood. In these eastern areas of the Coast District, the Revised USFWS Attachment B: Take Avoidance Analysis-Interior ("Attachment B") applies to proposed timber operations where coast redwoods are not present within the Timber Harvest Plan or Nonindustrial Timber Management Plan area. Within the range of redwood however, there are some areas where redwoods are actually absent. In these coastally-influenced areas within the Coast District that lack redwoods, Attachment A should still be applied.

II. Accuracy of NSO Activity Center Location and Mapping

The initial step in determining if the proposed timber operations may avoid take of NSO is to determine if the proposed operations would likely occur within the home range of a NSO (new or historical). The following information is necessary to support a conclusion that a proposed timber harvest is not within the home range of a NSO: A combination of survey data conducted to current protocol covering all suitable NSO habitat located within the 0.7-mile radius of the proposed harvest operations, and all applicable and current reports from California Department of Fish and Wildlife's (CDFW) Spotted Owl Observations Database (SPOWDB; see https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=166159&inline). Given the cooler temperatures and higher productivity of coast redwood forests as compared to interior forests,

[1] **Incidental take -** take that is incidental to, but not the purpose of, carrying out an otherwise lawful activity.

and also territorial pressure from barred owls, NSO in the Coast Redwood Region readily change activity center locations necessitating up-to-date survey information for timber harvest planning.

Accurately mapping the location of each activity center is critical to the protection of core use area habitat. Because NSO can move from year to year, current activity center locations are more accurate when plotted as a result of surveys rather than solely relying on the locations found in SPOWDB. Multiple activity centers for an NSO home range are possible. If one core use area does not encompass all known activity centers (current and historical), then multiple core use areas will need to be mapped and protected to avoid the likelihood of incidental take. Where it makes biological sense, multiple activity centers can be contained within a single core use area.

If some, or all, of the habitat in the survey area cannot be surveyed due to lack of access, the most recent update of the SPOWDB should be consulted for activity center information within the 0.7-mile survey area. In addition, landowners that are adjacent to the proposed timber operations should be contacted so that for those that voluntarily agree to share information, all the known current NSO locations can be identified and mapped. Landowners should submit their annual datasets directly to SPOWDB. All detections reported to the SPOWDB are assigned to a known site or given a new site number. *SPOWDB Report #1* (Spotted Owl Sites Found) identifies the most important detection locations for each site, and those locations should be included as "known" activity centers. The guidance contained herein applies to all sites listed in *Report #1*, until such detections are determined by the AFWO not to qualify for protection (e.g., site abandonment or non-valid site determination). *SPOWDB Report #2* (Observations Reported) lists all observations associated with each site and may include more than one nest location for a pair of NSO. The SPOWDB lists one activity center per site; however, additional nests or other locations provided in *Report #2* may also need to be considered activity centers and be protected.

III. Flexibility in the Revised 2011 NSO Survey Protocol

The Revised 2011 NSO Survey Protocol replaces all prior versions of the NSO survey protocol. Reference to prior protocols should be limited to confirming compliance with earlier protocols during those survey years, for appropriate crediting of earlier, completed surveys. Only the revised 2011 Survey Protocol should be used as direction for surveys during 2019 and subsequent years. Please refer to the Revised 2011 NSO Survey Protocol for complete details regarding survey area, timing, design, and documentation of conditions necessitating deviation from the Revised 2011 NSO Survey Protocol, with the exception of the deviation outlined below.

Data and information specific to the Coast Redwood Region show that NSO nest slightly earlier in the year than interior areas within California. Furthermore, additional data from the Coast Redwood Region have shown that the high response rates of NSO begin as early as March 1. However, the Revised 2011 NSO Survey Protocol states "At least 3 of the complete visits should be conducted before 30 June; this includes at least one visit in April, one in May and one in June."

To accommodate the earlier breeding season for NSOs in the Coast Redwood Region, survey dates should be moved forward 15 days, as follows:

- At least one survey should occur during the period March 15 to April 14.
- At least one survey should occur during the period April 15 to May 14.
- At least one survey should occur during the period May 15 to June 15.

Spot Check Surveys

The protocol currently recommends spot check surveys in years 3 and 4 for the purpose of extending the utility of a 2-year, 6-visit survey effort into years 3 and 4, this provides an opportunity to detect owls that may have moved into the survey area and immediate vicinity after the first two years of surveys. For project areas that have long and ongoing survey histories (e.g., 3 complete protocol surveys [a complete survey consists of 2 years of 6 visits per year] over the past 12 years with the most recent survey being no more than 3 years old), and at the discretion of NSO review agencies, the use of annual spot check surveys may be acceptable to extend the utility of 2-year protocol surveys into years 5 and 6. Subsequent to year 6, a full 2-year, 6-visit survey effort would again be recommended. For this option to apply, at least one spot check survey should occur after May 14 but before June 15 in each of the four years of spot checks subsequent to the 2-year, 6-visit surveys. When timber operations remove or downgrade suitable habitat (such as under the General Core Use Area Habitat Protection), spot checks in years 5 and 6 may need to extend to 0.7 miles from harvest units to reduce the likelihood that habitat removal or downgrading results in take of NSO that have established territories after the initial 2-year survey.

Modifying the number of required survey visits

Under advisement by the NSO review agencies, survey requirements can be relaxed in the unlikely situation where barred owls are determined to be absent from the survey area. For example, when no barred owls have been detected over an extended period (3 complete protocol surveys over the past 12 years with the most recent survey being no more than 3 years old). The CDFW Barred Owl Observations Database (https://map.dfg.ca.gov/metadata/sec/ds0008.html?5.80.28l) should be consulted and the use of barred owl-specific surveys may be warranted.

With the exception of some allowed deviations from the Revised 2011 NSO Survey Protocol discussed in this document such as the scheduling survey visits and the use of spot check surveys for years 5 and 6, all other timing, location, and operability requirements (including at least 7 days between complete visits, prompt daytime follow-ups, number of complete visits, etc.) should remain consistent with the Revised 2011 NSO Protocol. Written justification should be provided for any deviation from the Revised 2011 NSO Survey Protocol, including explanation of any access limitations that result in the survey area not being thoroughly surveyed.

Modifying the Survey Area

The Revised 2011 NSO Survey Protocol assumes the entire survey area (0.7 mile radius) will be surveyed prior to management activities that may alter suitable NSO habitat. Surveys are not necessary for non-habitat altering activities (i.e., disturbance-only, including yarding, loading, hauling, and decking) if the activities are conducted outside of the NSO breeding season. For

operations that are anticipated to result only in disturbance to NSO during the breeding season and not habitat alteration, only the suitable NSO habitat within the proposed harvest area should surveyed, plus an additional 0.25 mile radius outside the project footprint. It is also unnecessary to survey out to 0.7 mile around the project footprint when all suitable NSO habitat is maintained (no downgrading of habitat type) as suitable habitat post-harvest, in which case surveys need only cover those areas to be treated and out to a distance of 0.25 miles. This assumes any NSO nesting within 0.25 mile of the area to be harvested will be detected and protected, and any NSO using the area for foraging will continue to be able to do so.

In some cases, access issues related to private property can prevent surveys from being conducted across the entire survey area. At a minimum, surveys should be conducted on the property within which the proposed timber operations will occur. In addition, surveys should be conducted on any adjacent accessible private land (if voluntarily allowed by the landowner) or public land and along all appurtenant public roads. If available, survey data from adjacent landowners may be used to obtain information on the presence/absence of NSO on portions of the survey area not accessible to the project proponent.

Survey documentation for proposed timber operations should include a description of proposed operations, a map of the 0.7-mile survey boundary including topography (i.e., contour lines), a map of the actual surveyed area including call points used, suitable habitat present, all NSO detections, and an explanation and justification of any deviation from complete Revised 2011 NSO Survey Protocol. An explanation is especially important when removal or downgrading of suitable NSO habitat is proposed.

IV. Post-Harvest Habitat Retention and Habitat Typing

Because the structural characteristics of forest stands used by NSO are heterogeneous, management based on stand average values are unlikely to adequately describe suitable habitat at a scale that is meaningful to NSO. For this reason, the habitat definitions provided below are intended for application at the scale of roughly 20 acres. This means that within any given 20-acre area intended to serve as nesting/roosting or foraging habitat, the habitat values will be variable, but average values should approximate the standards provided under each habitat definition. It is important to recognize habitat quality will be compromised by timber harvesting that moves stand parameters towards uniformly low average values for stand density and tree size, especially during multiple entries. To avoid take, the highest-quality habitat available should be identified and retained before the treatment of other suitable habitat is considered.

Accurate habitat typing is essential to determine if habitat quantities will be retained above the habitat thresholds described below. The NSO review agencies will need habitat typing to verify that pre-harvest habitat typing is correct and post-harvest habitat retention is feasible.

Inventory data provides the best support for accurate habitat typing. When inventory data is not available, habitat typing using available satellite, air photos, or LiDAR is acceptable, provided harvest histories showing any habitat alterations since the imagery was generated are incorporated into the analysis. Imagery alone can provide reasonably accurate canopy closure estimations, but since stand age and diameter class can be difficult to determine from imagery

alone, it is important to conduct ground truthing as well. CAL FIRE maintains timber harvest histories by watershed, available on-line at https://egis.fire.ca.gov/watershed_mapper/. This information should be used in conjunction with imagery for off-property habitat typing.

Watercourse and Lake Protection Zones (WLPZs; as well as other narrow habitat strips), typically have the highest canopy closure and the largest trees on the landscape. However, WLPZs are not wide enough by themselves to provide functional nesting/roosting habitat (i.e., at least 600 feet wide). Therefore, if a WLPZ is bordered on both sides by unsuitable habitat, then the WLPZ cannot be typed as nesting/roosting habitat and is considered functionally Foraging habitat at best. If one or both slopes on either side of a WLPZ can be accurately typed as foraging habitat, the WLPZ can be considered functional nesting/roosting habitat if there is a minimum of 60% canopy closure and trees are at least 11" diameter at breast height (DBH).

Priority Ranking of Habitat Retention Acres

1) Tree species composition:
   a) Conifer-dominated stands should be selected over hardwood dominated stands.
   b) Retained areas should feature a multi-layered, multi-species stand structure with abundant large woody debris on the forest floor.

2) The following abiotic considerations help with the priority determinations:
   a) Distance to nest: nesting/roosting and foraging habitat closest to the identified nest trees, or roosting trees if no nest trees have been identified.
   b) Contiguity: nesting/roosting habitat located within the 0.7-mile radius should be as contiguous as possible; and minimize fragmentation of foraging habitat as much as possible.
   c) Slope position: habitat located on the lower 1/3 of slopes provide cooler microclimate conditions and sheltering from adverse weather, greater occurrence of large trees, and higher abundance of prey species.

If the proposed timber operations retain at least 66% of the pre-harvest basal area of trees at least 11” DBH, and meet the functional definition of nesting/roosting or foraging habitat post-harvest as described above, off-property habitat typing is not necessary unless needed to illustrate the core use area protections.

General Core Use Area Habitat Protection/Take Avoidance Guidelines

The following General Core Use Area Habitat Protection measures are typically, but not exclusively, used in situations where nesting/roosting habitat is being removed or downgraded.

Once an activity center has been accurately mapped, a 100-acre core use area polygon should be identified that contains the highest-quality nesting/roosting habitat contiguous with the activity center.

When an activity center is surrounded by sufficient nesting/roosting habitat, the core use area polygon is typically mapped starting with a 1,000-foot radius circle (72 acres) centered on the

activity center, and is connected on one side to a WLPZ and expanded until the core use area includes at least 100 acres. Limited timber operations are allowed within the core use area polygon (see VI. Timber Operations).

When the outside edge of the nesting/roosting habitat is closer than 500 feet to the activity center, the non-nesting/roosting habitat within 500 feet of the activity center is included, but should be augmented with additional nesting/roosting habitat elsewhere in the core use area polygon to make a minimum of 100 acres of the highest-quality habitat.

When the outside edge of the nesting/roosting habitat is closer than 1,000 feet to, but not within 500 feet of the activity center, the protected core use area should extend to that most distant edge of the nesting/roosting habitat but shall not be less than a 500-foot radius.

Operations conducted outside the core use area, but within 1,000 feet of an activity center should retain the functionality of any NSO habitat present pre-harvest within this area, i.e., operations do not downgrade nesting/roosting habitat to foraging habitat or remove any suitable habitat.

The 100-acre core use area should not be redrawn in subsequent entries, and the 500-foot radius should remain unchanged.

Within the 0.7-mile radius (985 acres) of each activity center please use the following:

1) Retain habitat to maximize attributes desirable for NSO.

2) Retain at least 500 acres of suitable (nesting/roosting/foraging) NSO habitat, post-harvest, as follows:
   a) Retain 200 acres of nesting/roosting habitat within a 0.7 mile radius of the activity center consisting of:
      i) 100 acres of the 200 acres of nesting/roosting habitat retained should be contiguous, or as contiguous as possible with the activity center.
      ii) An additional 100 acres of nesting/roosting with in the 0.7-mile radius:
         (1) For the second 100 acres, maintain nesting/roosting habitat with a minimum of 66% of the harvest basal area per acre of trees at least 11” DBH.
   b) Retain at least 300 acres of suitable NSO habitat, post-harvest, of at least foraging quality. Remove no more than 1/3 of the remaining suitable habitat in excess of 500 acres within 0.7 mile of an activity center during the life of the timber operations.

Alternative Core Use Area Habitat Protection/Take Avoidance Guidelines

In situations where all proposed timber harvest within 0.7 miles of an activity center will maintain 66% of the pre-harvest basal area per acre of trees at least 18" DBH, 66% of the pre-harvest basal area of trees at least 30” DBH, 60% canopy closure of trees that are ≥18" DBH, and will have a post-harvest basal area ≥150 square feet per acre of trees ≥18" DBH (i.e., high-quality nesting/roosting habitat), and will have no group openings larger than 1/4 acre per each 10 acres, then the following core use area habitat protections can be applied.

Post-harvest, these areas should retain well-distributed multistoried stands composed of a diversity of species and size classes similar to, or better than, pre-harvest conditions. Accordingly, snags and trees with broken tops, reiterated trunks, epicormic branches, cavities, or other structures potentially suitable for NSO nest sites should be maintained.

Once an activity center has been accurately mapped, a 40-acre no-cut core use area polygon should be identified that contains the highest-quality nesting/roosting located contiguous with the activity center.

When an activity center is surrounded by sufficient nesting/roosting habitat, the core use area polygon is typically mapped starting with a 500-foot radius circle (18 acres) centered on the activity center, and is connected on one side to a WLPZ and expanded until the core use area includes at least 40 acres of nesting/roosting. In situations where all habitat within 750-feet (40 acres) of the activity center is high-quality nesting/roosting, the core use area can be drawn as a 750-foot radius circle. Only limited timber operations are allowed within the core use area polygon (see Section VI. Timber Operations).

When the outside edge of the nesting/roosting habitat is closer than 500 feet to the activity center, the acres of non-nesting/roosting habitat acreage within 500 feet of the activity center are included, but should be augmented with additional nesting/roosting habitat elsewhere in the core use area polygon to make a minimum of 40 acres of the highest-quality nesting/roosting habitat.

In all cases, at least 40 acres of the highest quality nesting/roosting should be included in the core use area, and the core use area should contain all acres within 500 feet of the activity center.

The 40-acre core use area should not be redrawn in subsequent entries, and the 500-foot radius should remain unchanged.

Within 10 years after the application of the Alternative Core Use Area Habitat Protection measures, if the General Core Use Area Habitat Protection measures are subsequently applied to an activity center, then high-quality nesting/roosting habitat as defined in this document should be maintained within the 100 acres around the activity center.

V. Road Use

To avoid take of NSO from noise disturbance during the breeding season, road use within 0.25 mile (1,320 feet; or see Service 2006 for other potential buffer distances based on site-specific ambient and project-generated noise) of an occupied NSO activity center should not occur until July 10, unless:

1) Protocol surveys determine that NSO are non-nesting, or that nesting has failed (note that activity centers occupied in year 1 and/or year 2 cannot be determined to be non-nesting or failed until on or after May 1 in years 3 through 6), or;
2) The activity center is within 165 feet of a major highway that typically has high traffic year-round (Hwy 1, 36, 101, 128, 299, etc.) and the appurtenant road is not within 165 feet of the activity center.

3) After July 9th and until the end of the breeding season, road use within any core use area should be limited to use of existing roads, maintenance, and map point work.

4) At the discretion of the NSO review agencies, deviations to the above road use guidelines may be made depending on proposed noise minimizations (e.g., speed limits and compression brake restrictions), duration, distance of the noise source from the activity center, site topography (i.e., significant topography exists between the noise source and the activity center), and existing pre-project use.

VI. Timber Harvest Operations

A 0.25-mile seasonal restriction on timber operations (except for road use after July 9th) applies to every known NSO activity center during the breeding season, unless it is determined via a site monitoring visit, "activity center search" (Revised 2011 NSO Survey Protocol), that NSO are not nesting, or nesting failure has occurred. If it cannot be determined whether NSO are nesting, or nesting failure cannot be determined, the 0.25 mile seasonal restriction should stay in effect for timber operations until after July 31st. In lieu of the standard distance of 0.25 mile, project proponents may opt to use distances as described under the most recent version of AFWO's document entitled "Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California" (Service 2006; https://www.fws.gov/arcata/es/birds/NSO/documents/MAMU-NSO%20Harassment%20Guidance%20NW%20CA%202006Jul31.pdf).

For all known activity centers, timber operations should adhere to the following recommendations:

1) Within any (either 100- or 40-acre) core use area polygon of an NSO activity center:
   a) Outside the breeding season, limited timber operations (i.e., only road use and maintenance, map point work, tail-hold placements, use of existing skid roads, and loading) may be conducted, provided no trees >11" DBH are cut or removed by the operations, and no new cable corridors, skid trails, or roads are constructed in the core use area.
   b) During the NSO breeding season, timber operations (including use of roads before July 9), should not occur within any core use area, except as allowed in subsections 4 and 5, below.

2) Timber operations outside any core use area, but within 0.25 mile of an NSO activity center:
   a) Outside the breeding season, timber operations may be conducted.
   b) During the breeding season, timber operations should not proceed unless protocol surveys determine that nesting NSOs are not present or that nesting has failed.

3) For all NSO activity centers, prior to May 15th (until the recommended May 15 or later survey is completed):

a) Timber operations (except helicopter yarding or staging) should be conducted only >0.25 mile from the activity center.
b) Helicopter yarding and staging should occur only >0.5 mile from the activity center.

4) For NSO activity centers where current nesting status has been determined (to protocol) to be non-nesting or failed nesting, or when fledglings are greater than 0.25 miles from the nest tree:
   a) Limited timber operations (road use and maintenance, map point work, use of existing skid roads, tail-hold placements and loading) may be conducted within any core use area of the activity center provided no trees >11" DBH are cut or removed by the operations, and no new cable roads or corridors or skid roads or trails are created in the core use area.
   b) Full timber operations, including helicopter yarding and staging, may be conducted within 0.25 mile but not within any core use area. Helicopter flyovers should not occur within 1,000 feet of the activity center.

5) For NSO activity centers, where status has been determined to be nesting, nesting unknown, or nesting is presumed according to the Revised 2011 NSO Survey Protocol:
   a) For activity centers where fledging status has not been determined, timber operations should be conducted only in approved THP areas that are >0.25 mile from the activity center until the end of the breeding season.
   b) Helicopter yarding and staging should occur only on approved THP areas >0.5 mile from the activity center.

6) For any NSO activity center, regardless of current nesting status:
   a) If NSO move to a new location (>1,000 feet from the historical activity center), the appropriate protection measures should be provided to each activity center, or consultation with NSO review agencies should occur to evaluate the status of what may be multiple activity centers.

VII. February Extensions for Timber Operations:

There is no way to extend on-going timber operations into the breeding season without first completing surveys. General surveys and spot checks cannot begin until March 1, therefore, in order to avoid potential take of NSO, and lacking surveys for the current year, operations cannot start until March 1 at the earliest. However, when a 2-year, 6-visit survey effort has been conducted, and operations are conducted in years 3-6 with spot check surveys, yarding, loading, hauling, and decking may be extended into the breeding season when greater than 0.25 miles from any known activity center, or when intervening topography ameliorates noise.

VIII. CAL FIRE Review

As Lead Agency for timber harvest review, CAL FIRE has the ultimate responsibility for determining whether or not THPs and NTMPs are in conformance with the Forest Practice Rules

based on NSO take avoidance. CDFW is the Wildlife Trustee Agency responsible for evaluating wildlife concerns in THPs and NTMPs.

When reviewing information related to NSO Activity Centers, NSO review agencies may use the following information to check for adequacy and accuracy:

1) Location
    a) Confirm plotted activity center location accuracy.
        i) Review recent surveys, including survey summaries, datasheets, call point maps, follow-up route maps, and detection maps.
        ii) Review SPOWDB Report #1 and #2 and the Spotted Owl Observations layers in CDFW's BIOS Viewer.
        iii) Review data from adjacent landowners.
    b) Evaluate deviations from SPOWDB locations.
    c) Determine if habitat maps and tables are up to date.
2) Activity center and project area habitat typing.
3) Verify pre-harvest habitat typing of project area, survey area and 0.7-mile radius from each activity center using aerial photos, equivalent imagery, or field visits.
4) Determine if any habitat alterations have occurred which should be reflected in current NSO habitat tables and habitat analysis maps.
5) Verify post-harvest habitat typing reflects the silvicultural prescriptions.
6) Determine activity center status.
7) Is it a valid site?
    a) Review most current protocol to determine if the location is consistent with the definition of a site.
    b) Report both new sites and potentially non-valid sites to CDFW for review and the next SPOWDB update.
8) Determine current occupancy status.
9) Determine current nesting and reproductive status, if they were determined.
10) Activity center habitat and disturbance protection measures.
11) Confirm consistency with Attachment A.

IX. Determination

The NSO review agencies should use the following list to help with take avoidance determinations:

1) If surveys or survey documentation are inadequate or do not meet the intent of the NSO protocol in effect during the year(s) of survey, a take avoidance determination may not be possible.

2) If habitat typing is inadequate, a take-avoidance determination may not be possible.
3) If NSO home range or core use area habitat acres are below the desired conditions, additional loss of suitable habitat can lead to unauthorized take.
4) If NSO are or may be nesting, use seasonal restrictions for all timber operations within 0.25 mile (or use Service 2006) of a nest (February 1 through July 31).
5) If effects are limited to noise disturbance (e.g., no suitable habitat in timber harvest units, but suitable habitat is located within 0.25 mile of units), a modified seasonal restriction may be used from February 1 through July 9, as follows:
    a) Seasonal restriction applies to unsurveyed suitable habitat within 0.25 mile of a unit boundary.
    b) If protocol surveys were conducted and did not detect nesting NSO, or barred owls, seasonal restrictions may not be warranted.
6) When multiple projects are located within a given NSO home range, all habitat conditions should be considered collectively.

X. Contents of Technical Assistance Requests

Information to be submitted by project proponents to CAL FIRE or CDFW should include:

1) Date of written technical assistance request.
2) Date request received.
3) Assigned technical assistance number (only if previous technical assistance has been provided by AFWO in the past for this project).
4) Number of acres within the THP boundary.
5) Maps indicating types and locations of harvest units with silviculture prescriptions.
6) Map showing exact locations of any know NSO activity centers within the survey area.
7) Location of THP, including County(s); Meridian(s); and, Townships, Ranges, and Sections.
8) Identify all known NSO activity centers.
9) Results (including maps and coordinates, as necessary) of all daytime and nighttime surveys conducted and activity center status for any known activity center.
10) Logic behind the take avoidance determination.
    a) Habitat considerations:
        i) Acres, quality, and location of suitable habitat pre- and post-harvest,
        ii) Effects of timber operations on suitable habitat;
            (1) Maintain: suitable habitat is altered but still functions in the capacity it did pre-harvest (i.e. foraging habitat before harvest functions as foraging habitat

post-harvest, nesting/roosting habitat pre-harvest functions as nesting/roosting habitat post-harvest);
(2) Downgrade: pre-harvest nesting/roosting habitat becomes foraging habitat post-harvest;
(3) Remove: nesting/roosting or foraging habitat is harvested, such that it no longer functions as the same habitat post-harvest;

b) Proximity of activity center to operations, and;
c) Survey data.

11) Sunset date and seasonal restrictions:

a) If operations are not complete before February 1, surveys are required to determine the location and status of NSO prior to operations during each breeding season that operations are ongoing. However, see the exception above for yarding, loading, hauling, and decking after completion of 2-year, 6-visit survey effort.
b) Additional technical assistance or consultation with the NSO review agencies may not be required if NSO are not known or found within 0.7 mile of THP units, there is no suitable habitat within the harvest units, or if suitable habitat is not identified within 0.25 mile of harvest units.

12) Name of agency person to contact if there are questions regarding the technical assistance.

Generally, technical assistance requests may only be submitted to AFWO by CAL FIRE or CDFW. Technical assistance may be provided to CAL FIRE and CDFW, by AFWO, on complex determinations, points of clarification, or regarding activity center (and site) abandonment or invalidation, movement of activity centers, and for the purposes of developing agreements or plans with AFWO.

Requests for technical assistance regarding activity center (and site) abandonment can be made directly to AFWO by project proponents. Open NTMPs, THPs, or other current plans that have active agreements with AFWO and that have received previous technical assistance from the AFWO (i.e., have an AFWO technical assistance correspondence number) also may continue to receive additional technical assistance from AFWO.

It should also be noted that Attachment A, the Revised 2011 NSO Survey Protocol, and any other agreements or plans with AFWO do not exempt project proponents from complying with applicable State regulations. Specifically, project proponents are not exempt from reporting NSO survey information to the SPOWDB, NSO review agencies, or meeting any other State regulations.

XI. Definitions

This section defines several terms used in the analysis of take avoidance of NSO within the coast redwood portion of the Coast District (additional terms are defined in the Revised 2011 NSO Survey Protocol):

Abandonment: When an activity center, defined below, is considered unable to support NSO now or in the future, typically due to habitat loss. Requests for technical assistance on abandonment of activity centers can be made to CAL FIRE, CDFW, or AFWO.

Activity Center: A mapped point located at the highest-ranking detection for each breeding season (e.g., nest, then daytime pair, then daytime single, etc.) at an area of concentrated activity. Activity centers occur within, but not necessarily in the exact center of, the "core use area," defined below. An NSO home range may have multiple mapped activity centers, and multiple activity centers may need protection to prevent take. Generally, single nighttime detections where an owl cannot be located during adequate daytime follow-ups should not be considered a valid activity center. All activity centers within a home range should be identified, mapped, and considered, however, not all activity centers are of equal value and site-specific information may be useful in determining which activity centers require more or less protection on an annual basis as determined by the NSO review agencies.

Core Use Area: 100 acres of the 200 acres, or 40 acres (depending on silviculture prescription), of the highest-quality nesting/roosting habitat that is retained around each activity center, regardless of ownership. If contiguous nesting/roosting habitat is not available, then the highest quality habitat available shall be included.

Downgrade habitat: A downgrade occurs when modifications to NSO habitat cause a change in the habitat type. For example, when nesting/roosting habitat is converted to foraging habitat.

Foraging Habitat: The minimum criteria is habitat that contains

1) Basal area ≥75 square feet per acre of trees ≥ 11" DBH
2) ≥40% canopy closure of trees that are ≥11" DBH
3) Trees may be conifer or hardwood

High-quality Nesting/Roosting Habitat: Post-harvest, the minimum criteria is habitat that contains

1) Post-harvest maintain 66% of the pre-harvest basal area per acre of trees ≥ 18" DBH
2) Post-harvest maintain 66% of the pre-harvest basal area per acre of trees ≥ 30" DBH
3) Post-harvest maintain canopy closure >60% of trees ≥ 18" DBH
4) Post-harvest maintain basal area ≥150 square feet per acre of trees ≥ 18" DBH
5) Trees may be conifer or hardwood

Nesting/Roosting Habitat: The minimum criteria is habitat that contains

1) Basal area ≥100 square feet per acre of trees ≥11" DBH
2) ≥60% canopy closure of trees that are ≥11" DBH
3) Trees may be conifer or hardwood

NSO Breeding Season: Defined as February 1 to July 31 for the Coast Redwood Region.

NSO Home Range: Defined as a 0.7-mile radius circle centered on an activity center.

NSO Review Agencies: CDFW and CAL FIRE. The Service may be requested when appropriate to assist as an advisor in the NSO review process.

Suitable or Functional Habitat: Habitat that meets either the minimum criteria for nesting/roosting or foraging habitat, or a combination of nesting/roosting and foraging habitat.

Survey Area: All suitable or functional NSO habitat within 0.7 mile of the project boundaries; or for disturbance-only activities, a 0.25 mile area outside the edge of the project should be surveyed.

Survey Dates: For the Coast Redwood Region, surveys should start on or after March 1. For "activity center searches" no fixed date is set, but the Revised 2011 NSO Survey Protocol should be followed. For years 1 and 2 of the Revised 2011 NSO Survey Protocol, the last survey visit should occur on or after May 15.

XII. Literature Cited

U.S. Fish and Wildlife Service. 2006. Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California. Unpublished report on file at Arcata Fish and Wildlife Office, 1655 Heindon Road, Arcata, CA.

U.S. Fish and Wildlife Service. 2012. Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls. Unpublished report on file at Arcata Fish and Wildlife Office, 1655 Heindon Road, Arcata, CA.

Northern Spotted Owl Take Avoidance Analysis and Guidance for Private lands in California

Attachment B: Take Avoidance Analysis-Interior

I. Background

This document provides the Fish and Wildlife Service's (Service) guidelines to avoid the incidental take, as defined in the Endangered Species Act of 1973 (ESA; 16 U.S.C. § 1531 et seq.) of Northern spotted owls (*Strix occidentalis caurina,* NSO), that may result from timber operations within the California Klamath and California Cascade Provinces (see Appendix 7 of the 2011 revised survey protocol for maps of Provinces). Areas in other portions of the range of the NSO where redwoods are lacking may also use Attachment B rather than Attachment A if a justification is provided by the project proponent and accepted by NSO review team agencies (CDFW, CALFIRE, the Service as an advisor when requested by CAL FIRE). When site-specific information is lacking, take avoidance can be achieved by following the General Take Avoidance guidelines (below). When site-specific information is available, several examples are provided in section **VII. Information based Take Avoidance** below that explain how take avoidance standards may be refined.

This document (Attachment B) dated November 1, 2019, replaces, in full, all prior versions of this guidance (USDI FWS 2008a), and remains in effect until replaced or voided.

II. Accuracy of NSO Activity Center Location, Status, and Mapping

Accurately mapping the location of NSO activity centers (see Glossary below) is critical for avoiding take of NSO. Activity center locations are more accurate when plotted as a result of current surveys rather than solely relying on using the locations found in the California Department of Fish and Wildlife's (CDFW) Spotted Owl Observations Database (SPOWDB; see https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=166159&inline). Multiple activity centers for an NSO pair are possible. If one core use area (defined below) does not encompass all known activity centers, then multiple core use areas may need to be protected. When several years of survey records including positive and negative survey results are available, it may be possible to more precisely map a logical core use area and home range that captures important habitat available to NSO.

This is particularly true in the interior portion of the NSO range in California because, relative to coastal areas, NSO tend to remain in the same areas over time. Northern spotted owls in the hotter and drier portions of their range rely on topographical features (canyons and lower slope positions) to provide relatively stable micro-climates that are within NSO thermal tolerances (Forsman 1975, Barrows and Barrows 1978, Barrows 1981, Forsman et al. 1984). Further, habitat in the interior portion of the NSO range is often more heterogeneous than in coastal areas, with south facing slopes naturally devoid of dense forest. For these reasons, home ranges and core use areas for NSO on the interior are often more accurately depicted by non-circular polygons that often follow drainages where higher quality habitat is present compared to upslope areas. When identified, these

non-circular home ranges rarely cross over significant ridges, are limited to lower slope positions, and exclude large non-forested areas (south facing slopes dominated by brushy vegetation types).

The analysis of take avoidance should apply to all activity centers listed in the SPOWDB and other available sources (i.e. USFS data and survey results). The SPOWDB lists one activity center per site; however, additional nests or other locations provided in the database may also need to be considered activity centers and protected. If it can be demonstrated that the site does not qualify for protection (e,g, abandoned or non-valid site determination) then take avoidance may not apply. When the site can no longer support an NSO due to changes in habitat as the result of fire, timber harvesting, or other disturbance, it may be deemed abandoned by the review team agencies. If the activity center does not meet the criteria for an activity center and additional negative response data is available it may be considered non-valid.

Alternatively, activity centers may be unoccupied (an annual condition) if NSO are not present, despite adequate surveys, but enough suitable habitat is present to support a territorial pair of NSO. Limited operating periods near unoccupied sites are not necessary, but to ensure take is avoided, timber harvesting should not change the types of existing NSO habitat (nesting remains nesting, foraging remains foraging etc.) within the core use area. Take avoidance analysis for unoccupied sites should be developed in consultation with NSO review team agencies (CDFW, CALFIRE, the Service as an advisor when requested by CAL FIRE).

III. Flexibility in the Revised 2011 NSO Survey Protocol (revised survey protocol)

The Service has identified three areas in the revised survey protocol where flexibility for landowners exists and where take can still reasonably be avoided (as defined in the Endangered Species Act). They are: 1) spot check surveys, 2) modifying the number of required survey visits, and 3) modifying the survey area. Examples of each are described below in **VII. Information based Take Avoidance**. Please refer to the revised survey protocol for complete details regarding survey area, timing, design, and the documentation of conditions for justifying or necessitating deviation from the revised survey protocol.

The revised survey protocol assumes there is little or no previous information regarding NSO in the survey area (i.e., a naive landscape). When repeated surveys of a particular area have occurred (for example, 3 years of complete surveys over the past 12 years with the most recent survey being no more than 3 years old), it may be reasonable to provide flexibility to landowners by extending the period when spot check surveys can be used, reducing the number of survey visits required, and limiting the extent of the area to be surveyed (for example out to 0.25 miles instead of 1.3 miles).

Determining effects to NSO as the result of timber operations is an information driven process. High quality information that describes what is known about NSO and its habitat in a particular location can be used to develop site-specific take avoidance recommendations. These recommendations still effectively conserve spotted owls and their habitat while maximizing flexibility for forestland owners and reviewing agencies.

The revised survey protocol was developed to establish a reliable method for locating spotted owls. The revised survey protocol confidently detects spotted owls regardless of previous survey efforts. Based on information, a site-specific analysis can be used to determine appropriate survey methods,

delineate areas that are important to NSO, and determine the amount and spatial configuration of habitat to be retained following harvesting. Below are several examples of how to apply site-specific information in evaluating effects to NSO. In the absence of detailed information regarding spotted owl surveys and habitat use, the 1.3 mile home range and 0.5 mile core use area buffers are recommended (see General Take Avoidance, below), as is adherence to the revised survey protocol.

Spot Check surveys

The revised survey protocol describes spot check surveys that may occur in years 3 and 4, following more thorough 2 year surveys that occur 6 times per year and out to 1.3 miles. These spot check surveys need only cover the portions of the project area where work is ongoing or yet to be completed. The goal of spot checks is to avoid impacting any owls that may have moved into an area following the first two years of surveys and that may be inhabiting areas within 0.25 miles of pending operations.

For projects in areas (watersheds or landscapes) that have long and ongoing survey histories, practitioners may propose extending the use of spot check surveys into years 5 and 6. After year 6, a full 2-year, 6-visit survey effort may be required depending on the type of proposed operations, the quality of the habitat, or the area covered by spot check surveys. Full surveys may be needed after year 6 because NSO may establish new territories or activity centers in areas not covered by spot-checks. Proposals to continue spot check surveys beyond year 4 require approval by NSO review team agencies and early collaboration is encouraged. In some cases where protocol level or agency approved surveys are repeated each year, spot check surveys may continue beyond year 6.

Modifying the Number of required survey visits

We have worked closely with private landowners who have been conducting NSO surveys for many years (some going back to when the owl was listed in 1990) in the same area. The majority of these landowners are forest management companies that employ full-time professional wildlife biologists. The flexibility in the revised survey protocol has been used to reduce the number of survey visits required in certain circumstances (e.g. when no barred owls have been detected within 1.3 miles despite annual surveys over a number of years). Proposals to modify the number of visits described in the revised survey protocol require approval by NSO review team agencies and early collaboration is encouraged.

Landowners are encouraged to work with CALFIRE, CDFW, and the Service and to gather data for these site-specific survey determinations. For example, if surveys have been conducted over an extended period (3 years of complete surveys over the past 12 years with the most recent survey being no more than 3 years old) and can be used to establish a “baseline” of known NSO locations and demonstrate a lack of barred owl detections within the surrounding area, then 3 visit surveys may be appropriate. If 3 visit surveys are determined to be appropriate, at least one visit should occur after April 14 and one should occur after May 14.

It is important to contact adjacent land managers regarding barred owl presence. If there are any known barred owl detections in the surrounding vicinity (within 1.3 miles of the project area), then

3 visit surveys may **not** be appropriate. The CDFW Barred Owl Observations Database (https://map.dfg.ca.gov/metadata/sec/ds0008.html?5.80.28l) should be consulted.

If at any time a barred owl is detected or discovered within 1.3 miles of an area where 3 visit surveys are being conducted, then surveys should revert to 6 visit surveys. If after 3 years of consecutive surveys no more barred owls are detected, project proponents may develop a new justification for conducting a 3 visit NSO surveys.

Modifying the Survey Area

See Section 9.0 of the revised survey protocol for procedures for disturbance-only projects. For operations with only noise disturbance to NSO during the breeding season, and no direct impacts to habitat, all suitable NSO habitat within the proposed timber operation plan area should be surveyed, plus an additional 0.25 mile radius outside the plan area to ensure take is avoided.

In the revised survey protocol, all NSO habitat within 1.3 miles of the project footprint will be surveyed prior to management activities (see Figure 1 in the revised survey protocol). However, this assumes an area has not been previously or recently surveyed and little is known about owl locations, local habitat associations, or NSO distribution in the landscape. Because surveys in most commercial forest lands in the interior portion of the NSO range in California have been ongoing (at least periodically every ten years) since about 1992, there is often a significant amount of data regarding places where NSO have been detected and areas where they have not been detected. For this reason, in instances where there is a significant amount of data, reducing the survey area may be appropriate.

If a reduced survey area is proposed, at a minimum, surveys of the best available habitat should be conducted on the property where the proposed timber operations will occur (see the revised survey protocol, "project footprint" in Figure 1). Project footprint surveys should be designed to locate any NSO that exist within 0.25 miles of the proposed operations. Where there is sufficient existing data (3 years of complete surveys over the past 12 years with the most recent survey being no more than 3 years old) from previous surveys in a particular landscape or ownership and where the proposed timber operations will maintain the existing function of the habitat (no downgrade), surveys that cover only the project footprint may be sufficient. They are sufficient because any nesting NSO within 0.25 miles will be detected and those further away than 0.25 miles and that may be using the project area for foraging will continue to do so post-harvest. Proposals to modify the survey area as described in the revised survey protocol require approval by NSO review team agencies and early collaboration is encouraged.

IV. Pre-Harvest and Post-Harvest Habitat Typing

Because forest stands used by NSO are naturally variable structurally, management based on stand average values is unlikely to adequately describe suitable habitat at a scale that is meaningful to NSO. For this reason, the habitat definitions provided below are intended for application at the scale of roughly 20 acres. This means within any given 20 acre area that serves as NSO habitat, the values for quadratic mean diameter (QMD), basal area, trees per acre (TPA), and canopy closure may be variable, but the average values should approximate the standards provided below. Where

ranges of values are provided (e.g. 150-180 ft^2 basal area), the mean values can vary across the many 20-acre areas that make up a spotted owl core use area and home range.

Accurate habitat typing within core use areas and home ranges is needed to determine how much habitat is present before and after harvest. Northern spotted owl habitat is appropriately described both in terms of vegetative structural components (tree size, tree density, canopy closure, multi-layered structure, coarse woody debris), but also by its spatial extent and proximity to other habitat. Small patches (less than 100 acres) of forest with large trees and dense canopy are not likely to function as NSO habitat if they are less than 100 yards wide or separated by more than about 0.5 miles from other areas of NSO habitat (USDI FWS. 2009). Patches of habitat must be of sufficient size to allow NSO to complete their life functions. Therefore, Watercourse and Lake Protection Zone (WLPZs), small patches, or narrow strips of forest should usually not be counted as NSO nesting or roosting habitat if they are isolated (>0.5 miles) from other suitable areas.

It is important that project proponents provide clear and accurate information as well as their biological rationale for any habitat typing or conclusions that are drawn. This applies both to habitat that is proposed for harvest, and habitat that will be counted towards retention standards. If the harvested or treated areas do not downgrade habitat, off-property habitat typing is not necessary, unless needed to display core use area protections.

The quality of NSO habitat is compromised by timber harvesting that moves stand parameters (see **XIII. Definitions.** Interior Habitat Definitions) towards uniformly low average values for stand density and tree size, during single or multiple entries. This is particularly true at spotted owl territories with stand parameters that are less than the quantities described below in sections **VI. General Habitat Protection,** and **VII. 6) Information based Habitat Protection.** To avoid take, the highest-quality NSO habitat available should be identified and retained over lesser-quality habitat. See below for a description of how to prioritize NSO habitat.

Prioritization of NSO habitat to retain (Interior)

1) Tree species composition and existing habitat quality:
   a) Highest quality existing habitat should be prioritized for retention.
   b) Mixed conifer stands should be selected over pure pine stands.
   c) Retained areas should feature multi-layered, multi-species stand structure with abundant large woody debris on the forest floor.

2) Abiotic considerations to help with priority determinations:
   a) Distance to nest: nesting/roosting and foraging habitat should be retained as close as possible to nest trees, or roosting trees if no nest trees have been identified.
   b) Contiguity: nesting/roosting habitat within the core and surrounding home range (circular or non-circular) should be as contiguous as possible.
   c) Slope position: Habitats located on the lower 1/3 of slopes should be retained because they provide more suitable microclimate conditions and an increased potential for intermittent or year-round water sources.
   d) Habitat to be retained should be <6,000 ft. in elevation (this is a generally accepted elevation maximum, above which nesting NSO are not encountered).

V. General Take Avoidance

When site-specific information is lacking, take avoidance can be achieved by following the General Take Avoidance guidelines (below). When site-specific information is available, several examples are provided in section **VII. Information based Take Avoidance** below that explain how take avoidance standards may be refined.

As described in the previous Attachment B, in order to avoid take, once an activity center has been accurately mapped, a 0.5 mile circle, centered on the activity center (502 acres) is delineated as the core use area. Within the core use minimum habitat thresholds to avoid take are listed in VI. General Habitat Protection (below). The home range of NSO is a 1.3 mile radius circle centered on the activity center (USDI FWS, 2009 and USDI FWS 2012). With the home range minimum habitat thresholds to avoid take are listed in **VI. General Habitat Protection** (below).

VI. General Habitat Protection

In the absence of site-specific information, please apply the requirements used in the previous Attachment B, which are listed below. Higher quality habitat should always be retained over lower quality habitat when feasible. Within the 1.3 mile radius (3,397 acres) of each activity center please use the following:

1) Quantities
   a) Within 1000 feet of activity center
      i) Outside breeding season (September 1 through January 31), no timber operations other than use of existing roads
      ii) ii. During the breeding season (February 1 through August 31), no timber operations other than the use of existing, permanent, year-round roads

   b) Within 0.5 mile radius (502 acres) centered on activity center
      i) Retention of habitat should follow **IV. Pre-Harvest and Post-Harvest Habitat Typing** of this document
      ii) At least 250 acres nesting/roosting habitat present, as follows:
         (1) 100 acres high quality nesting/roosting habitat, **and**
         (2) 150 acres nesting/roosting habitat

-AND-

      iii) At least 150 acres foraging habitat must be present, as follows:
         (1) 100 acres foraging habitat, **and**
         (2) 50 acres low quality foraging habitat
      iv) No more than 1/3 of the remaining suitable habitat may be harvested during the life of the THP

   c) Between 0.5 mile radius and 1.3 miles radius circles centered on activity center

i) Retention of habitat should follow **IV. Pre-Harvest and Post-Harvest Habitat Typing** (above)
ii) 935 acres suitable habitat must be present, as follows:
    (1) At least 655 acres foraging Habitat, and
    (2) At least 280 acres low quality foraging, and
    (3) No more than 1/3 of the remaining suitable habitat may be harvested during the life of the THP

VII. Information based Take Avoidance

As an alternative to the general take avoidance (**VI. General Habitat Protection** above) the Service recognizes the risk of NSO being harmed (as defined by the ESA) by timber harvest is dependent on:

1) the degree of change to NSO habitat from harvest, and,
2) the proximity of harvest activities to areas being used by NSO.

For example, harvesting that significantly modifies and degrades existing habitat within an occupied core use area poses a higher risk than harvesting that maintains habitat conditions and occurs outside the core use area. As noted in the Service's letter dated May 22, 2008,(USDI FWS 2008b) and reiterated above, the evaluation of impacts to NSO resulting from forest management is most appropriately done using site-specific information. Complete and accurate information regarding past and present NSO surveys (positive and negative); NSO locations; NSO habitat quantity, quality, and spatial arrangement; barred owl presence in the vicinity; and post-harvest conditions allows for more effective conservation of NSO and reduces unnecessary constraints on timber landowners. The following are examples of how information based take avoidance determinations can be made.

1. Information based delineation of Activity Centers.

The "best of detections" concept, described in the definition of an activity center in the revised survey protocol, should consider how an activity center has been used in addition to when it was used by spotted owls. For example, successful nest sites are more important than daytime roosts, which are better than nighttime roosts, which are better than single owls, etc. All activity centers within a home range should be considered, however, not all activity centers are of equal value and site-specific information may be useful in determining which activity centers require more or less protection. For example, activity centers based on multiple detections of single NSO or non-nesting pairs may not be as important as actual nest sites, especially sites where NSO have successfully fledged young or that have been used for multiple years. When the survey history for a particular NSO territory allows, several activity centers may be grouped or consolidated logically into an area that represents a single NSO territory with multiple activity centers. Project proponents are encouraged to work with all adjacent landowners whose property may be affected. Proposals to

group or consolidate activity centers require approval by NSO review team agencies and early collaboration on this is encouraged.

2. Information based core use area delineation.

When a single NSO home range contains multiple activity centers, a core use area should be delineated based on site-specific survey data concerning owl detections or lack thereof, habitat configuration, and abiotic variables such as slope, aspect, or elevation. These core use areas need not be circular, but should encompass the approximate quantity and quality of habitat described in Section VI General habitat protection.

Information based Habitat Protection.

Satellite imagery and knowledge from the field can help to identify core use area boundaries. Project proponents are encouraged to work with all adjacent landowners whose property may be affected when proposing to use non-circular core use areas in Timber Harvest Plans (THPs). Proposals to apply non-circular cores in THPs require approval by NSO review team agencies and early coordination on these proposals is encouraged. Once a non-circular core use area is delineated and approved, the polygon must be recorded and submitted to NSO review team agencies. Once recorded, the polygon should not be changed for the purposes of subsequent take avoidance determinations. Adjustments can be made to these non-circular polygons based on survey data if necessary but such changes should be made cautiously with the objective of including the best available activity centers and habitat within a particular NSO core use area.

3. Information based home range delineation.

Home ranges can be delineated using site-specific survey data concerning owl (NSO and BDOW) detections or lack thereof, habitat configuration, and abiotic variables such as slope, aspect, or elevation. Using satellite imagery and knowledge from the field, non-circular home ranges should be delineated to include a logical area that encompasses the best available NSO habitat. Home ranges should be large enough (1,336 to 2,000 acres) to support a reproductive pair of spotted owls and their offspring. Once delineated, further operations within the non-circular home range should not occur. Project proponents are encouraged to work with all adjacent landowners whose property may be affected and to pre-consult with NSO review team agencies when proposing to use non-circular Home Ranges in THPs. We encourage the delineation of non-circular home ranges when they provide improved conservation benefits for NSO by identifying the best available habitat and minimize unnecessary constraints on landowners.

Where habitat is available, non-circular home ranges and cores will contain approximately the same amount of area and habitat that would be retained in a standard circular configuration (about 400 acres of habitat in a 500 acre core use area and about 1,336 acres of habitat within the home range). When delineating a non-circular core use area and home range, all affected landowners (i.e., property on which the habitat is identified and delineated) should be included and concur that the delineated habitat polygon is acceptable. Once a non-circular home range or core use area is delineated, it must be recorded (with NSO review team agencies as noted above) and used for

subsequent take avoidance analyses. Adjustments can be made to these non-circular polygons based on survey data if necessary but such changes should be made cautiously with the objective of protecting the best available habitat within a particular NSO home range.

4. Information based survey area delineation

In some cases, surveys out to 1.3 miles from the project area may not be necessary to avoid take, particularly when previous surveys have been conducted and timber harvesting will maintain habitat type immediately post-harvest (i.e., following light, single tree selection harvesting rather than clearcutting). Based on existing information and historical survey data concerning spotted owl and barred owl detections or lack thereof, habitat configuration, and abiotic variables such as slope, aspect, or elevation a modified survey area may be proposed. Project proponents are encouraged to pre-consult with NSO review team agencies when proposing to use modified survey areas THPs. Proposals to use modified survey areas in THPs require approval by NSO review team agencies. To avoid surveying very large areas when the potential impacts to NSO from proposed timber operations are relatively minor, we encourage the use of focused surveys out to 0.25 miles of the project area when habitat type will remain unchanged immediately post-harvest.

5. Information based use of spot check surveys

It may be acceptable to continue using spot check surveys beyond year 4 in areas with long survey histories. Project proponents are encouraged to pre-consult with NSO review team agencies when proposing to continue spot checks beyond year 4 in THPs. Proposals to continue spot checks beyond year 4 in THPs require approval by NSO review team agencies.

6. Information based Habitat Protection

In order to avoid take, please use the following:

1) Retain the best available habitat over at least 40% of the area (1,336 acres within a roughly 3,400 acre polygon centered on the AC).
2) If a non-circular home range is delineated based on site-specific circumstances, the area comprising the home range should include the best available habitat closest to the activity center and be at least 1,336 to 2,000 acres in size. Once delineated, further operations within the non-circular home range should not occur unless approved by the NSO review team agencies. Operations should not be deleterious to owls. Operations that improve or maintain habitat into the future could be approved if justified.
3) Within core use area retain at least 400 acres of Nesting/Roosting/Foraging NSO habitat, post-harvest, as follows:
    a. Retain 250 acres of nesting/roosting habitat within the core use area surrounding the activity center. One hundred of these acres should be contiguous, or as contiguous as possible with the activity center.

b. Retain an additional 150 acres of nesting/roosting or foraging habitat, within the delineated core use area.

c. Retained habitat should be within the same drainage, if possible.

d. No operations should be conducted during the breeding season in an occupied core use area. Outside the breeding season or when a core use area has been shown to be non-occupied, operations may be conducted but habitat shall not be downgraded.

4) If a non-circular core use area is delineated based on site-specific circumstances, the area comprising the core should be a minimum of 500 acres in size and should contain the best available habitat, generally within the same drainage and as close as possible to the activity center. Once delineated, further operations within the non-circular core use area should not occur unless approved by the NSO review team agencies.

VIII. Timber operations that modify habitat

Operations within a Core Use Area or Home Range: For operations within the core use area or home range, see **VII. 6. Information based Habitat Protection** above. If a circular home range is used (1.3 mile radius), there may be areas that may be harvested without substantial risk to NSO if those areas are in abiotically unfavorable positions such as near ridgetops or on the opposite side of a ridge from the activity center.

For unoccupied activity centers, the habitat retention values included in **VII. 6. Information based Habitat Protection** (quality and quantity) should be maintained. This is because NSO are known to reoccupy previously used sites 8 or more years after they were last detected (Dugger et al. 2009) and modifications to previously occupied sites may preclude NSO returning to these sites. To determine the likelihood of reoccupancy, consider the survey history (repeated negative surveys), the status of the activity center (successful nest, pair, resident single), and changes to the quality and quantity of the habitat that have occurred since the site was last known to be occupied. If barred owls have been detected within 1.3 miles of the activity center, caution should be applied in determining occupancy. Some activity center locations, particularly those representing night time detections of single NSO at the periphery of home ranges may be of low value to the overall suitability of the home range and may require less protection.

IX. Timber operations that do not modify spotted owl habitat

Timber harvest that does not change the function of the existing NSO habitat within a core use area or home range may require less pre and post-harvest habitat analysis and mapping, and less rigorous survey methods because any NSO currently using the area should continue using it immediately following the harvest. In these cases, it should be demonstrated in the THP or Notice of Timber Operations (for an NTMP) that habitat will not be downgraded (i.e, no change in function for nesting, roosting, foraging).

Where there is existing NSO habitat prior to harvesting and that habitat will continue to function equally after harvest (no downgrade), surveys only need to cover harvested areas, and areas out to a

distance of 0.25 miles (assuming any NSO nesting within 0.25 miles of the harvest area will be detected and protected, and any NSO using the area for foraging will continue to be able to do so). No timber harvesting should be conducted within occupied core use areas during the breeding season to avoid disrupting courtship, nesting, or juvenile owls that are still dependent on adults. Proposals to conduct Timber Operations within 0.25 miles of an activity center require approval by NSO review team agencies and early coordination is encouraged. Timber harvest outside of 0.25 miles but within the core, no more than 40 percent of the existing NSO habitat should be treated during any 10 year period.

X. Road Use

To avoid take of NSO from noise disturbance (USDI FWS 2006) no road maintenance or use within 0.25 mile (1,320 feet) of an occupied NSO activity center during the breeding season should occur, unless:

1) Activity center searches (see Appendix 1., Glossary of Terms in the revised survey protocol) conducted after June 1 determine that NSO are not nesting or nesting has failed (no juvenile owls are present), or,
2) The road receives year-round use and proposed operations will not exceed ambient noise conditions.
3) Proposals to use or maintain roads within 0.25 miles of an activity center during the breeding season require approval by NSO review team agencies and early coordination is encouraged.

Deviations to the above road use guidelines may be proposed depending on noise minimization measures (e.g., speed limits and compression braking restrictions), duration, extent, frequency, and distance of the noise source to the activity center. Additionally topography, dense vegetation, or other factors that attenuate noise may be considered and noise restrictions may be waived or minimized by NSO review team agencies.

Regardless of the time of year, no new road construction should occur within the core use area unless the site specific circumstances and potential changes to habitat are carefully considered. For example, outside the breeding season, construction of a new road segment through non-habitat or low quality foraging habitat at the periphery of the core use area that has ample amounts of high quality habitat (over 250 acres of nesting/roosting habitat), would not likely result in take.

XI. Information quality and organization required for take avoidance determinations

As described above, determining the potential impacts to NSO from timber operations requires several pieces of information: 1) surveys must be conducted so that there is a high degree of certainty regarding the presence of NSO and BDOW within the project area; 2) habitat typing must be accurate and relative to NSO; and 3) the proposed operations must be clearly described. The following information is often necessary to determine take avoidance:

1) Surveys must meet the intent of the revised survey protocol. Project proponents may need to seek assistance from a qualified wildlife biologist familiar with NSO habitat

relationships, life history, and ecology to prepare and present a biologically sound justification for approaches that deviate from methodologies described in the revised survey protocol. Pre-consultation with reviewing agencies is encouraged.

2) Habitat must be typed accurately to capture within stand variability that is important to NSO, see **IV. Pre-Harvest and Post-Harvest Habitat Typing** (above).
3) Timber operations must be clearly described. Any effects to NSO habitat must be described so the degree of change caused by the proposed timber operations to NSO habitat is clear.
4) All THPs or other activities that may affect NSO habitat that are located within a given NSO territory must be considered collectively to determine the potential for cumulative **i**mpacts to occur.

XII. Conclusions

We have provided this guidance to assist landowners, Registered Professional Foresters, and State agencies in the interior portion of the geographic range of the NSO in northern California in making NSO take avoidance determinations. We have provided examples of how site-specific information can be used to make biologically rational determinations that take of NSO will be avoided. These determinations may require a knowledgeable biologist to assess the appropriateness of survey methods, assess the habitat conditions, and assess the potential effects of proposed timber operations on NSO. We encourage project proponents to apply site specific information to develop defensible recommendations. In the absence of site-specific information the **V. General Take Avoidance** guidelines (above) will provide a reasonable level of confidence that take of NSO will be avoided.

XIII. Definitions

This section clarifies, but does not replace several terms used in the analysis of take avoidance of NSO within the interior of northern California. Several of these terms are defined in the revised survey protocol.

Activity Center (AC) (defined in the revised survey protocol, Appendix 1, Glossary of terms). An area where a resident single or pair of spotted owls have demonstrated concentrated use. There may be multiple activity centers within an NSO territory as owls move from year to year or are detected within their home range in different locations over a series of years.

Core Use Area (inland) (revised survey protocol, Appendix 1, Glossary of terms). In the absence of site-specific data, the Core Use Area (core) is the 502 acres in a 0.5 mile radius circle surrounding the activity center.

Breeding Season (defined in the revised survey protocol, Appendix 1, Glossary of terms). For the interior northern California the breeding season is February 1st through August 31st and includes courtship, nesting, nestling, and fledgling dependency periods.

Degrade Habitat: signifies when treatments have a negative influence on the quality of habitat due to the removal or reduction of NSO habitat elements but not to the degree where the existing habitat function is changed.

Downgrade Habitat: applies to treatments that reduce habitat elements to the degree the habitat will not function in the capacity that exists pre-treatment, but the activities will not remove habitat entirely (i.e., downgrade from nesting/roosting to foraging or low quality foraging habitat). A Downgrade of habitat can skip intermediate conditions, for example when High Quality Nesting/Roosting habitat changes to Low Quality Foraging. The larger the degree of change, the more likely that impacts to NSO will occur.

Home Range: (defined in the revised survey protocol, Appendix 1, Glossary of terms). In the absence of site-specific data, the Home Range is a 1.3 mile radius circle centered on the activity center (see Figure A1 of the revised survey protocol).

Interior Habitat Definitions:

a. Nesting/roosting
    i. High quality nesting/roosting habitat
        1. Basal area = 210+ square feet, **and**
        2. > 15" quadratic mean diameter (QMD), **and**
        3. > 8 trees per acre (TPA) of trees > 26" in diameter at breast height (DBH), **and**
        4. > 60% canopy closure
        5. Fairly open understory through which owls can fly in a multi-layered, multi-species forest structure
    ii. Nesting/roosting habitat
        1. A mix of basal areas ranging from 150-180+ square feet, **and**
        2. > 15" QMD, and
        3. > 8 TPA of trees > 26" DBH, **and**
        4. > 60% canopy closure
        5. Fairly open understory through which owls can fly in a multi-layered, multi-species forest structure.
b. Foraging
    i. Foraging habitat (owls can forage in high quality nesting and nesting/roosting described above. Foraging habitat just lacks the mature forest conditions (nest sites) found in these higher quality types)
        1. A mix of basal areas ranging from 120-180 + square feet, **and**
        2. > 13" QMD, and
        3. ≥5 TPA of trees > 26" DBH, **and**
        4. A mix of 40%-100% canopy closure
        5. Foraging habitat must generally have some higher quality habitat nearby (within 0.5 miles)
    ii. Low quality foraging habitat
        1. l. A mix of basal areas ranging from 80-120+ square feet, **and**
        2. l1" QMD, **and**

3. 40% canopy closure

Spotted owls also forage in more open vegetation types than those listed above including the edges between heavily forested areas and brushy openings. However, for the purposes of take avoidance determinations, the quantity and quality of habitat types described above have been shown to increase the persistence of spotted owls in known home ranges following timber harvesting (USDI FWS 2009).

NSO Review agencies: Review Team Members as defined in the California Forest Practice Rules, 14 CCR Section 1037.5, including, CDFW and CAL FIRE. The Service may be requested by CALFIRE when appropriate to assist as an advisor in the plan review process.

Survey Area (inland) (defined in revised survey protocol, Appendix 1, Glossary of terms). The survey area includes all areas of NSO habitat within 1.3 miles of the project (THP) area where habitat modification or noise may affect NSO. Surveys should cover all areas where an NSO response to broadcast vocalizations may be elicited.

Survey Dates (defined in the revised survey protocol, Appendix 1, Glossary of terms). For the interior of northern California surveys may begin March 15. As described in the revised survey protocol Section 5.5 (4) at least one complete visit should be conducted in April, one in May, and one in June. For "activity center Searches" and spot check surveys no fixed date is set, but the revised survey protocol should be followed.

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