

**Biological Opinion and Letter of Concurrence
for Effects to Bald Eagles, Marbled Murrelets,
Northern Spotted Owls, Bull Trout,
and Designated Critical Habitat for Marbled Murrelets
and Northern Spotted Owls
from Olympic National Forest Program of Activities
for August 5, 2003, to December 31, 2008
(FWS Reference Number 1-3-03-F-0833)**

U.S. Department of the Interior
U.S. Fish and Wildlife Service
Western Washington Fish and Wildlife Office
Lacey, Washington
August 2003

Our beloved programmatic assessment
Was becoming a horrible messment
But we knew if we could
Make it once again good
It would be a tremendous successment.

So we gathered with great dedication
To update all the old information
So that fishes and fowls
Even silly old owls
Would not have to face extirpation.

Through hard days and long nights we did struggle
To amend and adjust and debuggle
All the standards and rules
And mitigational tools
That make “take” such a difficult juggle.

And so now you have here before you
A new product we hope will assure you
If you stay in its bounds
When disturbing the grounds
It will work, not against you, but for you.

By Ward Hoffman
Forest Plan Monitoring and NEPA Coordinator
Olympic National Forest
January 2003

This Programmatic BO is the result of the effort of the following biologists:

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CONSULTATION HISTORY

The U.S. Fish and Wildlife Service (FWS) completed a consultation (USDI 1994) on Alternative 9 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 USDI 1994a). National Forest Plans and Bureau of Land Management Resource Area Plans were amended by the Record of Decision (ROD) for *Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (also known as the Northwest Forest Plan) (USDA and USDI 1994b).

In the Biological Opinion (BO) for the Northwest Forest Plan (NWFP), FWS determined that the adoption of the NWFP would not jeopardize the continued existence of listed species or result in adverse modification or destruction of designated critical habitat. However, because the NWFP is a range-wide management strategy, FWS did not quantify incidental take for site-specific management actions. Thus, incidental-take assessments were deferred to future consultations such as this one.

An assumption in the BO for the NWFP was that all future actions would be consistent with the NWFP. FWS assumes that U.S. Forest Service (USFS) projects are designed to be in compliance with the NWFP. Through Level 1 Team reviews, projects will be reviewed for compliance with the NWFP and existing programmatic consultations. The Olympic National Forest (ONF) 2003-2008 Biological Assessment (BA) (USDA 2003; herein referred to as “the Programmatic BA”) on which this programmatic BO is based appears to be in compliance in that all NWFP and Land and Resource Management Plan standards and guidelines are being implemented, including the Aquatic Conservation Strategy.

On February 28, 2003, ONF submitted a draft BA for this effort, and we received a written request from the ONF for informal and formal consultation on April 9, 2003. The Level 1 Team concurred that this draft BA was sufficient for FWS to begin writing the BO, realizing at that time that further work was required by both ONF and FWS to finalize the document. The final draft BA was developed through interagency collaboration and was based on the May 2002, programmatic consultation for ONF (USDI 2002). Changes to what became the final BA for this BO (USDA 2003) continued up to August 3 2003, as personnel in both ONF and FWS improved and revised the expected level of activities in various programs and analyses of those effects. Through adaptive management and monitoring of previous ONF programmatic consultations, this programmatic consultation contains revised analysis procedures based on best-available science. This BO also is more comprehensive than the 2002 BO (USDI 2002) in that it addresses all federally listed species occurring in ONF: marbled murrelet (murrelet) (*Brachyramphus marmoratus*), northern spotted owl (spotted owl) (*Strix occidentalis caurina*), bald eagle (*Haliaeetus leucocephalus*), bull trout (*Salvelinus confluentus*), and critical habitat for marbled murrelets and northern spotted owl, for routine land management actions on ONF. This BO is also based on information contained in the *Forest Ecosystem Management Assessment Team Report* (FEMAT) (USDA et al. 1993) and the Streamlined Consultation Procedures for section 7

of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA) (USDA et al. 1999).

This programmatic consultation covers actions that are “not likely to adversely affect” (NLAA) bull trout, bald eagle, spotted owl, and murrelet, as well as actions that are “likely to adversely affect” (LAA) spotted owl and murrelet and their designated critical habitat.

With respect to the murrelet, this BO is also based upon: the 1988 Status Review (Marshall 1988); final rule designating the murrelet as threatened (57 FR 45328) (USDI 1992a); final rule designating critical habitat for the species (61 FR 26256) (USDI 1996); *Recovery Plan for the Threatened Marbled Murrelet in Washington, Oregon, and California* (USDI 1997a); *Forest Habitat Relationships of Marbled Murrelets in Western Washington* (Hamer et al. 1994a); and *Ecology and Conservation of the Marbled Murrelet* (Ralph et al. 1995a).

With respect to the spotted owl, this BO is also based upon: the 1990 Status Review (USDI 1990a); final rule listing the spotted owl as threatened (USDI 1990b; 55 FR 26114); final rule designating critical habitat (USDI 1992b; 57 FR 1796); *Final Draft Recovery Plan for the Northern Spotted Owl* (USDI 1992c); Interagency Scientific Committee (ISC) Report (Thomas et al. 1990); Scientific Analysis Team (SAT) Report (Thomas et al. 1993); *Spotted Owl Habitat in Washington: A Report to the Washington Forest Practices Board* by the Spotted Owl Scientific Advisory Group (SAG) (Hanson et al. 1993); Proposed 4(d) Special Rule (USDI 1995a; 60 FR 9484); *Environmental baseline update for the Northern Spotted Owl in Olympic National Forest and Washington Olympic Peninsula Physiographic Province* (USDI 2001a); and *2001 Rangewide Baseline Summary, Final Report* (USDI 2001b).

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Scope of Consultation

This document is a multiple-program BO for USFS activities that are expected to occur on ONF. It does not cover activities conducted on nonfederal lands. This consultation is designed to facilitate consultation under the ESA for projects that have a similar design, occur several times a year, and which are likely to adversely affect the murrelet or the spotted owl or their respective critical habitat. This BO covers projects that may adversely affect the murrelet or the spotted owl or their respective critical habitat. The enclosed letter of concurrence addresses ONF actions that are not likely to adversely affect the bald eagle and bull trout. This consultation expires on September 30, 2008.

Consultation Process

Section 7(a)(1) of the ESA requires federal agencies to carry out their programs for the conservation of listed endangered and threatened species. Section 7(a)(2) of the ESA requires federal agencies to review actions authorized, funded, or carried out by them to ensure such actions do not jeopardize the continued existence of federally listed species, or result in the destruction or adverse modification of designated critical habitat. This BO evaluates effects of management actions that are consistent with ONF Land and Resource Management Plan (USDA 1990), as amended by the NWFP. Projects and activities implemented as a result of this consultation will be consistent with the intent of minimizing or avoiding adverse effects to federally listed species and designated critical habitat.

Up-front coordination between ONF and FWS is encouraged for large, complex, or innovative projects or projects where effects determinations may not be well defined. Prior to project implementation, ONF terrestrial and aquatic biologists will evaluate the project for consistency with this BO. If a project is found to be consistent, ONF biologists will complete the Project Consistency Evaluation Form (PCEF) (Appendix A) with a description of the proposed project and a determination of effects for species and critical habitat. The level of documentation in the PCEF should correspond to the anticipated level of impacts.

PCEFs for projects with No Effect determinations for both aquatic and terrestrial species will be kept in ONF project files and will not require further review.

PCEFs for projects with NLAA or LAA determinations for any aquatic species, terrestrial species, or critical habitat will be sent to the designated ONF Level 1 representative for review and approval. If the project is among the project types that are always NLAA or less for bull trout and NLAA or less for terrestrial species and critical habitat, ONF will provide a tracking form to FWS that lists the program type, project type, and project name. If the project is among the project types that are always NLAA or less for bull trout, and adverse impacts to terrestrial species are limited to noise disturbance to spotted owls or murrelets or removal of hazard trees, ONF will provide a tracking form to FWS which lists the program type, project type, project name, acres of harassment, and the number of suitable hazard trees felled. No further consultation will be necessary for these projects. If the project is among the project types that maybe LAA for bull trout, or adverse impacts may occur to terrestrial species from effects other than noise disturbance or removal of hazard trees, or if site-specific conditions warrant different harassment distances for spotted owls or murrelets, the project will be reviewed by the Level 1 Team.

Projects are assumed to always be NLAA for bull trout if the project is located in a 5th-field watershed that only contains migrating bull trout; if the project is among the project types that are designated as “Always NLAA” for bull trout in Appendix O; or if the project is designated as “May be LAA” for bull trout in Appendix O and the project meets all of the following criteria to limit bull trout impacts:

- a. The project does not include any instream work within ¼ mile of occupied or presumed occupied bull trout spawning or rearing habitat within the Skokomish, Dungeness, Elwha, Hoh, Queets, and Quinault watersheds.
- b. The project does not include any Watershed Restoration Activities that exceed the “flag” for potential slope stability problems under Conservation Measures for all Watershed Restoration Activities No. 4 within watersheds containing spawning populations of bull trout.
- c. The project does not include any landslide stabilization activities that involve heavy equipment within watersheds containing spawning populations of bull trout.
- d. The project does not include any overstory canopy removal within 100 feet of stream channels within watersheds containing spawning populations of bull trout.

All consultation requests under this programmatic utilizing the PCEF documentation shall be submitted no later than ten business days prior to the scheduled Level 1 meeting for which they are proposed for final review and concurrence.

The Level 1 Team will resolve any concerns raised by FWS or USFS. If conflicts cannot be resolved, they will be elevated to the Level 2 Team.

If a project is found to be inconsistent with this BO and will result in an effect to a listed species that is outside the scope of this consultation, a separate Biological Assessment will be prepared by ONF and submitted to the Level 1 Team. The project could also be submitted as part of a batched BA.

If a proposed project is consistent with a project type described in this BO and the potential effects to one or more listed species or critical habitats are consistent with those covered under this BO but potential effects to another listed species are beyond those covered in this document, the PCEF will provide adequate documentation and analysis for those species and critical habitats that are consistent with this BO. The separate BA only needs to evaluate effects for the listed species where the effects determination is inconsistent with this BO. The separate BA and the PCEF will be submitted to FWS in one package.

Upon completion of any project resulting in a LAA determination for any species, the project leader will complete the Monitoring Form and submit it to the appropriate district wildlife and fishery biologists for evaluation of effects. On an annual basis, ONF will prepare a summary report for the Level 1 Team that displays the number of projects and project types by watershed approved as consistent with the BO. For those projects ongoing for more than one year, a monitoring form will be completed at the end of each fiscal year until the project is completed. On an annual basis, ONF will prepare a monitoring report for the Level 1 Team displaying anticipated versus actual effects from projects completed or ongoing throughout the fiscal year. The monitoring report will be submitted to FWS no later than February 15 each year. The Level 1 Team will review monitoring reports to ensure consultation intent is being met, or to modify guidance, if necessary. Periodic monitoring reviews of ongoing or recently completed projects will also be conducted by the Level 1 Team to ensure that requirements are adequately

incorporated into contracts and compliance monitoring visits will be conducted to ensure that projects have been implemented as designed.

Systematic monitoring and review are crucial steps in measuring successes of this streamlined multi-program, multi-year programmatic consultation, as well as to provide needed adjustments in a timely and efficient manner. Projects and activities implemented as a result of this consultation will not be considered in compliance with the BO if they are not included in monitoring reports. The Level 1 Streamlining Team will develop a monitoring form. Special site or project specific conditions may call for additions to the generalized monitoring requirements. The determination of these requirements will be made at the Level 1 review of the proposed project.

Process for Updating and Revising

Through use of this document, monitoring of activities implemented under it, and new information, we may identify changes that are needed. When changes are substantial enough in number or content to warrant an update of this BO, FWS will work with ONF to make adjustments as appropriate. The Level 1 Team will review proposed changes. When the proposed changes do not alter the means by which effects are determined, Level 1 agreement for change is sufficient otherwise ONF will reinitiate consultation. If additional species become listed under the ESA, ONF will work with FWS to incorporate the species into this BO through a re-initiation of consultation.

Limitations and Assumptions

Only ONF actions (including issuance of special use permits, easements, and right-of-ways) and cooperative projects in which ONF plays a direct role in designing and implementing the project are covered under this BO. Activities conducted on National Forest lands by any other agencies or groups or their contractors, permittees, licensees, leasees, grantees, or agents are not covered by this BO, but must be addressed in separate consultations by those respective agencies. The federal action of ONF issuing an easement or right-of-way may be covered as an interrelated and interdependent action through the consultation conducted with the other agencies regarding the larger action.

Nonfederal activities over which ONF has no control, such as unauthorized flights and illegal actions, and emergency situations (natural disasters or other calamities) are not addressed in this BO. Emergency situations involving an act of nature, casualties, national defense or security emergencies, etc., including response activities that must be taken to prevent imminent loss of human life or property will be consulted on separately, utilizing the emergency consultation process (50 CFR §402.05). A description of how the emergency consultation process works can be found in the ESA Consultation Handbook (USDI 1998).

Habitat modification activities on National Forest lands as outlined in the BO will not change the habitat suitability category for federally listed species. For example, if habitat is determined to be suitable for spotted owl dispersal prior to implementation of a habitat modification activity, that

habitat will be suitable for spotted owl dispersal after project implementation. Habitat structure and quality, however, may change. These habitat quality changes may be neutral, beneficial, or may result in short-term adverse effects. Exceptions in this include road and trail access to nonfederal lands through federal lands when there is no other viable or economical alternative. No more than 30 acres of dispersal for the northern spotted owl may be removed during road or trail access permits. Up to 163 acres of dispersal habitat may be removed during new road construction and temporary road construction to access commercial and uneven-aged management areas for silvicultural treatments. Temporary roads would be closed, or decommissioned following use and would result in a short-term loss of dispersal habitat during harvest activities.

Access to timber harvest on nonfederal lands may change habitat suitability on nonfederal lands. For spotted owls and marbled murrelets covered by this BO, effects from access across federal lands is assessed, and only removal of spotted owl dispersal habitat on nonfederal land is assessed through the cumulative effects analysis (see Lands and Special Uses Program) unless the removal of habitat for both species has already been assessed by a Habitat Conservation Plan, or other authorization under the ESA. Adverse effects to any listed or proposed species on nonfederal lands will not be authorized through this programmatic consultation regarding road-use permits or other access-related projects.

Northwest Forest Plan Consistency

Through the NWFP, USFS and Bureau of Land Management adopted a plan for their lands that provides a long-term conservation management strategy for murrelets and spotted owls (USDA and USDI 1994b). This document tiers to the BO (USDI 1994) prepared for the NWFP (USDA and USDI 1994a). Consistency with the standards and guidelines contained in the Record of Decision (USDA and USDI 1994b) for the NWFP is a key element in this consultation, because many projects that will be addressed under this programmatic consultation will be in or adjacent to, suitable nesting habitat for the murrelet and spotted owl. The NWFP includes an overall strategy to benefit late-successional associated species, such as the spotted owl and murrelet, through the establishment of a series of Late-Successional Reserves (LSRs). Within LSRs, timber management may be conducted in stands less than 80-years-old if it is anticipated to be beneficial to late-successional related species (ROD: C-12). Non-timber activities must be beneficial or neutral to late-successional species (ROD: C-16).

LSRs are designed to form the basis of spotted owl conservation. In addition, 100 acres of the best habitat will be retained as close to the nest site or activity center as possible for all known (as of January 1, 1994) spotted owl activity centers located on federal lands in the matrix or Adaptive Management Areas (ROD:C-10). Timber management activities within the 100-acre area should comply with management guidelines for LSRs. Management around these areas will be designed to reduce risk of natural disturbance. These areas are to be maintained even if spotted owls no longer occupied them because these areas are considered important to meeting objectives for species other than spotted owls.

The Final Marbled Murrelet Recovery Plan, completed in 1997 (USDI 1997a), determined that suitable habitat in LSRs and the Olympic Adaptive Management Area (AMA) is essential for the recovery of the murrelet within the State of Washington.

Adaptive-Management Approach

For the duration of this programmatic consultation, FWS and ONF expect to gather additional information regarding projects and their implementation, conservation measures, effects upon species and their habitats, and the agencies' processes of monitoring, tracking, and communication. We expect to utilize that information through the Level 1 Team to adjust our approach under this programmatic consultation. For instance, if we discover that more-effective conservation measures can be logistically employed, existing conservation measures may be replaced with more effective or efficient conservation measures. Activities conducted under certain situations may be interpreted currently as having certain levels of effects; however, based on new information, those interpretations may be changed through additional information. For example, if it is determined that more appropriate dates are available to separate early and late breeding seasons, or if it is determined that more-appropriate distance thresholds are available based on noise attenuation and/or the reaction of murrelets and spotted owls to sights or sounds at various levels, we would amend our effects determinations to correspond with the best-available science. This adaptive-management approach is expected to operate in conjunction with the reinitiation criteria (50 CFR 402.16); for example, if the amount of take anticipated increase beyond the amount anticipated in this document, then ONF would reinitiate consultation.

CONCURRENCE FOR BALD EAGLE AND BULL TROUT

Bald Eagle

FWS concurs with ONF's determination that the proposed Programs and Activities, with all applicable project design criteria and conservation measures, are not likely to adversely affect the bald eagle. The following conservation measures for bald eagles were taken from the Programmatic BA (USDA 2003 Table G-3).

Habitat Removal

1. Activities within a bald eagle use area (Bald Eagle Management Area as described in the Olympic NF LRMP, known nest territory, known winter roost sites, and concentrated winter foraging areas) will not alter, remove, reduce or degrade eagle habitat, nor will adversely impact the eagles' primary food sources or foraging areas.

Individual Trees

2. Known (occupied or historic) bald eagle nest trees or trees adjacent to known (occupied or historic) nest trees will not be felled.
3. When feasible, minimize the number of large conifers (21 inches dbh, or greater) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from roosting or nesting habitat if it is possible and safe to do so.
4. Any proposed removal of any tree greater than 36 inches dbh within a bald eagle use area will require an ONF wildlife biologist review.

Active Nest

5. If an active bald eagle nest is found, a ONF wildlife biologist will be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances as presented in USDA (2003) Table G-3 will be prohibited during the bald eagle nesting season (January 1 to August 15).

Ground-Level Disturbance

6. When feasible, design projects to occur outside the appropriate season (breeding and/or wintering) and outside Bald Eagle Management Areas.
7. When feasible, adjust the location of activities to utilize topographic and vegetative buffers.

Aircraft

8. During the bald eagle breeding season (January 1 to August 15), overflights will be restricted to a minimum altitude of 1000 feet within 1 mile of an active nest or nest of unknown status.
9. From November 1 through March 15, overflights will be restricted to a minimum altitude of 1000 feet within 1 mile of a bald eagle wintering area.

Prescribed Burning

10. Burning during the nesting season for bald eagles (January 1 to August 15) will be conducted 1 mile away from a bald eagle use area.
11. Burning during the wintering period (October 31 through March 15) will be conducted 1 mile away from a bald eagle use area.

Blasting

Appendix M presents blasting guidelines.

As a result of the above-listed conservation measures, all Programs and Activities will be conducted in a manner consistent with all Bald Eagle Management Plans. No known nest tree, roost tree, or perch tree will be removed. In addition, no disturbance will occur during the

nesting period (January 1 to August 15) or in key winter habitats, such as roosting and foraging areas, from October 31 to March 15. The following distances from bald eagle use areas will be followed: explosives – 1 mile; impact pile drivers, jackhammers, or rock drills – 0.25 mile (no line-of-sight) or 0.50 mile (line-of-sight); helicopters and airplanes – 1 mile or a minimum altitude of 1,000 feet; heavy equipment and motorized tools – 0.25 mile (no line-of-sight) or 0.50 mile (line-of-sight), prescribed burning – 1 mile. These distances are consistent with the recommendations in the Bald Eagle Recovery Plan (USDI 1986).

The *only* Program that has the potential to affect bald eagle habitat is Hazard Tree Removal. The Hazard Tree Removal Program shall occur along roads and in human-use areas such as campgrounds and administrative sites. Again, no known bald eagle use areas would be affected; therefore, the risk of the Hazard Tree Removal Program is the felling of unknown perch or roost trees. The felling of an unknown nest tree is highly unlikely given the visibility of the nest structure in many cases and the visibility of the bald eagles that are readily identified even by casual forest users. Most roost and perch trees occur within 1 mile of a large water body or river that supports a large prey base (fish). Hazard tree felling in developed sites and along roads near lakes and rivers may remove unknown bald eagle perch or roost trees. Hazard trees are usually along heavily used roads thereby reducing the potential risk of felling a roost or perch tree due to lack of use by bald eagles because of human presence or the high likelihood that perch or roost sites would be detected because of the high human use in the area. Hazard tree removal along trails will not be standing trees, but trees leaning over trails (root-sprung trees) or partially fallen trees which are not likely to be used as roost or perch trees by bald eagles. Roost and perch trees outside of known use areas are generally not a limited resource for bald eagles on ONF. Therefore, the risk of felling unknown bald eagle roost or perch trees outside of known use areas is considered insignificant to the bald eagle.

ONF may issue road use and access permits to nonfederal landowners that may facilitate harvest of timber on the nonfederal lands; some Bald Eagle Management Areas are located adjacent to private land. In addition, timber on these lands are generally second growth which usually do not provide the stand structure (large trees) necessary for bald eagle nest, roost and perch trees (USDA 2003). Regardless, this programmatic consultation does *not* cover actions on nonfederal lands associated with the issuance of an ONF Special Use Permit. Any subsequent actions on nonfederal lands would need to be reviewed for the potential to cause the incidental take of a federally listed species for which a section 10 Habitat Conservation Plan or take avoidance agreement would be necessary.

Many program activities such as fuel wood collection, campground maintenance and road maintenance may slightly increase public use of roads on ONF. Increased road use is not expected to be appreciably noticeable and the majority of use will occur on existing high-use roads. Therefore, disturbance to bald eagles is not expected to be appreciably different than current conditions.

The out-placement of salmon carcasses along major rivers would be a food source for bald eagles. All other proposed management actions are not expected to reduce food sources for bald

eagles as no long term adverse effects to aquatic habitats or fish populations are anticipated. Some actions may provide long-term benefits to fisheries which could slightly improve this food source for bald eagles over the long term.

PCEFs for NLAA actions for bald eagles will be forwarded to FWS for review. If a wildlife biologist from ONF or FWS determines through review of project-specific PCEFs that the effects of the action would be adverse to bald eagles or if the action would be conducted in a manner inconsistent with this BO, the Programmatic BA (USDA 2003), or any Program/Activity description or conservation measure, then the proposed activity is *not* covered by this programmatic consultation and would require separate consultation.

Bull Trout

The 5th-field watersheds on the ONF that are known or potentially contain spawning populations of bull trout are the: South Fork Skokomish, Upper North Fork Skokomish, Lower Dungeness, Upper Dungeness, Grey Wolf, Lower Elwah River, Middle Hoh River, Lower Queets River, Salmon River, Matheny Creek, Middle Queets River (Sams River), Lower Quinalt River, Frontal Lake Quinalt, Upper Quinalt River, and Quinalt/Cook. The environmental baseline condition for these watersheds is displayed in Table 4 of the Programmatic BA with narrative discussion supporting Table 4 in Appendix E (USFS 2003).

Migratory bull trout may occur in other 5th-field watersheds adjacent to watersheds with bull trout spawning populations. Fifth-field watersheds where migratory bull trout have the potential to occur and which contain at least some ONF lands include the: East Fork Humptulips, West Fork Humptulips, Stevens Creek, East Fork Satsop, Middle Fork Satsop, West Fork Satsop, Upper Wishkah, Middle Wynoochee, and Lower Wynoochee. With the exception of the Satsop watershed, no bull trout have ever been observed on National Forest lands within these watersheds (R. Metzger, pers. comm. 2003). Focused bull trout surveys within the Satsop watershed have failed to detect bull trout in recent years (R. Metzger, pers. comm. 2003).

The ONF, FWS, and NOAA Fisheries have developed the following process to review proposed actions upon listed and proposed aquatic species; the following discussion will be limited to bull trout. This consultation only authorizes those actions determined to be not likely to adversely affect bull trout. Any action that may adversely affect bull trout or is outside of the scope of these processes would require separate consultation under the ESA.

- All proposed actions must be consistent with the Program/Activity Descriptions and all applicable conservation measures specified in the BA and reiterated in the body of the BO.
- Appendix D in USDA (2003) documents the review and consistency determination for each Program/Activity proposed by the ONF with the Aquatic Conservation Strategy (ACS) Objectives in the NWFP. The need to prepare a project-specific ACS Objectives consistency finding is dependent upon the proposed action (see Project Consistency Evaluation Form (PCEF) Process described in detail in the BO under Consultation Process; Step 16).

- Appendix L in USDA (2003) displays the potential worst-case impact to each Matrix of Diagnostics/Pathways and Indicators (Matrix) from implementation of the proposed Program/Activities. The Matrix was completed for each Program/Activity regardless of species. The Matrix displays potential effects at the 5th-field watershed and site-specific scale. The need to prepare a project-specific Matrix is dependent upon the proposed action (see PCEF Process described in detail in the BO under Consultation Process; Step 15).

The Matrix identifies the potential (*worst-case*) for short- and long-term effects to Matrix indicators. Short-term impacts are expected to affect a habitat or species indicator for a period of less than 1 year, but generally occur for a period of hours or days. Long-term impacts may occur for greater than 1 year or may result in permanent changes to baseline conditions. Only short-term impacts that are minimized through site conditions, project design criteria, conservation measures, or other means that would result in a not likely to adversely affect determination for bull trout are authorized in this consultation. Activities that constitute long-term impacts or may adversely affect bull trout are not authorized in this consultation and would require separate consultation under the Act.

- Appendix O contains a list of those Programs/Activities that have been analyzed and determined to be, given all project design criteria and conservation measures, “Always Not Likely to Adversely Affect” or “Maybe Likely to Adversely Affect” bull trout.
- Table 11 in USDA (2003) was developed to assist the Level 1 Team in reaching a final effect determination for proposed actions that are considered “Maybe Likely to Adversely Affect” bull trout and which do not meet the established criteria to minimize potential adverse effects as described in Step 12 of the PCEF Process (see PCEF Process described in detail in the BA under *A Project Consistency Evaluation Form (PCEF) Process for Terrestrial and Aquatic Species*; Steps 12 and 17).
- *A Project Consistency Evaluation Form (PCEF) Process for Terrestrial and Aquatic Species* (Chapter IV, BA) was prepared to guide the review of each proposed action under this programmatic consultation using the above Tables and Appendices.

Use of the above processes will result in a site-specific review and documentation of each proposed action with one of the following potential outcomes:

1. A determination of no effect;
2. A determination of not likely to adversely affect if the action would be located with a migratory-only watershed;
3. A determination of not likely to adversely affect if the action was classified as being “Always Not Likely to Adversely Affect” bull trout (Appendix O) and the action was to occur within a watershed that supports a spawning population of bull trout;
4. A determination of not likely to adversely affect if the action was classified as “Maybe a Likely to Adversely Affect” action (Appendix O) within a watershed that supports a

spawning population of bull trout *and* the action meets specified criteria to reduce potential effects to a not likely to adversely affect determination;

5. A determination of not likely to adversely affect if the action was classified as “Maybe a Likely to Adversely Affect” action (Appendix O) and the action is within a watershed that supports a spawning population of bull trout and does *not* meet the specified criteria to reduce potential effects to a not likely to adversely affect determination, but for which the Level 1 Team would review the site-specific conditions of the proposed action and make a final effect determination of not likely to adversely affect. A determination by the Level 1 Team that the action is likely to adversely affect bull trout would trigger a separate consultation.

1. No Effect Determination by the ONF

If the ONF reviews a proposed action and determines there would be no effect to bull trout, the ONF will complete a PCEF and retain a copy of the PCEF in their project files. The FWS will not review or concur with these effect determinations unless requested by the ONF. No effect determinations will generally result from proposed actions within watersheds that do not support spawning, rearing, or migrating bull trout or for which proposed actions would not effect aquatic habitat (Step 9 in the PCEF Process).

2. Not Likely to Adversely Affect Bull Trout within Migratory-only Watersheds

The FWS concurs with the ONF’s determination that the proposed Programs and Activities, including all applicable conservation measures, if conducted in watersheds that only provide foraging, overwintering or migratory habitat (referred to as migratory-only watersheds) for bull trout are not likely to adversely affect the Coastal/Puget Sound distinct population segment of bull trout. The Coastal-Puget Sound bull trout distinct population segment is unique across the range of bull trout within the coterminous United States due to the presence of anadromous life history morphology in some individuals. Anadromous bull trout are able to move into saltwater and travel to adjacent freshwater rivers and lakes to take advantage of productive foraging opportunities. Watersheds adjacent to bull trout spawning populations may also provide overwintering habitat or migratory corridors between spawning populations. Adult and sub-adult bull trout are the most common migratory life history stages to be found in adjacent watersheds. Migratory bull trout generally utilize the estuaries and lower river areas, but they may occasionally move upstream to the limit of anadromous habitat.

The occurrence of bull trout on ONF lands within the Wynoochie, Satsop, Wishkah, and Humptulips watersheds is unlikely. ONF lands generally include the upper limits of anadromous habitat and headwater areas rather than the larger lower reaches and estuaries where migratory bull trout are most commonly found. Electrofishing, day snorkeling, and night snorkeling surveys conducted by the ONF in 1997, 1999, 2000, and 2001 in the Satsop and Wynoochie basins all failed to detect bull trout (L. Ogg, pers. comm.).

In addition, bull trout have never been observed above the confluence of the East Fork and West Forks of the Humptulips River. ONF lands begin several miles above this point. The watershed assessment team concluded that neither the East Fork nor West Fork Humptulips were likely to support native char populations (Martin and McConnell, 1999). Numerous electrofishing, day snorkeling, and spawning ground surveys completed for other species have failed to document bull trout in the upper watershed.

Although migratory bull trout may occur in watersheds adjacent to bull trout spawning watersheds, their occurrence on ONF lands is expected to be rare. Consequently, there would be, at most, only a low likelihood of presence of bull trout within any project area during the time of construction that may generate short-term effects to the aquatic environment.

Most proposed activities would have no direct effect on aquatic resources. For activities that do have the potential to impact aquatic habitat, project effects would be small, and limited in extent and duration. Primary impacts from these activities would be short-term increases in turbidity and sediment, and the potential for physical disturbance due to instream activities. Prior monitoring has shown that turbidity and/or sediment pulses from the proposed activities would generally occur for no more than a couple of hours at an individual site. Bull trout, if present, would be expected to avoid the site during the sediment/turbidity plume, but would not be expected to experience physiological effects given the small quantities of sediment/turbidity, the short duration of the plume, and their life stage (mature, larger fish). Physical disturbance due to instream activities would be limited to brief periods when heavy equipment was actually crossing a stream channel or a culvert was lifted from or installed into the stream bottom. All instream work activities would be conducted during low summer streamflows, further reducing the likelihood of construction activities occurring during a time when bull trout may be present. One of the standard project conservation measures requires the de-watering of the work-site stream section prior to construction activities. This will further reduce potential water quality degradation.

Based on the small number of projects proposed in “migratory only” bull trout watersheds, the small amount of sediment and turbidity that would potentially be generated by project activities, the short duration of potential effects, the timing of instream activities during the summer low flow period, and the low likelihood of bull trout presence in action areas during project activities, the proposed activities are not anticipated to adversely affect bull trout.

3. Always Not Likely to Adversely Affect Bull Trout

The FWS concurs with the ONF’s determination that the Programs/Activities specified as “Always Not Likely to Adversely Affect” in Appendix O of the Programmatic BA, with all applicable project design criteria and conservation measures, are not likely to adversely affect the Coastal/Puget Sound distinct population segment of bull trout. These Programs/Activities were reviewed by the Level 1 Team and determined to be insignificant and discountable. Although Appendix L may show a short-term degrade for some indicators in the Matrix, these are for a worst-case scenario. When project design criteria and project-specific conservation measures are

applied, these actions are not expected to cause any observable adverse impacts to bull trout or their habitat. The project activity, scale, and/or location would be such that instream effects to bull trout habitat are not anticipated. In-channel work would be limited to culvert cleaning and installation or replacement of culverts on intermittent streams and non-fish bearing streams. Culvert installation and replacement would only occur during summer low flow periods when streamcourses are dry or at minimal flows. One of the standard project conservation measures requires the de-watering of the work-site stream section prior to construction activities. This will further reduce potential water quality degradation. No activities would occur within bull trout spawning or rearing habitat.

Any potential sediment generated by these actions would not be detectable in downstream bull trout habitat. Ground disturbance, if any, would be minimal and would not result in increased erosion or sedimentation into bull trout waters. Sediment control measures (required conservation measures) will limit or avoid sediment inputs to bull trout habitat, especially during spawning periods. Adequate riparian buffers would be maintained to prevent any potential stream temperature increases and maintain adequate sources of future large woody debris. Potential short-term degrades in the Matrix, if any, would be unlikely to occur, minor, localized, and limited to a short period of time. Effects of these short-term degrades in the Matrix indicators would be undetectable within bull trout habitat. There would be no direct handling of bull trout.

4. Given Specified Criteria, These Actions Are Not Likely to Adversely Affect Bull Trout

The FWS concurs that Programs and Activities designated as “Maybe Likely to Adversely Affect” bull trout in Appendix O but which meet the following criteria also are not likely to adversely affect the Coastal/Puget Sound distinct population segment of bull trout (see PCEF process step 12):

- a. The project does not include any instream work within ¼ mile of occupied or presumed occupied bull trout spawning or rearing habitat.
- b. Any blasting and/or pile-driving within 300 feet of potential bull trout spawning habitat between October 15 and April 15 will be reviewed by the Level 1 team to evaluate potential shock damage to eggs or pre-emergent fry. There is a high level of uncertainty regarding the potential for shock or vibration damage from these activities. As of this writing, we assume that any impacts will attenuate rapidly and that blasting and/or pile-driving activities beyond about 300 feet from potential spawning habitat will always be NLAA for bull trout.
- c. The project does not include any Watershed Restoration Activities that exceed the “flag” for potential slope stability problems under conservation measure No. 4 for all Watershed Restoration Activities (see page 68) within watersheds containing spawning populations of bull trout.
- d. The project is not a landslide stabilization activity that involves heavy equipment within watersheds containing spawning populations of bull trout.

- e. The project does not include any overstory canopy removal within 100 feet of stream channels within watersheds containing spawning populations of bull trout.

No projects that involve in-channel work would occur within ¼ mile of occupied or presumed occupied bull trout spawning or rearing habitat in the Skokomish, Dungeness, Elwha, Hoh, Queets, or Quinault 4th-field watersheds. Avoiding instream activities within bull trout habitat will preclude any potential for physical disturbance of bull trout due to project activities. Sediment and turbidity generated from instream activities upstream of bull trout habitat would be limited to short periods and would create only localized impacts. Prior monitoring has shown that turbidity and/or sediment pulses from these types of activities generally occur for no more than a couple of hours at an individual site and that the majority of fine sediment would be expected to settle out within approximately 100 meters of the source (Duncan et al. 1987). Therefore, sediment-related impacts, if any, are not anticipated to extend downstream into bull trout spawning or rearing habitat. All instream activities would be completed during the summer low flow season and would avoid the bull trout spawning period, thereby further reducing the potential to adversely affect bull trout. One of the standard project conservation measures requires that de-watering of the work-site stream section prior to construction activities. This will further reduce potential water quality degradation.

No projects that create unusually unstable slopes or high-risk erosion sites would occur within watersheds containing spawning populations of bull trout. Watershed restoration activities, especially road decommissioning projects have the potential to create future surface erosion or mass wasting problems under certain conditions. The Level 1 team, in conjunction with geologists, geomorphologists, and engineers, identified the site-specific characteristics that may be indicators of future erosion problems. These are listed as slope stability “flags” in Conservation Measure No. 4 for all Watershed Restoration Activities in the ONF BA. Monitoring and past experience indicate that watershed restoration project sites which do not exceed the slope stability “flags” generally result in stable slopes with minimal future erosion problems. Therefore, adverse impacts to bull trout habitat are not anticipated from projects that do not occur at sites that exceed these slope stability indicators for the reasons stated above.

Projects that attempt to stabilize large, existing landslides also have the potential to create future erosion problems that could adversely impact bull trout or their habitat. This potential is greatest for large projects where heavy equipment is used to move or place material. Past experience has shown that small-scale projects utilizing hand crews and small power equipment to stabilize existing landslides do not create large-scale future erosion problems that would adversely impact bull trout. Landslide stabilization projects that utilize heavy equipment are specifically excluded from coverage under this category for this reason. Small-scale landslide stabilization projects utilizing bio-engineering, hand crews, and small power tools are not anticipated to adversely impact bull trout habitat for reasons stated above.

No projects that remove overstory canopy within 100 feet of stream channels would occur within watersheds containing spawning populations of bull trout. Maintaining a 100-foot buffer of vegetation along stream channels would maintain full vegetative shading and preclude any

potential for adverse stream temperature changes due to vegetation removal. Maintaining a 100-foot buffer along stream channels would also provide a vegetated area to filter out any sediments created by project activities from surface waters before they reach stream channels and can be routed to bull trout habitat. Past monitoring and experience has shown that commercial thinning and uneven age management activities rarely create sufficient soil disturbance and compaction to cause sediment to be carried from the site by overland flow. If the vegetated buffer is maintained along stream channels during commercial thinning and uneven age management activities, adverse impacts to bull trout habitat from temperature increases or sediment are not anticipated.

5. Actions That Require Level 1 Concurrence for Not Likely to Adversely Affect Determinations for Bull Trout

For all other proposed actions, a fisheries biologist proposing an effect determination will prepare a site-specific PCEF. The PCEF will be submitted to the Forest's Level 1 fisheries biologist who will confirm the effect determination. If the ONF proposes an effect determination of "not likely to adversely affect" bull trout then the PCEF will be submitted to the Level 1 Team for concurrence by the FWS. Signature on the PCEF by the FWS Level 1 representative will complete consultation on that action. If the effect determination is "likely to adversely affect" bull trout, the action is not covered by this programmatic consultation and would require separate consultation under the Act.

Only effects to spotted owls and murrelets and their respective critical habitats will be considered further in this BO. The potential effects to spotted owls and marbled murrelets and their respective critical habitats were evaluated for all proposed Programs and Activities. Therefore, the body of this BO contains both the concurrence for not likely to adversely affect actions and an analysis of likely to adversely affect actions for these two species and their critical habitats.

ACTION AREA

The proposed actions would be conducted on National Forest System lands on the Olympic Peninsula, in the northwest portion of Washington State (Appendix Figure 1). These lands are located within the Lower Chehalis, Gray's Harbor, Queets-Quinault, Hoh-Quillayute, Crescent-Hoko, Dungeness-Elwha, Sequim Bay, Hood Canal, and Skokomish basins.

Although actions conducted under this programmatic consultation will occur on National Forest system lands, direct and indirect effects may occur on adjacent or interspersed nonfederal lands. Therefore, consideration of effects extends more broadly within the Olympic Peninsula Physiographic Province. Specifically, the area of direct and indirect effects may extend up to 1 mile around the periphery of ONF boundary due to the potential that blasting may occur near the edge of ONF and the effect of that noise may extend up to 1 mile. Therefore, the Action Area is defined as ONF and all non-forest system lands within the ONF boundary and within a 1-mile buffer around the ONF boundary.

Physical Description

ONF is located on the Olympic Peninsula. The Peninsula is a separate and unique geographical area surrounded on three sides by saltwater. U.S. Highway 101 is the main travel route, paralleling the Pacific coast on the west, Straight of Juan de Fuca on the north, and Hood Canal and the inland waters of Puget Sound on the east. This 6,500 square mile area is an association of complex winding ridges, rugged and steep mountains, deep canyons, and tree-covered slopes. Because of the extremely rugged topography, there are no roads crossing the center of the Peninsula (USDA 1990).

The Peninsula is an area generally characterized by steep, mountainous terrain dissected by large rivers that radiate from the center. However, much of the area on the south and west sides also have extensive areas of flat, gentle topography with rolling foothills. Lowland strips are narrow on the north side of the Peninsula. To the east, lowland areas are part of the Puget Trough Geologic province. Most ridges in the Olympic Mountains are 4,000 to 5,000 feet in elevation with some higher peaks attaining elevations of 6,900 to almost 8,000 feet. Glaciation has strongly influenced landforms. All main river valleys are broad and U-shaped, and all major peaks are ringed with cirques, many containing active glaciers. The extremely high precipitation has caused rapid down-cutting by streams, resulting in many precipitous mountain slopes. Soils have formed from a variety of geologic parent materials. The broad level areas along the western and southern margins of the Peninsula have been interpreted as marine terraces or glacial outwash fans.

Precipitation is heavy in the fall and winter, reaching a peak in December and January. The driest area is in the northeastern corner, which receives less than 25 inches of precipitation a year. The wettest areas, with more than 220 inches annually, are on the windward side of Mount Olympus and in the upper Clearwater River drainage. Winter snowfall ranges from less than 10 inches in the lower valleys to more than 250 inches in the higher mountains. Winters are wet and mild, with temperatures in the lowlands seldom dropping below 20⁰ F. Summers are relatively dry and mild, with the warmest temperatures averaging near 75⁰ F (Franklin and Dyrness 1973).

The center of the Olympic Peninsula is managed by the National Park Service (Appendix Figure 2). Additional Park lands are found at the western edge of the Peninsula along the Pacific Coast and are known as the “coastal strip.” The Park manages over 900,000 acres, most of which is also designated as Wilderness. National Forest Lands and lands managed by the Washington Department of Natural Resources (DNR) surround the central portion of the Peninsula. DNR-managed lands are managed consistent with a Habitat Conservation Plan (Washington DNR 1996). Much of the over 350,000 acres of DNR-managed lands on the Peninsula are within the Olympic Experimental State Forest in which much of the emphasis of management is on research. Several Indian Reservations (e.g., Quinault, Makah, and Skokomish) are also located on the Peninsula in proximity to ONF. Much of the land in private ownership is managed as commercial timberlands. Simpson Timber Company lands are managed according to a recently issued Habitat Conservation Plan (Simpson Timber Company 2000). Both the Simpson and

DNR Habitat Conservation Plans significantly improve management of riparian and aquatic conditions and address marbled murrelets, but only the DNR Habitat Conservation Plan addresses spotted owls. Various other timber companies include almost 1 million acres in holdings and are managed according to State regulations recently developed as a result of the Forest and Fish Report (Washington State Forest Practices Board 2000) as well as in compliance with section 9 of the Endangered Species Act for species not addressed by the Forest and Fish Report (i.e., spotted owls and marbled murrelets). The Forest and Fish Report called for significant improvements in land management that should benefit salmonids and should result in ongoing improvements in the aquatic baseline conditions.

Other private lands with smaller acreage have been and continue to be subject to construction of residences or other facilities reducing the acreage being managed for forest products. There are also several private recreation developments, primarily along State Highway 101. There are also about 18 State Parks on the Olympic Peninsula.

Lands administered by ONF occupy about 632,324 acres in Clallam, Jefferson, Grays Harbor, and Mason counties. There are approximately 67,200 acres of private land and land administered by other government agencies within the boundary of ONF, mostly on the west side.

Vegetation

The Olympic Peninsula has an incredible variety of environments. Within less than 50 miles between Mount Olympus and the Pacific Ocean, the vegetation changes from lush, temperate rain forests of the Hoh, Queets, and Quinault valleys to an arctic environment of lichens and mosses above 7,000 feet. Franklin and Dyrness (1973) provided a detailed description of the geology, soils, climate, and vegetation of the Olympic Peninsula; the following is a brief synopsis.

The Sitka Spruce (*Picea sitchensis*) vegetative zone is generally only a few miles wide, except where it extends up river valleys. On the west side of the Peninsula, where an extensive coastal plain exists, it is much broader. This zone has a mild climate characterized by frequent summer fog and drip precipitation. Winter rains are heavy and snow is infrequent. Soils are fine-textured, deep, relatively rich, high in organic matter, and typically acidic. Coniferous forest stands in this zone are typically dense, tall, and among the most productive in the world. Constituent tree species are Sitka spruce, western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*). Lodgepole pine (shore pine) (*Pinus contorta* var. *contorta*) is common along the ocean shore. Not all of the zone is forested with conifers. Red alder (*Alnus rubra*) is common on recently disturbed sites, often occurring in nearly pure stands. Along river terraces on the western portion of the Peninsula, alder is often the initial species which is eventually replaced by Sitka spruce, cottonwood (*Populus balsamifera* or *Populus trichocarpa*), and big-leaf maple (*Acer macrophyllum*). Succession in most mature conifer stands is toward western hemlock. On moist sites, however, cedar and spruce comprise a larger component of the climax vegetation.

Some areas in this zone are known as the “Olympic Rain Forest” and are characterized by an abundance of big-leaf maple with conspicuous coverage of epiphytic plants (arboreal lichens, mosses, and ferns), vine maple (*Acer circinatum*) clumps, and use of nurse logs by conifer trees. These stands have relatively open canopies and low densities of trees, but trees of massive size. Forested cedar and alder swamps are locally common on the coastal plains, and portions of the glacial drift adjacent to Puget Sound. The constant habitat characteristic for these swamps is a high water table, or even standing surface water, for all or a portion of the year.

The Western Hemlock vegetative zone occurs between 490 and 1,800 feet on the western slopes and from nearly sea level to 3,690 feet on the drier eastern slopes of the Peninsula. Large areas of this zone are dominated by Douglas-fir (*Pseudotsuga menziesii*). Climax species are often western red cedar on the wetter sites and Douglas-fir on drier sites. Much of the zone has been logged or burned, or both, during the last 200 years and Douglas-fir is usually dominant in such stands. Even old-growth stands frequently retain a major component of Douglas-fir. This zone has a wet, mild, maritime climate, but there is wide climatic variation within this zone. Moisture stresses are sufficient to result in distinctive community spectra along moisture gradients. Soils are derived from a wide variety of parent materials, but tend to be moderately deep and of medium acidity. Organic matter content varies, but can be high on the Peninsula. Hardwoods are not common in these forests, except on recently disturbed sites or specialized habitats. Portions of the Peninsula within the Puget Trough lie within the rain shadow of the Olympic Mountains. Many soils in this area developed in glacial drift and outwash, and such soils are often coarse-textured, nutrient-poor, and excessively drained. This variation has resulted in plant communities which are not common elsewhere. Portions of this area that are poorly drained have developed swamp or bog communities.

The Pacific Silver Fir (*Abies amabilis*) vegetative zone is also conspicuous in the Olympic Mountains, except in the rain shadow on the northeastern slopes of the Peninsula. This zone receives more of its precipitation in the form of snow. Above this zone is the Mountain Hemlock (*Tsuga mertensiana*) zone, coolest of the forested zones. At the upper end of the mountain hemlock zone, a mosaic of forest patches and tree groups are interspersed with shrubby or herbaceous subalpine communities. The highest portions of the Olympic Peninsula are either vegetated with alpine vegetation or are covered with rock, snow, or ice.

The Sitka Spruce and Western Hemlock zones, where dominated by mature conifers, offer the best murrelet and spotted owl habitat due to species composition, associated structure, and proximity to marine waters. A winter storm in 1921 caused significant stand-replacing windthrow. As these areas naturally regenerated, they have become locally referred to as “21-blow” stands. They tend to be dominated by western hemlock and contain significant defects. Stands dominated by western hemlock are subject to infestation by dwarf mistletoe (*Arceuthobium campylopodum*), which is an important factor in creating nesting platforms for murrelets. Due to the inherent diversity of habitats on the Olympic Peninsula, and management history, not all lands serve or will serve as murrelet or spotted owl habitat in the near or foreseeable future.

Because of their accessibility, most of the Western Hemlock and Sitka Spruce zones have been disturbed by logging or burning at least once during the past 200 years. As a result, large portions are now dominated by Douglas-fir or western hemlock in seral stands or contain a significant red alder component. Generally, remnant old growth persists only where logging was not logistically practicable.

Land-Management Categories

A variety of federal, State, Tribal, and private lands are present on the Olympic Peninsula. ONF lands occupy about 632,324 acres in Clallam, Jefferson, Gray's Harbor, and Mason counties. There are approximately 67,200 acres of non-forest system land within ONF boundary, most of which is on the western side, in private ownership or administered by other agencies.

The National Park Service manages over 922,000 acres on the Peninsula, most of which is designated as Wilderness. The Olympic National Park (ONP) was established in 1938 and is comprised of an interior unit (about 878,600 acres) in the center of the Peninsula and a coastal unit (about 43,400 acres). The coastal unit is located at the western edge of the Peninsula along the Pacific Coast. Much of the ONP is without roads. National Forest Lands, and lands managed by Washington Department of Natural Resources (WDNR), surround the interior portion of the ONP. Within the action area there are about 107,334 acres of ONP lands.

Several Native American Indian Reservations, occupying over 236,000 acres (e.g., Hoh, Jamestown S'Klallam, Makah, Quilayute, Quinault, and Skokomish) are also located on the Peninsula; of which, about 16,246 acres occur within the action area. Major land-use activities on the larger Reservations have focused on timber harvest. Additionally, most of the Native American Tribes, particularly those without reservation lands, also have their usual and accustomed gathering areas on National Forest lands where Tribes routinely utilize their cultural resources.

WDNR-managed forest lands are managed consistent with a Habitat Conservation Plan (HCP) (WDNR 1997). Approximately two-thirds of the more than 360,000 acres of WDNR-managed lands on the Peninsula are within the Olympic Experimental State Forest (about 278,000 acres) in which much of the emphasis of management is on research. Simpson Timber Company lands (about 266,000 acres) are also managed according to a HCP (Simpson Timber Company 2000). Both the Simpson and WDNR HCPs manage riparian, aquatic, and murrelet habitat, but only the WDNR HCP addresses management of spotted owls. Within the action area, there are about 118,956 acres of WDNR and Simpson Timber Company Lands that are managed by HCPs.

There are about 109,621 acres of private/city land, excluding private lands holding a HCP, within the action area. Much of the land in private ownership is managed as commercial timberlands with a small amount of land being managed as non-industrial tree farms or as residential or commercial facilities. Commercial timberlands and non-industrial tree farms are managed according to Washington State forest practices regulations.

Background Levels of Human Presence

ONF receives over 1.2 million visitor days annually. It supports 116 developed recreation sites, including 20 developed campgrounds, 5 rustic campgrounds, 3 rental cabin, 1 picnic area, 2 observation sites, 1 boat launch, and 84 trailheads. There are more than 260 miles of Forest trail, of which 88 miles are within wilderness. ONF personnel (J. Heller, ONF, pers. comm.) estimated that approximately 117,331 campsite-nights are used each year and there are 202,648 hikers per year.

ONF maintains 2,200 miles of road in four maintenance-level (ML) categories. About 29 percent of the roads are ML-1; these roads have been closed to vehicular traffic, are not maintained, but have not yet been decommissioned. About 53 percent of the roads are ML-2 roads, which are maintained for high-clearance vehicles only. Thirteen percent of the roads are ML-3 roads, which are gravel roads maintained for standard cars and passenger vehicles. ML-4 and ML-5 roads include only about 5 percent of the total roads, but receive high levels of use from standard passenger cars and other vehicles. Many ML-2 roads are located in high-traffic situations (ONF letter to WWFWO, June 14, 2001).

ONF personnel (J. Hocking, ONF, pers. comm.) estimated the daily number of vehicles that use all of the roads throughout ONF during the 7-month recreation season (March 1 to September 30). For ML-2 roads, approximately 27,000 vehicles pass any one location during the recreation season. For ML-3 roads, it is approximately 59,000 vehicles, and for ML-4 it is approximately 58,000 vehicles per season (Appendix I).

Summary–Action Area

For both murrelets and spotted owls, the action area covers ONF and all non-forest system lands within a 1-mile buffer around the ONF boundary. Within the action area, the National Park Service manages approximately 107,364 acres, most of which is also designated as Wilderness. More than 86,526 acres are managed by WDNR and over 32,430 acres are managed by Simpson Timber Company under their respective HCPs. Much of the land in private ownership (approximately 109,621 acres) is managed as commercial timberlands. Native American Reservations occupy approximately 16,000 acres within the action area. ONF occupies about 632,324 acres on the Olympic Peninsula and is comprised of 394,000 acres of Late Successional Reserve (LSR), 150,400 acres of Adaptive Management Area (AMA), and 88,000 acres of Wilderness. Within these land allocations, there are 316,000 acres of Riparian Reserves that are distributed across ONF and are included in the acreage for the other management areas. Many thousands of people use ONF annually for recreation and ONF maintains hundreds of miles of roads to access the forest.

PROGRAM DESCRIPTIONS (INCLUDING CONSERVATION MEASURES)

This section describes the programs which are covered by this BO. Each program has one or more project types. The degree to which murrelets and spotted owls and their respective critical habitats may be affected by these projects is addressed in “Effects of the Action.” This section identifies the types and approximate amounts of work, the types of equipment used, and the typical timing of various activities.

ONF generally conducts maintenance and watershed restoration-type activities. They repair and maintain structures and facilities (e.g., campground and road maintenance, culvert repairs), take steps to reduce the impacts of those facilities on the environment, and decommission roads. Timber-harvest activities are limited to pre-commercial thinning and commercial thinning that improve stand conditions for late-successional species.

Projects generally are designed with a multiple-resource or ecosystem perspective; however, this section is divided functionally to make it easier to use for program managers. For this reason, some activities are listed under more than one program. For instance, many types of activities, such as campground maintenance or road reconstruction, may include hauling of existing materials from rock sources.

Even though this BO covers only effects to spotted owls and murrelets, the conservation measures presented here include those required for protection of bald eagles and bull trout. These were included here to fully present the list of conservation measures required for each program/project. In addition, conservation measures are presented species-specifically (vs. program-specifically) in Appendix G1-G3 (from USDA 2003).

Conservation Measures Applicable To All Activities

The following conservation measures must be followed by all activities. These conservation measures were taken from the Programmatic BA (USDA 2003), although some conservation measures that were listed many times in the BA under the various Programs were moved to this section to avoid redundancy.

Consistency with Plans and Assessments

1. Activities will be consistent with the ONF Land and Resource Management Plan (USDA 1990), as amended by the Northwest Forest Plan (USDA and USDI 1994 b; 2001).
2. Project design will reflect applicable watershed assessments, Late-Successional Reserve assessments, and the Olympic Adaptive Management Area guidelines.
3. Activities will be consistent with all recovery plans and conservation strategies for listed species, or established interim management guidelines, as amended, including:
 - a. Pacific Bald Eagle Recovery Plan (USDI 1986) and Bald Eagle Management Plans for specific sites on ONF.
 - b. Recovery Plan for the Threatened Marbled Murrelet (*Brachyramphus armoratus*) in Washington, Oregon, and California (USDI 1997).

Bald Eagles

4. Activities within a bald eagle use area (Bald Eagle Management Area as described in the Olympic NF LRMP, known nest territory, known winter roost sites, and concentrated winter foraging areas) will not alter, remove, reduce or degrade eagle habitat, nor will adversely impact the eagles' primary food sources or foraging areas.
5. Activities during the bald eagle breeding period (January 1 through August 15) or wintering periods (October 31 through March 15) will be conducted at the appropriate distance away (Table G-3) from a bald eagle use area to avoid adverse effects.

Bull Trout

6. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.

Spotted Owls and Murrelets

7. Activities within critical habitat for the northern spotted owl and marbled murrelet will not significantly alter, remove, or reduce the constituent elements of critical habitat (either nesting/roosting/foraging or dispersal habitat). Activities will not degrade the structure of the stand so as to change the habitat classifications of those stands or the function of the CHU; that is, stands will not be reclassified to a lower status, suitable habitat would not be degraded to unsuitable habitat, and spotted owl dispersal habitat would not be degraded to non-dispersal. Exceptions include issuance of road use and access permits that may authorize road construction through ONF lands to access nonfederal land and permanent and temporary road construction for commercial thinning.
8. Activities in occupied habitats or unsurveyed habitats for the spotted owl and marbled murrelet will not result in: (a) changing suitable habitat to unsuitable; (b) changing spotted owl dispersal habitat to non-dispersal (exceptions include road use and access permits, realigning small road segments for transportation system repair, and permanent and temporary road construction for commercial thinning activities); and (c) the significant degradation of habitat for the spotted owl or marbled murrelet (activities may modify some components of owl or murrelet habitat such as potential nest trees, logs, snags, mistletoe structure, etc.), but not to a degree that would change the habitat classification, or function of the stand. Suitable nest trees have the characteristics (i.e., cavities for spotted owls or large limbs with mistletoe for murrelets) required by these species for use as nest trees but for which occupancy is not known.
9. Projects that could result in removal of habitat elements (potential nest tree, dispersal habitat in designated critical habitat, or suitable habitat) for spotted owl and marbled murrelet during times that those areas are being used by the species will incorporate the conservation measures presented in Tables G-1 and G-2 of the Programmatic (USDA 2003) and in this BO.

10. To minimize the risk of attracting avian predators to project areas, any accumulation of garbage (especially food products) shall be contained or removed regularly from the vicinity. This is important to minimize the effects of corvid predation on murrelet nests.

Disturbance

11. Guidelines to minimize disturbance effects to terrestrial species from projects generating noise above levels at which harassment is expected to occur, as presented in Tables G-1 thru G-3 of the Programmatic BA (USDA 2003) and in this BO, will be followed. Project-specific review will assess the need for modification of the threshold buffer widths to account for topographic, vegetative, and other factors to assess their applicability on a project-specific basis. These distances can be modified (increased or decreased) based on project-specific analysis and Level 1 Team review.
12. Projects including mechanized equipment (chainsaws, blasting, aircraft, heavy equipment, etc.) within suitable nesting habitat for spotted owl and marbled murrelet, and roosting, wintering and foraging habitat by bald eagles, during times that those areas are being used by the species will incorporate the conservation measures presented in Tables G-1 thru G-3 of the Programmatic BA (USDA 2003) and in this BO. These activities, when conducted in known occupied, unsurveyed suitable, or potential marbled murrelet habitat between April 1 and September 15 will not begin until 2 hours after sunrise and will end 2 hours before sunset. After August 5, the effect determination will change from LAA to NLAA within harassment distances, but work should still take place outside the two, 2-hour windows.

Collection of species

13. No collection of listed species is allowed.

Blasting

14. Activities will adhere to guidelines for blasting (Appendix M) and the decision pathway for potential nest-tree removal (Appendix N).

Large-Diameter Tree Removal

This BO includes the removal of trees that have the nest structure characteristics of murrelet and spotted owl nest trees (“nest-potential trees” or “potential nest trees”) or trees that provide buffering to nest-potential trees. Specific programs that may remove or alter such trees during this 5-year BO are: trail bridge construction/ reconstruction for log stringers (8 trees); hazard tree removal for public safety (1,500 trees); tailhold and guyline anchor permits (90 trees); road decommissioning and bridge removal during watershed restoration (25 trees); and requests by Native American Tribes for ceremonial trees (15 trees). These project types are described further in their respective sections and include the allocated removal of potential nest trees (i.e., large-diameter trees that have characteristics of a nest tree or that provide protection to a nest tree). ONF proposes to remove (or alter, as under the tailhold and guyline anchor program) a total of **1,638 nest-potential trees** during this 5-year BO. This BO does not allow for the removal of bald eagle nest trees or bald eagle winter roost trees, nor trees that would likely be used for nesting or roosting within bald eagle use areas.

Known occupied murrelet nest trees or spotted owl nest trees shall not be removed during the breeding season. If removal of a potential nest trees is to be done for projects within suitable murrelet or spotted owl habitat during the murrelet early breeding season (April 1 to August 5) or during the spotted owl early breeding season (March 1 to July 15), review by an ONF wildlife biologist and consultation by Level 1 Team is required. The potential nest tree that is felled will be surveyed once on the ground to determine if owlets or murrelet chicks were using the tree. If young are found, an ONF biologist and a FWS wildlife biologist will be notified immediately. Such a find would trigger reinitiation of this consultation, because we do not anticipate such an event to occur and we are not covering any deaths of spotted owls or murrelets in the Incidental Take Statement.

Survey Recommendations

It is recommended, though not required, that surveys for spotted owls and marbled murrelets be conducted according to protocol if suitable habitat is to be degraded by a project, or there is the likelihood that nesting owls or murrelets may be disturbed by project construction or operation. If the project has not had surveys completed to protocol, the area is assumed to be occupied. The programmatic biological assessment provides conservation measures (Tables G-1 and G-2) for the spotted owl and marbled murrelet to minimize disturbance from project activities.

Non-Forest Service Project Activities

Only ONF actions (including issuance of special use permits, easements, and right-of-ways) and cooperative projects in which ONF plays a direct role in designing and implementing the project are covered under this BO. Activities conducted on National Forest lands by any other agencies or groups or their contractors, permittees, licensees, lessees, grantees, or agents are not covered by this BO, but must be addressed in separate consultations by those respective agencies. The federal action of ONF issuing an easement or right-of-way may be covered as an interrelated and interdependent action through the consultation conducted with the other agencies regarding the larger action.

Monitoring

For projects which always result in a NLAA or less determination for all aquatic species (Appendix O, USDA 2003), and which result in a NLAA or less determination of terrestrial species as outlined in Chapter IV of the Biological Assessment, ONF will be responsible for tracking impacts to ensure ONF is within the allocated activity levels. For NLAA projects that have potential to be a LAA project, monitoring needs will be developed by the Level 1 Team on a project-by-project basis.

ONF will track the number of trees removed, the acres of suitable habitat degraded, and the acres of potential harassment for all projects that result in LAA determinations in an electronic

database. ONF also will track all NLAA projects in the database. ONF will provide annually to FWS a print-out from the database no later than February 15 each year.

Upon completion of any project resulting in a LAA determination for any species, the project leader will complete the Monitoring Form and submit it to the appropriate district wildlife and fishery biologists for evaluation of effects. On an annual basis, ONF will prepare a summary report for the Level 1 Team that displays the number of projects and project types by watershed approved as consistent with the Programmatic BA (USDA 2003). The report will also display anticipated versus actual effects from LAA projects completed or ongoing throughout the fiscal year. The monitoring report will be submitted to FWS no later than February 15 each year. The Level 1 Team will review monitoring reports to ensure consultation intent is being met, or to modify guidance, if necessary. Periodic monitoring reviews of ongoing or recently completed projects will be conducted by the Level 1 Team to ensure that requirements have been adequately incorporated into projects and that projects have been implemented as designed.

Recreation Management

Recreation management is designed to provide opportunities for public enjoyment of the forest while maintaining resources and reasonable public safety. Management activities include campground and other developed-site maintenance and operations, and trail management.

Conservation Measures for All Recreation Management Activities

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. If wet weather conditions during project operations generate and transport sediment to a stream channel or other water body, cease operations until the weather conditions improve, unless delaying operations would increase the risk of adverse resource impacts. Coordination with aquatic specialists should be part of this decision process.
4. Disturbed ground where runoff has the potential to drain into stream channels shall be revegetated or protected from surface erosion by seeding, mulching, or other methods prior to the fall rainy season. Within one year after project completion, disturbed streambanks will be revegetated with woody vegetation to maintain soil stability and provide shade and future sources of instream large woody debris (LWD).
5. To insure adequate amounts of LWD in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic

improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood, or sold.

6. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
7. All conservation measures specified under the Hazard Tree Removal Program will be applied.

Developed-Site Operation and Maintenance

Developed sites include developed campgrounds, rustic camps, recreation cabin rentals, interpretive sites, scenic overlooks, picnic areas, launching facilities, and trailheads. Trails are described separately below. The purpose of the developed-site maintenance program is to provide a safe and clean camping experience for the public. Campgrounds and developed sites generally are located along rivers, streams, or lakeshores, and are accessed by major roads. Campground maintenance is normally conducted in the spring from mid-March until campgrounds are opened. Campgrounds generally are operated during, and receive peak use between, Memorial Day and Labor Day; they are less use before and/or after these dates up until snow cover and access prevent people from reaching or entering the campground. Crews can spend up to 3 weeks completing pre-season maintenance on the developed campgrounds. There are **116 developed recreation sites** on ONF, including 20 developed campgrounds, 5 rustic campgrounds, 1 picnic area, 2 observation sites, 1 boat launch, 1 rental cabin, and 30 trailheads. Heavy-equipment use occurs in maintenance of developed campgrounds but is less common in rustic campgrounds. The observation points are located along major highways. Four of these developed sites are open year-round, however they are not maintained from November through April. Campground capacities range from eight to 55 sites.

Recreation facility maintenance includes road and campsite maintenance, hazard tree removal (see below), revegetation where necessary, and general cleanup and repair (tables, stoves, toilets, signs, barrier (re)placement, water systems, pumps, foot bridges, paths and steps, fences). Toilet repair/replacement and maintenance may involve digging new vaults, some vegetation removal, and toilet pumping. Several new wells may be drilled because of campground relocations and current wells with inadequate water supply. Several abandoned wells on ONF may be removed. Heavy maintenance may include extended use of mechanized equipment.

Minor maintenance activities in campgrounds or other developed sites include lawn-mowing, weed eating, leaf blowing, sign placement, kiosk development, roadway sweeping, and trash collection. Equipment used ranges from road equipment for road maintenance to chainsaws, lawn mowers, augers, and small power tools. Minor campground maintenance continues through September 15 or later, and can be year-round for the four sites on ONF which are open year-round. Activities within this project type may include hauling of existing materials from rock sources.

Excluding hazard tree removal, which is address below, developed site operations and maintenance would not remove any suitable spotted owl habitat, marbled murrelet or bald eagle

habitat. Use of mechanized equipment would occur during the spotted owl and marbled murrelet breeding seasons.

In stream work will generally be conducted from July through September (low flow season), timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Dispersed Site Maintenance

Dispersed sites are minimally maintained and do not contain structures such as toilets. ONF proposes to maintain each of its approximately **1,405 dispersed sites** during each year. Maintenance in dispersed sites may include barrier (re)placement, cleaning fire rings, collecting and removing garbage, removing nails from trees, etc. Equipment used may include dump truck, front-end loader, or power and hand tools.

The vast majority of dispersed sites are near or along roads. A number of dispersed sites are located at higher elevations and may require maintenance during the late spring or summer. ONF expects that heavy equipment would be used in only 10 sites annually during the early murrelet or spotted owl nesting seasons in areas of low background noise and visual levels. Dispersed site maintenance would not result in the removal of any suitable habitat of spotted owls, marbled murrelets, or bald eagles.

Trail Maintenance

The purpose of the trail maintenance program is to provide the public safe access into the forest. Maintenance work is normally conducted in the spring and summer to repair winter damage to trails. There is a total of **270 miles** of trail on ONF, of which 88 miles are in wilderness. In general, non-mechanized hand tools are used in the wilderness; blasting is permitted, whereas use of chainsaws is not permitted. Equipment used for trail maintenance outside of wilderness includes chainsaws, motorized wheelbarrows, and weed-eaters. All 182 miles of non-wilderness trails and 88 miles of wilderness trails will be maintained each year.

Trail maintenance includes windfall removal within the trail prism where necessary, brushing, drainage maintenance, tread maintenance (remove loose rock, fill holes, etc.), and repair of cribwalls and puncheons. The amount of maintenance required can range from very limited, where only the minimum necessary to prevent serious damage from erosion and keep the trail passable is required, to higher levels where logs and windfall are removed to an 8-foot width, brush is cleared to a 10-foot height and 8-foot width, the tread is restored to its original width, and all drainage structures are repaired or replaced. This involves work in the established clearing width and does not involve relocating the trail.

The majority of the trail maintenance is done during the spring and summer. Clearing trails to open them for public travel is a priority between March 15 and July 1, before the heavy-use period begins. However, general maintenance, such as clearing occasional down trees, continues

throughout the year on the majority of the trails. ONF anticipates that all of the non-wilderness trails may have some maintenance on them during the early nesting season. Occasionally, crews will need to clear several trees, which could take from four hours to two days, depending on the size of the trees, tree position on the slope, etc.

Blasting or use of helicopters occasionally may be required, but it is expected that most blasting will occur outside the murrelet and spotted owl breeding seasons, except for an average of 20 sites per year. All blasting for this activity will be done with charges of 2 pounds or less. A “site” is defined as the area within the harassment distance for charges of 2 pounds or less. No more than two helicopter flights are anticipated each year. Trail maintenance would not result in the removal of any suitable habitat of spotted owls, marbled murrelets, or bald eagles. Activities may take place during the spotted owl and marbled murrelet early breeding season.

Specific Conservation Measure for Trail Maintenance

1. Blasting during the breeding season will follow the guidelines outlined in Appendix M and Tables G-1 and G-2.
2. To retain the largest pieces of downed wood possible in stream channels and floodplains, minimize bucking of large riparian trees during trail clearing activities.

Trail Construction, Reconstruction, and Restoration

The purpose of trail relocation, construction and reconstruction is to provide access in the forest which meets USFS standards for safety, provides recreational opportunities to the public, and provides for resource protection. The current trail system includes some trails that were historic user-created or were designed for fire-suppression access. Many of these trails include segments with steep grades and are located in areas prone to erosion or drainage problems. Trails often followed major drainage or stream systems and have been impacted by shifting stream channels. Trail re-routes are necessary when site conditions are too adverse and/or damaged on a particular segment of trail to keep away from a wet, riparian, or unstable area. Re-routes can be as long as 100 to 200 yards, and as short as around a tree root ball. A re-route can generally be done by simply moving loose brush, cutting out fallen logs, pruning live brush and limbs, establishing a tread on the ground with hand tools, and providing for drainage.

In order to provide trails which meet Forest standards, and resource concerns, a program of trail construction/reconstruction is part of the yearly Forest program of work. Trail construction herein does **not** include construction of new trails into new undeveloped areas. Existing trail locations may be realigned or relocated to better address resource or safety concerns. New construction of trails within developed recreation sites for such uses as campsite access and interpretive trails are included in this assessment. The length of new trail within these sites can vary from a short spur up to 1-mile in length. ONF proposes to relocate, construct or reconstruct **85 miles** of trail during the life of this BO.

Trail construction and reconstruction projects can require the use of chainsaws, small power tools, hand tools, and trail machines (small excavators, tractors, etc. that are used during trail construction). Some understory clearing will occur, including the removal of small trees (less than 12 inches in diameter). Even though trails are usually designed to minimize the removal of larger trees because of their aesthetic value, a few larger trees or snags (greater than 1 inches dbh) may need to be removed. Some trail restoration may involve the use of blasting or aircraft. It is anticipated that no more than 10 sites per year would be blasted using blasts of 2 pounds or less. No more than two helicopter flights are anticipated each year. Trail location work will not remove trees that have suitable nest structures for spotted owls, murrelets, or eagles, or that provide cover for suitable murrelet nest trees.

Specific Conservation Measure for Trail Relocation, Construction and Reconstruction

1. Trail locations will avoid removal of trees that have suitable nest structures for spotted owls, murrelets, or eagles; or which provide cover for potential murrelet and spotted owl nest trees.
2. To retain the largest pieces of downed wood possible in stream channels and floodplains and minimize the need to buck large riparian trees during trail clearing activities, relocate trails away from streambanks and out of floodplains where feasible.
3. The old trail section will be obliterated to prevent further human/stock use from occurring.

Trail Bridge/Foot Log Construction Reconstruction

Most trail bridges and foot logs are reconstructed because the current crossing structure has reached the end of its expected design-life and is becoming or has become unsafe. Trail bridges include everything from log stringers installed exclusively with hand tools in Wilderness, to steel and/or glue-laminated structures installed with heavy equipment or aircraft. Manufactured bridges are preferred because of their longevity (50 to 75 years) versus native materials (up to 20 years). Up to eight live Douglas-fir or western redcedar ranging from 18 to 35 inches dbh would be found on site and used for bridge construction. Trees found on site would be winched no more than 500 feet to the bridge location. It is anticipated that no more than 10 bridges would need to be replaced with manufactured or native material during the life of the BO. New trail bridge construction will be limited to previously disturbed locations such as existing trail crossings or modifications of existing structures and new locations associated with trail reroutes. Foot logs are made from a single western red cedar or Douglas-fir with diameter up to 4 feet and 60 feet in length. Generally, foot logs are constructed within designated wilderness. Trees used for foot logs are found on site. Bridge and foot log construction is generally done in mid-summer, but occasionally can be done in the fall. ONF proposes to restore, modify, or remove **25 trail bridges and foot logs** during the life of this BO. During the life of the BO, **8 potential nest trees** may be removed as part of bridge or foot log construction.

Equipment usually consists of chainsaws, small power tools, a power wheelbarrow, and hand tools, but could entail use of small excavators or tractors, or helicopters (single or double rotor). It is anticipated that no more than two sites per year would be blasted using blasts of 2 pounds or less. A helicopter may be used to fly in a manufactured bridge or natural stringers; distances of

flight vary up to three miles and typically are completed within one day. Bridges are generally flown on site between August and October. During the life of the BO, of the 10 bridges to be replaced, eight manufactured bridges would be flown in.

For new bridge construction, only bridges that fully span the bankfull stream channel are included. Construction of bridges which have supports or abutments within the bankfull channel are not covered under this programmatic assessment.

Reconstruction of existing bridges which fully span the bankfull stream channel and reconstruction activities of other bridges which does not involve any instream work, such as replacing bridge decking, are also included. Reconstruction of existing bridge supports or abutments within the bankfull channel are excluded under this programmatic.

In stream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measures for Trail Bridge/Footlog Construction/Reconstruction

1. Any tree larger than 21 inches dbh within suitable habitat for the spotted owl or marbled murrelet and that has nest-tree characteristics (limbs/platforms over 5 inches in diameter, cavities, broken top, mistletoe, witches brooms, raptor nest) or that provides buffering to a potential nest tree may be used as bridge stringers or foot logs, but will require consultation with an ONF wildlife biologist.
2. If removal of potential nest trees is to be done during the early murrelet nesting season (April 1 to August 5) or during the spotted owl early nesting season (March 1 to July 15), Level 1 review will be required; this may include a visual inspection of the tree prior to felling. ONF will require a visual survey in the area immediately after felling the tree to determine if young murrelets or owls were on the tree. An ONF and FWS wildlife biologist will be notified if occupancy was found.
3. Occupancy of the site by murrelets or owls will prohibit tree removal during the nesting season.
4. Known occupied murrelet nest trees or spotted owl nest trees shall not be removed.
5. To ensure adequate amounts of large woody debris in streams, trees within 100 feet of a streamcourse will not be used as bridge stringers unless an aquatic specialist determines that the tree is not needed to meet current or future instream LWD objectives.
6. Disturbed ground where log stringers were dragged will be evaluated and erosion-control measures applied where needed.

Trail Bridge Maintenance

Trail-bridge maintenance is often done in conjunction with regular trail maintenance. ONF proposes to maintain **65 bridges** during the life of this BO. Typical items of work can include, but are not limited to: hand rail and rail post replacement; deck plank replacement, which can involve use of treated timber; cleaning/flushing bridge deck; removal of brush from beneath and alongside bridge; and repair of concrete bridge components. Each bridge repair may take up to 6 hours and may need to be done every other year. Equipment used may include chainsaws, brush cutters, gas-powered tooting machines, and power and hand tools. Trail bridge maintenance will not remove suitable habitat for spotted owls, marbled murrelets or eagles.

Instream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

New Recreation Site Creation

This activity includes construction of new picnic areas, gravel-parking areas, small boat ramps, or toilets, in already disturbed areas such as existing dispersed recreation sites. ONF proposes to create **10 new sites** during the life of this BO. New developments will be located in already disturbed areas (such as dispersed sites or sites already being used by the public for parking or picnic activities) or will require coordination with the Level 1 Team to ensure that impacts to threatened and endangered species and their critical habitats remain within the levels anticipated by this BO. Equipment used may include backhoe, front-end loader, graders, dump trucks, chainsaws, explosives, and power and hand tools. All blasting activities would be done with charges of 2 pounds or less and will occur after August 6. New recreation site creation will not remove suitable habitat for spotted owls, marbled murrelets or eagles. Project activities may occur during the breeding season.

Specific Conservation Measure for New Recreation Site Creation

1. Design sites to assure new sites do not degrade habitat for threatened and endangered fish and wildlife.

Administrative Facilities Maintenance

Administrative sites include office compounds, housing compounds, visitor centers, guard stations, rental cabins, lookouts, and pastures. The maintenance and repair of existing sites may require the use of small power and hand tools, chainsaws, trucks, mowers, and weed-eaters. ONF proposes to maintain **15 administrative facilities** per year. Visitor centers and office compounds tend to be located in already developed areas with high background-noise levels. Administrative facilities are generally accessed by major paved roads. Excluding hazard tree maintenance, as addressed below, maintenance facilities would not result in the loss or degradation of spotted owl, marbled murrelet or bald eagle habitat. All of the facilities are father

than 75 yards from suitable owl and murrelet habitat.

Specific Conservation Measure for All Administrative Facilities Maintenance Activities

1. Hazard trees within administrative facilities will be determined according to the assessment, protocol, and recommendations developed by Harvey and Hessburg (1992).

Hazard Tree Removal

The purpose of the hazard-tree removal program is to provide for public safety. Hazard tree removal is a critical maintenance activity because untreated hazards can result in personal injury, death, or facility damage or closure. Hazard trees are defined as standing trees, alive or dead, or tree parts, at substantial risk of failure, which may hit a permanent or transitory object of value (e.g. humans, picnic areas, parking pad, campsite, power line, fence, road, mineral claim, or other structure, resulting in injury or damage) (Harvey and Hessburg 1992). Hazard increases with increasing tree defect, potential for failure, potential for damage, and target value (Harvey and Hessburg 1992).

In some cases, hazard tree reduction may involve removal of important components of northern spotted owl and marbled murrelet habitat, and their designated critical habitats.

Hazard trees that are included in the BO and which are counted for effects to spotted owl and marbled murrelet may be one of two types: (1) trees larger than or equal to 21 inches in diameter at breast height (dbh) that are within suitable nesting habitat for the spotted owl and marbled murrelet and have nesting structure or provide a buffer to a potential nest tree; (2) trees larger than or equal to 21 inches dbh that are within suitable nesting habitat and do not have nesting structure nor provide a buffer to a potential nest tree or trees greater than or equal to 21 inches dbh that are not within suitable nesting habitat. Those trees less than 21 inches dbh are *not* included in either count, but may be felled to meet public safety without Level 1 review under this BO.

ONF proposes to remove up to **300 potential nest trees** per year as hazard trees (100 trees per year from developed recreational sites, areas adjacent to recreation residences and administrative sites and near commercial facilities authorized by special-use permits; and 200 habitat hazard trees during road maintenance activities, including roadways, power line corridors or other access areas). These trees will be considered a LAA determination for spotted owls and marbled murrelets. An **additional 400 non-potential nest trees** per year that are 21 inches dbh or greater and are not within suitable nesting habitat or do not have suitable nest structure characteristics, or may be within dispersal habitat for the northern spotted owl may be felled and are covered under this programmatic assessment. These trees will be considered a NLAA determination for spotted owls and marbled murrelets.

To determine if a tree results in incidental take of spotted owls or murrelets, the project leader must consult with an ONF wildlife biologist to determine if the project area is within suitable

murrelet or owl habitat and if within a designated critical habitat unit. If the proposed project is not within suitable habitat, the project lead may fall trees greater than or equal to 21 inches dbh and count it towards their allocated non-suitable nest hazard tree total for the year. If the project is within suitable habitat, the project lead has the option of either using the Decision Pathway for Potential Nest Tree Removal (USDA 2003 Appendix N) and determining in the field if the tree(s) meets the definition of a habitat tree, and count it as a potential nest tree before felling or not using the decision pathway and counting the tree towards the potential nest tree total allocated under their program. Consultation with an ONF wildlife biologist is required for the following circumstances: (1) the tree proposed to be felled is greater than or equal to 36 inches dbh and the project is within suitable spotted owl or marbled murrelet habitat or within a bald eagle use area; (2) the project is in suitable nesting habitat for owl and murrelet and more than 1 tree less than 36 inches dbh per ½-mile of road or trail or 2 trees less than 36 inches dbh per acre are proposed for removal; or (3) two or more adjacent trees greater than 21 inch dbh are to be removed within suitable spotted owl or suitable marbled murrelet habitat.

It is anticipated that some of the hazard trees will be felled during the spotted owl and marbled murrelet breeding season to ensure a facility or travel system will provide a safe recreation or working environment. For road maintenance, the largest program that removes hazard trees, tree removal is generally done between July and September, and commonly extends into the fall. Those trees identified as hazards are within 50 feet downhill and 150 feet (approximate tree height) uphill of the road, and pose a threat of falling on the road. Approximately 24 percent of all roads within the ONF system are adjacent to spotted owl and marbled murrelet nesting habitat. Campground hazard tree removal is scheduled in the early spring before the campgrounds are open, and after Labor Day, when recreation use is lower.

Trees that are not considered hazard trees and need to be removed for logistical reasons associated with a project (re-opening of road to gain access to pre-commercial units) are not included as hazard trees (see silviculture program). Annual removal is much higher, however, in some locations, particularly in areas with high disease or insect infestation or at sites that have not had routine hazard tree maintenance. If these projects propose to exceed the allocation described above, a separate biological assessment may need to be required

Corrective actions may include removing limbs or the hazardous portion of the tree, or felling of the whole tree. Methods of removal may include using a chainsaw, hand-tools, shooting, or blasting. Hazard trees, which cannot be safely felled with a saw, may need to be blasted even if such trees are located in the wilderness. It is anticipated that no more than five sites per year would be blasted using explosives of 2 pounds or less. Removal of these trees will either be conducted by USFS employees or contractors hired by ONF.

Removal of potential spotted owl or marbled murrelet nest trees, or trees which provide cover to potential nest platforms or cavities is provided for under this programmatic consultation following consultation with an ONF wildlife biologist, exploration of less-destructive alternatives, and consistency with the NWFP. Routine hazard tree removal reduces potential roosting habitat for eagles, especially if trees overlook feeding areas and are of sufficient size.

The biologist will also assess the potential impacts to potential roosting habitat for bald eagles. This BO does not cover adverse effects to bald eagle as a result of removal of suitable habitat within bald eagle use areas (see habitat description for bald eagle). No known eagle nest trees will be removed.

Depending on the Forest-management allocation for the area, the condition of the hazard tree, and current site condition in relation to down woody material, the trees may be left in place to provide large woody habitat, removed for use in instream aquatic improvement projects, left for firewood, or sold. Where a tree can safely be felled into a stream to improve fish habitat, this may be done. Some trees left on site that are accessible from roads are likely to be taken by the public for firewood.

Specific Conservation Measure for All Hazard Tree Removal Activities

1. Hazard trees within administrative sites and developed recreation sites, such as campgrounds and trailheads, will be determined according to the assessment, protocol, and recommendations developed by Harvey and Hessburg (1992). Only those trees that fit the hazard tree determination of Harvey and Hessburg (1992) shall be felled.
2. Appendix N (Decision Pathway for Potential Nest Tree Removal) may be consulted for those areas other than administrative and developed recreation sites to determine ‘take’ of potential murrelet or owl nest tree.
3. Known occupied murrelet nest trees or spotted owl nest trees shall not be removed.
4. If hazard tree removal is to be done within suitable murrelet or suitable owl habitat during the murrelet breeding season (April 1 to August 5) or during the spotted owl early breeding season (March 1 to July 15), an ONF wildlife biologist shall be consulted and Level 1 review will be required.
5. Occupancy of the site by murrelets or owls will prohibit tree removal during the breeding season. If removal of such tree is necessary to meet public safety objectives during the nesting season it will require Level 1 review to determine if this falls within the scope of the programmatic.
6. ONF will require a visual survey in the area immediately after felling the potential nest tree to determine if young murrelets or owls were on the tree. An ONF and FWS wildlife biologist will be notified if occupancy was found.
7. Conservation measures for terrestrial species specific to the type of disturbance will be used (see Tables G-1 through G-3).
8. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible.
9. Felled trees will be left in place to provide large woody habitat or removed for use in instream aquatic improvement projects. Excess trees that are not needed for either of these purposes may be used for other administrative purposes, left for firewood, or sold.
10. Fall trees in a manner to minimize impacts to surrounding trees.

Silviculture

The Silviculture Program on ONF is predominantly designed to improve stand diversity and facilitate the development of late-successional habitat at more-rapid rates than what can be expected without treatment. Production of timber may be a by-product. A secondary component to the program is uneven-aged management, used to develop multiple-aged stand classes, which can also improve stand diversity and produce commodity goods. Salvage, another component of the silviculture program, is mainly a response to a stand-replacing event such as a windstorm or icestorm and may include harvest of "green" standing timber that is insect, disease infested or with a high probability of falling down.

Salvage generally consists of downed material, including larger material than many other silvicultural treatments. All cutting of trees generally will be done outside of the murrelet and spotted owl early nesting seasons (March 1 to August 5), unless the site is farther than the appropriate harassment distance from suitable habitat.

Silvicultural treatments may be used within Riparian Reserves to promote growth of conifer trees to maintain or restore habitat to support well-distributed populations of riparian dependent species; maintain or restore structural diversity in riparian plant communities; and provide future recruitment trees for large organic debris in the streams. Treatments may include thinning to increase growing space and accelerate diameter growth, underplanting to increase diversity, planting trees to reestablish conifer stands in brush-dominated riparian areas, or converting alder stands to riparian conifer stands.

Silvicultural activities within Riparian Reserves will be designed and implemented to meet Aquatic Conservation Strategy objectives and protect or restore aquatic habitat. Prescriptions for riparian stands will be tailored to the site-specific conditions and management objectives for each individual site. In most situations, treatments will extend to the topographic break in slope, to the edge of an inner gorge or unstable area, or to the extent of riparian vegetation, leaving a no-cut buffer along the stream to protect riparian conditions. Wider buffers will be left if necessary to provide additional protection. In some cases, a portion of the trees in riparian buffers may be cut after the adjacent thinning and left on the ground and in the stream as down woody debris. At other times, trees in these buffers will be left to continue competing and developing at a slower rate. Aquatic specialists will be involved in the design and implementation of all silviculture projects within riparian reserves to ensure activities do not degrade aquatic habitat. For projects that propose to remove overstory trees within 100 feet of stream channels within watersheds containing spawning populations of bull trout require Level 1 review.

Conservation Measures for All Silvicultural Activities

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods

2. No known eagle nest or trees within a bald eagle use area that are used for winter roosting will be removed.
3. All conservation measures specified under the Hazard Tree Removal Program will be applied.
4. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
5. Riparian buffer locations shall be reviewed by an aquatic specialist to assure consistency with riparian resource objectives. Projects that propose to remove overstory trees within 100 feet of stream channels within watersheds containing spawning populations of bull trout require Level 1 review.

Commercial Thinning and Uneven-aged Management

There may be a wide variety of silvicultural prescriptions that would fit the guidelines in the NWFP and occur in a variety of land allocations. On ONF, typical commercial thinning sales are in dispersal habitat for the northern spotted owl, which is non-suitable habitat for marbled murrelets. Located in Late Successional Reserves and Adaptive Management Areas, thinned areas would retain spotted owl dispersal habitat conditions. Within Riparian Reserves and LSRs, an upper diameter limit for harvest is prescribed. Timber sales covered by this BO would not remove or adversely degrade existing suitable habitat for any threatened or endangered species. ONF proposes to manage **6,400 acres** over the life of the BO. Some of this work (about 3,200 acres) is expected to be started during the later portion of the early murrelet or spotted owl nesting seasons (mid-July). However, the proposed treatment units would be farther than the appropriate harassment distance from suitable habitat for spotted owls and murrelets. Many of the units would be harvested during the summer season to reduce necessary road construction and road standards and avoid placement of rock on temporary roads. Hauling would be permitted from mid-July through the end of February. Harvest units would range from about 5 acres to about 100 acres with an average size of about 40 acres.

A typical silvicultural prescription for commercial thinning on ONF utilizes a "thinning from below" technique, where smaller diameter (generally less than 12 inches dbh) suppressed and intermediate trees are removed from the stand to allow more growing room for the dominant and co-dominant trees, although removal of some co-dominants may occur to release dominants. Also, some understory suppressed (non-merchantable) trees may be retained to accelerate development of a second or third canopy layer. Other prescriptions, such as creating small openings in the canopy to enhance structural and age diversity, may be used. Variable-density retention of trees is accomplished through relative-density and/or basal-area prescriptions, utilizing species-specific calculations rather than rigid spacing. A mix of species is retained, frequently favoring minor species components and retention of a variety of hardwoods. Snags are retained to the degree safely possible, and existing down wood is retained.

Uneven-aged management is the development and maintenance of at least three age classes in an area. One means of accomplishing this is through the creation of small patch openings (usually less than 1 acre) in the canopy. These openings emulate the gaps of late-successional forest

stands. Such treatments do not reduce either the stand or unit below 40 percent crown closure as a whole. Unthinned areas, or skips, may be left to provide density diversity, and/or there could be thinning between patches.

Generally about 10 to 15 thousand board feet (mbf) is harvested per acre on ONF. Thirty to 50 percent of the basal area may be removed. However, since the smaller trees are removed, less than 40 percent of the stand volume is removed. The average dbh removed is generally less than 12 inches. Because of the diversity of climate and vegetation from the wet westside to the dry eastside of the Olympic Peninsula, individual site prescriptions may vary substantially geographically and between land allocations.

On ONF, some stands are too small for commercial sale, but are in definite need of thinning to improve stand conditions. These stands may be thinned with the trees left on the ground (see “Precommercial Thinning”).

Harvesting is accomplished using ground-based tractor systems, cable systems, and helicopter systems. Equipment could include log trucks, skidders, loaders, tractors, skyline-cable-yarding systems, chainsaws, harvesters, forwarders, helicopters, etc. Tailholds are commonly used in association with certain cable-yarding systems.

Dates of project or prescription implementation vary considerably depending on the species of concern, potential for damage during sap flow, and site conditions. Fire season restrictions, generally in August and September, limit the hours available for work in some years.

Access to timber sale sites may require some road construction with necessary machinery such as excavators, shovels, graders, and dump trucks. The amount of road building varies widely, but most roads are of a temporary nature (less than 5 years) and will be restricted, closed, or decommissioned following use. Some roads may remain open for use based on site-specific analysis in environmental assessments and watershed analyses. Harvest using helicopters allows removal of trees from sensitive and non-sensitive sites without building new roads, though some reconstruction of existing roads and helicopter landings may be required. Log haul on these roads occurs about six times per day and may be adjacent to suitable owl and murrelet habitat.

Road construction and reconstruction associated with timber sales is included in this project description for information only and are addressed in more detail under the section “Transportation System: Road Reconstruction and Temporary Road Construction.” During the life of this BO, ONF proposes to **reconstruct up to 5 miles** of existing driveable road, **construct up to 5 miles of new permanent road**, and to **construct up to 40 miles** of temporary road to access commercial thinning units. Approximately 20 miles of the temporary road would be constructed on old railroad grades or abandoned roads. Approximately 20 miles of temporary road would be constructed on previously undisturbed ground.

Specific Conservation Measures for Commercial Thinning and Uneven-aged Management

1. Road construction and reconstruction conservation measures can be found under the Transportation System section. Conservation measures for road decommissioning can be found under the Watershed Restoration section.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. If wet weather conditions during project operations generate and transport sediment to a stream channel or other water body, cease operations until the weather conditions improve, unless delaying operations would increase the risk of adverse resource impacts. Coordination with aquatic specialists should be part of this decision process.
4. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood or sold.
5. Fall trees in a manner to avoid or minimize impacts to surrounding trees.

Salvage Sales

A typical salvage sale would remove some, but not all, dead or damaged dying trees from a stand that had been commercially thinned or are smaller scattered areas of windthrow and leave adequate quantities of coarse woody materials as prescribed in the NWFP and associated assessments. Other reasons to salvage include disease infestations such as root rot and clearcut logging adjacent to recently thinned ONF land. ONF proposes to salvage **200 acres** over the life of this BO; however, some of this work is expected to be conducted during the early murrelet or spotted owl nesting seasons (March 1 to August 5). Those units proposed for salvage removal would farther than the appropriate harassment distance from spotted owl and murrelet suitable habitat. The levels of snags and coarse woody materials that need to be maintained will vary by situation, depending on how many standing trees remain, or whether the activity is associated with a thinning or is a complete salvage. Standing healthy green trees, which do not impose operational hazards, as well as some defective trees which are safe and sound, would be left in the sale unit to provide a stand legacy to the regenerating area. Standing green trees would not generally be included in the sale except those leaning or "root sprung" and likely to blow down in the near future. There may be small salvage sales of scattered hazard trees found along roadways, power line corridors or other access areas. In the past, such sales have been hardwoods or blown down conifers in, adjacent to or leaning over the road prism. Refer to the Hazard Tree Removal section elsewhere in these descriptions.

Specific Conservation Measures for Salvage Sales

1. Road construction and reconstruction conservation measures can be found under the Transportation System section. Conservation measures for road decommissioning can be found under the Watershed Restoration section.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. If wet weather conditions during project operations generate and transport sediment to a stream channel or other water body, cease operations until the weather conditions improve, unless delaying operations would increase the risk of adverse resource impacts. Coordination with aquatic specialists should be part of this decision process.
4. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to meet and improve terrestrial large wood habitat, left for firewood collection, or sold.

Pre-commercial Thinning

Pre-commercial thinning, also known as young-stand thinning, stocking-level control, or density control, generally occurs in plantation stands that are 10 to 25 years of age. ONF anticipates thinning about **15,000 acres** of young stands over the life of this BO; however, some of this work (about 500 acres) is expected to be conducted during the later part of the early murrelet or spotted owl nesting seasons (early to late July). These stands typically originated after removal of an older forest stand by clear cutting, with post-harvest management activities consisting of various types of site preparation and natural regeneration and/or replanting of the unit. The units typically consist of densely stocked conifer stands (800 to 5,000+ trees per acre) with varying numbers of minor species. Generally, treated trees are less than 6 inches dbh.

Typical pre-commercial thinning activities consist of removing small diameter conifers using various spacing methods to achieve the desired objectives for each unit based on the growing potential of the site. Thinning increases growth rates and produces larger trees with deeper crowns and heavier limbs. Future beneficial effects of thinning include diversifying species composition, and creating variable spacing and understory development. Thinning activities will still leave a full range of options available for future stand management. Thinned young stands may retain a combination of planted species and natural regrowth, and will not result in a monoculture stand. Thinning will be used to enhance species diversity by giving some retention preference to minor species in stands otherwise dominated by one or two major species. These minor species might include Western red cedar, Pacific silver fir, Sitka spruce, Pacific yew, Western white pine, cascara, wild cherry, big-leaf maple, red alder, willow, black cottonwood, vine maple, and red elderberry. Thinning prescriptions and the quantity of minor species

retained will vary among stands depending on presence, land allocations, site-potential, stand objectives, potential wildlife use, and other local site indicators. Thinning objectives should be developed cooperatively by resource specialists to meet desired future conditions of the stands so that the silviculturist can develop responsive prescriptions. Depending on stand objectives and capabilities, the prescription might include small openings and/or unthinned areas to provide forage areas, cover, and structural diversity. Within riparian reserves and late successional reserves, prescriptions are generally designed to enhance growth and structural/species diversity in the stand.

Some removal of remnant trees may be required if they create a hazard for silvicultural workers. Such removal is included in the Hazard Tree Removal program.

Another type of pre-commercial thinning the Pacific Ranger District has undertaken involves thinning the dense hemlock understories of older stands. These older stands generally were commercially thinned 20 to 30 years ago, allowing a dense carpet of hemlock seedlings to become established and grow to sapling size before becoming stagnated because of shading from the overstory and competition among themselves. The dense understory can shade out desirable shrubs and herbs on the forest floor, inhibiting the development of a three-layered forest structure. Thinning the sapling understory can maintain these shrubs and herbs and allow the residual understory trees to grow and develop into a mid-level canopy layer. Typical prescriptions may specify thinning the understory trees up to 6 inches dbh to spacing ranging from 16 to 20 feet, ignoring all trees over 6 inches dbh. Minor hardwood species and vine maple shrubs are not cut. ONF anticipates thinning up to 1,000 acres of understories over the life of the BO.

Young stand manipulations such as stocking level control will be implemented over the next several years, at a rate that reflects available funding. ONF has identified several thousand acres that are ready for treatment. Work crews will use chainsaws to accomplish the thinning. The cut trees may either be left on site to decompose into the soil or be removed. Narrow strips along traveled roads may be piled and burned to reduce potential fire hazards or include other fuel treatment methods, such as lop and scatter or chipping. Project work is frequently carried out from October through April with crews of six members each working in a unit. The average rate of thinning is 1.3 acres per day per person. For a typical 40-acre unit, it would take five days to complete the unit with a crew of six people, but 10 days to complete the unit with a three-person limit.

Specific Conservation Measure for Pre-commercial Thinning

1. To prevent large quantities of small, mobile debris from entering streams, trees shall not be felled toward streamcourses.

Timber Stand Improvement (non-PCT)

Timber Stand Improvement work includes “release,” pruning, and conversion of stands from hardwood-dominated to conifer. ONF proposes to improve **500 acres** during the life of this BO; however, most of this work would be conducted outside the early nesting season of the marbled murrelet or spotted owl. Those units scheduled for treatment in the spring would farther than the appropriate harassment distance from spotted owl and murrelet suitable habitat. Treatment units would range from about 5 acres to about 150 acres with an average size of about 40 acres. For this BO, we estimate that there will be 13 40-acre units.

Release involves work crews with chainsaws and brush cutters to remove competing brush vegetation. Prescriptions are designed to promote growth on residual trees, but will vary based on site-specific stand needs. Treatments within Riparian Reserves will be designed to meet Aquatic Conservation Strategy objectives by enhancing growth and structural and species diversity in the stand. Release generally occurs from April through October to minimize regrowth and maximize effectiveness. Trees cut will be left on the ground. Release treatments would not occur in suitable northern spotted owl or marbled murrelet habitat.

Pruning entails the removal of limbs using hand tools, usually through the first 8 to 32 feet on trees within existing plantations to open the stand and encourage understory development. Pruning might be used to create knot-free wood for future availability. Pruning occurs in any of the snowfree months but mainly in the spring or fall. Pruning would not occur in suitable spotted owl or marbled murrelet habitat.

Stand conversion projects adjust hardwood and conifer stands to move stands toward desired forest characteristics. It is expected that stand-conversion projects will only occur where conifer would naturally have occurred. This activity may include removal of hardwoods such as red alder, big-leaf maple, black cottonwood, and vine maple. However, such activities are expected to retain minor hardwood species, especially mast-producing species such as bitter cherry, cascara, Pacific dogwood, and beaked hazelnut. Removal may be accomplished by a variety of means such as cutting or girdling. The intent of the activity is to remove competition and promote the establishment of conifers to provide for future large conifers for late-successional forest characteristics, large diameter snags, or down wood for riparian, stream, or upland areas.

Where stand-conversion projects occur in riparian areas, individual treated areas will be small (generally less than 3 acres) and widely distributed. A buffer of uncut hardwoods will be left to protect stream-bank stability and minimize loss of stream shading. Wider buffers will be left as necessary depending on site-specific conditions, existing vegetation, and stream temperature concerns. Aquatic specialists will be involved in the design and implementation of all riparian stand-conversion projects to ensure activities do not degrade aquatic habitat. Hand tools are proposed for work during the early breeding season where noise impacts are of concern.

Specific Conservation Measures for Timber Stand Improvement

1. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood, or sold.

Aerial Fertilization

Aerial fertilization involves use of a low-flying, light to medium helicopter to apply fertilizer (200 pounds of nitrogen/acre) to young stands of trees 20 to 80 years of age. ONF proposes to fertilize **500 acres** over the life of this BO. A forestry-grade size prill is used to minimize wind drift and optimize control of spread and penetration through the canopy.

Specific Conservation Measures for Timber Stand Improvement

1. Aerial application of fertilizer will occur only between October 1 and February 28.
2. Application will not be allowed on windy days, on snow-covered ground, or during very rainy or long-term dry weather conditions.
3. Non-fertilized buffers will be utilized to protect streams, lakes, ponds, and meadows. The width of the buffers will be determined during NEPA analysis based on site-specific characteristics.

Planting

Artificial regeneration will be done in the spring months utilizing a variety of seedling types (bare root, plug, transplants, wild seedlings) and species (conifer, hardwood) to meet resource objectives. About **600 acres** of reforestation will be accomplished over the life of this BO. Usually hand tools such as shovels, hoes, and planting spades are utilized, with conditions and planter preference determining which will be used in a given situation. Hand crews of 1 to 20 people are best suited for this type of work, with crew size dependent upon project size and time frames.

Cone Collection

Cone collection is a part of the reforestation program and may occur **one to three times** during the life of the BO, using methods such as tree climbing and hand picking, felling of trees (usually less than 21 inches dbh), or other mechanical methods. The majority of this work is outside the established seed orchard. Cedar, spruce, and fir cones are collected in the early fall after September 15 and are completed by the end of October.

Specific Conservation Measure for Cone Collection

1. Potential nest trees for marbled murrelet, spotted owl and bald eagle will not be felled for cone collection.

Seed Orchard Operation and Maintenance

There is **one active seed orchard** on ONF which is at least 0.25 mile from suitable spotted owl and murrelet habitat. Operation and maintenance activities include mowing and bark scoring, pruning, fertilizing, and some planting, grafting, and cone collecting. ONF annually piles and burns woody debris at a designated site within the orchard, and will hand pull noxious weeds as necessary. Equipment used includes a tractor, mower, and hand tools.

Noxious Weed Control

Noxious weed control is a program designed to limit the spread of noxious weeds and reduce or eliminate them in sensitive areas. The major noxious weed species on ONF include Scotch broom, thistle, knapweed, and tansy ragwort. ONF proposes to control noxious weeds on **607 acres** during the life of this BO. ONF has completed an Environmental Assessment for the noxious weed control program (USDA 1999). The preferred alternative in the ONF assessment includes the potential for use of manual, mechanical, biological, chemical, and cultural methods of control. Control efforts may take place anywhere on ONF, but are most likely along roads and trails, in openings and meadows, at administrative and recreational facilities, special areas (e.g., Botanical Areas) and project areas where ground disturbance occurs. Noxious weed work is performed between June and September, with the highest control activity done in the months of June and July. No coverage is provided by this consultation for treatment of noxious weeds using chemical (herbicide) control (7 acres). Separate consultation will be needed for this action.

Conservation Measures for All Noxious Weed Control Activities

1. Mitigation measures are described in ONF Integrated Weed Management Program Environmental Assessment (USDA 1999) must be implemented and will be amended by the Region 6 Invasive Plant Environmental Impact Statement (now in draft) and Terms and Conditions outlined in the BO of the Invasive Plant Biological Assessment (USDA 1999).
2. Conservation measures for terrestrial species specific to type of disturbance will be used *Tables G1 to G3*
3. All noxious weed control using herbicides will require separate consultation.

Mechanical/Manual

Mechanical methods may include use of tractors, graders, brush cutters, or other machinery with various types of blades to remove plants, their roots, or sometimes part of the top layer of soil. Manual methods include the use of hand-operated tools (e.g., axes, brush hooks, hoes, shovels,

hand clippers) to dig up and remove noxious species. About 100 acres of mechanical removal would be performed each year.

Biological

Biological methods include the use of insects and pathogens tested for host specificity that are released selectively in order to weaken or kill specific noxious weeds. Cultural methods such as seeding with a desirable ground cover, is another form of biological control. Application is by hand. About 20 acres would be treated annually using biological methods.

Herbicide

No coverage is provided by this consultation for treatment of noxious weeds using chemical (herbicide) control. Separate consultation will be needed for this type of action.

Prescribed Fire

The most common prescribed burning techniques for noxious weed control are pile burning. Refer to the Fire Hazard Reduction section later in this document for descriptions of these activities.

Transportation System

The transportation system program includes activities related to constructing, reconstructing, or repairing national forest roads.

Conservation Measures for All Transportation System Activities

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. Disturbed ground where runoff has the potential to drain into stream channels shall be revegetated or protected from surface erosion by seeding, mulching, other methods prior to the fall rainy season. Within one year after project completion, disturbed streambanks will be revegetated with woody vegetation to maintain soil stability and provide shade and future sources of instream LWD.
4. Excess material (spoils) shall be disposed of so it does not enter stream channels or other water bodies.
5. If wet weather conditions during project operations generate and transport sediment to a stream channel or other water body, cease operations until the weather conditions

improve, unless delaying operations would increase the risk of adverse resource impacts. Coordination with aquatic specialists should be part of this decision process.

6. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood, or sold.
7. Existing large woody material in stream channels shall be left in place if feasible or replaced in the stream channel at the conclusion of the project, unless doing so would cause degradation of habitat or put a drainage structure at risk.
8. All machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc) shall occur at a site more than 100 feet from stream channels, water bodies, or wetlands.
9. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Road Reconstruction

Road reconstruction is an activity within existing or previously used road prisms to improve drivability or bring the roads up to current standards. ONF proposes to reconstruct approximately **55 miles** of road during the life of this BO. Approximately 5 miles of road will be reconstructed to access commercial thinning and uneven-aged management projects, 3 miles during the early breeding season for murrelet and owl. An additional 50 miles of reconstruction may be accomplished to upgrade road surfaces, improve safety, or replace aging structures, about one-half of the miles would be reconstructed during the early breeding season for murrelet and spotted owl.

Reconstruction activities include the use of heavy earth moving equipment, including backhoes, bulldozers, excavators, dump trucks, low boy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. No more than five sites would have explosives used each year. In some cases, road work may continue for several weeks at a site.

In stream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

New Road Construction

Access to timber harvest-sites may require some road construction with machinery such as excavators, shovels, graders, and dump trucks. The amount of road building varies widely. Some roads may remain open for use and become part of the permanent forest road network.

Log haul on these roads will be variable but will generally be up to about six times per day and may be adjacent to suitable owl and murrelet habitat.

ONF proposes to construct approximately **5 miles** of new permanent road during the life of this BO. Road building for silvicultural activities generally occur outside the murrelet and owl breeding period. No suitable habitat will be removed as a result of the new road construction. Removal of spotted owl dispersal habitat may occur with the building of new permanent roads. Some large diameter trees may be removed from the road right-of-way, however no potential nest trees will be felled. Road building for silvicultural activities generally occur in June through October, about three miles of new road may be constructed during the later part of the early murrelet and owl breeding period. Up to 18 acres of dispersal habitat may be removed (assuming maximum clearing width of 30 feet). Any removal of dispersal habitat will require Level 1 review. These activities include the use of heavy earth moving equipment, including backhoes, bulldozers, excavators, dump trucks, low boy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. No more than five sites would have explosives used each year. In some cases road work may continue for several weeks at a site.

Instream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measures for New Road Construction

1. No suitable marbled murrelet or suitable spotted owl habitat will be removed for new permanent road building.
2. Any removal of dispersal habitat within spotted owl designated critical habitat will require Level 1 review.
3. Any proposed removal of any tree larger than 36 inches dbh will require an ONF wildlife biologist review.

Temporary Road Construction

Access to timber harvest-sites may require some road construction with machinery such as excavators, shovels, graders, and dump trucks. The amount of road building varies widely, but all roads are of a temporary nature (less than 5 years) and will be closed or decommissioned following use. Log haul on these roads will be variable but will generally be up to about six times per day and may be adjacent to suitable owl and murrelet habitat.

Temporary road construction will generally be limited to short spur roads needed to access landings for thinning and uneven-aged management projects. ONF proposes to construct approximately **40 miles** of temporary road during the life of this BO. Approximately 20 miles of temporary road will be constructed on old previously disturbed railroad grades or old abandoned road beds that are no longer drivable. Approximately 20 miles of temporary road will be built on

previously undisturbed ground. Approximately 10 percent, or 4 miles of road building would be outside of thinning units. Road building for silvicultural activities generally occurs in June through October, about 20 miles of road may be constructed during the later part of the early murrelet and owl breeding period. No suitable habitat will be removed as a result of the temporary road construction. Some large diameter trees may be removed from the road right-of-way, however no potential nest trees will be felled. Removal of spotted owl dispersal habitat may occur with the building of temporary roads. Up to 145 acres of dispersal habitat may be removed (assuming maximum clearing width of 30 feet) and will require Level 1 review.

These activities include the use of heavy earth-moving equipment, including backhoes, bulldozers, excavators, dump trucks, low boy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. No more than five sites would have explosives used each year. In some cases road work may continue for several weeks at a site.

In stream work will generally be conducted from July through September (low-flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Conservation Measures Specific to Temporary Road Construction

1. No suitable marbled murrelet or suitable spotted owl habitat will be removed for temporary road building.
2. Any removal of dispersal habitat within spotted owl designated critical habitat will require Level 1 review.
3. Any proposed removal of any tree larger than 36 inches dbh will require an ONF wildlife biologist review.

Bridge Construction/Reconstruction

Bridges on forest roads are installed/reinstalled to provide passage of flood flows and associated bedload, for better fish passage, or because the current crossing structure has reached the end of its expected design-life and is becoming unsafe. Extent of this activity varies, but generally will be limited to previously disturbed locations. ONF proposes to construct or reconstruct **40 bridges** during the life of this BO. Most in-stream bridge construction activities would occur during the summer low-flow period to meet conditions of the HPA. Road bridges could include everything from prefabricated bridges set from one side of the stream onto spread footings (with no stream crossings by heavy equipment and no excavation), to built-in-place steel or concrete structures which may include some stream crossings with equipment, excavation within the wetted perimeter for footings and/or rip-rap, and re-channeling of the water flow (for either temporary diversions or permanent fill removal and regrading). Placement of rip-rap, if any, will be limited to the amount necessary to protect bridge abutments and footings. Treated timber will not be used for abutments or other structures within the bankfull channel. Equipment includes larger tracked excavators and cranes, bulldozers, dump and concrete trucks, helicopters, and

generators for pumps. Pile-driving and/or blasting might also be performed on about 16 bridges. Blasting with charges of 2 pounds or less may occur two times per year during the early nesting season (March 1 through August 5). Charges greater than two pounds will not be used until after August 5. A portion of the work will be conducted in the late period of the early breeding season for owl and murrelet. No removal of suitable habitat for the spotted owl, marbled murrelet or bald eagle will occur as a result of this activity.

For new bridge construction, only those bridges that fully span the bankfull stream channel are included in this BO. Construction of bridges which have supports or abutments within the bankfull channel are not covered under this programmatic consultation.

Reconstruction of existing bridges which fully span the bankfull stream channel, and reconstruction activities of other bridges which do not involve any instream work, such as replacing bridge decking, are also included. Reconstruction of existing bridge supports or abutments within the bankfull channel are excluded under this programmatic.

Instream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Conservation Measure Specific to Bridge Construction/Reconstruction

1. Any blasting and/or pile-driving within 300 feet of potential bull trout spawning habitat between October 15 and April 15 will be reviewed by the Level 1 team to evaluate potential shock damage to eggs or pre-emergent fry.

Transportation System Repair

As a result of storm events or other natural disturbances, road system segments may be damaged or undermined. Minor storm-related repairs such as cleaning blocked culverts, clearing roadways of trees and slide debris, and removing bank sloughs from ditch lines are covered under routine road maintenance. This project type is intended to cover repairs of more severe storm damage to the road prism or drainage structures. Such situations may require placement of riprap and fill at failures, installation of new culverts or drainage devices, or realignment of road segments. ONF proposes to repair **400 sites** per year on the transportation system. Placement of riprap, if any, will be limited to the amount necessary to protect existing structures (bridge abutments, footings, culvert inlets and outlets) and fill minor erosion sites.

These activities include the use of heavy earth moving equipment for up to several weeks at a site. Equipment may include backhoes, bulldozers, excavators, dump trucks, lowboy tractor-trailers, rock crushers, and road graders. Activities within this project type may include hauling of existing materials from rock sources for riprap, surfacing, or barriers. The use of explosives, jackhammers, and pile drivers could occur at several sites where bridges are constructed to replace culverts. Blasting with charges of 2 pounds or less may occur two times per year during

the early nesting season (March 1 through August 5). Charges greater than two pounds will not be used until after August 5. A portion of the work will be conducted in the late period of the early breeding season for owl and murrelet. No removal of suitable habitat for the spotted owl, marbled murrelet or bald eagle will occur as a result of this activity.

Instream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects. About 20 percent of the sites may be initiated during early breeding season of the spotted owl and marbled murrelet.

Conservation Measure Specific to Transportation System Repair

1. Blasting with charges of 2 pounds or less will occur after the early nesting season for the marbled murrelet (April 1 to August 5) and early nesting season for the northern spotted owl (March 1 to July 15).

Rock Sources

Activities associated with the operation of existing rock sources may include blasting, excavating with heavy equipment, crushing operations, stockpiling rock material, and hauling material to project sites. Blasting at these sites may be accomplished with large “in-the-hole” charges that cause minimal noise disturbance. Occasionally surface charges are detonated which cause greater noise. ONF will attempt to limit activities to existing quarries and rock sources only. Any new sites will require Level 1 review to determine if the proposed site is within the limits anticipated in this BO. Removal or degradation of habitat for rock sources should only be considered when it is the environmentally preferred alternative, and must be consistent with the NWFP. ONF proposes to operate **40 rock sources** intermittently during the life of this BO. It is anticipated that blasting with charges 2 pounds and less may occur at five sites per year, three sites during the early breeding season of the spotted owl and marbled murrelet and will require Level 1 review.

Conservation Measures Specific to Rock Sources

1. Blasting with charges of 2 pounds or less will occur after the early nesting season for the marbled murrelet (April 1 to August 5) and early nesting season for the northern spotted owl (March 1 to July 15).

Road Maintenance

The purpose of the ONF road-maintenance program is to provide safe vehicular access to the forest by maintaining the existing road surfaces, culverts, ditches, and roadsides free of potholes, debris, brush, etc., and to perform work necessary to minimize road-related erosion.

Maintenance activities include culvert cleaning, replacement, and installation; grading, erosion control, brushing, hazard and downed tree removal, pavement repair, bridge maintenance, gate installation and maintenance, painting, and shoulder maintenance. ONF maintains 2,200 miles of road in four different maintenance levels (ML). Road maintenance activities can occur year-round. ONF proposes to maintain up to **2,200 miles** of road per year during the life of the BO. It is anticipated that about 1,200 of these miles would be maintained between March 1 and August 5 during early owl and murrelet breeding seasons (500 miles in ML 1 to 2 (450 miles-mechanized; 50 miles-non-mechanized), 700 miles in ML 3 to 5). From August 6 through September 30, 350 miles of road would be maintained (150 miles in ML 1 to 2, 200 miles in ML 3 to 5). From October 1 through March 1, 650 miles of road will receive maintenance, of those 300 miles would be on ML 1 to 2 roads and 350 miles on ML 3 to 5. Note that some ML 2 roads are located in high traffic situations and require maintenance on a year-round basis, similar to ML 3 status (June 14, 2001, letter from ONF to FWS, on file at ONF).

In addition to this mobile-maintenance work, ONF estimates that relatively immobile tasks (culvert repairs, slide repairs, etc.) would be done at about **80 sites** on ML-3 to 5 roads. About 12 miles of helicopter survey will be required as part of the road management program and are included in the allocated total in the Administrative Tours and Remote Site Inspection section. The following describes the amount of maintenance done at each maintenance level.

Maintenance level 1: Preventative maintenance generally conducted with non-mechanized hand tools with minimal use of mechanized equipment (These roads have been closed to vehicular traffic but not decommissioned.) Approximately 29 percent of total road miles are in ML 1.

Maintenance level 2: Cross ditching (10 per mile, work on 30 percent each year), ditch maintenance (work on 10 percent each year), culvert cleaning (10 per mile, work on 30 percent each year), brushing (every 4 years), removals (slides, unstable fill slopes, etc., average 18 cu yd/mile). Approximately 53 percent of total road miles are in ML 2. These roads are maintained for high clearance vehicles only and generally have low or infrequent use.

Maintenance level 3: Blading (2.5 bladings/year), ditch maintenance (annual), culvert cleaning (10 per mile, 35 percent each year), brushing (every other year), removals. Approximately 13 percent of total road miles are in ML 3. These gravel roads are maintained for standard cars and passenger vehicles and can have a wide range of use.

Maintenance level 4 and 5: Ditch maintenance (annual), culvert cleaning (10 per mile, 35 percent per year), brushing (every other year), removals, shoulder maintenance (annual), sweep road (annual), paint striping (every 5 years), chip seal (every 8 years). Approximately 5 percent of total road miles are in ML 4 to 5. These roads generally receive high use from standard passenger cars and other vehicles.

Road maintenance activities such as grading, culvert cleaning, drainage maintenance, ditch cleaning, surfacing replacement, road closures, gate maintenance, and tree removal are usually done between March 15 and November 30 and are limited by snow during the winter months.

Road maintenance activities that require dry weather such as shoulder maintenance, painting, pavement skin patching/potholes, cracks, and bridge maintenance are usually done during August, but can occur anytime between June 1 and September 30 depending on the weather. Bridge maintenance has a longer window and might occur between April 1 and the end of October.

Road maintenance activities involving controlling vegetation such as brushing are done year round, but are usually done in the spring through mid-summer when the sap is flowing because effects will last longer (April 1 to June 30).

Heavy run-off events or other natural disturbances may require minor road repairs to alleviate imminent resource damage or public safety issues at any time.

In stream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Conservation Measures for All Road Maintenance Activities

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. To protect key bull trout spawning populations, road blading, ditch maintenance, and culvert cleaning will not occur on the following roads between October 1 and April 1 (except for emergency storm-related work): South Fork Skokomish watershed - Road 2361 and spurs, Road 2363 and spurs; Dungeness and Graywolf watersheds – Roads 2860, 2870, 2880.
4. Disturbed natural ground where runoff has the potential to drain into stream channels shall be revegetated or protected from surface erosion by seeding, mulching, other methods prior to the fall rainy season. Within one year after project completion, disturbed streambanks will be revegetated with woody vegetation to maintain soil stability and provide shade and future sources of instream LWD.
5. Maintain vegetated ditchline where functional to help control soil erosion. Retain grasses and other herbaceous vegetation in ditches to reduce water velocity, trap sediment, and retard woody plants.
6. Excess material (spoils) shall be disposed of so it does not enter stream channels or other water bodies.
7. If wet weather conditions during project operations generate and transport sediment to a stream channel or other water body, cease operations until the weather conditions improve, unless delaying operations would increase the risk of adverse resource impacts.

Coordination with aquatic specialists should be part of this decision process.

8. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood, or sold.
9. Large woody material removed from a culvert inlet shall be put back into the stream channel downstream of the culvert unless doing so will cause degradation of habitat. An example where wood removal would be appropriate is removal of wood from culverts on a stacked road, where replacing wood in the stream would increase the potential for damage to another culvert directly downstream.
10. All machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc) shall occur at a site greater than 100 feet from stream channels, water bodies, or wetlands.
11. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Culvert Replacement/Installation

This activity is normally done during the summer low-flow period on Maintenance Level 1 to 4 roads. It includes replacement of existing culverts that have become damaged or are no longer functional and installation of new culverts needed to improve road drainage. Culvert replacements/ installations under road maintenance are limited to ditch relief pipes and structures which convey intermittent channels or small non-fish bearing streams where the new culvert is less than or equal to 36 inches in diameter. Replacement of larger culverts, or culverts on fish bearing streams are discussed in the sections Transportation System Repair or Fish Passage Improvement. Equipment used would generally include a backhoe or excavator and a dump truck. Culvert replacement can take a day or more.

Grading

This activity is done year round on Maintenance Levels 3 to 4, and includes cross ditches and some cleaning and pulling ditches. A road grader is usually used which can cover 4 to 6 lane miles/day depending on road location and condition.

Drainage Maintenance

This activity is done normally in fall and spring on Maintenance Levels 2 to 4. Equipment used is usually a backhoe and sometimes a dump truck. About 15 culverts can be cleaned per day. Culverts infrequently need replacement, which requires a backhoe or excavator and can take a day or more. Pulling ditches (ditch cleaning) would also be completed. Equipment used is a road grader, loader, dump truck, and chainsaw.

Brushing

This activity is normally done in during the spring when it is more effective, and can cover 5 side miles per day depending on site conditions. Brushing is normally done on Level 4 roads every other year and may be done on Level 3 roads every third year. Brushing is done on Level 2 roads when needed for access, public safety, and drainage maintenance.

Down Tree Removal

This activity involves removing windfalls within the road prism using a chainsaw, and takes about 1/2 to 1 hour/tree. Most of this work is done in early spring after the winter storms, but can occur anytime during the year when needed.

Hazard Tree Removal

Hazard tree removal along roads (maintenance levels 2 to 5) occurs annually. All conservation measures specified under the Hazard Tree Removal Program will be applied.

Pavement Skin Patching/Potholes/Cracks

This activity is normally done in August through September using a dump truck, paver, and roller. Work normally goes fairly quickly, and is done about every five years. Individual potholes are filled annually using a dump truck or pickup.

Surfacing Replacement

This activity is normally done July through September using dump trucks, pavers, rollers, and graders. Work includes replacement of aggregate surfacing or chip sealing of asphalt surfacing.

Bridge Maintenance

This activity is done every 2 to 3 years in the summer using a compressor and power washer. The High Steel Bridge takes 1/2 to 1 day to complete. The steel bridges on ONF (**14 total**) also require periodic painting every 15 to 20 years, and 2 of the 14 require more frequent painting every 0 to 5 years. Routine bridge maintenance involves the following items of work: repair of bridge approaches with gabions or Hilfiker walls, brushing of approaches, hazard tree removal, removal of drift logs from the channel near bridge, asphalt patching and crack sealing, bridge and approach guardrail repair, skin patching of bridge deck, sign installation, replacement of deck running planks, flush/clean bridge decks, cleaning of all bridge bearing seats and bridge components, cleaning, sandblasting and spot painting of steel bridges with containment, removal of fill from contact with girder, in-place chemical treatment of timber bridge components, periodic inspections with UBIT truck.

Gate Installation and Maintenance

On roads where public access is restricted, road gates earthen berms, jersey barriers, ecology blocks, or boulders are installed to prevent vehicle access. A backhoe, boom truck, or similar machinery is typically used, with work completed in one day or less. Gate maintenance normally consists only of painting, but some times total replacement is required, which takes a backhoe up to three hours; and a welder up to two hours.

Painting

Stripe painting on paved roads is done every five years using a paint truck.

Shoulder Maintenance

This activity involves shaping the road shoulder so that it meets the edge of the pavement smoothly. It is accomplished with a road grader, and generally does not involve the ditchline portion of the road prism. A tractor with a rotary broom follows the grader and sweeps loose gravel off the paved surface. The activity is best accomplished from July to September, as dry conditions are needed to avoid mud on the road surface and possible movement of sediment into streamcourses. About 5 miles/day can be accomplished depending on site conditions.

Lands and Special Uses

The Special Use Program involves a variety of activities that require the issuance of permits, including occupancy of recreational residences and cabins, use and maintenance of facilities, and commercial operations. Currently there are 295 special use permits on ONF. Of those 76 are under the recreation program, and 219 are considered non-recreation.

Conservation Measures for All Lands and Special Use Activities

1. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Road Use and Access Permits

Road use permits authorize haul, usually of timber and rock, to and from nonfederal lands over National Forest System roads. ONF proposes to issue approximately **100 road use permits** over the life of this BO. This number includes the road construction/reconstruction permits described below. Under the 2001 USDA Interim Directive 7709.59-2001-1, road use permits that are issued for commercial use of existing roads that are available for public use, and suitable for the planned commercial use without reconstruction, are exempt from requirements of the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA). Most of the use permits issued by ONF will meet this exemption. Road use requests that require construction or reconstruction prior to use are subject to NEPA and ESA requirements.

As stated in USDA and USDI (1994b:C-19), “Access to nonfederal lands through LSRs will be considered and existing right-of-way agreements, contracted rights, easements, and special-use permits in LSRs will be recognized as valid uses. New access proposals may require mitigation measures to reduce adverse effects on LSRs. In these cases, alternate routes that avoid LSR habitat should be considered. If roads must be routed through a reserve, they will be designed and located to have the least impact on late-successional habitat.”

Road Construction/Reconstruction Permits authorize the construction or reconstruction of a road across USFS lands to access nonfederal lands, usually for purpose of timber harvest with necessary machinery such as excavators, shovels, graders, and dump trucks. The amount of road building on ONF lands varies widely; requests range from 25 feet to 1-mile (average 500 feet). Some roads may remain open. Others will be of a temporary nature (less than 5 years) and will be restricted, closed, or decommissioned following use. Road construction may entail cutting of federal timber. ONF anticipates that **20 road construction/reconstruction permits** will be issued over the life of this BO. ONF anticipates that a total of **5 miles** of new road construction/reconstruction on federal land will be authorized during the life of the BO. This is generally limited to spurs less than 1,000 feet; longer roads will require Level 1 review. About 30 acres of land will be converted to road (assuming 50-foot clearing width, however up to 30 feet clearing preferred). However, ONF anticipates **that no more than 30 acres of dispersal habitat for the northern spotted owl will be removed** from National Forest lands as a result of Road Use and Access Permits. Additional mitigations may be required consistent with the Northwest Forest Plan.

Most of the requests for permits involve access to privately owned land for timber harvest. A section 10 permit or other authorization is required under the ESA for activities on nonfederal lands, and therefore a separate consultation, would need to be undertaken if the permittee’s actions on nonfederal lands would result in incidental take. If the private landowner has completed a HCP and holds a section 10 permit, there will be no further assessment under section 7 of the ESA.

If the timber on nonfederal land is second growth, and most often functions as dispersal habitat for the northern spotted owl, it is estimated from the recent years’ Forest Practice Application review that up to 500 acres of dispersal habitat may be removed annually from nonfederal lands adjacent to ONF.

These activities include the use of heavy earth moving equipment including backhoes, bulldozers, excavators, dump trucks, lowboy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. In some cases road work may continue for several weeks at a site. Instream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measures for Road Use and Access Permits

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. All conservation measures specified for road construction/ reconstruction under the Transportation System Program will be applied on National Forest lands.
3. All conservation measures specified for road maintenance under the Road Maintenance Program will be applied on National Forest lands.
4. All conservation measures specified for road decommissioning under the Watershed Restoration Program section will be applied on National Forest lands.
5. No removal of suitable nesting habitat for the marbled murrelet or spotted habitat.
6. Any removal of dispersal habitat within CHU will require Level 1 review.
7. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
8. All conservation measures specified under the Hazard Tree Removal Program will be applied.

Road and Trail Easements

These agreements provide for joint use and management of the road system(s), exchange of easements where needed, and agreements on road access locations, construction standards, and maintenance levels, for the parties to the Agreement. Roads and investments in roads become a shared responsibility between the parties, allowing for cost-effective cooperation in construction, maintenance, and repairs. ONF currently administers up to seven road and trail easements and proposes to issue **20 new easements** during the life of this BO. Activities may include minimal removal of timber (hazard tree removal or right-of-way widening) and surface disturbance. Typical road right-of-way length is 0.10 to 5.0 miles and width is 40 to 60 feet. Actual road prisms are 12 to 22 feet wide. New road construction is not anticipated as a result of this project type.

ONF anticipates that 20 new easements may each add about 3 miles of road/trail under which hauling may occur at unlimited times and dates (total of 60 miles).

As stated in USDA and USDI (1994b:C-19), “Access to nonfederal lands through LSRs will be considered and existing right-of-way agreements, contracted rights, easements, and special-use permits in LSRs will be recognized as valid uses. New access proposals may require mitigation measures to reduce adverse effects on LSRs. In these cases, alternate routes that avoid LSR habitat should be considered. If roads must be routed through a reserve, they will be designed and located to have the least impact on late-successional habitat”.

Joint Road Agreements are used between corporate and state entities where desired. Other landowners within or adjacent to ONF, with similar long-term access needs of a lesser scope, would utilize other types of easements consistent with the Forest Road and Trail Act or Forest Land Policy Management Act together with Cooperative Road Maintenance Agreements, to

perfect their right of access, obtain county building permits, provide for private driveways, and coordinate road use and maintenance with ONF. In some instances, permits or easements may be required to resolve an existing unauthorized use, such as residential/agricultural driveways, lost or unrecorded deeds, etc.

In stream work will generally be conducted from July through September (low flow season); timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measures for Road and Trail Easements

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. All conservation measures specified for road construction/ reconstruction outlined under the Transportation System section of this BO will be applied on National Forest lands.
3. All conservation measures specified for road maintenance outlined under the Road Maintenance section of this BO will be applied on National Forest lands.
4. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
5. All conservation measures specified outlined under the Hazard Tree Removal section of this BO will be applied.

Tailhold and Guyline Anchor Permits

These permits authorize the use of trees on National Forest lands for tailholds and guyline anchors, which enables cable logging on adjacent nonfederal lands. ONF receives requests to use ONF trees for logging tower guyline anchors or tailholds when a log landing for a cable yarding operation on private land is located so near to the property boundary that there is not sufficient room on the private land to extend the guyline far enough out to provide support for the tower. Since cable landing locations are dictated by terrain, the operators usually don't have much choice in where the landing would be located, and are unable to move the landing farther away from the boundary.

Trees on National Forest lands will not be cut down or removed to place tailholds or guyline anchors without prior approval from ONF. It is usually necessary to notch the trees at the base to prevent the cable from riding up the tapering bole, but often the tree can be left standing, and if the notches are replaced after use, the tree has a good chance of survival. Protective straps and tree plates will be used as necessary to minimize damage to trees. The largest trees that are in the most suitable location are preferred for use as guyline anchors or tailholds. There may be minor ground disturbance due to the cable touching the ground near the tree. There may also be some branches lost or removed from adjacent trees as a result of raising and lowering the cable. Chainsaws may be used on Forest lands; however, other motorized equipment may be used on the permittee's lands.

ONF proposes to issue **45 permits** during the life of this BO, each covering multiple trees (tailholds or guyline anchors). Permits are anticipated to authorize an average of up to five trees per permit. Up to 225 trees would be used as tailhold or guyline trees. During the life of this BO up to **90 potential nest trees** may be used as a tailhold or guyline anchor. ONF anticipates less than 200 trees will be notched, these may include potential nest trees, however no potential nest trees will be felled, and less than 25 non-potential trees may be felled. Prior to the use of removal of a potential nest tree, ONF will require of the permittee prioritized options to locate the trees: (1) high quality stumps; (2) standing trees that do not have nest tree characteristics nor provide buffering of a nest tree; and (3) potential nest tree or tree that provides buffering of a nest tree.

A section 10 permit or other authorization under the ESA, and therefore a separate consultation, will need to be undertaken if the permittee's actions would result in incidental take. If the private landowner has completed a HCP and holds a section 10 permit, there will be no further assessment under section 7 of the ESA.

Specific Conservation Measures for Tailhold and Guyline Anchor Permits

1. Logging activities on federal land within appropriate harassment distance of suitable habitat will be allowed between October 1 and February 28.
2. Known marbled murrelet nest trees or spotted owl nest trees will not be used.
3. Known or historic bald eagle nest trees will not be used.
4. Any tree 21 inches dbh and greater that has nest tree characteristics that is within suitable spotted owl or marbled murrelet habitat and proposed as a tailhold or guyline anchor will be field reviewed by a wildlife biologist (either an ONF biologist, or biologist from the private land owner). If the tree is determined to be either a potential nest tree or tree that provides cover to a potential nest tree it will not be felled.
5. Protective straps and tree plates will be used as necessary to minimize damage to trees.
6. Notches will be replaced on the tree after use.

Linear Right-of-Way Operations and Maintenance

These activities include linear right-of-way operations and maintenance for power, phone, cable, water, and pipe lines. Water pipe lines typically range between 200 feet and 1,000 feet in length and are about 6 feet in width; power transmission lines (both above and below the ground) and telephone lines range from 0.10 to 20.0 miles in length and up to 200 feet in width and are usually confined within road rights-of-ways. ONF has 26 waterline permits, 12 power line permits, four telephone permits, and one cable television permit. Approximately **20 permits** will be issued or renewed for existing right-of-ways during the life of this BO. Maintenance activities include brushing below power lines or in ditches to keep vegetation low, hazard tree removal, and noxious weed control. Repair or replacement of damaged waterline segments and upgrading of lines to fiber optic cable are common permitted activities. Vegetation Management Plans are being developed for some utilities.

A number of these activities are federal projects conducted by their respective lead agencies, such as the Federal Energy Regulatory Commission, Bonneville Power Administration, or other federal agencies. Activities conducted by other federal agencies (other than ONF) or their contractors, permittees, licensees, lessees, grantees, or agents are not covered by this BO, but will be addressed in separate consultations with those respective agencies. The federal action of ONF issuing an easement or right-of-way may be covered as an interrelated and interdependent action through the consultation conducted with the other agencies regarding the larger action.

Specific Conservation Measures for Linear Right-of-Way Operations and Maintenance

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. All conservation measures specified for road maintenance under the Road Maintenance Program will be applied for right-of-way maintenance.
3. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
4. All conservation measures specified under the Hazard Tree Removal Program will be applied.

Communication/Weather Sites

ONF has three designated communications sites (North Point, Neilton Point, and Buck Mountain) at which multiple commercial and private leased communications facilities are operated. Leases are generally issued for 10 years. ONF also has a number of radio repeater and weather stations for internal use. ONF proposes to issue or amend leases, maintain, and/or upgrade **22 sites** per year during the life of this BO. Construction of new communication sites that include tower installation is not covered under this assessment and will require separate consultation. For a list of communication/weather sites, the local Ranger District may be contacted.

Maintenance activities include brushing and clearing of sites to keep vegetation low, structural maintenance and repair and replacement of facilities, road maintenance for access, and fuels management activities, as described in the administrative site plans.

Specific Conservation Measure for Communication/Weather Sites

1. Extension of current tower height will need Level 1 review.

Permits for Research and Monitoring

ONF proposes to issue **20 permits** for miscellaneous research and monitoring activities during the life of this BO. Activities may include collection of aquatic flora and fauna (including possible animal baiting, trapping, and banding), collection of physical riparian and in-stream habitat data, excavation of test pits for groundwater, collection of sedimentation/scouring data in potential spawning habitat, possible limited cutting of trees and ground vegetation, establishment of temporary research plots, burial of sensors (which may require minimal ground disturbance), seismic testing, construction of tree-mounted data collection platforms, and installation of radio transmission antennas. Equipment used may include augers, chainsaws, equipment tooters, and power and hand tools. Research and monitoring may require permits from USFWS, NMFS, and/or WDFW. It is anticipated that ten of the permits could affect murrelets and spotted owls. It is likely that each permit may include as many as 10 sites for activities.

Due to the variable nature of these activities, FWS and ONF will discuss project proposals that involve the use of heavy equipment or other motorized equipment which may generate high noise levels, visual disturbance, or removal of platform trees, suitable spotted owl nest trees or trees that provide cover to platform trees to ensure consistency with the intent of this consultation. Research and monitoring activities for listed species will require section 10(a)(1)(A) permits for those species and, therefore, separate section 7 consultations would be required for such activities. This consultation only addresses the effects of such activities on listed species not covered under section 10(a)(1)(A). The NWFP directs USFS to consider whether there are equivalent opportunities available outside LSRs and whether such activities are consistent with LSR objectives.

Water Withdrawal Permits

This BO covers only the re-issuance of existing water withdrawal permits, not the issuance of new permits. For domestic water supply, an applicant must obtain a water right from Washington Department of Ecology before applying for a Special Use Authorization from ONF. There are approximately 26 existing operational permits on ONF, ranging in size from single dwelling, to small communities (e.g., Neilton), to the City of Port Townsend. Repair and maintenance of existing water transmission lines and systems can require the use of a backhoe, flatbed truck, boom truck, dump truck, chainsaw, and drilling rig. About three to five permit requests are received each year for re-issuance on ONF, most of which involve individuals. A total of about **11 permits** will be re-issued during the life of this BO. A list of water withdrawal permits may be obtained at the local ranger district.

The following activities can be expected in the maintenance and upkeep of existing water transmission lines and systems, typically using backhoe, flatbed truck, boom truck, dump truck, chainsaw, and/or drilling rig: 1. installation of new water pipeline, requiring excavation using backhoe or ditch witch; 2. maintenance of access roads and trails (brushing, removal of hazard trees, grading and shaping, surfacing); 3. removal of hazard trees near pumphouse, intake and filtration structures, and other improvements; 4. upgrading facilities on existing sites to meet

DOE standards, including installation of filtration buildings, replacement of water pipeline, relocation of intake site, and construction of new drainfields to handle overflow at filtration sites; and 5. drilling of additional wells on existing sites.

Specific Conservation Measures for Water Withdrawal Permits

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. All conservation measures specified for road construction/ reconstruction under the Transportation System Program will be applied for construction or facility upgrades.
3. All conservation measures specified for road maintenance under the Road Maintenance Program will be applied.
4. All conservation measures specified under the Hazard Tree Removal Program will be applied.
5. Any project involving placement/repair of instream diversion or withdrawal structures, excavation within the bankfull stream channel, or drilling new wells will be reviewed by the Level 1 Team to determine consistency with the programmatic.
6. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Outfitter Guide Permits

Outfitter-guide permits are granted to outfitters for backcountry trips (such as hunting, fishing, or sightseeing), mountain climbing, and trail-hiking guides, which may include the use of saddle and pack stock as part of the permit. There are typically four to six permits issued on ONF per year which are usually one year in duration. ONF proposes to issue up to **36 permits** during the life of this BO. Outfitter-guide permits provide ONF with the opportunity to clearly state conditions for outfitter operations that will minimize user impacts on species of concern, and their habitats.

Specific Conservation Measures for Outfitter Guide Permits

1. Special Use permits will contain terms and conditions as necessary to avoid adverse impacts to listed species or their habitats. Permits will also include specifics on sanitation and cleanup of site.
2. Food and garbage must be stored properly to prevent attraction of corvids.

Developed Facilities Permits

Developed facilities include structures and other improvements located on National Forest lands that are owned or leased by corporations, organizations, and individuals. This BO only covers the reissuance of existing permits. ONF proposes to re-issue **20 permits** during the life of this BO. The developed facilities can be commercial (resorts, cabins, campground concession, cabin rentals, stores, gas stations) or non-commercial (summer homes, organization camps) in nature.

The larger developed facilities, such as the Lake Quinault Lodge and Satsop Work Center, have master development plans to guide their use. Permits for many developed facilities are long-term commitments of National Forest land, generally for a period of 20 years. ONF permission is not needed for normal facility maintenance, unless the activity is ground or vegetation disturbing. Activities such as land clearing, installation of new structures, well-drilling, septic-system installation, and tree removal require prior ONF review and approval. Developed-facilities permits are administered primarily under the Recreation Special Uses program. New land clearing is not anticipated to exceed 10 acres of non-habitat adjacent to existing facilities during the life of this BO.

Specific Conservation Measure for Developed Facilities Permits

1. All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other water bodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
3. All conservation measures specified under the Hazard Tree Removal Program will be applied.
4. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Recreation Residence Maintenance

There are 65 recreational residences on ONF. Recreation residences are permitted homes on National Forest land which are maintained by the permittee. Approximately **65 permits** will be re-issued during the life of this BO. Maintenance activities such as painting, roofing, washing windows, and cleaning gutters do not require ONF permission prior to each activity. Prior ONF permission is required for ground-disturbing or vegetation-disturbing activities such as land clearing, installation of new structures, hazard tree falling, and/or sewer hookups. It is likely that fewer than 15 sites per year would involve these type of activities. When pit toilets are replaced, vault toilets are required. New land clearing is not anticipated to exceed 10 acres of non-habitat adjacent to existing facilities during the life of this BO.

Specific Conservation Measures for Recreation Residence Maintenance

1. All projects potentially affecting the bed or banks of streams, lakes, or other waterbodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams or other waterbodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.

3. Disturbed ground where runoff has the potential to drain into stream channels shall be revegetated or protected from surface erosion by seeding, mulching, other methods prior to the fall rainy season. Within one year after project completion, disturbed streambanks will be revegetated with woody vegetation to maintain soil stability and provide shade and future sources of instream LWD.
4. All conservation measures specified under the Hazard Tree Removal Program will be applied.

Permits for Other Special Uses

ONF receives requests for special and group events such as club meetings, Native American gatherings, search and rescue, photography, commercial filming, group hikes, and apiaries. Under new direction for non-commercial group use, permits are required only when a group exceeds 75 people. ONF proposes to issue approximately **14 permits** during the life of this BO. On a project-specific basis, requirements are developed to maintain and protect resource values. These requirements are expected to address location, time of year, and sanitation measures.

Land Line Survey and Boundary Adjustments

Activities associated with surveying land lines may include hand-brushing and use of chainsaws for traversing, tree-blazing, establishment of corner markers, and posting of boundary signs. Trees 6 inches dbh or less may be cut in dense stands. Boundary adjustments are performed to resolve existing encroachments, or when a ONF boundary is not precise. Boundary adjustments require a re-survey of the proper boundary line and proper documentation. These activities are not ground disturbing. About **15 miles** of survey will occur over the life of this BO, with about 5 miles occurring in the early murrelet or spotted owl breeding seasons.

Conservation Measures for All Land Line Survey and Boundary Adjustment Activities

1. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Administrative Tours and Remote Site Inspections

Periodic overflights and helicopter travel are conducted by ONF. In order to demonstrate a number of projects or issue-sites to members of ONF from Regional or National Headquarters, or other officials, it is often necessary to use fixed-wing aircraft for overflights or to travel via helicopter. ONF expects to conduct several overflights each year to display progress and issues as well as to track landscape conditions. Overflights are generally at least 500 feet above ground level and seldom are conducted below 300 feet. Smaller propeller aircraft are generally used for such flights and take-off and landing generally occur outside ONF. Helicopter tours generally include an average of four stops each. These are generally located in a clearing or on a landing. ONF expects to conduct an average of three helicopter tours each year, involving a total of about four stops each or **60 stops** over the life of the BO.

Specific Conservation Measures for Administrative Tours and Remote Site Inspections

1. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Waste Cleanup Activities

Because of their remoteness and easy access, forest roads are often used to discard garbage and other forms of waste materials. Non-hazardous materials are cleaned up on an intermittent basis, and generally involve handwork and a medium-sized truck or pickup-trailer combination. Power winches may be used to pick up and load larger items.

Occasionally, hazards are discovered or are accidentally created on ONF that need immediate attention due to health/safety risk. In the past, these have included fuel/petroleum-based product leaks/spills, unknown barrels, and methylethylketones. These are usually treated as emergency situations, in accordance with existing laws and regulations. Intensity of the clean-up activity may vary widely. In other cases, abandoned recreational vehicles that have been contaminated may have to be removed. In the case of a spill of liquid contaminants, substantial volumes of soil may have to be excavated and disposed of, utilizing heavy equipment such as backhoes, front-end loaders, and dump trucks. Theft of standing cedar trees is unfortunately common on ONF; about 10 sites per year are found. It may take from 1 to 6 hours in suitable spotted owl and murrelet habitat to clean up the debris from the area using power and nonmotorized tools. In addition, there are usually four to six incidents of hazardous waste disposal on ONF in a given year.

A total of approximately **110 sites** of all types will be cleaned during the life of this BO. Assume that about one-third (36) would require use of heavy equipment and, of those, only 15 sites may be cleaned during the early breeding season for murrelets and spotted owls.

Specific Conservation Measures for Waste Cleanup Activities

1. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Watershed Restoration

The project types in this section are specifically designed to restore watershed conditions and reduce the potential for catastrophic impacts from management activities.

Conservation Measures for All Watershed Restoration Activities

1. All projects potentially affecting the bed or banks of streams, lakes, or other waterbodies must meet all conditions specified in the WDFW Hydraulic Project Approval (HPA) for the project, including appropriate in-water work timing periods.
2. Erosion control methods shall be used to minimize the entry of silt-laden water into streams

or other waterbodies. These may include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.

3. Disturbed ground where runoff has the potential to drain into stream channels shall be revegetated or protected from surface erosion by seeding, mulching, other methods prior to the fall rainy season. Tops, branches, and woody material removed during project activities may be scattered across disturbed streambanks and sideslopes to break up the erosive energy and trap mobilized sediments. Within one year after project completion, disturbed streambanks will be revegetated with woody vegetation to maintain soil stability and provide shade and future sources of instream LWD.
4. Disturbed streambanks and sideslopes greater than 20 feet in height, containing especially unstable soils, containing seeps or locally saturated soils, or with finished slopes steeper than 2 horizontal to 1 vertical in soil materials will be analyzed to evaluate slope stability and identify appropriate measures to control erosion. Additional erosion control measures at these sites may include, but are not limited to, brush waddling, log terracing, benching, log crib walls, erosion control matting, hydromulching, and/or use of bonded fiber matrix mulch (USDA 1996a).
5. Excess material (spoils) shall be disposed of so it does not enter stream channels or other waterbodies.
6. If wet weather conditions during project operations generate and transport sediment to a stream channel or other waterbody, cease operations until the weather conditions improve, unless delaying operations would increase the risk of adverse resource impacts. Coordination with aquatic specialists should be part of this decision process.
7. To insure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place or utilized to armor disturbed streambanks. If an aquatic specialist determines the trees are not needed to meet current instream LWD objectives, they may be removed for use in instream aquatic improvement projects or other administrative uses, left on-site to improve terrestrial large woody habitat, left for firewood, or sold.
8. Existing large woody material in stream channels shall be left in place if feasible or replaced in the stream channel at the conclusion of the project, unless doing so would cause degradation of habitat.
9. All machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc.) shall occur at a site greater than 100 feet from stream channels, waterbodies, or wetlands.
10. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Storm-proofing and Road Drainage Upgrading

ONF proposes to storm-proof or upgrade drainage on **250 miles** of road during the life of this BO. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, about 20 to 30 miles of storm-proofing or drainage upgrades will be initiated prior to August 6 each year. Activities may include correcting stream-diversion potentials at stream crossings; removing unstable fill; rerouting road drainage to stable areas; adding new culverts; installing proper-sized culverts; lowering fills; hardening stream crossings; lowering inlets; out-sloping; installing waterbars; and other activities designed to control erosion and sedimentation. This activity includes projects that are commonly referred to as Active Reduction in Maintenance Level.

Heavy equipment (grader, excavator, bulldozer, backhoe, dump trucks) is usually involved. Activities range from highly mobile activities such as constructing waterbars to activities that remain in one location for extended periods (three to 120 days) such as large fill removals. Blasting may be needed occasionally. ONF anticipates blasting at no more than three sites per year with 2 pound charges would be during the early breeding season.

In stream work will generally be conducted from July through September (low flow season). Timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measure for Storm-proofing and Road Drainage Upgrading

1. When installing new culverts or waterbars on steep slopes in fine materials and without a resistant vegetative cover, place rock or large wood at the outlet to dissipate flow energy.

Landslide Stabilization

This activity involves soil bioengineering techniques designed to restore stability and vegetation on existing landslides or other areas that are actively eroding. Most sites range from less than 1 acre in size to 5 acres. A large landslide stabilization site may approach 100 acres. ONF proposes to stabilize approximately **150 acres (12 miles)** during the life of this BO. Common techniques such as seeding and fertilizing, installation of erosion-control matting, willow wattling, brush layering, and planting or transplanting of trees and shrubs typically involve hand labor. Occasional activities such as live cribwall construction and log terracing typically involve the use of heavy equipment. Equipment utilized may include chainsaws, log trucks, front end loaders, backhoes, and various power and hand tools.

Erosion control, bioengineering, and revegetation activities may continue for several years after project implementation if necessary to achieve project objectives.

Specific Conservation Measure for Landslide Stabilization

1. Any landslide stabilization activities that utilize heavy equipment will be reviewed by the Level I team to insure that adequate mitigation measures are in place and that the project is consistent with the programmatic consultation.

Road Decommissioning and Bridge Removal

ONF proposes to permanently close and decommission approximately **150 miles** of road during the life of this BO. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, about 10 miles of decommissioning per year or 50 miles during the life of this BO will be initiated prior to August 6 each year. Activities may include removing culverts, ripping or decompacting road surfaces, out-sloping, removing unstable fills, removing bridges or conversion from a road bridge to a trail bridge, constructing waterbars, seeding/planting, installing erosion-control measures, and placing travel barriers. Heavy equipment (grader, excavator, bulldozer, backhoe, dump truck), helicopters (no more than two per year during the owl and murrelet early breeding season), and mobile cranes may be used. Time required to complete a project will vary depending on local conditions.

Over the life of this BO, approximately **25 potential nest trees** may be removed as part of road decommissioning, incidental to removal of culverts and large fills, or necessary shaping of the road prism. Of these 25 trees no more than one annually (5 total during the life of this BO) will be removed during the early nesting season for spotted owl and marbled murrelet.

In stream work will generally be conducted from July through September (low flow season). Timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Erosion control, bioengineering, and revegetation activities may continue for several years after project implementation if necessary to achieve project objectives.

Specific Conservation Measure for Road Decommissioning and Bridge Removal

1. When removing culverts, all fill material shall be removed and the streambed shall be restored to the original gradient if feasible. The bottom width of the fill excavation shall be at least as wide as the bankfull stream channel. Any fill removals which will not completely remove the fill and/or return the stream to its original gradient will be reviewed by the Level I team to insure that adequate mitigation measures are in place and that the project is consistent with the programmatic consultation.
2. When removing culverts, consider placing wood or rock structures in the new stream channel to dissipate flow energy and reduce incision.
3. When removing culverts, excavated fill slopes shall be sloped to an angle of natural stability as much as possible while minimizing disturbance of upslope vegetation.
4. Projects which create excavated fill slopes that have a high potential to remain unstable due to natural soil movement or future mass wasting will be reviewed by the Level 1 team to

insure that adequate mitigation measures are in place and that the project is consistent with the programmatic consultation. Only a portion of the sites described under #3 above are anticipated to require this level of review.

5. Known marbled murrelet nest trees or spotted owl nest trees will not be removed.
6. Known or historic bald eagle nest trees will not be removed.
7. If a potential nest tree is to be removed during the marbled murrelet early breeding season (April 1 to August 5) or during the spotted owl early breeding season (March 1 to July 15), an ONF wildlife biologist shall be consulted and Level 1 review will be required.
8. Occupancy of the site by murrelets or owls will prohibit tree removal during the breeding season.
9. ONF will require a visual survey in the area immediately after felling the potential nest tree to determine if young murrelets or owls were on the tree. An ONF and FWS wildlife biologist will be notified if occupancy was found.

Instream Aquatic Improvement

ONF proposes to improve instream aquatic habitat at **30 sites** during the life of this BO. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, improvement of only two sites per year are expected to be initiated prior to August 6. Activities may involve the placement of logs and/or rock structures in stream channels to restore hydrologic functions by providing energy dissipation, improved sediment routing and storage, stabilizing streambeds and streambanks, restoring degraded components of fish habitat and providing channel complexity, repair and maintenance of existing structures, and bioengineering. Work may include the re-connection or improvement of rearing ponds and other off channel habitat. Helicopters may be utilized on up to five projects over the life of this BO. If needed, a project longer than a mile in length may require two drop-off locations. This program will occur after the early breeding season. Blasting may be required occasionally, but will be conducted after August 5 and is anticipated to involve no more than three sites over the life of the BO using charges of 2 pounds or less. Placement of riprap to stabilize streambanks is not included in this consultation.

The collection, transport, and storage of boulders, large trees, and root wads needed to implement instream structure projects are included within this project description. Project materials may be derived from off-site sources (including hazard trees and trees removed for temporary road construction), excess down woody material or standing trees within the immediate project area (see below criteria), or from adjacent silvicultural treatments, provided they are consistent with the NWFP. A separate biological assessment will be required if trees needed for instream structures cannot be met through projects covered under this BO or the criteria listed below under conservation measures.

Activities may also include the introduction of salmon carcasses or artificial slow-release fertilizers to restore depleted stream nutrients and enhance productivity. Salmon carcass introductions are conducted during the fall hatchery spawning periods from late September through December. The carcasses are distributed at numerous locations along many stream miles. For the purpose of this BO, one project site is considered to be the entire 5th-field

watershed in which the nutrient supplementation takes place. Helicopters may be used occasionally to access remote sites from November through January.

Equipment may include tracked excavators, boom trucks, dump trucks, cats, loaders, hand tools, drills, and chainsaws. Helicopters and explosives may be used occasionally. Instream construction work will generally be conducted from July through September (low flow season). Timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects.

Specific Conservation Measure for Instream Aquatic Improvement

If additional trees are needed for instream restoration projects, those trees shall meet the following criteria:

1. Only trees without murrelet nest structures shall be removed.
2. Remove trees that can be felled with minimal damage to the stand.
3. Preference for tree removal sites should include blowdown or windthrow adjacent to harvested units that may require a helicopter and along roads immediate to or within the project drainage that would remove trees no more than 200 feet from the road edges.
4. Trees removed shall not alter the existing canopy closure of the stand.
5. Trees removed shall not remove spotted owl or murrelet habitat, including dispersal habitat.
6. The largest trees with the potential to develop future nest structures for bald eagle, marbled murrelet or spotted owl shall not be taken.

Fish Passage Improvement

ONF proposes to improve fish passage at **35 sites** during the life of this BO. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, work will be initiated in as many as two sites per year prior to August 6. Activities for improving fish passage include installing properly sized culverts, bridges, and open-bottomed arch culverts; removing culvert, and resetting culverts to meet current WDFW fish-passage criteria. Baffles, weirs, or fishways may occasionally be installed to improve or maintain fish passage conditions. Helicopters may be needed to deliver equipment and supplies in remote areas. It is anticipated that only one, if any, of these improvement projects will require the use of helicopters per year during the spotted owl and marbled murrelet early breeding season.

Maintenance and cleaning of existing fish passage structures is included within this project description. Maintenance activities typically involve hand labor only. Heavy equipment may be used occasionally.

Instream construction work will generally be conducted from July through September (low flow season). Timing will vary by watershed to meet current WDFW allowable work windows for hydraulic projects. Fish passage maintenance work may occur year-round as necessary to maintain adequate fish passage conditions.

Wildlife Habitat Management

Habitat Restoration Activities

Many activities described under the Silviculture or Fire Management program can also be considered wildlife habitat restoration (e.g., upland and riparian thinning, prescribed fire for meadow restoration). Other activities to improve habitat quality include snag creation, installation of nest boxes, or falling of individual trees for downed wood and may be included in a KV plan for a timber sale. ONF proposes approximately **500 acres** of habitat restoration activities (outside the Silviculture and Watershed Restoration Programs) during the life of this BO.

Snag creation can include blasting or cutting tops off of trees with chainsaws, inoculation with local fungi, or girdling. Creation of cavities and other defects in a tree may also be done without killing the tree. These activities will generally be conducted within areas designated for silvicultural treatment such as thinnings, and must be consistent with the NWFP. Blasting or use of helicopters occasionally may be required, but will occur outside the murrelet and spotted owl breeding season. After August 5, blasting may occur with charges of 2 pounds or less. No more than two helicopter flights are anticipated each year (after August 5).

Some silvicultural activities are designed to accelerate development of multi-storied stand character by removing selected trees to promote growth of residual trees. Trees cut are left on the ground or may be used for other restoration activities. Much of the downed wood on ONF is created from windstorms and the need for mechanical recruitment is not a major contributor of material on the ground. Thinning (in plantations) and release (in natural stands) involve work crews with chainsaws. ONF proposes **160 acres** of this activity during the life of the BO.

Specific Conservation Measure for Habitat Restoration Activities

1. To ensure adequate amounts of large woody debris in streams, any trees greater than 12 inches dbh to be felled within reach of a stream shall be felled toward the stream and left in place if feasible.

Forage Planting

This activity can entail the use of a hydro-mulcher, but normally occurs with the use of hand seeders within areas of disturbance (natural and management-caused). This is usually done in the spring or fall seasons when seed survival is higher. Native and desired non-native species are used depending on availability, site conditions and desired future condition of the area. ONF proposes to plant forage on **100 acres** during the life of this BO.

Inventory and Monitoring of Aquatic and Terrestrial Habitat/Biota

ONF proposes to conduct **numerous surveys** during the life of this BO. Activities may include physical stream and riparian surveys, spawning surveys, snorkel surveys, water quality and quantity monitoring, inventory of lakes, mollusk surveys, and bryophyte/fungi surveys. Surveys may be by foot, vehicle, boat or aircraft. Recurring surveys from fixed-wing aircraft are anticipated to occur along approximately 30 miles of the Dungeness and Graywolf Rivers every ten days during late summer and fall as part of the Dungeness Bull Trout telemetry project. This overflight activity will be above 500 feet altitude. Helicopters may be used to transport field crews to conduct salmon redd surveys or to collect other data, but is not anticipated to exceed two times per year; one of which may be during the early nesting season.

Research and monitoring activities may require permits from FWS, NMFS, and WDFW. Electro-fishing, dip-netting and smolt trapping are activities which require a permit under section 10 of the ESA for the listed target species.

Established survey protocols for wildlife species are used to determine occupancy and use of an area by a particular species. Surveys involve simulated vocalizations to elicit responses, remote cameras, track surveys, and use of helicopter and fixed wing aircraft. Research and monitoring also take place on ONF, either by federal biologists and researchers, university staff, or state agencies.

Specific Conservation Measure for Inventory and Monitoring of Aquatic and Terrestrial Habitat/Biota

1. Avoid walking on bull trout redds during stream surveys.
2. All fish and wildlife surveys that involve capture, confinement, or collection of animals will be done under the appropriate state and federal collection permits.
3. Inventory and monitoring will be carried out using protocols that minimize the disturbance to wildlife and are effective at obtaining necessary information.

Fire Hazard Reduction

One purpose of USFS fire management program is to reduce the potential fire hazard, primarily along road corridors and other heavy human-use areas. Another purpose of the fire management program is to conduct prescribed fire projects for restoration of habitats, and to create a diversity of habitats on the landscape. Current activities include vegetation removal around administrative sites and prescribed piling and burning to reduce fire hazards. Additionally, prescribed fire and thinning projects are planned to restore meadows and prairies, maintain forest openings, and to provide a safer fire environment around communities adjacent to USFS lands. On ONF, the Hood Canal District typically piles material along roadsides and landings; however, the Pacific District has historically piled material throughout the project area. Each project will be assessed as to how thoroughly clean-up activities will be addressed. Dry piles that burn hot produce a limited amount of smoke that dissipates quickly. Dry piles can burn completely within three hours, while wet conditions may result in a cooler burn that is not as complete. Equipment used

during burning includes drip torches, chainsaws, pumps, and fire engines.

ONF proposes to treat about **590 acres** of all types per year during the life of this BO. Approximately 200 acres would be treated when crews are available in June and July. This acreage is likely to occur on both sides of the road in many cases, and may occur along a continuous road system. Chainsaws and hand tools are generally used to remove small ladder fuels or downed and dead material from landings and road corridors. Hand-piling is sometimes performed and may be followed by burning. Burning is generally conducted in the fall (September through November) or spring (March through June).

Methods utilized for reducing fire hazards on ONF are hand piling, machine piling, landing piling, chipping, lop and scatter, underburning, and slash pullback along roads. About **45 acres of fuels reduction using mechanized equipment** (hand piling and chipping) are accomplished during the early nesting season for murrelets (April 1 to August 5) and spotted owls (March 1 to July 15). Additional information for some of these methods follows:

Hand Piling/Burning

This activity is done utilizing hand tools and minimal chainsaw use. With this method ONF treats 130 to 150 acres per year in relation to timber sales, and 5 to 10 acres per year in relation to other activities. **During the early nesting season, up to 20 acres** would occur each year.

Machine Piling/Burning

Machine piling of slash created through the clearing of road rights-of-way is done with a tractor; ONF treats 10 to 25 acres per year.

Landing Piling/Burning

This activity is usually done by the mechanized loader working on site of a recent thinning operation. ONF treats 10 to 50 acres per year.

Chipping/Burning

Chipping of roadside debris is done with a chipping/mulching machine; ONF treats 5 to 55 acres per year. **During the early nesting season, up to 25 acres** would occur each year.

Broadcast Burning and/or Underburning

This activity is done using drip torches and other firing devices. The activity will normally be associated with habitat restoration and enhancement, but could be used for small areas of post activity clean-up. These levels of treatment have been fairly constant for the last few years. Timing for burning is very weather-dependent. Most of the burning is conducted during the fall, especially from mid-October through November, to take advantage of fall rains and safe burning conditions. Minimal burning is done during the spring through the end of July to finish areas not completed in the fall. About 150 acres are burned during the early nesting season for murrelets

(April 1 to August 5) and spotted owls (March 1 to July 15). ONF may treat from 50 to 300 acres per year.

Conservation Measures for All Fire Reduction Activities

1. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).
2. Projects will be designed to protect natural woody material in streams, lakes, or wetlands. This may be achieved through site conditions or active protection measures as necessary.
3. Burning during the early nesting season for murrelets (April 1 to August 5) and spotted owls (March 1 to July 15) will be conducted 0.25-mile away from suitable nesting habitat.
4. Burning during the nesting season for bald eagles (January 1 to August 15), or during the wintering period (October 31 through March 15) will be conducted 1-mile away a bald eagle use area.

Special Forest Products

This program includes the harvest of bear grass, transplants of small conifers and shrubs, mushroom and berry picking, bough-cutting, Christmas tree cutting, cutting for posts and rails, firewood cutting, pole cutting, and collection of other forest products. Permits are required for the collection of these products. ONF proposes to issue approximately **4,500 permits** of all types during the life of this BO. ONF will complete one Project Consistency Evaluation Form to report the number of permits issued for each of these project types.

Commercial users desiring to camp are issued a permit to do so, which include limitations as to where they are allowed to camp. They are not allowed to camp in developed campgrounds and must camp at least 50 feet away from stream courses. The permit also specifies the length of stay permitted and is based on time to complete work. The permit specifies other requirements, including necessary sanitation and camp cleanup needs.

Conservation Measures for All Special Forest Products

1. Commercial users desiring to camp are issued a permit to do so, which include limitations as to where they are allowed to camp. They are not allowed to camp in developed campgrounds, and must camp at least 50 feet away from stream courses. The permit also specifies the length of stay permitted and is based on time to complete work. The permit specifies other requirements, including necessary sanitation and camp cleanup needs.
2. Food and garbage must be stored properly to prevent wildlife conflicts and attraction of corvids to site.
3. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Salal Harvest

Most of the 4,500 permits or contracts under the Special Use Program are represented by this activity; occurring on both the Pacific and Hood Canal Ranger District's. Harvest is located on lower elevation sites and generally within second growth stands having a hemlock/salal plant association. Harvesting is accomplished by hand picking when new growth of stems and leaves have hardened off in August. Picking will continue up until May if a suitable crop is still available. Salal is very common throughout ONF, but heavier harvest occurs closer to brush buying centers located in Forks and Shelton, Washington.

Bear Grass Harvest

This activity occurs on the east side of ONF, generally in drier, high-elevation sites. Harvest occurs during the spring (May and June) and early fall (September and October). Permits stipulate only plants with 24-inch leaves may be used. Harvest is of limited duration and intensity, using three to five people in a site for a period of 1 or 2 weeks. Hand tools are used, with permits specifying areas for camping on site as needed.

Christmas Tree Cutting

This activity generally occurs from early November through December 24. Areas closed to tree cutting are National Recreation Areas, Wildernesses, riparian reserves, developed campgrounds, private/state-owned lands within National Forest boundaries, and some smaller areas as identified by each Ranger District. On ONF, 2,000 to 3,000 permits are issued in a given year. Trees are harvested by handsaw. This activity generally occurs in regenerating timber harvest units.

Bough Cutting

Fee use permits are issued for commercial users. All bough cutting takes place after October 1, mainly in noble fir, cedar, and silver fir plantations at low to mid elevations. Only tip-pruning is permitted, and boughs may only be cut from the lower half of the tree. Hand tools are used, with most cutting adjacent to open roads.

Cutting for Firewood, Posts, and Rails

Approximately 3,500 permits would be issued for firewood cutting, which may occur year-round when other constraints are not present. Removal of down wood for such things as firewood, shakes, fence posts, rails, or other uses may occur in most land allocations, provided NWFP standards and guidelines are met. Typically, removal is only from road prisms and old log landings. ONF may offer some firewood permits that would allow wood-cutters to thin some pre-marked (by silviculturist) stands.

Some permits will result in cutting at multiple sites and other permits will result in no new sites as they will cut where previous permittees have already cut. ONF estimates that one site will be

used per permit.

Specific Conservation Measures for Cutting of Firewood, Posts and Rails

1. The amount of trees removed will not result in a change in the habitat classification of the stand.
2. All natural woody material in streams, lakes, or wetlands shall be left in place.
3. No firewood permits will be issued for riparian areas.

Mushroom Picking

This activity occurs across ONF. It involves hand picking without motorized equipment for harvest. Commercial permits are issued with time limits. About 100 permits are issued for personal use. Chanterelles form the majority of harvested mushrooms and are generally found in fairly dense (closed canopy) and relatively young Douglas-fir stands, also categorized as stem-exclusion stage forests.

Disposition of Confiscated Materials

Theft of forest products is common. High economic value is placed on cedar and maple. These products can be removed in smaller portions than traditional “logs” and still marketed for a high price. This allows removal of these products with a chainsaw and a pick-up truck. Other products which are portable are also removed illegally. These actions often occur along roads. When such an infraction is encountered and even when enforcement/legal actions initiated, such materials do not remain in place for many days once the tree has been felled. When it is appropriate to do so, based upon enforcement actions, legal proceedings, levels of downed wood in adjacent stands, and other considerations, ONF attempts to properly dispose of such materials in a manner that discourages future additional illegal use of that material. In order of preference, ONF generally uses such material to fill administrative needs, such as restoration projects. When there is not an administrative need, such materials may be made available to Native American Tribes to fill their ceremonial or traditional needs for such products, or they may be sold or otherwise disposed of as necessary.

Other Forest-Product Requests

These requests include transplants, brush (evergreen huckleberry (*Vaccinium ovatum*), swordfern (*Polystichum munitum*), salal (*Gaultheria shallon*), etc.), moss, plants, conifer cone and seedling collection, and cedar bark for cultural use. Some collection of plants for medicinal, pharmaceuticals, and flavorings, or weaving and dyeing materials also occurs.

Tribal Requests

Requests are received by Native American Tribes for various forest products that include firewood, yew, western red cedar, and Alaska yellow cedar for ceremonial, artistic, traditional, and other needs. ONF proposes to allow removal of up to **15 potential nest trees** over the life of

this BO. Any incidental loss of adjacent potential nest trees during the felling of the selected tree will be counted towards these 15 trees. Prior to the removal of a cedar tree, ONF will explore three, prioritized options to located the trees: (1) blow down, confiscated material, or trees identified as hazard trees; (2) standing trees within the AMA allocation, areas outside designated Critical Habitat, and outside northern spotted owl and marbled murrelet suitable habitat; (3) standing trees in LSR, designated Critical Habitat, and suitable habitat.

Specific Conservation Measures for Tribal Requests

1. Consultation with an ONF wildlife biologist is required if the tree proposed to be removed contains nest structures and/or is within suitable spotted owl or marbled murrelet habitat, within designated critical habitat, or within a bald eagle use area.
2. Known marbled murrelet nest trees or spotted owl nest trees will not be removed.
3. Known or historic bald eagle nest trees will not be removed.
4. Potential murrelet and spotted nest trees will be felled between October 1 and February 28, after the murrelet and owl breeding season.

Summary: Program Descriptions

Table 1 presents a complete summary of project-specific totals for the 2003-2008 field seasons included in this BO.

Table 1. Project-specific totals included in this BO

Project type	Activity levels covered in this BO
Developed site operations and maintenance	116 sites
Dispersed site maintenance	1,405 sites
Trail maintenance	270 miles
Trail construction, reconstruction and relocation	85 miles
Trail bridge maintenance	65 bridges
Trail bridge/footlog construction and reconstruction	25 bridges plus 8 potential nest trees removed
New recreation site creation	10 sites
Administrative facilities maintenance	15 sites
Hazard tree removal	1,500 potential nest trees, plus 2,000 non-potential nest trees
Commercial thinning	6400 acres; reconstruct up to 5 miles of existing road, construct up to 5 miles of new permanent road, and 40 miles of new temporary road
Salvage	200 acres
Pre-commercial thinning	15,000 acres
Timber stand improvement	500 acres
Aerial fertilization	500 acres
Planting	600 acres
Cone collection	1-3 collections
Seed orchard operation and maintenance	1 site/year
Noxious weed control	607 acres
Road reconstruction	55 miles
New road construction	5 miles
Temporary road construction and road reconstruction	40 miles
Bridge construction and reconstruction	40 bridges
Transportation system repair	400 sites

Table 1. Project-specific totals included in this BO

Project type	Activity levels covered in this BO
Rock sources	40 sites
Road maintenance	2,200 miles per year total of which 1,200 mi. maintained between March 1 and August 5; 500 miles in ML 1-2, 700 miles in ML 3-5; and 80 sites of immobile work in ML 3-5 during the early nesting season
Road use and access permits	100 permits
Road construction/reconstruction permits	20 permits; 5 miles new road; 30 acres of dispersal habitat removed
Road and trail easements	20 new easements; 60 miles of existing road/trail
Tailhold and guyline anchor permits	45 permits; up to 225 trees total; of which up to 90 may be potential nest trees
Linear right-of-way operations and maintenance	20 permits
Communication/Weather Sites	22 permits
Permits for research and monitoring	20 permits
Re-issuance of water withdrawal permits	11 permits
Outfitter Guide Permits	36 permits
Developed facilities permits	20 permits
Recreation residence administration	65 permits
Other non-developed site permits	14 permits
Land line survey and boundary adjustments	15 miles
Administrative tours and remote site inspections	60 stops
Waste cleanup	110 sites
Stormproofing and road drainage upgrading	250 miles
Landslide stabilization	150 acres (12 miles)
Road decommissioning and bridge removal	150 miles plus 25 potential nest trees may be removed
Instream aquatic improvement	30 sites

Table 1. Project-specific totals included in this BO

Project type	Activity levels covered in this BO
Fish passage improvement	35 sites
Terrestrial habitat restoration	500 acres (includes 160 acres of thinning (in plantations) and release (in natural stands))
Forage planting	100 acres
Inventory and monitoring of aquatic and terrestrial habitat/biota	numerous
Fire hazard reduction	2,950 acres total
Special forest products	4,500 permits/year
Tribal trees	15 large, suitable nest trees

SPOTTED OWL

STATUS OF THE SPECIES

Legal Status

The spotted owl was listed as threatened in 1990 due to widespread habitat loss across the entirety of its range and the inadequacy of existing regulatory mechanisms to provide for its conservation (USDI 1990b; 55 FR 26114). Critical habitat for the spotted owl was designated on January 15, 1992 (USDI 1992a). Critical habitat is based on the identification of primary constituent elements of the environment that are important to conservation, that is, recovery, of the listed species. For the spotted owl, these elements reflected the principles for spotted owl conservation established by Thomas et al. (1990). The final rule for designating critical habitat recommended physiographic provinces developed by Franklin and Dyrness (1973) as the primary basis for assessing actions under section 7 of the ESA. In Washington, the spotted owl is listed as endangered by the State (77.12 RCW).

Life History

The northern spotted owl, one of three subspecies of spotted owls currently recognized by the American Ornithologists' Union, is typically associated with old-growth forested habitats throughout the Pacific Northwest. A more detailed account of the taxonomy, ecology, and reproductive characteristics of the spotted owl is found in the 1987 and 1990 FWS Status Reviews (USDI 1987b, 1990a); the 1989 Status Review Supplement (USDI 1989); the Interagency Scientific Committee (ISC) Report (Thomas et al. 1990); the Forest Ecosystem Management Assessment Team (FEMAT) Report (USDA and USDI 1993); and the final rule

designating the spotted owl as a threatened species (USDI 1990b).

Current/Historical Range

The current range and distribution of the spotted owl extends from southern British Columbia through western Washington, Oregon, and California as far south as Marin County (USDI 1990a). Although the current range of the spotted owl is similar to the historical range where forested habitat still exists, the spotted owl has been extirpated or is uncommon in certain areas. Past and ongoing timber harvest has eliminated, reduced or fragmented spotted owl habitat sufficiently to decrease overall population densities across the range, with owl occupancy rarer throughout northern Washington, southern British Columbia, and northeastern California.

Habitat

Spotted owls rely on older, forested habitats because they contain the structures and characteristics required for nesting, roosting, foraging, and dispersal. These characteristics include a multi-layered, multi-species canopy dominated by large over-story trees; moderate to high canopy closure; a high incidence of trees with large cavities and other kinds of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas et al. 1990, USDI 1990a). Forested stands with high canopy closure also provide thermal cover and protection from predation.

Reproductive Biology

The spotted owl is a relatively long-lived bird, with an average life span of 8 years, and a naturally low reproductive rate. Spotted owls do not reach maturity until after 2 years; once an adult, females lay an average of 2 eggs per clutch, with a range of 1 to 4 eggs. Nest sites are usually located within stands of old-growth and late-successional forest dominated by Douglas-fir, and consist of existing structures such as cavities, broken tree tops, or mistletoe (*Arceuthobium* spp.) brooms (Forsman et al. 1984, LaHaye and Gutierrez 1999). Reproductive behavior starts in March and continues into June, although elevation influences the exact timing of nesting. After the young fledge, they are still dependent on their parents until they are able to fly and hunt on their own. Parental care continues post-fledging into September and sometimes into October (Forsman et al. 1984). During this time adults may not roost with the young during the day, but they will respond to begging calls by bringing food to the young (Forsman et al. 1984).

Dispersal Biology

Dispersal away from the natal site is random with juvenile spotted owls dispersing between 9 and 30 miles from the nest grove during their first year (Miller 1989). Forsman et al. (2002) found that most juveniles settled into temporary home ranges in their first summer, moving again in the spring, settling into permanent territories or continuing to occupy a series of temporary home ranges before eventually settling on territories when they were 2 to 5 years old. After their first year, spotted owls that were 1 to 2 years old tended to disperse farther than owls that were

more than 2 years old (Forsman et al. 2002). Recent studies in California suggest that successful dispersal of juvenile spotted owls is dependant upon their ability to locate unoccupied suitable habitat that is within close proximity to other occupied sites (LaHaye et al. 2001). However, juvenile spotted owls experience extremely high mortality rates (USDI 1990b). Leading known causes of mortality are starvation and predation by great horned owls (*Bubo virginianus*) (Miller 1989, USDI 1990b).

Food Habits

The spotted owl's dietary species composition varies geographically and by forest type. Generally, northern flying squirrels (*Glaucomys sabrinus*) and red tree voles (*Arborimus longicaudus*) are a more prominent prey item for spotted owls in Douglas-fir and western hemlock forests (Forsman et al. 1984). Depending on location, other prey species (i.e., woodrats (*Neotoma* spp.), mice, birds, and insects) also comprise a small portion of the spotted owl diet (Forsman et al. 1984). Mostly nocturnal, Delaney et al. (1997) found that prey delivery rates are highest during the hours just prior to dawn and following dusk. Stand vertical diversity and snag density and volume have been positively correlated with spotted owl foraging intensity, likely because they influence local prey abundance (North et al. 1999).

Home Range

The home range used by spotted owls for nesting, roosting, and foraging can vary depending on the location and the type of habitats available. Spotted owl home range size varies by physiographic province and generally increases from south to north, which is likely in response to decreasing habitat quality (USDI 1990b). While there are differences in the natural stand characteristics that influence provincial home range size, habitat loss and forest fragmentation caused by timber harvest effectively reduce home range habitat quality. Data indicate that a reduction in the amount of suitable habitat reduces spotted owl abundance and nesting success (Bart and Forsman 1992, Bart 1995). In the Olympic Peninsula Province, the median annual home range for spotted owls is estimated at 14,232 acres (Hansen et al. 1993). There is considerable geographic variation in home range size, with spotted owls occupying the Olympic Peninsula exhibiting the largest home ranges (Thomas et al 1990). It has been found that home range sizes increase as the amount of old-growth forest within home ranges decrease (Carey 1985; Forsman et al. 1984; Thraillkill and Meslow 1990).

Population Dynamics

The spotted owl embodies a life-history strategy typically referred to as "K-selected"; it is a relatively long-lived organism, produces fewer and larger young, invests significantly in parental care, experiences later or delayed maturity, and exhibits high adult survivorship (Begon and Mortimer 1986). In general, K-selected organisms are often associated with environments that are either constant or predictably seasonal in time, and thus experience less in terms of random environmental fluctuations. Longitudinal studies on population dynamics of spotted owls suggest that spotted owl populations are regulated; that is, densities fluctuate around a mean value within certain boundaries (Franklin et al. 2000). Potential regulating mechanisms include

habitat quality, habitat abundance, climate, and interactions between these factors. Annual variation in population parameters for spotted owls has been linked to environmental influences at various life history stages (Franklin et al. 2000). In coniferous forests, mean fledgling production has been reported higher when minimum spring temperatures were higher (North et al. 2000), a relationship that may be a function of increased prey availability.

Threats

Significant threats to the spotted owl were identified by province in the Draft Recovery Plan for the Northern Spotted Owl (USDI 1992b) as follows: low populations, overall population decline, limited habitat, declining habitat, distribution of habitat or populations, isolation of provinces, predation and competition, lack of coordinated conservation measures, and vulnerability to natural disturbance. These threats were characterized for each province as severe, moderate, low, or unknown. In general, declining habitat was recognized as a severe or moderate threat to the spotted owl in all 12 provinces, isolation of provinces within 11 of 12 provinces, and declining populations in 10 of 12 provinces. Vulnerability to natural disturbances was rated as low within 5 of 12 provinces, indicating that habitat loss due to fire, windthrow, insects, or diseases was less of a concern from a range-wide perspective. The degree to which predation and competition might be threatening the spotted owl was unknown in more provinces than any of the other threats, suggesting that further investigation is warranted. Threats to spotted owl recovery within the Olympic Peninsula Province are summarized below.

Low Populations

The 1992 estimated population of 200 pairs on the Olympic Peninsula has a low likelihood of persistence during the next 100 years unless measures are taken to resolve the existing threats (USDI 1992c).

Declining Populations

The spotted owl once inhabited lower-elevation areas, likely in high densities. The long-term demography data (Franklin et al. 1999:33) for the Olympic study area suggested a 6% annual decline in the spotted owl population for the years of study (1987-1998). The 2002 annual report (Forsman and Biswell 2003:3) stated: “The information collected since 1998 does not suggest any improvement in this picture” and “the percent of territories with pairs was still only about 50% of the levels detected in 1987-1992” (p. 2).

Limited Habitat

Suitable habitat is highly fragmented at lower elevations on the Olympic Peninsula. Past habitat loss has likely resulted in low numbers of spotted owls on Tribal, State, and private lands. Many spotted owl sites on National Forest lands are located in highly fragmented areas. Habitat within Olympic National Park is found in relatively large, intact drainages broken by high, rocky, and snow-covered mountains. Individual spotted owl pairs along the Olympic National Park coastal strip have become relatively isolated from the remaining spotted owls in the interior peninsula.

Effects of habitat loss on spotted owl productivity, dispersal, and turnover on the Peninsula are not well known.

Declining Habitat

High rates of habitat loss on nonfederal and National Forest lands undoubtedly are reflected in spotted owl population declines. Since World War II, old-growth forest on ONF has declined 76 percent (Morrison 1990). Suitable habitat has been reduced to low levels on National Forest lands. Habitat is unchanged and in good condition on suitable-habitat portions of National Park lands.

Distribution of Habitat and Population

Suitable habitat in the interior peninsula is shaped largely like a doughnut, with the center or “hole” consisting of high-elevation, non-forested areas of unsuitable habitat. Remaining habitat and spotted owls on the Olympic Peninsula are located centrally around this “doughnut hole” within the higher-elevation area of Olympic National Park and ONF. Large areas of recently logged, low-elevation lands are occupied by scattered, relatively isolated pairs of spotted owls in remaining patches of older forests. The central clustering restricts the distribution of the spotted owl to a portion of the province, generally at higher elevations. The long-term stability is unknown for these populations that once inhabited a wide range of ecological conditions, but are limited now to higher elevation habitat.

Predation and Competition

The recent range expansion of barred owls into the Pacific Northwest (Taylor and Forsman 1976, Dunbar et al. 1991) may pose a significant competitive threat to northern spotted owls. Barred owls are larger than spotted owls, are aggressive toward them (Leskiw and Gutiérrez 1998), may compete with them for prey (Hamer et al. 2001), and the presence of barred owls apparently increases the chance that spotted owl sites will become unoccupied by spotted owls (Kelly et al. 2003, Pearson and Livezey In review). Barred owls not only use old-growth forests (Hamer 1988, Dunbar et al. 1991, Dark et al. 1998, Herter and Hicks 2000, Pearson and Livezey In review), but they also use fragmented, second-growth stands in areas throughout Washington and Oregon outside of the range of the northern spotted owl (Smith et al. 1997, Kelly and Forsman 2003). Therefore, in areas where timber harvest has modified northern spotted owl habitat, barred owls may have a competitive advantage over northern spotted owls (Dark et al. 1998), which prefer structurally complex older forests for nesting and roosting (Forsman et al. 1984, Bart and Forsman 1992, Hunter et al. 1995, Swindle et al. 1999). The degree to which barred owls affect the conservation and recovery of the northern spotted owl is being considered in a 5-year review of the spotted owl; to be completed in 2004.

Province Isolation

The Olympic Peninsula province is isolated on three sides by coastline. To the south, timber harvest in the lowlands of western Washington virtually has eliminated the spotted owls (USDI 1992c). Currently, approximately 60 straight-line miles separate spotted owl subpopulations on the Olympic Peninsula and subpopulations in the western Cascades. Distance between currently known reproductive pairs is approximately 64 miles. The Rock Creek-Chehalis site in southwest Washington is 30 miles from the Canyon River pair on the Olympic Peninsula and 44 miles from a pair site near the Mineral Block. It is about 64 miles between pair sites on the Olympic Peninsula and those in the Cascades, if you exclude the 3 pair sites in southwest Washington. Isolation may decrease the number of successfully dispersing juveniles and inhibit movement of adults among populations (Thomas et al. 1990). There is little or no dispersal between this and other populations, and demographic rescue would be unlikely in the event of a population decline on the Olympic Peninsula. Isolation of small populations can result in loss of genetic variation and increased risk of inbreeding depression and genetic drift (Frankel and Soulé 1981 *in* Holthausen et al. 1995). These populations would also be more vulnerable to stochastic events.

Vulnerability to Natural Disturbances

Wind is the dominant disturbance factor along the western coast of the Peninsula and as far as 20 to 30 miles inland. Historic stand-replacing wind events occurred in 1921 and 1962. Logging within the past 30 years has resulted in increased fragmentation on USFS, State, and private lands. Exposed forest edges are much more susceptible to wind damage than are relatively unfragmented patches. The potential is high for a large-scale wind event to adversely affect spotted owl habitat in this region. Fire is also a significant threat on the Olympic Peninsula, especially the eastern portion. Recent fires, such as the Forks Burn, were stand-replacement events that eliminated significant tracts of spotted owl habitat. Agee (1991) suggests that under a worst-case scenario, wind and fire could reduce the capability of the Olympic Peninsula to support spotted owl pairs by up to 30 percent during the next 100 years.

Conservation of the Spotted Owl

Conservation Needs

Based upon the nature of the primary threats to the spotted owl over the majority of its range, the conservation needs of the spotted owl revolve around the following biological principles: 1) the presence of large blocks of habitat to support clusters or local population centers of owls, 2) habitat conditions and spacing between local populations of owls to facilitate survival and movement, and 3) a variety of ecological conditions within the owl's range to reduce risk of local or widespread extirpation (USDI 1992b). Reference to these biological principles as conservation needs of the spotted owl will be made throughout this document with respect to how these needs are being met at various scales.

Since listing, there have been numerous attempts to address the conservation needs of the species beginning with the Interagency Scientific Committee's Conservation Strategy (Thomas et al. 1990), continuing with the designation of critical habitat (USDI 1992a), the draft recovery plan (USDI 1992b), and the NWFP (USDA and USDI 1994a,b). Each of these conservation strategies was based upon the reserve design principles first articulated in the ISC's report, summarized as follows:

1. Species that are well distributed across their range are less prone to extinction than species confined to small portions of their range;
2. Large blocks of habitat, containing multiple pairs of the species, are superior to small blocks of habitat with only one to a few pairs;
3. Blocks of habitat that are close together are better than blocks far apart;
4. Habitat that occurs in less fragmented, that is contiguous, blocks is better than habitat that is more fragmented; and
5. Habitat between blocks is more effective as dispersal habitat if it resembles suitable habitat.

The NWFP, the current conservation strategy for the spotted owl on federal lands, is designed around the conservation needs of the owl and based upon the designation of a variety of land-use allocations. The land-use allocations intended to contribute primarily to supporting population clusters include: Late-Successional Reserves (LSRs), Managed Late-Successional Areas (MSLAs), and Congressionally Reserved Areas (CRAs) (Appendix Figure 3). The Matrix, Adaptive Management Areas (AMAs), Riparian Reserves, and Administratively Withdrawn Areas (AWAs) were to provide habitat connectivity between the reserve blocks.

The system of LSRs set up under the NWFP is distributed range-wide in order to capture the variety of ecological conditions within the 12 different physiographic provinces to which spotted owls are adapted and to reduce the potential for loss of the entire population due to large catastrophic events in a single province. Multiple, large LSRs in each province reduce the potential that spotted owls will be lost in any individual province and reduce the potential that large wildfires or other events will eliminate all habitat within a LSR. In addition, LSRs are generally arranged and spaced so that spotted owls may disperse to two or more adjacent LSRs. This network of reserves reduces the likelihood that catastrophic events will impact the meta-population connection between portions of a province or between provinces. While the FEMAT scientists expected spotted owl populations to decline in the Matrix over time, populations were expected to stabilize and eventually increase within LSRs as habitat conditions improve over the next 50 to 100 years (USDA and USDI 1993, USDA and USDI 1994a,b). For implementing the system of reserves and connectivity between reserves, the NWFP included standards and guidelines for managing all agency actions, and provided for an annual timber harvest program that would be consistent with the conservation principles of the NWFP (USDA and USDI 1994a,b).

In 1994, the FWS issued a BO on the NWFP that assessed the effects of adopting this comprehensive management plan on federal lands. In that Opinion, the FWS concluded that the NWFP would provide for a stable and self-sustaining spotted owl population on federal lands and, on that basis, would constitute the federal contribution to spotted owl recovery (USDA and

USDI 1994b). This conclusion was based on the assumption that the provinces would provide the building blocks for conserving this species. As such, the FWS concluded that if the NWFP was implemented as the FEMAT scientists intended, it would provide the basis for evaluating actions under the ESA.

The FEMAT noted that the ability to form an extensive reserve network to meet spotted owl conservation needs was constrained by limited federal ownership; thus, the contribution of non-federal lands was important to the goal of achieving conservation, including recovery, of the spotted owl. Although the FWS proposed a special rule for non-federal lands, it was never finalized. Consequently, the primary non-federal action taken towards furthering spotted owl conservation involves development of habitat conservation plans (HCPs) or provision of sufficient habitat around existing spotted owl pairs to avoid take of those owls as defined by the ESA.

Current Condition

The current condition of the species incorporates the effects of all past human and natural activities or events (USDI and USDC 1998). Baseline conditions for the spotted owl were evaluated to some degree during the process of formulating the NWFP through qualitative and quantitative analyses of various measures such as habitat availability, distribution, and condition. The following section reports on changes that have occurred to those baseline conditions since 1994, relying particularly on data provided in FWS consultations conducted pursuant to section 7 of the ESA, and various other technical assistance documents.

Range-wide

Since 1994, the FWS has consulted on many actions associated with implementation of the NWFP and other federal activities that may affect the spotted owl or its critical habitat. The geographic scale of these consultations has varied from individual timber sales or HCPs to multiple actions covering multiple administrative units, depending on the scope of the proposed federal action. In general, the analytical framework of these consultations was based on the reserve and connectivity goals achieved through the NWFP land-use allocations designed specifically to provide for those functions (USDA and USDI 1994a), and was expressed in terms of changes in suitable habitat within those land-use allocations.

In 1994, the FSEIS established the baseline for suitable spotted owl habitat under the NWFP management as 7,397,098 acres (Table 2). On June 26, 2001, the FWS finalized a range-wide baseline update (Range-wide Report) for the spotted owl (USDI 2001a). The Range-wide Report was based on a year-long effort to compile and evaluate information reported in all consultations involving effects to the spotted owl or its critical habitat that have been issued since 1994. In brief, that evaluation found that consulted-on effects of loss of suitable habitat from timber harvest-related projects were below the 2.5 percent estimated by the NWFP to be harvested from federal lands each decade, that not all consulted-on effects had actually occurred on-the-ground at that time, and that the range-wide effects to critical habitat had been minimal. The Range-wide Report concluded that consulted-on effects from 1994 to June 2001 were

consistent with the assumptions for the first decade of the NWFP implementation as discussed in the FWS's 1994 BO on that plan, and that effects to critical habitat have not impaired the NWFP's contribution to recovery of the spotted owl across its range. Based upon the range-wide database, the most current estimate of suitable habitat authorized to be removed from NWFP lands since 1994 is 183,647 acres. This number was the sum of acres to be removed or downgraded from 1994 to June 26, 2001, plus the acres to be removed or downgraded from June 26, 2001, to May 14, 2003. This total represents 2.48 percent of the extant suitable habitat in 1994. The total acres of habitat authorized to be removed or downgraded for timber harvest activities, however, equals 161,201 acres. This total represents 2.18 percent of the 1994 baseline.

Table 2. Suitable spotted owl habitat baseline on NWFP lands and summary of effects from 1994 to July 2003

Data Type	Reserves		Connectivity			Total
	LSR/ MLSA	CWAs	AWAs	AMAs	Matrix	
Evaluation Baseline	3,255,914	1,638,652	300,219	364,268	1,838,045	7,397,098
Removed/Downgraded (1994- June 26, 2001)	6,156	18	334	9,281	105,769 ¹	121,558
Removed/Downgraded (June 26, 2001 - February 2003)	2,308	908	54	5,687	53,132	62,089
Difference	3,247,450	1,637,726	299,831	349,300	1,679,144	7,213,451
Percent Change since 1994	0.26%	0	0.13%	4.10%	8.65%	2.48%

Source: Northern Spotted Owl Consultation Effects Tracking Database (USDI 2003).

¹Adjusted to include 77,937 matrix acres not counted in 1994 baseline.

For the purposes of discussing the effects of forestry practices and associated activities on spotted owl habitat, we categorized the degree of effect to habitat function using the following terms: removal, downgrade, and degrade. The term *removal* represents a complete loss of habitat function following an effect; that is, an area that functioned as nesting, roosting, foraging, or dispersal habitat for spotted owls before the effect, but no longer provides any habitat function for spotted owls after the effect. *Downgrade*, a kind of *removal*, refers to a reduction in the function of habitat; that is, an area that functioned as nesting, roosting, or foraging habitat before an effect, provides only dispersal habitat following the effect. *Degrade*, to be distinguished from *downgrade*, indicates a reduction in habitat quality but not habitat function following the effect; that is, an area that functioned as foraging habitat prior to the effect, and still provides such function after the effect, but perhaps is more limited due to a temporary reduction in prey base.

The FWS's primary expectations for non-federal lands are for contribution to demographic support; that is, pair or cluster protection or for connectivity with NWFP lands. However, State Forest Practice Rules designed to protect spotted owl habitat and HCPs prepared by private owners pursuant to section 10 of the ESA all vary in the amount and quality of habitat they contribute to the conservation of the spotted owl. Conclusions drawn from the Range-wide Report and the January 18, 2002, update were that non-federal lands are generally providing these intended functions across the landscape (USDI 2001a, 2002a).

In 1994, the confirmed number of spotted owls range-wide was 3,602 pairs and 957 resident singles (Thomas et al. 1993). However, the report stated that the population was probably higher because survey information was lacking for many areas. This figure was refined with the development of the 4(d) rule, using additional data from federal, State, Tribal, and private land management agencies. In 1995, the estimated number of spotted owls range-wide was 5,608 activity sites (pairs and singles combined), of which 1,322 were located on non-federal lands, primarily in the coastal region of northern California (USDI 1995).

Because survey efforts have neither provided complete coverage of the spotted owl's range nor been conducted systematically so as to produce reliable population estimates, the FWS and other agencies have turned to indices, such as demographic data, to evaluate the status of the owl. Franklin et al. (1999) analyzed demographic data from 1985 through 1998 from 16 independent study areas located throughout the spotted owl's range: 4 in Washington, 9 in Oregon, and 3 in California. The study areas encompassed 20,500 mi² representing about 23 percent of the spotted owl's range, and consisted primarily of federal lands although some private lands, Tribal lands, and Oregon State lands were included. Overall, 1999 results indicate that although the spotted owl population was still declining, the decline was slower than previously reported (Franklin et al. 1999). Such results were predicted by FEMAT scientists in 1993; however, in the absence of a predicted change in the trajectory of decline, it is not possible to determine how closely current observations conform to those anticipated.

The estimated range-wide annual decline in territorial females was 3.9 percent from 1985 to 1998 (Franklin et al. 1999). Although this is less than the 4.5 percent rate of decline estimated for the years from 1986 through 1993 (Forsman et al. 1996), it is still significantly different from a stable population (Franklin et al. 1999). After accounting for juvenile emigration, 4 of 16 individual spotted owl populations appear to be stable, at least 8 have evidence to support a decline, and the remainder could be either stable or declining. Mean estimates of apparent survival across all study areas increased with age. Survival rates of adult females across all study areas varied among years, but no longer exhibited the negative range-wide trend apparent in the 1993 analysis (Forsman and Anthony 1999). Fecundity (defined as the number of female young fledged by each territorial female) varied by year and by physiographic province. Across their range, spotted owls continue to show alternating good and bad reproductive years, and east-slope spotted owls had higher fecundity and lower survival rates than west-slope owls.

Past fire suppression efforts and other land management actions have resulted in vast forested areas that are susceptible to large-scale, stand-replacing fires that could reduce and possibly eliminate spotted owl habitat from extensive areas. Although the LSR network was intended to

reduce the likelihood that large-scale disturbances could break the metapopulation framework upon which the NWFP was based, the scale and intensity of several recent fires suggest that the vulnerability of federal forested lands to catastrophic fire and its implications to management of spotted owl habitat should be carefully evaluated. Habitat losses resulting from recent large-scale disturbances, for example, the Biscuit Fire in Southwest Oregon, and implications to conservation of the spotted owl will be addressed in a subsequent update of the Range-wide Report after official documentation of effects is received from the action agencies.

The most recent Range-wide update (USDI 2002a) on the spotted owl’s current status concluded that: 1) the estimated rate of change to the spotted owl habitat is consistent with expectations across the species’ range for the first decade of NWFP implementation, and 2) effects to critical habitat have not impaired its ability to provide for conservation across the range of the spotted owl.

Olympic Peninsula Physiographic Province

For analysis purposes, the ISC divided the spotted owl’s range into physiographic provinces (Thomas et al. 1990: 61). In Washington, there are four physiographic provinces. All of the ONF and the Action Area is located in the Olympic Peninsula Province. About 8 percent of suitable spotted owl habitat within the entire NWFP area is located in this Province (USDA and USDI 1994a: 3 & 4-214). There were about 564,000 acres of suitable habitat in the Province in 1994; today there are approximately 560,217 acres of habitat (Table 3). Most state and private lands within the province that provide spotted owl habitat have HCPs that complement the conservation of spotted owls in the NWFP area (USDI 2001b:16).

Table 3. Effects to suitable spotted owl habitat on federal lands in the Olympic Peninsula Province since 1994

Olympic Peninsula Province	
Olympic Peninsula Province 1994 baseline	560,217 ac.
Removed, downgraded, or adjusted (1994 - June 26, 2001)	79 ac.
Removed or downgraded (June 26, 2001 – July 21, 2003)	8 ac.
Total change	87 ac.
Percent change since 1994	0.02%

Source: Northern Spotted Owl Consultation Effects Tracking Database (USDI 2003a)

The landscape of the Olympic Peninsula Physiographic Province is highly fragmented as a result of extensive harvest on private, State, and federal lands. Almost 80 percent of old growth habitat in the Province has been lost by 1990, when the spotted owl was listed as threatened (Booth 1991). FWS (USDI 1991) reported that habitat quality and quantity within the Province are generally poor and limited to lower elevations. Extensive habitat loss throughout much of the

Province has resulted in isolation of the spotted owl population from other spotted owls occurring in the Cascade Mountains and the Coast Ranges of Oregon.

Federal lands comprise almost 50 percent of the Province's land base and most remaining old growth forests, primarily in Olympic National Park. Habitat in the Park is naturally fragmented, and consists of relatively large, intact drainages of habitat broken by high, rocky, snow-covered mountains. Most remaining spotted owl habitat outside of the Park is distributed in a band of ONF land surrounding the Park and on State lands in the Hoh and Clearwater River Basins.

Demographic results specific to the Olympic Peninsula Province indicate that the conditions necessary to achieve a stationary population within the Province are lacking due to an annual decline in territorial females and insufficient juvenile emigration rates (Franklin et al. 1999). The final draft recovery plan for the spotted owl (USDI 1992) stated: "There are an estimated 200 to 225 owl pairs in the [Olympic Peninsula] province (157 pairs are known at this time)." For the period from 1989 to 1994, Holthausen et al. (1995) reported a total of 155 pair sites and 79 sites occupied by single owls or multiple owls of undetermined status for the Peninsula, and 97 or 117 pairs of spotted owls for ONF. The long-term demography data (Franklin et al. 1999:33) for the Olympic study area suggested a 6 percent annual decline in the spotted owl population for the years of study (1987 to 1998). The 2002 annual report (Forsman and Biswell 2003:3) stated: "The information collected since 1998 does not suggest any improvement in this picture" and "the percent of territories with pairs was still only about 50 percent of the levels detected in 1987 to 1992" (p. 2). Because the demography studies are designed to measure long-term trends, the current information has limited application to the day-to-day consultation process.

An assessment of habitat baseline conditions since implementation of the NWFP was recently completed (USDI 2001a). This range-wide evaluation of habitat, as quantified by the FSEIS, was necessary to determine if the rate of potential change to spotted owl habitat was consistent with the predictions for the first decade of the NWFP. However, revised baselines in conjunction with site-specific field verification provide more accurate information regarding spotted owl presence and thus are more valuable for determining effects to individual owls. Therefore, for the purpose of this consultation, the FWS will present changes to the FSEIS baseline since 1994 to determine consistency with the expectations of the NWFP, but will use more recent data to make determinations with respect to adverse effects of habitat alterations on spotted owls.

In the absence of comprehensive survey data the FWS has relied upon results of demographic studies to provide information on the population dynamics of spotted owls. Although FEMAT scientists predicted that spotted owl populations would decline in the Matrix initially following NWFP implementation (USDA and USDI 1993, USDA and USDI 1994a), the rate of anticipated decline was not specified.

The barred owl's continued expansion into the range of the spotted owl may pose a serious threat to the spotted owl on the ONF. Perhaps the greatest risk is due to the territorial and aggressive nature of barred owls towards spotted owls. Pearson and Livezey (In review) suggested that

barred owls appear to be displacing spotted owl pairs, barred owls are occupying vacated spotted owl territories, and barred owls may be preventing dispersing juvenile spotted owls from finding unoccupied habitats in which to establish new territories.

Summary–Status of the Species: Northern Spotted Owl

The spotted owl was listed as threatened under the ESA due to concerns over widespread loss and modification of its preferred habitat—old-growth forest—and inadequacy of existing regulatory mechanisms. About 10 percent of pre-settlement old-growth remains in western Washington, and what is left is highly fragmented. Recently, the larger and aggressive northern barred owl has moved into the range of the spotted owl and is apparently competing with the spotted owl. Spotted owl populations are declining on average 3.9 percent per year range-wide, and are declining approximately 12.4 percent annually in the Olympic Peninsula demography study area (Franklin et al. 1999). The most recent Range-wide update (USDI 2002a) on the spotted owl’s current status concluded that: 1) the estimated rate of change to the spotted owl habitat is consistent with expectations across the species’ range for the first decade of NWFP implementation, and 2) effects to critical habitat have not impaired its ability to provide for conservation across the range of the spotted owl.

Spotted Owl Critical Habitat

Critical habitat serves to identify lands that are considered essential for the conservation of a listed species. As such, spotted owl critical habitat was based upon the conservation principles emphasized by the ISC strategy (Thomas et al. 1990) and was intended to provide large areas of suitable habitat to support multiple reproductive pairs or “population clusters” and to provide for dispersal between population clusters as represented by the primary constituent elements of 1) suitable habitat to support population clusters and 2) support for dispersal (USDI 1992b). Range-wide, FWS designated a total of 192 CHUs, containing 6,887,000 acres of critical habitat units (CHUs), encompassing about 3.1 million acres of suitable owl habitat. CHUs were intended to identify a network of habitats that provided the functions considered important to maintaining a stable, self-sustaining, and interconnected population over the spotted owls’ range with each CHU having a local, provincial, and a range-wide role in owl conservation, until a long-term conservation plan was implemented. Most CHUs were expected to provide suitable habitat for population support, while some were designated primarily for connectivity (or both).

FWS’s approach to designated critical habitat was based on the expectation that a long-term plan would be developed to provide for conservation of the spotted owl. The final rule designating critical habitat (USDI 1992b) states, “Critical habitat is primarily intended to identify the habitat that meets the criteria for the primary constituent elements. Designation will help retain recovery options and reduce the near-term risk until a long-term conservation plan is implemented.” The rule also states, “Designation of critical habitat does not offer specific direction for managing owl habitat. That type of direction will come ... through the development of land management plans that address management of the owl.” The rule also expressed the expectation that the primary scale of analysis for evaluating project-related effects to critical habitat to determine if the range-wide conservation goals are being met was the physiographic

province.

Since both the NWFP and critical habitat applied the same ISC principles, and both efforts used similar habitat data and maps (with slight improvements by 1994), it is not unexpected that the results of identifying large blocks of habitat would be similar. As such, the NWFP network of LSRs overlap critical habitat by about 70 percent along with spotted owl habitat in other Land Use Allocations (LUAs) and in the Matrix contributing to connectivity (and some population support). Although the NWFP was designed using the ISC principles, it also incorporated recommendations from the spotted owl recovery team (USDI 1992c), used better data, and was further strengthened to address the needs of other late-successional forest-associated species. Therefore, FWS concluded in its 1994 BO on the NWFP (USDA and USDI 1994a) that the reserve/connectivity strategy of that plan (as described in the preceding sections) was a reasonable match for critical habitat and would perform the habitat/dispersal functions of critical habitat. FWS also concluded (as noted above) that the NWFP would provide the basis for the federal contribution to recovery of this species. The redundancy of function between critical habitat and the NWFP reduces the significance of adverse effects to CHUs outside of reserves for this species and, as a result, consultations conducted on critical habitat since 1994 have considered effects to critical habitat in the context of NWFP's ability to support the biological functions of the constituent elements intended by the critical habitat designation.

Summary–Status of Critical Habitat: Spotted Owl

Range-wide, FWS designated a total of 192 CHUs, containing 6,887,000 acres of critical habitat units (CHUs), encompassing about 3.1 million acres of suitable owl habitat. CHUs were intended to identify a network of habitats that provided the functions considered important to maintaining a stable, self-sustaining, and interconnected population over the spotted owls' range with each CHU having a local, provincial, and a range-wide role in owl conservation, until a long-term conservation plan was implemented. Most CHUs were expected to provide suitable habitat for population support, while some were designated primarily for connectivity (or both).

ENVIRONMENTAL BASELINE: SPOTTED OWL

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, State, or private actions and other human activities in the Action Area, those already affecting listed species and their habitat. Also included in the environmental baseline are the anticipated impacts of all unrelated proposed federal projects in the action area which have undergone formal or informal section 7 consultation, federal and other actions within the action area that may benefit listed species, and the impacts of State and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land-management activities.

The Environmental Baseline includes adoption of the NWFP. Information relevant to describing the environmental baseline for this action is included in the NWFP and associated documents. Information used to update the environmental baseline includes the effects of: (1) actions implemented under the NWFP on federal lands which have undergone section 7 consultation; (2) section 10 incidental take permits with section 7 consultation completed; (3) completed section 7 consultations conducted with other federal agencies; (4) updated survey data concerning spotted owls the Action Area; and (5) updated habitat data for spotted owls in the Action Area. Consultations before the 2002 programmatic BO for ONF (USDI 2002) used a 0.25-mile radius distance around typical activities to estimate incidental take due to harassment of murrelets and spotted owls, and up to 1.0 mile for activities using blasting or aircraft; therefore, total numbers of acres possibly harassed in previous consultations are now believed to have exceeded the actual amount of harassment.

Spotted Owls and Their Habitat in the Action Area in 1994

The 632,324-acre ONF is located exclusively in the Olympic Peninsula Province. The entire Forest is within the NWFP area. The spotted owl generally occupies the remaining patches of suitable habitat (nesting, roosting, and foraging habitat or suitable habitat) in the lower elevation forests along major river systems that drain from these mountains.

In 1994, the FSEIS established the environmental baseline for ONF as consisting of 250,714 acres of suitable spotted owl habitat (40 percent of the 627,072 total Forest acres). LSR encompassed 394,460 acres, of which 207,644 acres (52 percent) were considered suitable spotted owl habitat. AMA encompassed 150,400 acres, of which 10,820 acres were considered suitable. Finally, Wilderness Areas encompass 88,000 acres of which 31,791 acres were considered suitable (Table 4).

Table 4. 1994 environmental baseline for spotted owls for ONF: number of acres and percent of suitable habitat by Land Use Allocation (there are no Matrix acres on ONF)¹

Land Use Allocation	LSR	AMA	CRA	AWA	Total
Acres of suitable habitat	207,644	10,820	31,791	459	250,714
% of total acres	33.1	1.7	5.1	0.1	40.0
% of total suitable habitat	82.8	4.3	12.7	0.2	100.0
Total Forest acres					627,072

¹The source of these data was Appendix Table G-11 of the FSEIS (USDA and USDI 1994a). Because these data were taken from a different source, the total acres of suitable habitat in LSRs here are not equal to data presented in Table 5.

Late-Successional Reserves

ONF contains six LSRs (USDA 1995, 1996b-d, 1998) that were grouped or divided from the original ten LSRs established in 1994 (Tables 4 and 5). These LSRs encompass 394,405 acres, of which 205,127 acres are considered suitable spotted owl habitat. A total of 52.0 percent of the LSRs on ONF are comprised of suitable spotted owl habitat. The amount of suitable spotted owl habitat within these 10 LSRs ranges from 42.0 to 76.6 percent.

Table 5. 1994 Late-Successional Reserve baseline for spotted owl habitat on ONF¹

LSR ID	Suitable habitat acres	Total Federal acres	% suitable habitat	No. of known activity centers
RW101	3,005	4,468	67.3	1
RW102	6,365	13,798	46.1	2
RW103	3,716	5,456	68.1	1
RW104	29,850	50,726	58.8	12
RW105	5,970	7,789	76.6	3
RW106	158	316	50.0	0
RW107	27,399	47,642	57.5	11
RW108	84,016	160,441	52.4	28
RW109	42,739	99,910	42.8	22
RW110	1,977	3,914	50.5	0
Total	205,195	394,460	52.0	80

¹The source of these data was G. Mayfield (FWS, pers. comm, 2001). Because these data were taken from a different source, the total acres of suitable habitat in LSRs here are not equal to those presented in Table 4.

A total of 82.8 percent of suitable spotted owl habitat on ONF is located within LSRs. The FSEIS identified 80 known spotted owl activity centers within these LSRs in 1994. Connectivity between reserves was designed to be maintained by the presence of spotted owl nesting, roosting, foraging, and dispersal habitat between them. Currently, connectivity between reserves is in poor condition due to extensive timber harvest prior to 1994.

The acre totals of suitable spotted owl habitat per LSR and per CHU used in this document were derived from the FSEIS. The FSEIS did not supply total acres and acres of suitable habitat for Land Use Allocations other than for LSRs; for this report, these data were generated through a Geographic Information System (GIS) process by staff of FWS Office of Technical Support (OTS) in the Pacific Regional Office in Portland, Oregon. Due to inaccuracies inherent in determining acre totals via GIS, the total acres and acres of suitable owl habitat in LSRs presented in the FSEIS and those derived from the GIS effort are not equal. Total acres per Land Use Allocation and acres of suitable habitat within LSRs and the percent overlap of LSRs and CHUs relative to total acres and acres of suitable habitat were taken from Appendix G of the FSEIS.

Soleduck LSR (RW-101). This reserve contains 85,060 acres, of which about 54 percent is suitable habitat.

Quinalt North LSR (RW-102) and Quinalt South LSR (RW-103). These LSRs encompass approximately 114,235 to 116,026 acres (as determined by FWS for this BO) and are part of a larger network of blocks of late-successional forest including the ONP, Colonel Bob Wilderness, and the Quinalt Recreation Area. The majority of the late-successional forest within these two LSRs is highly fragmented, with a substantial amount of the forest less than 80-years-old, with the exception of two relatively unfragmented blocks in LSR RW103 (USDA 1996b-d).

South Hood Canal LSR (RW-104). This LSR encompasses approximately 94,764 (as determined by FWS for this BO) to 101,000 acres and is part of a larger network of blocks of late-successional forest, including the ONP, Quinalt LSR, North Hood Canal LSR, and the Wonder Mountain Wilderness (USDA 1995). Some of the suitable habitat is highly fragmented or in residual strips. The upper Wynoochee and upper Skokomish drainages in the northern portion of this LSR contain the largest contiguous blocks of suitable habitat. These large blocks are relatively well-connected to each other, with a few notable exceptions (USDA 1995). Throughout the southern portion of the LSR, there are scattered, isolated, variably-sized blocks of suitable habitat.

North Hood Canal LSR (RW-105). This LSR encompasses approximately 42,324 (as determined by FWS for this BO) to 50,726 acres. RW-105 is part of a larger network of blocks of late-successional forest, including the ONP, Quilcene LSR, South Hood Canal LSR, Mt. Skokomish Wilderness, and the Brothers Wilderness (USDA 1996c). Some of the suitable habitat is fragmented or in residual strips. The upper Hamma Hamma drainage in the western portion of the LSR contains the largest contiguous blocks of suitable habitat (USDA 1996c).

Quilcene LSR (RW-106). The Quilcene LSR encompasses approximately 60,800 (USDA 1996b) to 73,355 (as determined by FWS for this BO) acres. RW-106 is part of a larger network of blocks of late-successional forest, including ONP, and the Buckhorn Wilderness (USDA 1996b). The northern portion of this LSR is highly fragmented, with large tracts of the forest less than 80-years-old interspersed with occasional blocks of older forest and small strips of late-successional forest (USDA 1996b). Little of the northern portion of this LSR currently provides sufficient late-successional forest habitat to maintain viable populations of late-successional dependant species, with the exception of the upper Dungeness drainage (USDA 1996b).

Other Land Allocations

There are five Wilderness Areas, encompassing a total of 88,265 acres, on ONF: the Colonel Bob Wilderness (11,961 acres); Buckhorn Wilderness (44,258 acres); Wonder Mountain Wilderness (2,349 acres); Mt. Skokomish Wilderness (13,015 acres); and The Brothers Wilderness (16,682 acres). All Wilderness Areas are Congressionally Reserved Areas and are therefore considered to be reserves under the NWFP in that no harvest is permitted. There are 31,791 acres of suitable habitat in Congressionally Reserved Areas on ONF. These wilderness areas are reserves that provide some suitable habitat for spotted owls. Much of these areas are

high-elevation areas that provide dispersal habitat. All National Parks also are considered as reserves under the NWFP in that no harvest is permitted. The 916,136-acre ONP lies in the center of the Peninsula and is surrounded by ONF. The ONP provides very important suitable habitat and dispersal habitat for the spotted owl.

There are a total of 203,207 acres of non-federal lands within the Action Area (a 1-mile buffer around ONF). HCPs that address spotted owls apply to 93,849 acres (Simpson and WDNR HCPs). The remaining acreage is either private, Tribal, or city government lands. The status of spotted owls or available habitat on these lands is unknown.

Spotted Owl Critical Habitat

The Action Area includes 10 CHUs (USDI 1992b) which total 387,295 federal acres, of which 197,696 acres (51 percent) were suitable spotted owl habitat in 1994 (Table 6). A total of 91 percent of the area of the CHUs is contained within LSRs. There were 92 known spotted owl activity centers in these CHUs in 1994 (G. Mayfield, pers. comm. 1999). These CHUs incorporate virtually all of the blocks of suitable spotted owl habitat on ONF. In addition, there are 60,355 acres of dispersal habitat on the ONF of which 16,945.4 acres occur within CHUs (USFS hab 2000 data). There are 27,818.7 acres of dispersal habitat within LSRs of which 10,873.4 acres occur within LSRs, but outside of CHUs. Two of these CHUs (WA-43 and WA-44) were established to provide suitable habitat and dispersal habitat for one pair of spotted owls each (USDI 1991). One CHU (WA-48) in the north is necessary to link the CHUs in the northwest to those in the northeast portions of the Peninsula.

Table 6. 1994 critical habitat baseline for spotted owls in the Action Area

CHU ID	FSEIS baseline							
	Total CHU acres	Federal CHU acres	Federal suitable habitat acres	Federal dispersal habitat	Federal LSR acres	% CHU in LSR	Federal LSR suitable habitat acres	% suitable habitat in LSR
WA-43	6,633	5,963	3,244	1,063	5,094	85	3,317	100
WA-44	4,615	3,710	2,717	716	3,671	99	2,606	99
WA-45	24,854	22,603	6,470	12,292	14,423	64	6,361	98
WA-46	354	315	125	0	315	100	158	100
WA-47	52,486	52,486	29,250	4,843	49,489	95	29,210	99
WA-48	9,279	8,253	5,735	890	7,701	93	5,924	100
WA-49	69,207	67,746	25,579	20,822	54,233	80	23,994	93
WA-50	38,810	38,810	19,045	8,233	38,061	98	19,129	99
WA-51	144,680	140,017	78,777	18,555	132,477	95	77,844	98
WA-52	47,825	47,392	26,754	4,284	46,605	98	26,603	99
Total	398,743	387,295	197,696	71,697	352,069	91	195,146	99

¹ The source of these data was G. Mayfield (FWS, pers. comm, 2001). Spatial data were overlaid based on FSEIS data (USDA et al. 1993; USDA and USDI 1994) for Land Use Allocations, spotted owl habitat, LSRs, ownership and FWS data for CHU boundaries (USDI 1994).

Authorized Actions that Affected Spotted Owls and Their Critical Habitat Since 1994

Since 1994, FWS has issued 11 consultations to ONF, 4 of which included removal, downgrading, or degrading suitable spotted owl habitat, for a total of 81 acres (Tables 7 and 8). The few acres of suitable habitat harvested (81) and degraded (68) on ONF since 1994 did not affect the range-wide status of the spotted owl. No dispersal habitat was harvested on ONF since 1994. Johnson et al. (1994) estimated an annual probable sale quantity (PSQ) of 13 million board feet (MMBF) for ONF during implementation of the NWFP. From 1994 through 2000, mean annual harvest on ONF has been 11.6 MMBF (8.0, 14.0, 18.0, 10.0, 15.0, 9.0, 7.0, respectively), which is less than the PSQ. PSQ is primarily met on the ONF through timber stand thinning to promote late-successional habitat development.

Table 7. All section 7 consultations issued for effects to spotted owl habitat on ONF since 1994

Project name	FWS log number	Acres of suitable habitat affected	Activity type(s)
Canal View Timber Sale	1-3-1994-F-0831	64	Timber Sale
Elkhorn Campground	1-3-1999-F-0773	5	Campground
Emergency Road and Flood Repair	1-3-1995-F-0834	0	Road Repair
FY95 Watershed Restoration	1-3-1995-F-0545	0	Watershed Restoration
Hass Salvage Sale	1-3-1996-I-0071	0	Salvage Sale
Rayonier/Bloedel Easement	1-3-1997-F-0224	0	Easement
Road 2918 Relocation	1-3-1998-F-0496	0	Road Relocation
Simpson ROW*	1-3-1998-F-0065	0	Right-of-way
FY00 Olympic NF Programmatic	1-3-2000-FR-0567	0	Programmatic
State Rt 101 Quinault hazard tree	1-3-2001-F-0017	10	Hazard tree removal
FY 02 Interim Olympic NF Programmatic	1-3-01-F-2371 and 1-3-02-F-0915	2 plus 425 hazard trees	Programmatic
Total		81	

* This project resulted in the removal of 13 acres of suitable habitat and 63 acres of dispersal habitat on private land.

Table 8. Effects to Land Use Allocations, 1994 to present, on ONF relative to spotted owls: acres of suitable habitat and percent change

	Total	% Δ	LSR	% Δ	AMA	% Δ	CRA	% Δ	AWA	% Δ
Suitable habitat 1994 baseline	250,714	--	207,644	--	10,820	--	31,791	--	459	--
Suitable habitat removed/degraded	79	0.03	55	0.03	24	0.22	0	0	0	0
Suitable habitat degraded	68	0.03	68	0.03	0	0	0	0	0	0
Suitable habitat added	0	0	0	0	0	0	0	0	0	0
2001 baseline	250,635	0.03	207,589	0.03	10,796	0.22	31,791	0	459	0
Dispersal removed	0	--	0	--	0	--	0	--	0	--
Trees removed	0	--	0	--	0	--	0	--	0	--
Acres harassed	648,012	--	--	--	--	--	--	--	--	--

¹ The source of the number of acres within these LUAs was G. Mayfield (FWS, pers. comm, 2001). Spatial data were overlaid based on FSEIS data (USDI et al. 1993; USDA and USDI 1994a) for Land Use Allocations, northern spotted owl habitat, LSRs, ownership and FWS data for CHU boundaries (USDI 1994).

² All spotted owls within a total of 64,801 acres were authorized for harassment under Incidental Take Statements of BOs.

The 2000 programmatic BO for ONF (USDI 2000a) described the incidental take which had been authorized for spotted owls between adoption of the NWFP and the preparation of that BO, as well as a section 318 timber sale which removed unsurveyed, suitable spotted owl habitat following the adoption of the NWFP. The 2000 BO anticipated 64,151 acres of incidental take in the form of harassment as a result of road restoration, maintenance activities, and firewood collection. Consultations before the 2002 programmatic BO (USDI 2002) used a 0.25-mile radius distance around typical activities to estimate harassment take, and up to 1.0 mile for activities using blasting or aircraft; therefore, total numbers of acres possibly harassed in previous consultations are believed to have exceeded the actual amount of harassment. The 2002 programmatic BO (USDI 2002d) provided new information and analysis about disturbance-related effects. Based on this analysis, the harassment distances from noise-generating activities were shortened in most cases. The present 2003-2008 BO further analyzed these distances (see

below).

Since the 2000 programmatic BO, FWS has completed several other project-specific BOs that authorized incidental take on ONF. In the Browns Creek Campground consultation, ONF relocated 13 existing campsites, made various improvements, and addressed stability of the riverbank. FWS authorized 30 acres of incidental take in the form of harassment. In the Highway 101 consultation, ONF removed hazard trees from along Highway 101. FWS authorized the removal of 51 to 68 acres of incidental take in the form of harm. In the Upper Dungeness consultation, ONF decommissioned about 3.8 miles of road, stabilized 6.3 miles of road, and repaired 10 flood-damaged sites. FWS authorized 2,706 acres of incidental take in the form of harassment. In the Hood Canal Batch Emergency Relief for Federally Owned Roads consultation, ONF decommissioned and stabilized about 9.3 miles of road and repaired 16 storm-damaged sites. FWS authorized 2,937 acres of take in the form of harassment. In the Elkhorn Campground consultation ONF relocated campsites and performed restoration activities. FWS authorized 5 acres of incidental take in the form of harm and 68 acres of incidental take in the form of harassment.

LSRs were virtually unaffected by consulted-on (authorized) projects from 1994 to the present (Table 9). FWS authorized the removal or downgrading of 55 acres of LSR (0.02 percent of total suitable owl habitat on ONF) and the degradation of 68 acres within LSRs (0.03 percent of total suitable habitat). The LSRs continue to provide the same functions in 2003 as in 1994 despite these minor effects.

Table 9. Changes in suitable habitat in Late-Successional Reserves, 1994 to present, on ONF

FSEIS baseline		LSR effects, 1994 to present			
Current LSR ID	Corresponding to these FSEIS LSR IDs	Acres of suitable habitat removed/downgraded	% suitable habitat removed/downgraded in all LSRs combined	Acres of suitable habitat degraded	% suitable habitat degraded in all LSRs combined
RW 101	RW101-RW106	0	0	0	0
RW 102	RW 107	2	0	0	0
RW 103	Part of RW108	8	0	0	0
RW 104	Part of RW108	0	0	0	0
RW 105	Part of RW109	40	0.02	0	0
RW 106	Part of RW108 plus RW110	5	0	68	0.03
Total		55	0.03	68	0.03

¹The source of these data was G. Mayfield (FWS, pers. comm, 2001). Spatial data were overlaid based on FSEIS data (USDA et al. 1993; USDA and USDI 1994) for Land Use Allocations, spotted owl habitat, LSRs, ownership and FWS data for CHU boundaries (USDI 1994).

Critical Habitat

CHUs were virtually unaffected by authorized projects since 1994. Within CHUs, 54 acres (0.03 percent of all suitable habitat on ONF) were authorized for removal or downgrading (Table 10). No suitable spotted owl habitat was removed, downgraded, or degraded by consulted-on projects within 7 of the 10 CHUs located on ONF. A total of 68 acres (or 0.03 percent of suitable habitat within all CHUs on ONF) of suitable owl habitat was authorized for degrading, all of which were in LSR/Managed Late-Successional Areas and CHUs. No dispersal habitat within CHUs was removed or degraded. Because so few acres within CHUs were removed/downgraded or degraded FWS concludes that the ability of these CHUs or their associated LSRs to function has not appreciably changed since their designation in 1992 at both the unit and the provincial scale.

Table 10. Effects to CHUs relative to spotted owls, 1994 to present, on ONF.

CHU ID	FSEIS baseline	CHU effects, 1994 to present				
	CHU suitable habitat acres	BO acres of suitable habitat removed/downgraded	Actual acres of suitable habitat removed/downgraded	% CHU suitable habitat removed/downgraded	Acres of suitable habitat degraded	% CHU suitable habitat degraded
WA-43	3,244	0	0	0	0	0
WA-44	2,717	0	0	0	0	0
WA-45	6,470	0	0	0	0	0
WA-46	125	0	0	0	0	0
WA-47	29,250	0	0	0	0	0
WA-48	5,735	0	0	0	68	0.27
WA-49	25,579	5	0	0.02	0	0
WA-50	19,045	40	0	0.21	0	0
WA-51	78,777	9	0	0.01	0	0
WA-52	26,754	0	0	0	0	0
Total	197,696	54	0	0.03	68	0.03

Connectivity Within ONF

Connectivity relative to the 1994 baseline condition was virtually unaffected by consulted-on projects. A total of 81 acres of suitable habitat was authorized for removal/downgrading (0.03 percent of total suitable owl habitat on ONF). Of this, 55 acres (0.02 percent of all suitable owl habitat) were affected within LSR/Managed Late-Successional Areas as noted above and 24 acres (0.01 percent of all suitable habitat) were affected within Adaptive Management Areas. A total of 68 acres of suitable owl habitat in LSRs was authorized for degrading (0.03 percent of total suitable habitat). No dispersal habitat was authorized for removal. The 1996 programmatic consultation (BO 1-3-1996-F0371) covered removal of as many as 350 trees and spotted owl harassment within 59,295 acres annually associated with restoration, maintenance, and rescue activities in the ONP during 1996 to 1998. Actual figures for these effects for the three years were 20, 10, and 15 trees and 61,000, 82,006, and 97,493 acres, respectively (Shelley Hall, Olympic National Park, pers. comm.). The 2002 Interim programmatic authorized the removal of up to 425 hazard trees and 2 acres throughout ONF. Based on the small amount of habitat loss and disturbance that has occurred since 1994, connectivity on ONF has not substantively changed since 1994.

Connectivity Between Provinces

Connectivity between the Olympic Peninsula Province and adjacent provinces was virtually unaffected by the small-scale impacts described above, and remains as it was in 1994 (i.e., in poor condition due to a high degree of habitat fragmentation as a result of extensive timber

harvest on federal, State, Tribal, and private lands).

Summary–Environmental Baseline: Spotted Owl

There are approximately 259,731 acres of suitable spotted owl habitat on ONF. There are 205,195 acres in LSRs and 197,696 acres in CHUs, most of which overlap. In 1994, the FSEIS established the environmental baseline for ONF as consisting of 250,714 acres of suitable spotted owl habitat (40 percent of the 627,072 total Forest acres). From 1994 to the present, FWS-authorized actions on federal lands resulted in the removal or downgrading of 81 acres of suitable habitat in all Land Use Allocations. In LSRs, 55 acres were removed or downgraded, and 68 were degraded. In critical habitat, 54 acres was removed or downgraded, and 68 acres were degraded. These changes to the amount of suitable habitat are small fractions of 1 percent of the available habitat.

MURRELET

STATUS OF THE SPECIES: MURRELET

Protective Mechanisms

Endangered Species Act

On October 1, 1992, FWS published a *Federal Register* listing the murrelet as a threatened species in Washington, Oregon, and northern California effective September 28, 1992 (57 FR 45328) (USDI 1992a). Excessive harvest of late-successional and old-growth forests, the habitat preferred for nesting by murrelets, was the primary reason for the listing. Other factors include high predation rates, mortality in gillnets, and oil-spill mortality.

State Listing

In Washington, the murrelet is listed as threatened by the State (RCW 77.12). Emergency rules for forest practices that impact murrelets were in effect since November of 1992. The State of Washington Forest Practices Board has now adopted permanent rules under the Forest Practices Act (76.09 RCW) that identify “critical wildlife habitat” for the murrelet and identify which forest practices impact murrelets.

State Forest Practices Rules

Under forest practices murrelet rules (WFPB 2000), certain forest-management activities on nonfederal lands within or adjacent to a known occupied murrelet site, or within designated critical habitat, are classified as “Class IV - Special” forest practices. The applicant for the Forest Practices permit must submit an environmental checklist under the State Environmental Policy Act (SEPA). The WDNR then makes a threshold determination from this information. The WDNR may make a determination of non-significance, mitigated determination of non-significance, or a determination of significance. If a determination of non-significance or

mitigated determination of non-significance is reached, the action can proceed without further environmental assessment. If a determination of significance is made, preparation of a SEPA Environmental Impact Statement is required.

Recovery Plan

The Marbled Murrelet Recovery Plan (USDI 1997a) outlines the conservation strategy for the murrelet. The Recovery Team identified six Marbled Murrelet Conservation Zones throughout the listed range of the species: Puget Sound (Zone 1), Western Washington Coast Range (Zone 2), Oregon Coast Range (Zone 3), Siskiyou Coast Range (Zone 4), Mendocino (Zone 5), and Santa Cruz Mountains (Zone 6) (Appendix Figure 4). It was recognized that the NWFP provided the backbone for the recovery of the murrelet, but additional recommendations were made for nonfederal lands within each Conservation Zone. Within Conservation Zones 1 and 2, the Final Recovery Plan considered the following lands as being essential for the recovery of the murrelet within the State of Washington: (1) any suitable habitat in a LSR; (2) all suitable habitat located in the Olympic AMA; (3) suitable habitat on State lands within 40 miles of the coast; and (4) habitat within occupied murrelet sites on private lands (USDI 1997b).

The Recovery Team estimated that the population was declining at annual rates of between 4 and 12 percent. These conclusions drawn by Ralph et al. (1995b) and the Marbled Murrelet Recovery Team (1994) are regarded as the best available information on the current status of the species; these are discussed in detail below. The Recovery Team believes that possible reasons for the decline in numbers of murrelets include the species' low reproductive rate, its dependence on older forests (that are now scarce and heavily fragmented) for nesting, and adult mortality due to entanglement in gill nets and encounters with oil spills.

The Marbled Murrelet Recovery Plan (USDI 1997a) states that the following actions are necessary to stabilize the population and allow for continued existence of viable populations: (1) increase the productivity of the population, as reflected by total population size, the juvenile: adult ratio, and other measures of nesting success; (2) minimize threats to survivorship; (3) identify and conduct research and monitoring necessary to determine specific delisting criteria; and (4) develop a research cooperative to coordinate monitoring and research efforts. The key method to stop population decline and encourage future increase in population growth is to stabilize and increase habitat quality and quantity on land and at sea.

Taxonomy and Range

The murrelet is a small seabird of the family Alcidae in the order Charadriiformes. The marbled murrelet species was recently split so that there is now the marbled murrelet in North America (*B. marmoratus*) and the long-billed murrelet in Asia (*B. perdix*). For the purposes of this consultation, we are concerned with the murrelet within the geographic area of Washington, Oregon, and California (the listed area), unless some other geographic area is specified. For instance, when life history requirements are described for the Pacific Northwest, data generally include Washington, Oregon, and California, as well as British Columbia (but not Alaska or California). The murrelet ranges from the Aleutian Archipelago to central California. The

distribution of murrelets becomes more disjunct at the southern extreme of their range. In Washington, Oregon, and California, there are distinct gaps between breeding populations which are thought to relate to availability of onshore nesting habitat. Murrelets are generally found in near-shore ocean waters but come inland to nest.

Life History

Physical Characteristics

The murrelets body shape and short wings require that it fly faster than 40 miles per hour to avoid stalling. This in turn influences its selection of nest sites and surrounding canopy. Adults have an alternate plumage during the breeding season that most likely protects breeding birds from detection by predators in forested environments. Juveniles are indistinguishable from adults outside the breeding season.

Foraging Habitat

Murrelets spend the majority of their lives on the ocean. Murrelets feed in near-shore ocean waters and in inland bays, sounds, and inland passageways. They feed on marine invertebrates and small fish traveling in schools. Small fish such as sand lance (*Ammodytes hexapterus*), Pacific herring (*Culpea harengus pallasi*), anchovy (*Engraulis mordax*), and “sea perch” are important during the breeding season (Burkett 1995). Inter-annual changes in the marine environment can result in major changes in prey consumption. Murrelets dive for their prey and their body shape facilitates underwater swimming. Murrelets feed most-actively during the morning, late afternoon, and sometimes at night. Additional information regarding foraging and food habitats can be found in Strachen et al. (1995), Burkett (1995), and Hunt (1995). Murrelets apparently exhibit diurnal changes in distribution. On Desolation Sound, murrelets were observed to move out from inner fjords into more open waters at night. Telemetry data indicated that these murrelets were not actively feeding at night.

Nesting Habitat

Murrelets fly inland to nest. They are solitary to semi-colonial in their nesting habits, and simultaneous detections of more than one bird are frequently made at inland sites. Murrelets are long-lived, and have high fidelity to nesting areas (Divoky and Horton 1995). The murrelet does not build nests or use cavities but use nest platforms usually on a horizontal, large-diameter, moss-covered limb, a dwarf-mistletoe broom, or other deformities. They require a sufficiently wide and flat space to retain a single egg. Nesting platforms are generally 50 feet or higher above the ground. Trees with this type of structure are typically greater than 200 years of age; therefore, they nest almost exclusively in inland mature to old-growth coniferous forests, described further under the section addressing habitat requirements.

Nesting Chronology

Murrelets reach sexual maturity during their second year, and courtship occurs at sea. It is believed that pairs may visit the nest stand to copulate, form and maintain pair bonds, and select nest sites before laying an egg. Incubation lasts 27 to 28 days. Both the female and male share incubation responsibilities by alternating days of brooding and foraging. However, the egg may be unattended for 3 to 4 hours per day. Murrelet chicks are born with downy feathers and juvenile plumage is established before they are 26 days old. Adults leave the chick alone on the nest except when actively feeding the chick. Adults fly inland to feed the chick at least once per day, typically carrying one fish at a time. Feedings occur most frequently at dawn or dusk. Murrelet chicks remain inactive for most of the time they are on the nest until about 2 days prior to fledging during which time their activity increases markedly and they remove the remaining down from their plumage. They flap their wings rapidly and vigorously during these last few days on the nest.

The early nesting season for murrelets in Washington—including egg-laying, incubation, and hatching—is considered to be April 1 to August 5 at this time, although after analysis of additional information collected for nests in British Columbia during 2002 these dates may change based on best available data. As stated in Hamer and Nelson (1995), and with recent agreement by K. Nelson (USFWS, pers. comm.) and R. Bradley (Univ. BC, pers. comm.), it is appropriate to combine breeding data from Washington and British Columbia: “The longer breeding season available for the murrelet in Oregon and California may make renesting more likely than in the northern regions of the range.” and “In Washington, the breeding season...is probably similar to that found in British Columbia” (Hamer and Nelson 1995:55). Hatching generally occurs from late May to early August. There is only one known instance in which a pair of murrelets renested in Washington or British Columbia; in that case, in British Columbia, they renested approximately 2 weeks after their nest first failed (a female requires 2 weeks to produce an egg), and the resulting fledging date was later than the rest of the murrelets that year (Bradley, Univ. BC, pers. comm.). To increase the Washington sample size, data from British Columbia were included in the following analysis; Hamer and Nelson (1995) supplied Washington ($n = 13$) and British Columbia ($n = 23$) data, and Bradley (Univ. BC, pers. comm.) supplied British Columbia data ($n = 85$). Ninety-five percent (115 of 121) of all known young in Washington and British Columbia hatched by July 22, and 99 percent (120 of 121) of these young hatched by August 6; the one young that hatched after Aug 6 hatched on August 10 (Hamer and Nelson 1995 and Bradley, Univ. BC, pers. comm.). This analysis used dates of known nests to estimate the early and late breeding seasons. Virtually all incubation exchanges take place at dawn before sunrise, although, in Alaska, they may take place also at dusk (Nelson and Hamer 1995).

The late nesting season is when most nesting murrelets are feeding hatched young. In Washington, the late breeding season is estimated to be August 6 to September. Approximately 90 percent of feedings take place between 2 hours after sunrise to 2 hours before sunset (167 of 187 (90 percent) dawn/dusk feedings approximated from Fig. 1, Nelson and Hamer (1995)).

Ninety-nine percent of the murrelet chicks in Washington should have fledged by September 5 (30 days after 99 percent have hatched), and 100 percent should have fledged by September 9 (30 days after 100 percent have hatched).

Flight

Murrelets fly at speeds exceeding 60 miles per hour. Because their wings are short for a bird of their weight, their stalling speed is quite fast and requires them to have open areas around nest branches in order to land and take off. Their landings are often hard and audible (Nelson and Hamer 1995). Murrelets land hard enough that repeated landings create a landing pad on the limb. Distinctive flights below the canopy are considered to be indicative of occupancy, but do not definitely confirm nesting. Single birds or flocks of birds circling the forest canopy is also considered by researchers to indicate that the stand may be occupied by murrelets, however such activity is not an indicator of occupancy under the Pacific Seabird Group protocol or under Washington State regulations. Murrelets tend to follow linear open features such as creeks, roads, or other natural or human-made corridors to directly approach and depart from nest stands. Nelson and Hamer (1995) found a correlation between flight paths and canopy gaps around nest trees.

Nest Success and Predation

Nesting success is likely influenced by a variety of factors such as habitat quality, weather conditions, predation, physiological condition of the breeding adults, and forage availability. However, little information is available on these relationships. Nelson and Hamer (1995) compiled and analyzed records between 1974 and 1993. Adequate information was available to determine nest success for 32 of the 65 nest tree sites. Of these 32 sites, 72 percent failed. Predation accounted for about half of nest failures. The authors recognized that the high rates of predation reported in their study may have resulted from a biased sample because most of the records came from nests that were in fragmented areas and near forest edges. Of the 16 nests studied, nests that were successful were located significantly farther from forest edges than those that failed. All successful nests were located at least 55 meters from an edge (mean = 166 meter), other than the Nemah nest in Washington that was located only 10 meters from an old road near the center of a 142-ha forest. Nests that were unsuccessful due to predation were all within 64 meters of an edge (mean = 24 meter). This agreed with findings from Paton (1994) who, in his review of numerous artificial nest predation studies, found evidence that predation of bird nests is higher within about 165 feet of edges. Nests located by researchers may also be more easily located by predators. Other factors believed to affect predation rates are stand size, canopy closure, percent cover over the nest cup, and distance of the nest from the tree trunk.

Numbers, Distribution, and Population Trends

Murrelet nests are not evenly distributed between the coast and the inland extremes of their range (up to 55 miles from marine waters in Washington State), but are observed most often within about 12 miles of the ocean. However, their inland nesting distribution is not fully known because survey effort has been inconsistently distributed, especially in areas greater than 40

miles from saltwater. In marine environments, there are distinct gaps between breeding populations that are thought to relate to availability of onshore nesting habitat. It is believed that marine productivity is high along most of this coast during the breeding season that may suggest that foraging habitat is not limiting.

The total population of the subspecies was recently estimated at 300,000 individuals, with about 85 percent of this estimate concentrated along the Gulf of Alaska and Prince William Sound (WDNR 1997). The population size of the murrelets in Washington, Oregon, and California has been estimated at 18,550 to 32,000 (Ralph et al. 1995b). The large range in the population estimate is a result of two widely divergent population estimates in Oregon, where there continues to be substantial variation in population estimates. For example, Varoujean and Williams (1995) used aerial surveys, conducted along the entire Oregon Coast in August and September 1993, to estimate that 6,600 murrelets occur in Oregon. They compared these aerial surveys with opportunistic boat-based surveys conducted along portions of the Oregon Coast in April and July 1986 to 1988, and concluded with some reservation that the murrelet population size has remained relatively stable in Oregon over the last 10 years. Strong et al. (1995) used boat surveys to estimate that 15,000 to 20,000 murrelets occur in Oregon; they cautioned that large numbers of non-breeding adults and low numbers of fledglings on the water may be a consequence of lack of suitable nesting habitat, and thus low numbers of nesting birds. Preliminary estimates of the population, based on recent data from the NWFP Marbled Murrelet Effectiveness Monitoring Program, are 17,427 (12,311 to 22,544) from the Canadian Border to San Francisco Bay. This estimate is based on a rigorous sampling design and is a more-reliable estimate than previous estimates. Puget Sound populations were estimated at 5,277 (2,856 to 8,850) and Coast Range populations were estimated at 750 (488 to 1,075). FWS interpretation of the differences between the previous and current population estimates is that the recent estimate is based on a rigorous sampling design that yields the most-accurate population estimate, and that comparisons with previous estimates to document trends would not be appropriate. The populations in the Puget Sound represent approximately 30 percent of the total listed population (Bentivoglio et al. 2001).

Various population estimates have been made for California over the past 15 years. SOWLS et al. (1980) estimated a breeding population of about 2,000 birds based on data collected opportunistically while surveying other seabirds. Carter and Erickson (1992) and Carter et al. (1992) reported similar population estimates. Ralph and Miller (1995) conducted intensive at-sea surveys in small portions of the murrelet's range primarily in northern California. These surveys were specifically designed to estimate population size for murrelets in California; they estimated a stable population of approximately 6,000 birds, including breeding and non-breeding birds. These authors extrapolated from small areas to estimate numbers over much larger areas. Given the non-uniform distribution of murrelets at sea, this process may have led to overestimation of murrelet numbers.

Beissinger (1995) constructed a demographic model of the murrelet population and concluded that the population may be declining at rates of 2 to 12 percent per year. It is possible that the age-ratio data used in the model are reflective of a relatively temporary decline due to unusual ocean conditions (Ralph et al. 1995b). Additionally, by the end of the breeding season when all

juveniles have fledged, adults have molted and are not distinguishable from juveniles. Warm ocean conditions, such as occur during El Niño events, can reduce prey availability and result in adults foregoing breeding (more adults present on water to be counted) and/or in chicks starving. Both of these responses may adversely affect reproductive rates and give a non-representative impression of long-term demographic trends.

Ralph et al. (1995b) summarized some of the reasons for variability in population estimates among researchers, including differences in methodology, assumptions, spatial coverage, and survey and model errors. Nevertheless, the Marbled Murrelet Recovery Team (USDI 1994 and 1997a) concluded that the listed population appears to be in a long-term downward trend and estimated that the population may be declining at rates of between 4 to 12 percent annually. Based on demographic analyses, Beissinger and Nur (1997) estimate the murrelet population to be declining at a rate of at least 4 percent per year and perhaps as much as 7 percent per year in Washington, Oregon, and California.

Circumstantial evidence of population decline includes observations that murrelets are abundant offshore of areas where extensive old-growth stands still exist (the Gulf of Alaska), while distribution is disjunct in areas where most of the old-growth has been harvested (Washington, Oregon, and California) with murrelets found offshore along remaining stands of old growth. In Alaska, Piatt and Naslund (1995) concluded from comparing small-boat survey counts for the 1972-1973 period and the 1989-1991 period, and Christmas bird counts, that populations have decreased by 50 percent. In British Columbia, Burger (1995) concluded that populations have decreased by 50 percent in Clayquot Sound. In Barclay Sound, he indicated populations there decreased in 1992-1993, but doubled or tripled the following year, in 1994. He speculated that low numbers in 1992-1993 count may have been due to El Niño factors. It has been hypothesized that a number of bird species feeding on small fish have decreased in the past several decades, while bird species feeding on benthic organisms did not decrease similarly. Following the Exxon-Valdez oil spill, a study was initiated in Prince William Sound that included a comparison of oiled areas with unoiled areas and also compared pre-spill populations with post-spill populations (Klosiewski and Laing 1994). That study indicated that murrelets decreased in both oiled and unoiled areas. Total population estimates declined from 304,400 in the 1972-1973 count to 98,400 in the 1989-1991 count.

Long-term data on the vital rates of murrelets are unavailable. Factors most likely to affect demography of murrelets include age at first breeding (2 year old), the proportion of adults breeding each year (variable reproductive rate), productivity (one egg per clutch), the number of young that survive to breeding age, and adult mortality rates. Murrelets have one of the lowest juvenile survival rates of alcid species (DeSanto and Nelson 1995). Low rates of juvenile survival and low annual production in any species mean that high rates of adult survival are necessary for a continued stable population.

Predation appears to have a large influence on reproductive success and adult and sub-adult mortality rates are increased by deaths due to human activities such as gill-netting, pollution, and oil spills. Year-to-year variation in all of these factors could influence prediction of long-term trends.

Habitat Requirements

Habitat Description

Murrelet nesting habitat is generally considered to be old growth or mature trees within about 55 miles of marine environments. In an analysis of Pacific Northwest nest sites, the mean elevation was 1,089 feet and the mean distance to the coast was 10 miles (Nelson and Hamer 1995). All nests found were below 3,600 feet in elevation. Most nest stands were within 19 miles of marine waters and all were within 25 miles. However, occupied behaviors have been documented much further inland. In Washington, 36 percent of occupied stands are more than 29 miles from marine water, with the farthest being 52.2 miles inland. Also, survey effort has not been high in areas further than 40 miles from marine waters (Hamer 1995). However, Hamer (1995) analyzed detection rates and number of surveyed stands that were verified as occupied against elevation and distance inland. He found that mean detection rate and number of stands verified as occupied declined sharply above 3,500 feet and at distances greater than 39 miles from marine waters. More than 98 percent of all murrelet detections were from forest stands below 3,500 feet and 98.5 percent of all detections were from areas less than 40 miles inland.

Nelson and Hamer (1992) and Hamer and Nelson (1995) examined nest-stand characteristics, Hamer and Nelson (1995) examined nest-tree characteristics, and a number of studies have attempted to examine the relationships between landscape, stand, and nest-tree characteristics with occupancy and documented nesting. The results of these studies establish a strong association of murrelet occupancy and nesting with old-growth forests and forests with old-growth characteristics. Suitable nesting habitat for the murrelet is considered to be mature to old-growth coniferous stands, or those younger stands with interspersed large trees which may provide nesting opportunities. Most nests are located on a very large branch with a moss substrate, with canopy cover over the nest. Generally, the habitat characteristics associated with murrelet nesting are large trees with large lateral branches, dwarf-mistletoe infection, witches brooms, and a mature understory that extends into the canopy. These elements provide nesting substrate. Such characteristics may not develop until trees are 200 to 250 years of age, or may occur over shorter time periods in response to severe dwarf-mistletoe infection or other defects (such as ice and storm damage) in mature stands.

Nest stands are characterized by large trees, moderate to high canopy closure, and a multi-storied canopy (USDI 1997a). Murrelets nest in low-elevation mature and old-growth trees; no nests were reported in stands younger than 180 years (Nelson and Hamer 1995). In Washington, the mean stand age for six nests was 879 years. In Washington and Oregon, mean tree size was 19 inches in nest stands. Many definitions of habitat used in the past have included the number of conifers or hemlock trees over 32 inches in diameter. Nest stands in the Pacific Northwest had a mean tree density of 73 trees per acre and mean composition of low-elevation tree species was 91 percent. Nest stands in the Pacific Northwest averaged 510 acres. The smallest stand was 7 acres.

Murrelets appear to nest in stands that have somewhat open canopies. This may be related to ease of access to the nest tree, which would be important for a bird that approaches nests at high speeds. Forest canopies in nest stands in Washington, Oregon, and California were characterized by multiple canopy layers (with two, three, and four layers), canopy heights averaging 210 feet, and an average canopy closure of 49 percent. About 80 percent of nests in the Pacific Northwest were located on the lower two-thirds of slopes. Nests tended to be close to streams or other forest openings that might facilitate access to nests. Mean slope in the Pacific Northwest was 23 percent (Hamer and Nelson 1995). Paton and Ralph (1988) found that stands of old-growth larger than 500 acres were likely to have more detections, and presumably support larger murrelet populations.

Large branches or deformities for nest platforms are present, including platforms created by dwarf-mistletoe infection. The mean nest tree diameter in the Pacific Northwest was 83 inches dbh and 35 inches at the height of the nest (Hamer and Nelson 1995). Mean branch diameter at the nest was 12.6 inches and mean nest branch height was 147.6 feet above the ground. Mean tree height was 217 feet. Most (94 percent) of the nests were located in the upper third of the tree. Mean distance from trunk to nest was 35 inches. Murrelets used moss and litter as substrate in platforms. Nest platforms were formed by large primary branches, the fork of a primary branch, juncture between branch and bole, dwarf-mistletoe brooms, large secondary branches, branch damage, and an old stick nest. Nests tended to have a high-degree of canopy closure over them. Mean percent cover over nests in the Pacific Northwest was 85 percent. A well-covered nest is probably a predator-avoidance strategy. Nest trees had a higher percentage of epiphyte (arboreal plants such as mosses and ferns) cover. Low-elevation tree species seem to be important as they may harbor more platforms than other species. Douglas-fir, western hemlock, and western red cedar are important species in Washington. Nest trees appear to have significantly more platforms than other trees within nesting stands.

Habitat Modeling

Hamer (1995) used logistic regression analysis to compare characteristics of 62 occupied stands with characteristics of 87 unoccupied stands. Starting with 38 forest-stand variables, he found that the probability of occupancy of an old-growth stand increased with an increase in the total number of potential nest platforms, percent moss coverage on limbs of trees greater than 32 inch dbh, percent slope, stem density of dominant trees (at least 32 inches dbh), and the mean dbh of western hemlock. At the same time, he found that the probability of occupancy decreased with increase in the percent coverage of lichens on the branches of dominant trees, stand elevation, and canopy closure.

Threats

The Recovery Team (USDI 1997a) identified the following actual or potential threats to the murrelet: (1) loss of nesting habitat, (2) poor reproductive success, (3) net-entanglement mortality, (4) pollution, and (5) prey abundance and distribution.

Ecology and Conservation of the Marbled Murrelet (Ralph et al. 1995a) is the most comprehensive summary of the status of the species. In the introductory chapter, the authors (pp. 11-22) made the following conclusions regarding the status of the murrelet:

1. "(E)vidence is mounting that population trends are downward where they have been measured, even though short-term fluctuations in climate and longer-term variation in ocean currents can result in apparent or temporary increases...The magnitude of the decline is unknown."
2. Declines in populations "have coincided with the cutting of a large fraction of the old-growth forests," although "cumulative effects of oil pollution, gill netting, and changes in the marine environment have undoubtedly played a role as well."
3. "(T)here is reason for concern for the continued viability of the species in some regions. Numbers at the southern end of the range are small and concentrated geographically, thereby leaving subpopulations vulnerable to damage by stochastic (catastrophic) events."
4. "The ultimate fate of the marbled murrelet is largely tied to the fate of its reproductive habitat, primarily old-growth forest or forest with an older tree component."
5. "(T)he trend in amount and distribution of suitable nesting habitat is the most important determinant of the long-term population trends."
6. "The cumulative effects of further incremental loss of existing habitat, in addition to continued loss of adults at sea, must immediately be considered and dealt with by all relevant agencies. To this end, we strongly suggest that a prudent strategy would be to curtail further loss of occupied nesting habitat in at least Washington, Oregon, and California."
7. "We feel that any further reduction in nesting habitat or areas for the murrelet in Washington, Oregon, and California would severely hamper stabilization and recovery of these populations to viable levels. Occupied habitat should be maintained as reserves in large contiguous blocks and buffer habitat surrounding these sites should be enhanced."
8. "The greatest threat to recovery, therefore, is continued loss of habitat, adult mortality, and causes of breeding failure, in that order. We stress that it is critical to maintain and enhance habitat, reduce adult mortality rates due to at-sea risks and predation, and reduce the loss of nest site contents to predators."

Fragmentation of suitable habitat is also a concern. Raphael et al. (2002) reported, in their radar monitoring of murrelets on the Olympic Peninsula, that numbers of murrelets increased with the amount of core area of late-seral forest, and decreased with increasing amounts of edge of late-seral patches.

Summary–Status of the Species: Murrelet

The murrelet is listed as threatened under the ESA and is also listed as threatened by the State of Washington. Murrelets feed on small fish in marine waters and nest in old-growth forests. Murrelets are long-lived. They require a sufficiently wide and flat branch to retain a single egg. Almost all chicks in Washington are hatched by August 6. Adults fly inland to feed the chick at least once per day. Feedings occur most frequently at dawn or dusk. Nest success appears to be quite low and predation on eggs and chicks is the major reason. Nests located near forest edges appear to be much more susceptible to predation, especially by corvids.

Two Conservation Zones are designated in Washington by the Recovery Plan: a Puget Sound Zone (Zone 1) and a Coast Range Zone (Zone 2). The Final Recovery Plan considered the following lands as being essential for the recovery of the murrelet within the State of Washington: (1) any suitable habitat in an LSR; (2) all suitable habitat located in the Olympic AMA; (3) suitable habitat on State lands within 40 miles of the coast; and (4) habitat within occupied murrelet sites on private lands. Murrelet numbers are dropping at an unknown rate, but the Marbled Murrelet Recovery Team (USDI 1994 and 1997a) concluded that the listed population appears to be in a long-term downward trend and estimated that the population may be declining at rates of between 4 to 12 percent annually. Factors most likely to affect demography of murrelets include age at first breeding (2-years-old), the proportion of adults breeding each year (variable reproductive rate), productivity (one egg per clutch), the number of young that survive to breeding age, and adult mortality rates. Marbled murrelets have one of the lowest known juvenile survival rates of any species in the Alcidae family.

Murrelet Critical Habitat

A proposal for designation of critical habitat for the murrelet was published in the *Federal Register* on January 27, 1994 (59 FR 3811). After reviewing comments and consideration of additional information, FWS added additional areas and released a revised proposal in the *Federal Register* on August 10, 1995 (60 FR 40892). The final rule designating critical habitat for the murrelet (61 FR 26256) became effective on June 24, 1996. Thirty-two units totaling 3,887,800 acres were designated on federal, State, county, city, and private lands in Washington, Oregon, and California (Appendix Figure 5). Of the 3,887,800 acres designated as critical habitat rangewide, approximately 1,631,100 acres were designated in Washington State (1,800 acres in Congressionally Withdrawn Lands [wildernesses]; 1,200,200 acres in LSRs; 426,800 acres in State lands; and 2,500 acres in private lands (61 FR 26256)) (Table 11). The majority of these units (78 percent) occurred on federal lands, while 21 percent occurred on State lands, 1.2 percent occurred on private lands, 0.2 percent occurred on county lands, and 0.003 percent occurred on city lands. Critical habitat designations on State lands were suspended upon completion of the WDNR HCP in 1997. Therefore, about 99.8 percent of the critical habitat in Washington State is on federal lands. Nine units (CHU 1-3 and 6-11) were designated on federal lands, and portions of two units (CHUs 5 and 7) occur on private lands.

Critical habitat is defined in section 3(5)(A) of the ESA as “(i) the specific areas within the geographical area occupied by the species, at the time it is listed...on which are found those physical and biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed...upon a determination...that such areas are essential for the conservation of the species.”

Table 11. Washington lands designated as murrelet critical habitat (61 FR 26269) after suspension of WDNR-managed lands

Ownership	Designation	Number of acres of designated critical habitat
Federal	Congressionally Withdrawn	1,800
	Late-Successional Reserve	1,200,200
	Federal Total	1,202,000
Nonfederal	State ¹	0
	Private, City, and County	2,500
	Nonfederal Total	2,500
	Grand Total	1,204,500

¹ Some lands managed by WDNR were originally designated as critical habitat, but designation was suspended following approval of the WDNR HCP.

In determining which areas to designate as critical habitat, FWS considers physical and biological features of the habitat that are essential to the conservation of the species and that may require special management considerations or protection. Such requirements include, but are not limited to, the following: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring; and, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

In the case of murrelet critical habitat, FWS has determined that the physical and biological habitat features, referred to as primary constituent elements, associated with the terrestrial environment that support nesting, roosting, and other normal behaviors are essential to the conservation of the murrelet and require special management considerations. The specific primary constituent elements identified for the murrelet were individual trees with potential nesting platforms and forested areas within 0.5 mile of individual trees with potential nesting platforms and a canopy height of at least one-half the site-potential tree height. These primary constituent elements were deemed essential for providing suitable nesting habitat for successful reproduction of the murrelet.

Specific selection criteria were considered in choosing areas for inclusion in murrelet critical habitat: (1) suitable nesting habitat; (2) survey data; (3) proximity to marine foraging habitat; (4) large, contiguous blocks of nesting habitat; (5) range wide distribution; and (6) adequacy of existing protection and management. There was a reliance on LSRs in the selection of critical habitat units.

Designated critical habitat included 695 of the over 807 known occupied sites (sites in Redwood National Park had not been entered into the database at the time) on federal lands, and 218 of the 354 known occupied sites on nonfederal lands. Although most of the areas designated as murrelet critical habitat occur on federal lands (LSRs), FWS designated selected nonfederal lands that meet the above selection criteria where federal lands are insufficient to provide suitable nesting habitat for the recovery of the species. The designated critical habitat units are distributed more or less evenly across the range of the species in Washington and Oregon and less so in California. The vast majority of nonfederal lands originally designated as critical habitat units in Washington were managed by WDNR.

Summary–Status of Critical Habitat: Murrelet

About 3,887,800 acres were designated as critical habitat rangewide, approximately 1,631,100 acres of which were designated in Washington State. In Washington State, 1,800 acres were designated in Congressionally Withdrawn Lands, 1,200,200 acres in LSRs, and 426,800 acres in State lands. The designation from State-managed lands was suspended following completion of the WDNR HCP. Approximately 99.8 percent of designated lands in Washington State are on federal lands, of which about 99.8 percent are in LSRs.

ONF contains 411,900 acres of designated critical murrelet habitat. ONF contains large areas of critical habitat, about one-half of which fall in each of the two Conservation Zones (Zones 1 and 2), and about one-half of which is considered to be suitable murrelet habitat. Some of the habitat is fragmented and some occurs in large blocks. These critical habitat units serve as part of a network of murrelet habitat, along with blocks of habitat in ONP and wilderness areas. Management of suitable habitat on WDNR HCP-lands under the HCP is expected to compliment designated lands in federal ownership. There is little land designated on private and municipal lands and all of that land is known to be occupied.

ENVIRONMENTAL BASELINE: MURRELET

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, State, or private actions and other human activities in the action area, those already affecting listed species and their habitat. Also included in the environmental baseline are the anticipated impacts of all unrelated proposed federal projects in the action area which have undergone formal or informal section 7 consultation, federal and other actions within the action area that may benefit listed species, and the impacts of State and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land-management activities. The Environmental Baseline includes adoption of the NWFP. Information relevant to describing the environmental baseline for this action is included in the NWFP and associated documents.

Consultations before the 2002 programmatic BO for ONF (USDI 2002) used a 0.25-mile radius distance around typical activities to estimate incidental take due to harassment of murrelets and spotted owls, and up to 1.0 mile for activities using blasting or aircraft; therefore, total numbers of acres possibly harassed in previous consultations are now believed to have over estimated the

actual amount of harassment.

Murrelets in the Action Area in 1994

In Washington, Speich and Wahl (1995) concluded that murrelet populations in Puget Sound are lower now than they were at the beginning of this century. Total estimates for Washington, which were derived from surveys conducted in the early 1980s, are about 5,500 murrelets (Speich and Wahl 1995, Ralph et al. 1995b). Varoujean and Williams (1995) estimated that 3,250 marbled murrelets occur on the outer coast of Washington and the western portion of the Strait of Juan de Fuca. There are no recent, complete surveys of ONF or any large area within the Action Area. GIS data on file at WDFW office in Olympia and FWS office in Lacey show locations of detections (presence, occupancy, etc.), but there is no way at present to extract from those data the actual number of sites or individuals.

Hall (2000) summarized the surveys done throughout the Olympic Peninsula between 1994 and 1999 and in her analysis of pristine vs. developed sites. Hall reported: (1) for ONP, 59.7 percent of surveyed sites as occupied, 34.3 percent of sites as present without occupancy, and 5.9 percent as probably absent ($n = 67$); (2) for WDNR sites, 29.4 percent occupied, 55.0 percent presence, and 15.6 percent probable absence ($n = 524$); (3) for Rayonier (private) sites, 23.5 percent occupied, 26.5 percent presence, and 50.0 percent probable absence ($n = 34$); and (4) for ONF sites, 8.6 percent occupied, 20.7 percent presence, and 70.7 percent probable absence ($n = 58$). Hall presented survey results of 29 sites, 18 of which were pristine and 11 of which were developed. Hall defined “pristine sites” as those areas which were within designated wilderness areas and greater than 2 km from a clearcut or a road. Occupied detections were recorded at 79 percent (23 of 29) of all sites—in 78 percent (14 of 18) of the pristine sites and 82 percent (9 of 11) of the developed sites.

For ONP, survey sites appear to be representative of the habitat throughout the park. However, for ONF, most of the surveyed sites were excluded. Hall (2000) included sites only from two of the four Ranger Districts, and the primary purpose of those project-specific surveys was to establish non-occupancy, rather than to randomly survey suitable habitat (D. Lynch, USFWS, pers. comm.). Therefore, the low rates of occupancy found for these sites on ONF probably do not accurately represent occupancy rates within all of ONF. Hall (2000) used data obtained from site-surveys to estimate percent occupancy for larger areas; she estimated that 80 percent of the 163,000 ha of suitable habitat in ONP is occupied habitat. The suitable habitat in portions of ONF is similar to, but more fragmented than, that in ONP. So it appears that occupancy rates on ONF would range between a low of 30 percent (using site-data for WDNR lands) and 80 percent (using large-area-corrected data for all of ONP).

The Marbled Murrelet Effectiveness Monitoring Report (Jodice et al. 2001) estimated that approximately 10,500 murrelets (5,250 pairs) feed in the ocean waters off the State of Washington in 2001. Assuming even distribution throughout the 1,265,155 acres of suitable murrelet habitat in the State, 241.0 acres would be required, on average, for each of these 5,250 pairs of murrelets. This approximation agrees with Raphael et al. (2002:340): “...we expect that 150 ha could support more than a single pair of marbled murrelets.” Again assuming even

distribution, dividing 241.0 acres by the 259,731 acres of suitable murrelet habitat on ONF yields an expected total of approximately 1,078 pairs of murrelets for ONF.

Murrelet Habitat in the Action Area in 1994

State, Zone, Action Area, and ONF

There are many estimates of the amount of suitable murrelet habitat throughout the species' range, within Washington State, within Conservation Zones 1 and 2, within the Action Area, and on ONF. Some of the estimates of acreage in suitable habitat do not agree with one another. This is because the methods for estimating murrelet habitat vary widely and result in different estimates, and because databases and information are being revised over time. Generally, inventories which identify stands as "old-growth forest," "late-successional forest," "large saw timber," or "spotted owl nesting, roosting, and foraging habitat" are used as a starting place to estimate potential murrelet nesting habitat (USDA 2000). Inventories seldom include the necessary information for making a habitat determination and definitions of habitat also vary widely. Refinements are sometimes made by biologists familiar with the local area or by use of aerial photo-interpretation. Other methods utilize factors such as various elevation thresholds, species composition, or stand-specific inventories and databases.

Examples of this variability follow. Perry (1995) summarized the amount of potentially suitable murrelet habitat remaining within Washington, Oregon, and California: Washington had approximately 977,811 acres, Oregon had approximately 565,185 acres, and California had approximately 819,472 acres, for a total of 2,362,469 acres. Based on analyses by Perry (1995) and USDA and USDI (1994a), FWS concluded (USDI 1997b) that the actual amount of good-quality nesting habitat available to murrelets in Washington, Oregon, and California is less than the 2,362,469 acres. The actual amount of suitable habitat remaining could have been significantly less, but FWS did not have the information to quantify this figure. Murrelet habitat on federal lands in Washington State was estimated as: 980,000 acres (USDA and USDI 1994b); 1,200,000 acres (USDI 1997b); and 1,500,000 acres (WDNR 1994 as presented in WDNR 1997). Murrelet habitat on all ownerships in Washington State was estimated as more than 1,800,000 acres of old-growth and large-saw forest stages on all ownerships (WDNR 1994 data as presented in WDNR 1997) and as about 1,660,000 (USDI 1997b) below 3,500 feet in elevation by various land-management category and Conservation Zones.

Estimates of the amount of suitable murrelet habitat on ONF are: 287,789 (USDA 2000), 247,741 (USDA 2001), and 262,074 acres (B. Dugas, ONF, 2002 pers. comm.); for the purposes of this BO, we are using the most recent GIS analysis provided by ONF which identifies 259,731 acres of suitable habitat. ONP contains about 741,818 acres of forested land which is potential suitable habitat, and contains the largest contiguous area of potential murrelet nesting habitat remaining in the lower 48 States (12). There are about 402,785 acres of suitable habitat below 3,000 feet in elevation in ONP (Hall 2000). ONP is characterized by uniform, high-quality habitat. Rate of occupancy is high, and does not appear to be related to how developed the sites are, the number of platforms per tree, or distance to marine waters.

Table 12. Estimated distribution of suitable murrelet habitat on the Olympic Peninsula (FWS analysis of WDNR/WDFW data)

Land owner	Total acres	Acres of suitable habitat
Nonfederal	2,227,045	263,606
Olympic National Forest	632,324	259,731
Olympic National Park	940,929	741,818
Total	3,800,298	1,265,155

Conservation Zones

Within ONF, approximately 125,782 acres of suitable murrelet habitat are in the Puget Sound Conservation Zone (Zone 1) and about 162,007 acres are within the Western Washington Coast Zone (Zone 2) (USDA 2000).

Late-Successional Reserves

Refinements in the ONF GIS layer in early 2001 resulted in increases in habitat estimates. About 89,818 and 116,493 (USFWS analysis for this BO) acres of habitat are within LSRs in Conservation Zones 1 and 2; respectively. The analysis by LSRs below also incorporates analysis by Conservation Zones within and between LSRs.

Soleduck LSR (RW-101)

About 54 percent of the 85,060 acre land base in this LSR (USDA 1998) is located in Conservation Zone 2; the remainder is in Conservation Zone 1. About 49 percent of the LSR in Conservation Zone 1 is comprised of suitable habitat and 65 percent of the LSR in Conservation Zone 2 is suitable habitat.

Quinault North LSR (RW-102) and Quinault South LSR (RW-103)

The Quinault LSRs are wholly located in Conservation Zone 2. These LSRs encompass approximately 116,026 acres and are part of a larger network of blocks of late-successional forest including the ONP, Colonel Bob Wilderness, and Quinault Recreation Area. The majority of the late-successional forest within these two LSRs is highly fragmented, with a substantial amount of the forest less than 80-years-old, with the exception of two relatively unfragmented blocks in LSR RW103 (USDA 1996a). Approximately 56 percent of LSR RW-102 and 56 percent of LSR RW-103 have been identified as suitable murrelet habitat.

South Hood Canal LSR (RW-104)

This LSR encompasses approximately 94,764 acres and is part of a larger network of blocks of late-successional forest, including the ONP, Quinault LSR, North Hood Canal LSR, and the Wonder Mountain Wilderness (USDA 1995). Approximately 46 percent of LSR RW-104 has been identified as suitable habitat for the murrelet. However, some of the suitable habitat is highly fragmented or in residual strips. The upper Wynoochee and upper Skokomish drainages in the northern portion of this LSR contain the largest contiguous blocks of suitable habitat. These large blocks are relatively well-connected to each other, with a few notable exceptions (USDA 1995). Throughout the southern portion of the LSR, there are scattered, isolated, variably-sized blocks of suitable habitat. About 46 percent of the portion of this LSR in Conservation Zone 1 is comprised of suitable habitat, and about 47 percent of the portion in Conservation Zone 2 is suitable habitat.

North Hood Canal LSR (RW-105)

This LSR is located completely in Conservation Zone 1 and encompasses approximately 42,324 acres. RW-105 is part of a larger network of blocks of late-successional forest, including the ONP, Quilcene LSR, South Hood Canal LSR, Mt. Skokomish Wilderness, and the Brothers Wilderness (USDA 1996b). Approximately 46 percent of LSR RW-105 has been identified as suitable habitat for the murrelet. However, some of the suitable habitat is fragmented or in residual strips. The upper Hamma Hamma drainage in the western portion of the LSR contains the largest contiguous blocks of suitable habitat (USDA 1996b).

Quilcene LSR (RW-106)

The Quilcene LSR is located completely within Conservation Zone 1 and encompasses approximately 73,355 acres. RW-106 is part of a larger network of blocks of late-successional forest, including ONP, and the Buckhorn Wilderness. Approximately 40 percent of LSR RW-106 has been identified as suitable habitat. However, the northern portion of this LSR is highly fragmented, with large tracts of the forest less than 80-years-old interspersed with occasional blocks of older forest and small strips of late-successional forest. Little of the northern portion of this LSR currently provides sufficient late-successional forest habitat to maintain viable populations of late-successional dependant species, with the exception of the upper Dungeness drainage (USDA 1996c).

In summary, ONF contains very large acreages of LSRs, about one-half of which fall in each of the two Conservation Zones, and about one-half of which is considered to be suitable murrelet habitat. Some of the habitat is fragmented and some occurs in large blocks. These LSRs serve as part of a network of murrelet habitat, along with ONP and Wilderness Areas.

Other Land Allocations

There are five wilderness areas, encompassing a total of 88,265 acres, on ONF: the Colonel Bob (11,961 acres); Buckhorn (44,258 acres); Wonder Mountain (2,349 acres); Mt. Skokomish (13,015 acres); and The Brothers (16,682 acres). All wilderness areas are Congressionally Reserved Areas and are therefore considered to be reserves under the NWFP in that no timber harvest is permitted. There are 31,791 acres of suitable marbled murrelet habitat in Congressionally Reserved Areas on ONF. Much of these areas are high-elevation areas that are not used by murrelets. All National Parks also are considered as reserves under the NWFP in that no timber harvest is permitted. The 916,136-acre ONP lies in the center of the Peninsula and is surrounded by ONF. The Park provides important suitable marbled murrelet habitat.

There are approximately 203,207 acres of non-federal lands within the Action Area. The acreage of suitable marbled murrelet habitat on these non-federal lands is unknown. However, 2,467 acres of these non-federal lands were designated as marbled murrelet critical habitat because of their known occupancy by the murrelet.

Murrelet Critical Habitat in the Action Area in 1994

The total acreage of designated critical murrelet habitat on ONF is 411,900 acres (Table 13). CHUs WA-01, WA-02, WA-03, and portions of WA-06 are located within the Action Area. All of the WDNR-managed lands identified as designated critical habitat have had their status as designated critical habitat suspended as a result of issuance of an incidental take permit in 1997. Therefore, this analysis will only discuss federal, county or private lands within critical habitat.

Table 13. Composition of murrelet critical habitat on ONF

CHU number	Conservation Zone	Acres	Percent of land in suitable habitat
01a	1	30,600	45
01a	2	29,900	60
01b	1	8,200	63
02a	2	16,000	73
02b	2	2,000	45
02c	2	46,300	56
02d	2	400	59
03a	2	97,800	54
03b	1	48,800	46
03b	2	16,100	41
06a	1	71,600	40
06b	1	44,200	46
Total		411,900	50

North Olympic Peninsula (WA-01)

This CHU is a combination of federal LSRs and county lands. County lands are to link LSRs together and provide lower-elevation habitat. The adjacent ONP is assumed to be contributing significant amounts of nesting habitat. Conditions are expected to improve in the future throughout much of the CHU on federal lands.

West Olympic Peninsula (WA-02)

This CHU is comprised of federal lands. Federal lands in the CHU are designated as LSR and conditions are expected to improve in the future within these lands. Suitable habitat in the adjacent ONP provides significant additional suitable habitat to this CHU.

South Olympic Peninsula (WA-03)

This CHU is entirely in federal ownership, and is comprised of two LSRs—Quinault South LSR 103 and South Hood Canal LSR 104. There are approximately 81,861 acres of suitable murrelet habitat in this CHU.

East Olympic Peninsula (WA-06)

This CHU contains federal lands in LSRs. Large blocks of old-growth forest are present in the CHU, as well as in the adjacent ONP. Habitat conditions in the CHU are expected to slowly improve as the forests within the LSRs continue to develop.

South Puget Sound (WA-04)

This CHU was entirely WDNR-managed lands in the Capitol State Forest and is now covered by the WDNR HCP.

Southwest Washington (WA-05)

This CHU is in private ownership. This unit is important for maintaining current distribution of the species because of the small numbers of murrelets, the limited amount and poor quality of habitat present in the CHU, and the lack of adjacent federal ownership with nesting habitat. The probability of murrelet occupancy of suitable habitat has been found to be high, possibly because of the limited availability of habitat.

Other Land Allocations

There are approximately 203,207 acres of non-federal lands within the Action Area. The acreage of suitable marbled murrelet habitat on these non-federal lands is unknown. However, 2,467 acres of these non-federal lands were designated as marbled murrelet critical habitat because of their known occupancy by the murrelet.

Authorized Actions that Affected the Amount of Murrelet Habitat Since 1994

Action Area

The authorized actions that affected the amount of murrelet habitat from 1994 to present in Conservation Zones 1 and 2 (USDI 2002 Appendix A) and in the Action Area (USDI 2002 Appendix B) were summarized as part of the writing of the 2002 BO for ONF. The following subsections describe some of these actions conducted in to show the variety of projects consulted upon.

Olympic National Forest

ONF staff estimate that there are approximately 262,074 acres of suitable murrelet habitat on ONF (B. Dugas, ONF, pers. comm.). The authorized actions that affected the amount of murrelet habitat from 1994 to present on ONF were summarized in Appendix C of USDI (2002). A total of 79.8 acres of suitable habitat were authorized for removal. In addition, the 1996 Jobs in the Woods project on ONF and ONP authorized the removal of 450 to 650 hazard trees annually during this 3-year programmatic consultation (1,350 to 1,950 total).

Habitat Conservation Plans

Ten HCPs have been completed for forest land managers in Washington State, of which two HCPs addressing murrelets have been completed for private/corporate land managers within the Action Area: Simpson Timber Company (Simpson Timber Company 2000) (Olympic Tree Farm HCP and WDNR HCP).

Most of the murrelet HCPs in Washington employ a consistent approach for murrelets. Most or all habitat is surveyed and only “poor-quality marginal” habitat (with a low likelihood of occupancy) is released for harvest without survey. All currently occupied habitat is protected to varying degrees, but a “safe-harbor-like” approach is used to address stands which may be retained as, or develop into, suitable habitat and become occupied in the future. This approach would allow harvest of habitat in the future, which is not currently habitat.

The Simpson Timber Company HCP for their Olympic Tree Farm employs the approach described above. It was estimated that 315 acres of suitable unoccupied habitat outside riparian reserves could become occupied prior to harvest. There was no known currently occupied habitat released for harvest.

The WDNR HCP murrelet conservation strategy has three phases: (1) the habitat-relationship study phase, (2) inventory-study phase, and (3) the adaptive-management phase. On WDNR-managed lands within the range of the murrelet, these would occur consecutively in a planning unit.

Phase 1

Conduct a 2-year murrelet habitat-relationship study within 50 miles of the coast on each west-side planning unit. These studies will identify murrelet habitat as either marginal habitat or higher-quality habitat types. WDNR would identify and defer from harvest any suitable murrelet habitat while conducting the 2-year habitat relationship study.

Phase 2

All high-quality murrelet habitat as identified by the 2-year habitat relationship study in each planning unit, expected to contain 95 percent of the occupied sites on WDNR-managed lands, would be surveyed to protocol to locate and protect occupied sites. No known occupied sites would be harvested. Marginal murrelet habitat types as identified by the 2-year habitat relationship study that would be expected to contain a maximum of 5 percent of the potentially occupied sites on WDNR-managed lands within each west-side planning unit would be released for harvest. This was estimated to be as much as 30 to 50 percent of the original baseline habitat. No known occupied sites would be harvested. Outside of southwest Washington, surveyed, unoccupied murrelet habitat would not be harvested if it is within 0.5 mile of a known occupied site or if, after harvest, less than 50 percent of the suitable murrelet habitat on WDNR-managed lands in that Watershed Administrative Unit would be left until Phase 3 for the planning units is

complete.

Phase 3

This third phase of the murrelet strategy is referred to in the HCP as the long-term plan. Information gathered during the habitat-relationship study and the inventory-survey phases of the HCP will be used to develop this long-term plan. This is an adaptive-management phase that has not yet been developed. The WDNR HCP permits the take of all murrelets associated with the harvest of 74,286 acres of unsurveyed low-quality habitat.

Other Consultations

Some consultations have addressed incidental take in the form of harm outside of ONF since 1994. For instance, consultations have been completed addressing incidental take in the form of harm from removal of isolated trees that may contain platforms. Such consultations have been completed with the ONP, Federal Highways Administration (Washington Department of Transportation (USDI 1999b)), and others. Incidental take in the form of habitat removal has also been issued for a number of timber-related activities including the Makah Forest Management Plan (USDI 1999a). Such consultations generally involve moderate amounts of habitat removal. However, one consultation issued to the Quinault North Boundary Area Forest Management Plan (USDI 1998) contained a Reasonable and Prudent Alternative that allowed the removal of an anticipated 1,273 acres of suitable habitat through harvest as well as minor amounts through tailholds and guideline trees.

Authorized Actions that Affected Individual Murrelets Since 1994

The Action Area

The authorized actions that affected individual murrelets from 1994 to present were presented for Conservation Zones 1 and 2 in USDI (2002 Appendix A) and the Action Area in USDI (2002 Appendix B). The following subsections describe some of these actions conducted to show the variety of projects consulted upon.

Olympic National Forest

The authorized actions that affected individual murrelets from 1994 to present on ONF were summarized in USDI (2002 Appendix C). On ONF, we anticipated in USDI (2002) that murrelets could be harmed by removing 425 hazard trees and 2 acres of potentially suitable habitat, and could be harassed by noise and visual disturbance to 22,733 acres of potential nesting habitat. Previously, a 2000 BO (FWS ref 1-3-00-FR-0567 and 1-3-00-FR-2096) anticipated 64,151 acres of incidental take in the form of harassment as a result of noise generated by road restoration, maintenance activities, and firewood collection. Since the 2000 BO, FWS has completed several other project-specific BOs that authorized incidental take of murreletes on ONF. In the Browns Creek Campground consultation, ONF relocated 13 existing campsites, made various improvements, and addressed stability of the river bank; FWS

authorized 30 acres of incidental take in the form of harassment. In the Upper Dungeness consultation, ONF decommissioned about 3.8 miles of road, stabilized 6.3 miles of road, and repaired 10 flood-damaged sites; FWS authorized 2,706 acres of incidental take in the form of harassment. In the Hood Canal Batch consultation concerned with Emergency Relief for Federally Owned Roads, ONF decommissioned and stabilized about 9.3 miles of road and repaired 16 storm-damaged sites. The FWS authorized 2,937 acres of incidental take in the form of harassment. In the Elkhorn Campground consultation, ONF relocated campsites and performed restoration activities; FWS authorized 68 acres of incidental take in the form of harassment. As previously discussed, prior efforts to quantify incidental take in the form of harassment have been recently revised and thus past analyses have over estimated the anticipated level of harassment incidental take of marbled murrelets.

Habitat Conservation Plans

In the WDNR and Simpson Timber Company HCPs, timing restrictions are used only for timber harvest and road construction when conducted during the murrelet breeding season in proximity to (within 0.25 mile of) occupied stands, even if those stands occur on neighboring National Forest lands. No disturbance of known occupied murrelet sites is generally expected. However, due to the possibility that habitat surveyed early in the permit period could become occupied in the future, and nonhabitat could develop into habitat and become occupied, some incidental take may occur as a result of harassment in the future.

The WDNR HCP does not contain any limited operating periods; however, that BO estimated that about 24,000 acres (16 percent of the 148,572 acres of the estimated suitable habitat, and therefore, 16 percent of the murrelets located on DNR-managed lands) per year could be harassed over the life of the 70- to 100-year permit. The estimated amount of harassment also included 338 acres per year that would be harassed as a result of non-timber activities.

Other Land-based Consultations

Some consultations have addressed incidental take in the form of harassment outside of ONF. For instance, a consultation was completed on the Anadromous Game Fish Investigations Harvest Management Plans for Steelhead, Quillayute River System Steelhead Escapement Surveys (USDI 2000b). These fish surveys were completed using helicopters flying slowly at low elevations. Incidental take in the form of habitat removal and harassment has also been issued for a number of timber-related activities including the Makah Forest Management Plan (USDI 1999a) and the Quinault North Boundary Area Forest Management Plan (USDI 1998). The Quinault consultation anticipated an unknown amount of harassment.

Authorized Actions that Affected Murrelet Critical Habitat Since 1994

A total of 79.8 acres of suitable murrelet habitat were authorized for removal on ONF since 1994. In addition, the 1996 Jobs in the Woods project on ONF and ONP authorized the removal of 450 to 650 hazard trees annually during this 3-year programmatic consultation (1,350 to 1,950 total). It is assumed that these actions occurred in critical habitat.

In addition, State Forest Practices Act applications were filed with the WDNR in 2000-2002 for the harvest of private lands within designated marbled murrelet critical habitat. A total of 352 acres were proposed for harvest (J. Springer, DNR, pers. comm.). We assume these actions have occurred and are therefore part of the environmental baseline.

Summary–Environmental Baseline: Murrelet and Murrelet Critical Habitat

Murrelet habitat on federal lands in Washington State was estimated as: 980,000 acres (USDA and USDI 1994b); 1,200,000 acres (USDI 1997b); and 1,500,000 acres (WDNR 1994 as presented in WDNR 1997). Murrelet habitat on all ownerships in Washington State was estimated as more than 1,800,000 acres of old-growth and large-saw forest stages on all ownerships by WDNR (1994 data as presented in WDNR 1997). USDI estimated about 1,660,000 acres of suitable murrelet habitat across all ownerships in the State of Washington (USDI 1997b). Approximately 125,782 acres of suitable murrelet habitat are in the Puget Sound Conservation Zone (Zone 1) and about 162,007 acres are within the Western Washington Coast Zone (Zone 2) (USDA 2000). The amount of suitable murrelet habitat on ONF is estimated to be 259,731 acres based on GIS data analyses in 2003.

Changes to the environmental baseline due to authorized actions from 1994 to present are presented in Appendices A to C for Conservation Zones 1 and 2, the Action Area, and ONF, respectively. The few consultations that have been completed for removal of suitable murrelet habitat from ONF lands from 1994 to the present resulted in the removal of only 79.8 acres. In addition, the 1996 Jobs in the Woods project on ONF and ONP authorized the removal of up to 1,950 trees, and the 2002 ONF programmatic BO authorized the removal of 425 hazard trees and 2 acres of suitable habitat.

ONF contains 411,900 acres of designated critical murrelet habitat. ONF contains large areas of critical habitat, about one-half of which fall in each of the two Conservation Zones, and about one-half of which is considered to be suitable murrelet habitat. Some of the habitat is fragmented and while some occurs in large blocks. These critical habitat units serve as part of a network of murrelet habitat, along with blocks of habitat in ONP and Wilderness Areas. Management of suitable habitat on WDNR HCP lands under the HCP is expected to compliment designated lands on federal lands. There are 2,467 acres of murrelet critical habitat on private lands within the action area. Approximately 352 acres are believed to have been harvested on private lands within critical habitat (J. Springer, DNR, pers comm.). It is not known how much of the harvested lands were considered suitable murrelet habitat.

EFFECTS OF THE ACTIONS: SPOTTED OWL, SPOTTED OWL CRITICAL HABITAT, MURRELET, AND MURRELET CRITICAL HABITAT

Analysis Process

The Programmatic BA (USDA 2003) described in detail project descriptions, conservation measures and the number, miles, or acres of habitat to be affected by the proposed 5-year program of work to be conducted on ONF. The Program and Activity descriptions and all conservation measures were included verbatim in the *Description of the Proposed Action* in this BO and were developed extensively through the Level 1 Team process.

The following summarizes each Program and Activity and their potential effects to the spotted owl, murrelet and their designated critical habitats. Following each summary is a conclusion by the Level 1 Team on how many of those activities are NLAA and LAA for each species and their critical habitat. Then an aggregated effects analysis is conducted for all LAA activities for each species and their designated critical habitat. Actions that are NLAA these species or their critical habitats will not be discussed further in the BO and are hereby concurred with by FWS.

For an action to be authorized under this BO, it must comply with the “General Conservation Measures for All Activities” and all program-specific, activity-specific, and species-specific conservation measures. In addition, the quantity of each Program/Activity analyzed by effect determination (NLAA and LAA) in this BO must not be exceeded. Also, even if a proposed Activity meets the below listed effects analyses for spotted owls, murrelets, and their designated critical habitats, but the proposed action does *not* meet the criteria for being a NLAA activity for bull trout and bald eagles, the proposed action is inconsistent with this consultation and would require separate consultation. For each Activity, a PCEF will be prepared in advance of the action and requires signature by ONF biologist(s). ONF will track all NLAA projects to ensure that the projects are consistent with applicable harassment thresholds and will submit an annual monitoring report to FWS no later than February 15 each year (see *Monitoring* above).

Spotted Owl

Analysis Criteria for Effects to Spotted Owls

The following Programs/Activities are NLAA the spotted owl when: 1) dispersal habitat is degraded or lost; 2) understory vegetation within suitable habitat is degraded; 3) sound-generating activities occur in the late breeding season (July 16 to September 30) within close proximity to unsurveyed suitable habitat or known nest sites; 4) sound-generating activities are greater than the established injury threshold distances from known nest sites or unsurveyed suitable habitat during the early breeding season (March 1 to July 15); or 5) the action would not generate sounds at or above the injury sound levels presented in Appendix 1. In this manner, these actions would not result in the loss of suitable habitat or key habitat elements such as potential nest trees, but may result in the localized degradation of suitable habitat through impacts to understory vegetation.

Dispersal habitat is not considered suitable habitat and the anticipated loss of dispersal habitat at the scale proposed in this action (193 acres) would not be likely to adversely affect local or regional dispersal capabilities of spotted owls. On ONF there are 413,308 acres (suitable plus dispersal) that provide dispersal functions. The loss of 193 acres would be immeasurable at the Forest scale. Post-treatment, the ONF would provide 66 percent of the Forest in a dispersal or better condition. This exceeds the 50 percent recommended by Thomas et al. (1990). Proposed commercial thinning of dispersal habitat stands would not reduce the areas ability to provide spotted owl dispersal because the post-harvest canopy closure would be at least 40 percent. Commercial thinning prescriptions are anticipated to benefit spotted owl habitat in the long-term through accelerated development of late-successional stand structure.

In addition, these actions would not be likely to disturb nesting spotted owls during the early breeding season. Spotted owlets are no longer completely dependent upon the adults and are able to thermoregulate, fly, and forage on their own after July 15, thereby reducing their susceptibility to disturbance-related effects. The ONF may determine, based on a site-specific review, that some of these actions would actually be no effect for spotted owls. If so, the ONF would complete a PCEF and file the PCEF in their administrative record for that project.

Some of the Programs/Activities are LAA the spotted owl. The removal of potential nest trees and trees adjacent to potential trees may adversely affect spotted owls through the removal of a nest site or the felling a tree that subsequently kills or injures a spotted owl. If sound-generating activities occur within close proximity to a nest or unsurveyed suitable habitat during the early breeding season (March 1 to July 15), spotted owls may be disturbed by the sound potentially causing missed feedings or the adults to flush leaving young susceptible to predation and weather.

Distances at which activities are anticipated to result in harassment, and the thought-process used to estimate them, are presented in Appendix 1. Calculations of the number of trees (or fraction thereof) with a nesting spotted owl in it to be removed as part of the activities covered in this BO, and the thought-process used to estimate them, are presented in Appendix 2.

Analysis Criteria for Effects to Spotted Owl Critical Habitat

The primary constituent elements of spotted owl critical habitat are nesting, roosting, foraging, and dispersal habitat (USDI 1992b).

Proposed actions that are NLAA spotted owl critical habitat include actions that may degrade understory vegetation within suitable (nesting, roosting and foraging) or dispersal habitat, but would not result in the loss of function of that habitat. Proposed actions that are LAA spotted owl critical habitat include the loss of potential nest trees or dispersal habitat.

Murrelet

Analysis Criteria for Effects to Murrelets

Programs/Activities are NLAA the murrelet when: 1) there would be no loss of potential nest trees or trees adjacent to potential nest trees within suitable habitat; 2) sound-generating activities occurred within close proximity to nest sites or unsurveyed suitable habitat from August 6 to September 15 and the activities did not occur from 2 hours before sunset to 2 hours after sunrise; 3) sound-generating activities are not within the established injury threshold distances from known nest sites or unsurveyed suitable habitat during the early breeding season (April 1 to August 5); or 4) the action would not generate sounds at or above the injury sound levels presented in Appendix 1. In this manner, these actions would not result in the loss of potential nest trees or trees adjacent to potential nest trees within suitable habitat. In addition, these actions would not be likely to disturb nesting murrelets during the early breeding season. More than 90 percent of have hatched by August 5 in Washington, are no longer brooded by the adults, and are left alone for the majority of the day while the adults forage in the open ocean. Murrelets are fed predominately during the early morning and evening. Therefore, after August 5, with the 2-hour timing windows, murrelet chicks are less susceptible to disturbance-related effects and adults are not likely to miss a feeding (Appendix 1). The ONF may determine, based on a site-specific review, that some of these actions would actually be no effect for murrelets. If so, the ONF would complete a PCEF and file the PCEF in their administrative record for that project.

Distances at which activities are anticipated to result in harassment, and the thought-process used to estimate them, are presented in Appendix 1. Calculations of the number of trees (or fraction thereof) with a nesting murrelet in it to be removed as part of the activities covered in this BO, and the thought-process used to estimate them, are presented in Appendix 2.

Analysis Criteria for Effects to Murrelet Critical Habitat

The primary constituent elements of murrelet critical habitat are: 1) trees with platforms suitable for murrelet nesting; 2) stands within one-half mile of individual trees with suitable platforms, and with a canopy height of at least one-half the site potential tree height (USDI 1996). Actions that are NLAA murrelet critical habitat include actions that may affect understory vegetation, but would not affect large, overstory trees that could provide suitable nest sites or cover to potential nest trees. Actions that are LAA murrelet critical habitat include the loss of potential nest trees or trees adjacent to potential nest trees.

Summaries of Analyses of Effects for Programs and Projects

The harassment distances mentioned in this section refer to the distances as presented in Appendix 1.

A. Recreation Management Program

A.1. Developed-Site Operation and Maintenance (excluding Hazard Tree Removal which is addressed below): This activity, excluding hazard trees, would not result in the loss of suitable spotted owl or murrelet habitat. Some minor amounts of understory vegetation may need to be removed for toilet repairs and well digging. This activity does not require the use of aircraft or blasting.

There are **116 developed recreation sites** on the Forest. The Forest attempts to maintain each of these sites every year. Analysis of effects for this program is based on the total number of site visits (e.g., 20 developed campgrounds are maintained each year equates to 100 sites visited) over the 5-year life expectancy of this consultation.

Heavy-equipment use occurs in maintenance of developed campgrounds but is less common in rustic campgrounds. It is assumed that all of the developed sites would be maintained and operated during the early nesting season for spotted owls and murrelets. Heavy equipment will be used on up to 20 sites per year within harassment distance of suitable habitat.

Spotted Owl

NLAA: 96 sites to be maintained (excluding hazard tree removal) each year (a total of 480 site visits during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat.

LAA: 20 sites to be maintained (excluding hazard tree removal) each year (a total of 100 site visits during the 5-year term of this consultation) within harassment distance of suitable habitat between March 1 and July 15.

Spotted Owl Critical Habitat

NLAA: Maintenance and operation of all (116) sites each year that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: 96 sites to be maintained (excluding hazard tree removal) each year (a total of 480 site visits during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat.

LAA: 20 sites to be maintained (excluding hazard tree removal) each year (a total of 100 site visits during the 5-year term of this consultation) within harassment distance of suitable habitat between April 1 and August 5.

Marbled Murrelet Critical Habitat

NLAA: Maintenance and operation of all (116) sites that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable habitat.

LAA: None anticipated.

A.2. Dispersed-Site Maintenance (excluding Hazard Tree Removal which is addressed below): This activity, excluding hazard trees, would not result in the loss or degradation of suitable spotted owl or murrelet habitat. The ONF attempts to maintain each of the 1,405 dispersed recreation sites on the Forest every year. Most dispersed recreation sites are along existing roads of which 24 percent are within 75 yards of suitable spotted owl and murrelet habitat. This maintenance activity does not require the use of aircraft or blasting. Of the 1,405 dispersed sites maintained each year on the ONF, only 10 sites would use heavy equipment before August 5.

Analysis of the effects for this program is based on the total number of site visits (e.g., 10 dispersed sites maintained each year using heavy equipment equates to 50 sites visited) over the 5-year life expectancy of this consultation.

Spotted Owl

NLAA: 1,395 sites could be maintained (excluding hazard tree removal) each year (a total of 6,975 site visits during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat.

LAA: 10 sites within harassment distance of suitable habitat could be maintained each year (a total of 50 site visits during the 5-year term of this consultation) using heavy equipment between March 1 and July 15.

Spotted Owl Critical Habitat

NLAA: Maintenance of all (1,405) sites that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: 1,395 sites could be maintained (excluding hazard tree removal) each year (a total of 6,975 site visits during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within

harassment distance of suitable habitat.

LAA: 10 sites within harassment distance of suitable habitat could be maintained each year (a total of 50 site visits during the 5-year term of this consultation) using heavy equipment between April 1 and August 5.

Marbled Murrelet Critical Habitat

NLAA: Maintenance of all (1,405) sites that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable habitat.

LAA: None anticipated.

A.3. Trail Maintenance: This activity would not result in the loss or degradation of suitable spotted owl or murrelet habitat. There is a total of **270 miles** of trail on the Forest, of which 88 miles are in wilderness. No use of heavy equipment or chainsaws are allowed in wilderness areas therefore there would be no adverse effects from trail maintenance from use of motorized equipment in the wilderness areas. Some blasting with ≤ 2 pound charges may occur in the wilderness area and are included in the total number of sites per year that may have blasting. Of the 182 miles of trail outside of wilderness, approximately 52 percent (95 miles) are within harassment distance of suitable habitat for spotted owls and marbled murrelets. Power tools, occasionally blasting and use of aircraft may be needed.

Only windfall and downed logs would be cleared from trails and left on site for coarse woody debris. The felling of hazard trees is not associated with this activity. Wind fallen trees (i.e., trees that have been blown over but are hung up on other trees) have naturally fallen and do not provide nesting habitat for murrelets, or nesting or roosting structures for spotted owls, but do provide habitat for spotted owl prey species. Due to the need to clear trails prior to the high-use period, spring and summer, the majority of trails will be maintained during the early breeding season.

Spotted Owl

NLAA: 175 miles of trail could be maintained each year (a total of 875 miles during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: 95 miles of trail within harassment distance of suitable habitat could be maintained each year (a total of 475 miles during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 20 sites within harassment distance of suitable habitat each year (100 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites during the early nesting season

each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: Maintenance of all 270 miles of trails that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: 175 miles of trail could be maintained each year (a total of 875 miles during the 5-year term of this consultation) either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with \leq 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: 95 miles of trail within harassment distance of suitable habitat could be maintained each year during the early nesting season (between April 1 and August 5) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 20 sites within harassment distance of suitable habitat each year (100 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat during the early nesting season.

Marbled Murrelet Critical Habitat

NLAA: Maintenance of all 270 miles of trails that occur within critical habitat may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable habitat.

LAA: None anticipated.

A.4. Trail Relocation, Construction, and Reconstruction: New trail construction into new undeveloped areas is *not* covered in this BO. As a result, introducing human activity to previously undisturbed areas would not occur. The Forest proposes to relocate, construct or reconstruct **85 miles** of trail during the life of this BO. New trail construction would only occur in developed recreation sites for such uses as campsite access and interpretative trails and each trail would not exceed 1 mile in length. Trail locations will not remove trees that have suitable nest structures or provide cover to suitable nest structures for the spotted owl or murrelet. This activity may require blasting at 10 sites per year and two aircraft flights per year. This action would require the use of power tools and may include the removal of understory vegetation within suitable habitat. This would include trees and snags more than 12 inches dbh. This may result in a suitable habitat stand being degraded, but not losing its suitability. All trees greater than 21 inch dbh require Level 1 review. It is assumed that all 85 miles of trail to be relocated,

constructed, and reconstructed over the life of the BO would occur within or in close proximity to suitable spotted owl or murrelet habitat and would occur during the early breeding seasons and would, therefore, result in adverse effects.

Spotted Owl

NLAA: Since all trail relocation, construction, and reconstruction may occur during the early nesting season and may use mechanized equipment all treatments are likely to adversely affect the spotted owl.

LAA: 17 miles of trail within harassment distance of suitable habitat could be reconstructed each year (a total of 85 miles during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 10 sites within harassment distance of suitable habitat each year (50 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites during the early nesting season each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: All 85 miles of trails that occur within critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Since all trail relocation, construction, and reconstruction may occur during the early nesting season and may use mechanized equipment all treatments are likely to adversely affect the murrelet.

LAA: 17 miles of trail within harassment distance of suitable habitat could be reconstructed each year (a total of 85 miles during the 5-year term of this consultation) during the early nesting season (between April 1 and July 15) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 10 sites within harassment distance of suitable habitat each year (50 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites during the early nesting season each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat.

Marbled Murrelet Critical Habitat

NLAA: All 85 miles of trails that occur within critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or potential habitat.

LAA: None anticipated.

A.5. Trail Bridge/Foot Log Construction and Reconstruction: The ONF proposes to construct or reconstruct 25 trail bridges over the life of the BO. It is assumed that the trail bridges are within or in close proximity to suitable spotted owl or murrelet habitat. This may include the use of 8 live Douglas-fir or cedar trees between 18 and 35 inches dbh for bridge construction. These trees would come from within 500 feet of the bridge location. These trees may be potential spotted owl or murrelet nest trees or are adjacent to potential nest trees. All trees that meet this definition will be reviewed by an ONF Biologist. If a potential nest tree needs to be felled during the early breeding season then Level 1 review is required. No known occupied nest trees would be felled. If the tree to be felled is in an occupied site, the tree must be felled outside the early breeding season. Blasting is expected to occur at two sites per year and eight manufactured bridges would be flown in per year. Bridges are flown in between August and October, outside the early breeding season. It is assumed 8 potential nest trees would be felled (equaling 8 bridges) and blasting would occur during the early breeding season at 2 bridges per year (10 total).

Spotted Owl

NLAA: Activities associated with construction or reconstruction of 25 trail bridges that occur outside the early nesting season or, if during the early nesting season (March 1 to July 15), do not use motorized equipment within harassment distance of suitable habitat, do no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat are not likely to adversely affect spotted owls.

LAA: Construction or reconstruction of 5 trail bridge/footlogs using motorized equipment within harassment distance of suitable habitat could occur each year (25 sites during the 5-year term of this BO) during the early nesting season (between March 1 – July 15). In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 2 sites within harassment distance of suitable habitat each year (10 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat during the early nesting season. Additional adverse effects would result from the removal of up to 8 potential nest trees during the early nesting season during the 5-year term of this consultation.

Spotted Owl Critical Habitat

NLAA: Construction or reconstruction of trail bridges that occur within critical habitat but do not result in the loss of potential nest trees.

LAA: Removal of up to 8 potential nest trees may occur within critical habitat during the life of this BO.

Marbled Murrelet

NLAA: Any activities associated with construction or reconstruction that occur outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: 5 trail bridge/footlogs within harassment distance of suitable habitat could be constructed or reconstructed each year during the early nesting season (between April 1 and August 5) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 2 sites within harassment distance of suitable habitat each year (10 sites during the 5-year term of this consultation). Helicopter support could also be used on 2 sites each year (10 sites during the 5-year term of this consultation) within harassment distance of suitable habitat during the early nesting season. Additional adverse effects may occur from the removal of up to 8 potential nest trees during the early nesting season during the 5-year term of this consultation.

Marbled Murrelet Critical Habitat

NLAA: Construction or reconstruction of trail bridges that occur within critical habitat but do not result in the loss of potential nest trees.

LAA: Removal of up to 8 potential nest trees may occur within critical habitat during the life of this BO.

A.6. Trail Bridge Maintenance: Power tools would be necessary to maintain trail bridges. The ONF proposes to maintain 65 trail bridges per year. It is assumed that the trail bridges are within or in close proximity to suitable spotted owl or murrelet habitat. This activity would not result in the loss or degradation of suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: Activities associated with the maintenance of trail bridges that do not require the use of mechanized equipment are not likely to adversely affect the spotted owl.

LAA: 65 bridges within harassment distance of suitable habitat could be maintained each year (a total of 325 miles during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: Maintenance of all 65 trail bridges may occur within critical habitat and may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

Marbled Murrelet

NLAA: Activities associated with the maintenance of trail bridges that do not require the use of mechanized equipment are not likely to adversely affect the murrelet.

LAA: 65 bridges within harassment distance of suitable habitat could be maintained each year (a total of 325 miles during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: Maintenance of all 65 trail bridges may occur within critical habitat and may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable habitat.

LAA: None anticipated.

A.7. New Recreation Site Creation: The ONF proposes to create 10 new recreation sites (picnic areas, gravel parking areas, toilets) over the life of the BO in already disturbed areas. Such development would not result in the loss or degradation of suitable spotted owl or murrelet habitat and would not occur within riparian reserves. All proposed new sites must be reviewed and approved by the Level 1 Team. It is assumed that new recreation sites would be within close proximity to suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: Any activities associated with the creation of new recreation sites that occur outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat are not likely to adversely affect the owl.

LAA: 2 new recreation sites could be created each year (a total of 10 sites during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using mechanized equipment within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: Creation of all 10 new recreation sites may occur within critical habitat and may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Any activities associated with the creation of new recreation sites that occur outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat are not likely to adversely affect murrelets.

LAA: 2 new recreation sites within harassment distance of suitable habitat could be created each year (a total of 10 sites during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: Creation of all 10 new recreation sites may occur within critical habitat and may affect but are not likely to adversely affect critical habitat due to minor understory vegetation effects in already disturbed areas, but no loss of suitable habitat.

LAA: None anticipated.

B. Administrative Facilities Maintenance: Maintenance of office compounds, housing compounds, visitor centers, guard stations, rental cabins, lookouts and pastures would require the use of hand and power tools and trucks in already high background-noise areas. All 15 administrative sites occur outside of suitable spotted owl or murrelet habitat and are greater than harassment distance from suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: Maintenance of 15 administrative sites is not likely to adversely affect spotted owl due to no impact to suitable spotted owl habitat and noise-generated activities would be greater than harassment distance from suitable spotted owl habitat.

LAA: None. There are no actions associated with the maintenance of administrative facilities over the life of the BO that would cause adverse effects.

Spotted Owl Critical Habitat

NLAA: 15 sites because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Maintenance of 15 administrative sites is not likely to adversely affect marbled murrelet due to no impact to suitable murrelet habitat and noise-generated activities would be greater than harassment distance from suitable murrelet habitat.

LAA: None. There are no actions associated with the maintenance of administrative facilities over the life of the BO that would cause adverse effects.

Marbled Murrelet Critical Habitat

NLAA: 15 sites because these sites would not result in the loss of potential nest trees or trees adjacent to potential nest trees.

LAA: None anticipated.

C. Hazard Tree Removal: Hazard trees will be identified based on USFS criteria and are by definition a tree that poses a safety hazard to the general public or a structure. Hazard trees that are included in the BA and for which adverse effects to spotted owls and murrelets may occur are one of two types: (1) trees ≥ 21 inches dbh that are within suitable nesting habitat for the spotted owl and murrelet and have nesting structure or provide a buffer to a potential nest tree; (2) trees

≥21 inches dbh that are within suitable nesting habitat and do not have nesting structure nor provide a buffer to a potential nest tree or trees ≥21 inches dbh that are not within suitable nesting habitat. Those trees with diameters less than 21 inches dbh are *not* included in either count, but may be felled to meet public safety without Level 1 review under this BA.

The Forest proposes to fell 300 trees per year over the 5 years of this BO of type (1) hazard trees. These are considered potential nest trees. One hundred of these trees (per year) would come from developed recreation sites, recreational residences, administrative sites, and commercial facilities operated under a Special Use Permit. Two hundred trees per year would come from road maintenance activities, including roadways, power line corridors, and other access areas. By definition, it is assumed that all of these hazard trees would come from suitable spotted owl or murrelet habitat. Of these 300 trees not more than 60 would be felled during the early nesting season for spotted owls and murrelets.

The Forest would also harvest 400 trees per year of type (2) hazard trees. These trees are not considered potential nest trees. Of these, not more than 96 will be felled within harassment distance of suitable habitat during the early nesting season for spotted owls and murrelets.

Corrective actions may include removing limbs or the hazardous portion of the tree, or felling of the whole tree. Methods of removal may include using a chainsaw, hand-tools, shooting, or blasting. Hazard trees, which cannot be safely felled with a saw, may need to be blasted even if such trees are located in the wilderness. It is anticipated that no more than five sites per year would be blasted using explosives of 2 pounds or less.

Prior to the felling of any tree greater than 21 inches dbh, the project leader must first consult a USFS wildlife biologist to determine if the hazard tree is within suitable habitat. If the tree is not within suitable habitat, the tree may be felled and would count towards the second category of hazard tree (i.e., non-potential nest tree). If the hazard tree is within suitable spotted owl habitat, then either the project leader may use Appendix N to determine if the tree meets the criteria of being a potential nest tree or simply by default assuming it is a potential nest tree. Consultation with a FS wildlife biologist is required for the proposed removal of any tree greater than 36 inches dbh.

The following are *Conservation Measures for all Hazard Tree Removal Activities* that pertain specifically to the spotted owl or murrelet; for a complete list please refer to the *Description of the Proposed Action*.

1. Known occupied murrelet nest trees or spotted owl nest trees shall not be removed.
2. If hazard tree removal is to be done within suitable murrelet or suitable owl habitat during the murrelet breeding season (April 1 to August 5) or during the spotted owl early breeding season (March 1 to July 15), a FS wildlife biologist shall be consulted and Level 1 review will be required.
3. Occupancy of the site by murrelets or spotted owls will prohibit tree removal during the breeding season. If removal of such tree is necessary to meet public safety objectives during the nesting season it will require Level 1 review to determine if this falls within the scope of the programmatic.

4. The Forest will require a visual survey in the area immediately after felling the tree to determine if young murrelets or spotted owlets were on the tree. A FS and FWS wildlife biologist will be notified if occupancy was found.
5. Conservation measures for terrestrial species specific to type of disturbance will be used (see Tables G-1 thru G-3).

Spotted Owl

NLAA: The felling of hazard trees that are more than harassment distance from suitable habitat (and therefore, by definition, are not a potential nest tree) or if within harassment distance of suitable habitat are not a potential nest tree (i.e., are ≤ 21 inches dbh or if ≥ 21 inches dbh do not have suitable nesting structure) and are felled outside the early breeding season is not considered to adversely affect the spotted owl. This would include 304 trees of type (2). These would primarily be individual trees along heavily used areas which may cause some degradation of spotted owl habitat, but would not result in the loss of key habitat elements (potential nest sites) or loss of a suitable stand.

LAA: The felling of 300 potential nest trees (trees 21 inches dbh or larger and with nesting structure) per year from within suitable spotted owl habitat would be an adverse effect from removal of habitat. In addition, 60 of these (300) potential nest trees and 96 (of the 400 total) non-potential nest trees would be felled each year during the early breeding season resulting in adverse effects. Blasting may be used on 5 of these sites each year.

Spotted Owl Critical Habitat

NLAA: The annual removal of up to 400 non-potential nest trees is not likely to adversely affect critical habitat since these trees would not be a constituent element and therefore the removal would not result in a loss or degradation of suitable habitat or dispersal habitat.

LAA: The annual removal of up to 300 potential nest trees may occur within critical habitat. This removal of a constituent element would result in an adverse affect to spotted owl critical habitat.

Marbled Murrelet

NLAA: The felling of hazard trees that are more than harassment distance from suitable habitat (and therefore, by definition, are not a potential nest tree) or if felled within harassment distance of suitable habitat are not a potential nest tree (i.e., are ≤ 21 inches dbh or if ≥ 21 inches dbh do not have suitable nesting structure) and are felled outside the early breeding season is not considered to adversely affect the murrelet. This would include 304 trees of type (2). These would primarily be individual trees along heavily used areas which may cause some degradation of murrelet habitat, but would not result in the loss of key habitat elements (potential nest sites) or loss of a suitable stand.

LAA: The felling of 300 potential nest trees (trees > 21 inches dbh and with nesting structure) per year from within suitable murrelet habitat would be an adverse effect from removal of habitat. In addition, 60 of these (300) potential nest trees and 96 (of the 400 total) non-potential nest trees would be felled each year during the early breeding season resulting in adverse effects. Blasting

may be used on 5 of these sites each year.

Marbled Murrelet Critical Habitat

NLAA: None anticipated.

LAA: The annual removal of up to 300 potential nest trees may occur within critical habitat. This removal of a constituent element would result in an adverse affect to murrelet critical habitat.

D. Silviculture: Silvicultural programs are designed to improve stand structure for late-successional associated species. Salvage may occur after a stand-replacing event which renders the area unsuitable to spotted owls and other late-successional species. Silvicultural activities within Riparian Reserves will be designed and implemented to meet Aquatic Conservation Strategy objectives and protect or restore aquatic habitat.

D.1. Commercial Thinning and Uneven-Aged Management: The ONF proposes to manage 6,400 acres of spotted owl dispersal habitat over the life of this BO. These areas would retain their dispersal habitat character post-harvest. Half of these acres (3,200) may be treated during the early nesting season. No suitable spotted owl or murrelet habitat would be removed or degraded by proposed harvest. Hauling would occur after the early breeding season and before the beginning of the next breeding season. Road construction is addressed separately below in “Transportation System.”

Spotted Owl

NLAA: The management of 3,200 acres of dispersal habitat that would remain dispersal habitat post harvest is not likely to adversely affect the spotted owl. In addition, the management of these stands outside the early breeding season or greater than harassment distance from suitable habitat if managed during the early breeding season is not likely to adversely affect the spotted owl. Similarly, road construction (excluding the felling of potential nest trees) and hauling is not expected to adversely affect the spotted owl because it would be conducted after the early breeding season.

LAA: 640 acres of commercial thinning and uneven-aged management treatment may occur within harassment distance of suitable habitat each year (a total of 3,200 acres during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: 6,400 acres because there would be no loss or degradation of suitable habitat and only temporary degradation of dispersal habitat. These stands, however, would continue to function as dispersal habitat given retention of 40 percent canopy closure post-harvest.

LAA: None anticipated.

Marbled Murrelet

NLAA: The management of 3,200 acres of spotted owl dispersal habitat using commercial thinning and uneven-aged management prescriptions is not likely to adversely affect the murrelet because no suitable murrelet habitat would be affected. In addition, the management of these stands outside the early breeding season or greater than harassment distance from suitable habitat if managed during the early breeding season is not likely to adversely affect the murrelet. Similarly, road construction (excluding the felling of potential nest trees) and hauling is not expected to adversely affect the murrelet because it would be conducted after the early breeding season.

LAA: 640 acres of commercial thinning and uneven-aged management treatment may occur within harassment distance of suitable habitat each year (a total of 3,200 acres during the 5-year term of this consultation) during the early nesting season (April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: 6,400 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.2. Salvage Sales: Salvage is expected to occur on 200 acres over the life of this BO. No suitable spotted owl or murrelet habitat would be removed or degraded by salvage operations. Half of the units would be either harvested outside the early breeding season or would be greater than harassment distance from suitable spotted owl or murrelet habitat if the unit was harvested during the early breeding season. Hauling would occur after the early breeding season and before the beginning of the next breeding season.

Spotted Owl

NLAA: Activities associated with salvage of 100 acres that occurs outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with \leq 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Salvage sales of 20 acres may occur within harassment distance of suitable habitat each year (a total of 100 acres during the 5-year term of this consultation) during the early nesting season (March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: 200 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with salvage of 100 acres that occurs outside the early nesting

season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Salvage sales of 20 acres may occur within harassment distance of suitable habitat each year (a total of 100 acres during the 5-year term of this consultation) during the early nesting season (April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: 200 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.3. Pre-commercial Thinning: The ONF proposes to pre-commercial thin 15,000 acres over the life of this BO. Pre-commercial thinning usually occurs in plantations that are 10 to 25 years of age. As such these plantations do not provide suitable or even dispersal habitat for the spotted owl or suitable murrelet habitat. Of the 15,000 acres, 500 acres are expected to be pre-commercially thinned during the early breeding season. It is assumed this would occur within harassment distance of suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: The pre-commercial thinning of 14,500 acres of unsuitable spotted owl habitat outside the early breeding season is not likely to adversely affect the spotted owl.

LAA: Pre-commercial thinning on 100 acres may occur within harassment distance of suitable habitat each year (a total of 500 acres total during the 5-year term of this consultation) during the early breeding season (March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: 15,000 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: The pre-commercial thinning of 14,500 acres of unsuitable murrelet habitat outside the early breeding season is not likely to adversely affect the murrelet.

LAA: Pre-commercial thinning on 100 acres may occur within harassment distance of suitable habitat each year (a total of 500 acres total during the 5-year term of this consultation) during the early breeding season (April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: 15,000 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.4. Timber Stand Improvement: The ONF proposes to improve 500 acres over the life of this BO. Timber stand improvement projects would not occur within suitable spotted owl or murrelet habitat. Approximately 100 acres of improvement activities would be conducted during the early breeding season and within harassment distance from suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: The improvement of 400 acres of unsuitable spotted owl habitat is not likely to adversely affect the spotted owl. In addition, activities that would be conducted outside the early breeding season or greater than harassment distance from suitable habitat if improvement activities occurred during the early breeding season are not likely to adversely affect the spotted owl.

LAA: Timber stand improvement activities on 20 acres may occur within harassment distance of suitable habitat each year (a total of 100 acres total during the 5-year term of this consultation) during the early breeding season (March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: 500 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: The improvement of 400 acres of unsuitable murrelet habitat is not likely to adversely affect the murrelet. In addition, activities that would be conducted outside the early breeding season or greater than harassment distance from suitable habitat if improvement activities occurred during the early breeding season are not likely to adversely affect the murrelet.

LAA: Timber stand improvement activities on 20 acres may occur within harassment distance of suitable habitat each year (a total of 100 acres total during the 5-year term of this consultation) during the early breeding season (April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: 500 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.5. Aerial Fertilization: The ONF proposes to aerial fertilize 500 acres over the life of this BO. Aerial application would occur between October 1 and February 28.

Spotted Owl

NLAA: Aerial application would occur at a time when low flights are not expected to disturb spotted owls (after the late breeding season).

LAA: None. There are no actions associated with aerial fertilization that would cause adverse effects over the life of the BO.

Spotted Owl Critical Habitat

NLAA: 500 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Aerial application would occur at a time when low flights are not expected to disturb murrelets (after the late breeding season).

LAA: None. There are no actions associated with aerial fertilization that would cause adverse effects over the life of the BO.

Marbled Murrelet Critical Habitat

NLAA: 500 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.6. Planting: Hand crews would plant 600 acres over the life of this BO.

Spotted Owl

NLAA: Use of hand tools within harvested areas (non-suitable habitat) even if conducted during the early breeding season is not expected to disturb spotted owls.

LAA: None. There are no actions associated with planting that would cause adverse effects over the life of the BO.

Spotted Owl Critical Habitat

NLAA: 600 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Use of hand tools within harvested areas (non-suitable habitat) even if conducted during the early breeding season is not expected to disturb murrelets.

LAA: None. There are no actions associated with planting that would cause adverse effects over the life of the BO.

Marbled Murrelet Critical Habitat

NLAA: 600 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

D.7. Cone Collection: Cone collection could occur up to three times during the life of this BO. Collection could be in the form of tree climbing and picking, felling of trees < 21 inches dbh, or other mechanical means. Potential spotted owl or murrelet nest trees would not be felled. Cone collection occurs during the fall after September 15 and before the end of October.

Spotted Owl

NLAA: Cone collection between September 15 and October 31 is not likely to disturb spotted owls since this is after the early breeding season. It is assumed that no more than one (1) tree < 21 inches dbh would be felled outside of the early breeding season. In addition, the tree to be felled would not be a potential nest tree and therefore the loss of an individual tree, if it occurred within suitable habitat, would degrade, but not result in the loss of that suitable habitat stand.

LAA: None. There are no actions associated with cone collection that would cause adverse effects over the life of the BO.

Spotted Owl Critical Habitat

NLAA: There would be no loss of suitable habitat from this activity.

LAA: None anticipated.

Marbled Murrelet

NLAA: Cone collection between September 15 and October 31 is not likely to disturb murrelets since this is after the early breeding season. It is assumed that no more than one (1) tree < 21 inches dbh would be felled outside of the early breeding season. In addition, the tree to be felled would not be a potential nest tree and therefore the loss of an individual tree, if it occurred within suitable habitat, would degrade, but not result in the loss of that suitable habitat stand.

LAA: None. There are no actions associated with cone collection that would cause adverse effects over the life of the BO.

Marbled Murrelet Critical Habitat

NLAA: There would be no loss of suitable habitat from this activity.

LAA: None anticipated.

D.8. Seed Orchard Operation and Maintenance: There is one seed orchard on the ONF and it is greater than 0.25 miles from suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: Operation and maintenance of the seed orchard is not likely to adversely affect suitable spotted owl habitat or have the potential to disturb nearby nesting spotted owls since it is greater than 0.25 miles from suitable habitat.

LAA: None. There are no actions associated with seed orchard operation and maintenance that would cause adverse effects over the life of the BO.

Spotted Owl Critical Habitat

NLAA: There would be no loss or degradation of suitable habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Operation and maintenance of the seed orchard is not likely to adversely affect suitable murrelet habitat or have the potential to disturb nearby nesting murrelets since it is greater than 0.25 miles from suitable habitat.

LAA: None. There are no actions associated with seed orchard operation and maintenance that would cause adverse effects over the life of the BO.

Marbled Murrelet Critical Habitat

NLAA: There would be no loss or degradation of suitable habitat.

LAA: None anticipated.

E. Noxious Weed Control Program: This program is designed to limit the spread of noxious weeds and control them in sensitive areas. The ONF proposes to control noxious weeds across 607 acres of the Forest over the life of this BO. The ONF proposes the use of mechanical/manual (500 acres), biological (100 acres), prescribed fire, and herbicides (7 acres) to control noxious weeds. All but herbicides will be addressed in this BO. Region 6 of the USFS is currently preparing an Environmental Impact Statement (EIS) for the use of herbicides to control noxious weeds. Future use of herbicides by the ONF must be in compliance with the Regional Program and EIS, which will be consulted on by the FWS therefore, the use of herbicides is *not* a covered action in this BO. Burning of noxious weeds is primarily a disposal action and is addressed under the fire/fuels hazard reduction program activity under the “pile” burning categories.

Of the 600 acres addressed by this consultation, approximately 100 acres would be treated annually using mechanical/manual methods of which 85 acres may be treated during the spotted owl and murrelet early nesting season. An additional 20 acres would be treated annually using biological control.

Spotted Owl

NLAA: Manual (use of hand tools) and biological (use of insects and host-specific pathogens) control activities on 182 acres over the life of this BO are not likely to disturb spotted owls or affect their prey base or habitat. Mechanical control is not likely to adversely affect spotted owls through disturbance if they are conducted outside of the early breeding season (March 1 to July 15) or, if during the early breeding season, are greater than harassment distance from suitable.

LAA: Mechanical treatment may occur on 85 acres annually (a total of 425 acres during the 5-year term of this consultation) during the early breeding season and within harassment distance of suitable spotted owl habitat.

Spotted Owl Critical Habitat

NLAA: 600 acres because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Manual (use of hand tools) and biological (use of insects and host-specific pathogens) control activities on 182 acres over the life of this BO are not likely to disturb murrelets. Mechanical control is not likely to adversely affect murrelets through disturbance if they are conducted outside of the early breeding season (April 1 to August 5) or, if during the early breeding season, are greater than harassment distance from suitable habitat.

LAA: Mechanical treatment may occur on 85 acres annually (a total of 425 acres during the 5-year term of this consultation) during the early breeding season and within harassment distance of suitable murrelet habitat.

Marbled Murrelet Critical Habitat

NLAA: 600 acres because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F. Transportation System: This program includes constructing, reconstructing and repairing national forest roads.

F.1. Road Reconstruction: This activity would occur within existing or previously used road prisms. The ONF proposes to reconstruct a total of **55 miles** of road over the life of the BO. Five miles of reconstruction would be associated with access to commercial thinning and uneven-aged management units. Three of these 5 miles may be reconstructed during the early nesting season for spotted owls and murrelets. The remaining 50 miles would be accomplished to upgrade road surfaces, improve safety, or replace aging structures. About one-half of these miles could be reconstructed during the early breeding season for spotted owls and murrelets. Reconstruction includes the use of heavy equipment. Work may also include hydromulching, hydroseeding, and blasting. Blasting may be necessary on up to 25 sites over the 5-year term of this consultation. Only charges of less than 2 pounds would be covered by this consultation and not more than 13 sites total (average of 2.6 per year) may have explosives used within harassment distance of suitable habitat during the early nesting season for spotted owls or murrelets.

No suitable murrelet or spotted owl habitat would be removed; however, spotted owl dispersal habitat may be degraded but not downgraded (removed) by this action.

Spotted Owl

NLAA: Road reconstruction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb charge outside the early nesting season or is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect spotted owls.

LAA: Over the 5-year term of this consultation, 3 miles (0.6 miles per year) of road reconstruction activities associated with access to commercial thinning units and 25 miles (5 miles per year) of road reconstruction activities for upgrades, safety, etc. that use mechanized equipment within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15) are likely to adversely affect spotted owls. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Spotted Owl Critical Habitat

NLAA: 55 miles because there would be no loss or degradation of suitable habitat, but potentially the degradation of dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Road reconstruction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelets habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect murrelets.

LAA: Over the 5-year term of this consultation, 3 miles (0.6 miles per year) of road reconstruction activities associated with access to commercial thinning units and 25 miles (5 miles per year) of road reconstruction activities for upgrades, safety, etc. that use mechanized equipment within harassment distance of suitable murrelets habitat during the early breeding season (April 1 to August 5) are likely to adversely affect murrelets. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Marbled Murrelet Critical Habitat

NLAA: 55 miles because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F.2. New Road Construction:

The Forest proposes to construct approximately **5 miles** of new permanent road during the life of this BO to access timber harvest-sites, half of which may be constructed during the murrelet and spotted owl early breeding period. These activities may include the use of heavy earth moving equipment, including backhoes, bulldozers, excavators, dump trucks, low boy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. Blasting may be necessary on up to 25 sites over the 5-year term of this consultation. Only charges of less than 2 pounds would be covered by this consultation and not more than 13 sites total (average of 2.6 per year) may have explosives used within harassment distance of suitable habitat during the early nesting season for spotted owls or murrelets.

No suitable spotted owl or murrelet habitat will be removed as a result of the new road construction however, up to 18 acres of dispersal habitat may be removed. Any removal of dispersal habitat will require Level 1 review.

Spotted Owl

NLAA: New road construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb charge outside the early nesting season or is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect spotted owls. The removal of 18 acres of dispersal habitat is not likely to adversely affect the spotted owl since it is not considered suitable habitat.

LAA: Over the 5-year term of this consultation, 3 miles total (0.6 miles per year) of new road construction activities within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15) are likely to adversely affect spotted owls. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Spotted Owl Critical Habitat

NLAA: Not anticipated.

LAA: Due to the loss of 18 acres of dispersal habitat; a primary constituent element.

Marbled Murrelet

NLAA: New road construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelets habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect murrelets.

LAA: Over the 5-year term of this consultation, 3 miles total (0.6 miles per year) of new road

construction activities within harassment distance of suitable murrelets habitat during the early breeding season (April 1 to August 5) are likely to adversely affect murrelets. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Marbled Murrelet Critical Habitat

NLAA: 5 miles because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F.3. Temporary Road Construction: The Forest proposes to construct approximately **40 miles** of temporary road during the life of this BO. Half (20) of these miles may be constructed during the spotted owl and murrelet early breeding season. Temporary road construction will generally be limited to short spur roads needed to access landings for thinning and uneven-aged management projects.

These activities may include the use of heavy earth moving equipment, including backhoes, bulldozers, excavators, dump trucks, low boy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. Blasting may be necessary on up to 25 sites over the 5-year term of this consultation. Only charges of less than 2 pounds would be covered by this consultation and not more than 13 sites total (average of 2.6 per year) may have explosives used within harassment distance of suitable habitat during the early nesting season for spotted owls or murrelets.

No suitable habitat will be removed as a result of the temporary road construction. Some large diameter trees may be removed from the road right-of-way; however, no potential nest trees will be felled. Up to 145 acres of dispersal habitat may be removed (assuming maximum clearing width of 30 feet) and will require Level 1 review.

Spotted Owl

NLAA: Temporary road construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect spotted owls. The removal of 145 acres of dispersal habitat is not likely to adversely affect the spotted owl since it is not considered suitable habitat.

LAA: Over the 5-year term of this consultation, 20 miles total (4 miles per year) of temporary road construction activities within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15) are likely to adversely affect spotted owls. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Spotted Owl Critical Habitat

NLAA: None anticipated.

LAA: Due to the loss of 145 acres of dispersal habitat, a primary constituent element.

Marbled Murrelet

NLAA: New road construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelets habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb charge outside the early nesting season or is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect murrelets.

LAA: Over the 5-year term of this consultation, 20 miles total (4 miles per year) of new road construction activities within harassment distance of suitable murrelets habitat during the early breeding season (April 1 to August 5) are likely to adversely affect murrelets. In addition, blasting with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season may occur on 13 sites during the 5-year term of this consultation (average of 2.6 blasts per year).

Marbled Murrelet Critical Habitat

NLAA: 40 miles because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F.4. Bridge Construction/Reconstruction: The ONF proposes to construct or reconstruct 40 bridges over the life of this BO. Equipment includes larger tracked excavators and cranes, bulldozers, dump and concrete trucks, helicopters, and generators for pumps. Pile-driving and/or blasting might also be performed on about 16 bridges. Blasting with charges ≤ 2 lbs. and pile-driving may occur two times per year (each) during the early nesting season. No removal of suitable habitat for the spotted owl or murrelet will occur as a result of this activity.

Spotted Owl

NLAA: Construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect spotted owls. Pile-driving outside the early nesting season or that is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect spotted owls.

LAA: Over the 5-year term of this consultation it is likely that adverse effects may result from the construction/reconstruction of a total of 40 bridges (8 per year average) within harassment

distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15); blasting on 10 sites (2 per year) with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season; and pile-driving on 10 sites (2 per year) within harassment distance of suitable habitat during the early breeding season.

Spotted Owl Critical Habitat

NLAA: Construction/reconstruction on 40 sites (bridges) because there would be no loss or degradation of suitable or dispersal habitat.

Marbled Murrelet

NLAA: Construction activities using mechanized equipment that would either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect murrelets. Pile-driving outside the early nesting season or that is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect murrelets. .

LAA: Over the 5-year term of this consultation it is likely that adverse effects may result from the construction/reconstruction of a total of 40 bridges (8 per year average) within harassment distance of suitable murrelet habitat during the early breeding season (April 1 to August 5); blasting on 10 sites (2 per year) with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season; and pile-driving on 10 sites (2 per year) within harassment distance of suitable habitat during the early breeding season.

Marbled Murrelet Critical Habitat

NLAA: Construction/reconstruction on 40 sites (bridges) because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F.5. Transportation System Repair: Transportation system repair includes severe damage to roads from storms and may include placement of rip rap and fill, new culverts and drainage devices, and realignment of road segments. The ONF proposes to repair **400 sites** per year. Of these 400 sites, 16 sites annually would be expected to be implemented during the early breeding season.

These activities include the use of heavy earth moving equipment for up to several weeks at a site. Equipment may include backhoes, bulldozers, excavators, dump trucks, lowboy tractor-trailers, rock crushers, and road graders. Activities within this project type may include hauling of existing materials from rock sources for riprap, surfacing, or barriers. The use of explosives, jackhammers, and pile drivers could occur at several sites where bridges are constructed to replace culverts. Blasting with charges ≤ 2 lbs. may occur two times per year and pile-driving up to 5 times per year during the early nesting season (March 1 through August 5).

Spotted Owl

NLAA: Construction activities at 384 sites per year using mechanized equipment would either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect spotted owls. Pile-driving outside the early nesting season or that is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect spotted owls

LAA: It is likely that adverse effects may result from the transportation system repair of 16 sites per year within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15); blasting on 2 sites per year with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season; and pile-driving on 5 sites per year within harassment distance of suitable habitat during the early breeding season.

Spotted Owl Critical Habitat

NLAA: Repair of 400 sites per year because there would be no loss or degradation of suitable or dispersal habitat.

Marbled Murrelet

NLAA: Construction activities at 384 sites per year using mechanized equipment would either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect murrelets. Pile-driving outside the early nesting season or that is greater than harassment distance from suitable habitat during the early nesting season is not likely to adversely affect murrelets.

LAA: It is likely that adverse effects may result from the transportation system repair of 16 sites per year within harassment distance of suitable murrelet habitat during the early breeding season (April 1 to August 5); blasting on 2 sites per year with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season; and pile-driving on 5 sites per year within harassment distance of suitable habitat during the early breeding season.

Marbled Murrelet Critical Habitat

NLAA: Repair of 400 sites per year because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

F.6. Rock Sources: The Forest proposes to operate **40 rock sources** intermittently during the life of this BO. Of these no more than 35 would be active during the early breeding season. The

Forest will attempt to limit activities to existing quarries and rock sources only. Any new sites will require Level 1 review to determine if the proposed site is within the limits anticipated in this BO. Activities associated with the operation of existing rock sources may include blasting, excavating with heavy equipment, crushing operations, stockpiling rock material, and hauling material to project sites. Blasting would use “in-the-hole” techniques as much as possible to reduce noise. Blasting using 2 lbs of explosives or less may occur at 5 sites per year with not more than 3 per year during the early breeding season.

Spotted Owl

NLAA: Activities using mechanized equipment that either occur outside the early nesting season or would occur greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect spotted owls.

LAA: It is likely that adverse effects may result from the general operation and use of mechanized equipment within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15) at 35 rock sources during the life of this BO and from blasting on 3 sites per year with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season.

Spotted Owl Critical Habitat

NLAA: 40 sites because there would be no loss or degradation of suitable or dispersal habitat.

Marbled Murrelet

NLAA: Activities using mechanized equipment that either occur outside the early nesting season or would occur greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets. Blasting that uses less than a 2 lb. charge outside the early nesting season or is greater than harassment distance from suitable habitat during the nesting season is not likely to adversely affect murrelets.

LAA: It is likely that adverse effects may result from the general operation and use of mechanized equipment within harassment distance of suitable murrelet habitat during the early breeding season (April 1 to August 5) at 35 rock sources during the life of this BO and from blasting on 3 sites per year with less than a 2 lb. charge within harassment distance of suitable habitat during the early breeding season.

Marbled Murrelet Critical Habitat

NLAA: 40 sites because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

G. Road Maintenance: Road maintenance is designed to provide safe roads and to minimize road-related erosion. These activities include culvert cleaning; replacement and

installation; grading; erosion control; brushing; hazard (addressed under the Hazard Tree Removal program) and downed tree removal; pavement repair; bridge maintenance; gate installation and maintenance; painting; and shoulder maintenance.

The ONF proposes to maintain 2,200 miles of road per year. Approximately 24 percent of all roads are within harassment distance of suitable spotted owl or murrelet habitat. Maintenance on 1,200 miles would occur from March 1 - August 5 (500 miles in ML 1-2 (450 miles-mechanized; 50 miles-non-mechanized), 700 miles in ML 3-5); 350 miles would be maintained from August 6 - September 30 (150 miles in ML 1-2, 200 miles in ML 3-5); and 650 miles of road would be maintained October 1 - March 1 (300 miles would be on ML 1-2 roads and 350 miles on ML 3-5). In addition, immobile repairs will be conducted at 80 sites each year on ML 3-5 roads during the early breeding season. Helicopter surveys would be required, but are covered under **Administrative Tours and Remote Site Inspections**.

Spotted Owl

NLAA: Road maintenance activities using mechanized equipment that occur either outside the early nesting season or greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls.

LAA: It is likely that adverse effects may result from road maintenance on 108 miles of ML 1-2 roads (24 percent within harassment distance of suitable spotted owl habitat of 450 miles of ML 1-2 roads using mechanized equipment) during the early breeding season (March 1 to July 15) and 80 sites with immobile repairs on ML 3-5 roads during the early breeding season.

Spotted Owl Critical Habitat

NLAA: 2,200 miles because there would be no loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Road maintenance activities using mechanized equipment that occur either outside the early breeding season or greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelet.

LAA: It is likely that adverse effects may result from road maintenance on 108 miles of ML 1-2 roads (24 percent (% within harassment distance of suitable marbled murrelet habitat) of 450 miles of ML 1-2 roads using mechanized equipment) during the early breeding season (April 1 to August 5) and 80 sites with immobile repairs on ML 3-5 roads during the early breeding season.

Marbled Murrelet Critical Habitat

NLAA: 2,200 miles because there would be no loss or degradation of suitable habitat.

LAA: None anticipated.

H. Lands and Special Uses

H.1. Road Use and Access Permits: The ONF expects to issue 20 road construction/reconstruction permits over the life of this BO. The ONF expects that this would result in the authorization of construction/reconstruction of **5 miles of new road** on federal land during the life of the BA. Assuming a 50-foot clearing width for the road prism (USDA 2003), up to 30 acres of spotted owl dispersal habitat would be removed. No suitable spotted owl or murrelet habitat would be downgraded or removed. These special use permits do not authorize activities on nonfederal lands; such activities require assessments and exemptions as appropriate under the ESA.

These activities include the use of heavy earth moving equipment including backhoes, bulldozers, excavators, dump trucks, lowboy tractor-trailers, rock crushers, and road graders. Work may also include hydromulching, hydroseeding, and blasting. In some cases road work may continue for several weeks at a site.

Spotted Owl

NLAA: All road construction/reconstruction permit related activities using mechanized equipment either outside the early breeding season or greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls. This would include road construction through dispersal habitat.

LAA: All road construction (5 miles) using mechanized equipment within harassment distance of suitable spotted owl habitat during the early breeding season (March 1 to July 15).

Spotted Owl Critical Habitat

NLAA: None anticipated.

LAA: 5 miles of new road resulting in the loss of 30 acres of dispersal habitat but no loss or degradation of suitable habitat.

Marbled Murrelet

NLAA: All road construction/reconstruction permit related activities using mechanized equipment either outside the early breeding season or greater than harassment distance from suitable murrelet habitat during the early breeding season (March April 1 to August 5) are not likely to adversely affect murrelets.

LAA: All road construction (5 miles) using mechanized equipment within harassment distance of suitable murrelet habitat during the early breeding season (April 1 to August 5).

Marbled Murrelet Critical Habitat

NLAA: 5 miles of new road; no loss or degradation of suitable habitat.

LAA: None anticipated.

H.2. Road and Trail Easements: The ONF expects to issue 20 new road or trail easements over the life of this BO. Each easement would average approximately 3 miles. New road construction would not occur. New easements would cover approximately 17 miles of road per year. Activities may include minimal removal of timber (hazard tree removal or right-of-way widening) and surface disturbance. Removal of hazard trees would fall under the **Hazard Tree Removal Program** and any road maintenance needs would fall under the **Transportation System Program**. Therefore, habitat effects to the species or their critical habitat have been evaluated under those Programs. (In Appendix G, only disturbance effects are presented under the Road and Trail Easement program.)

H.3. Tailhold and Guyline Anchor Permits: These permits authorize the use of trees on federal lands to be used for tailholds and guylines to enable logging on adjacent nonfederal lands. No potential nest tree or tree adjacent to a potential spotted owl or murrelet nest tree may be felled.

The Forest proposes to issue **45 permits** during the life of this BO, each covering multiple trees (tailholds or guyline anchors). Permits are anticipated to authorize an average of five trees per permit (225 trees total) that could be used as tailhold or guyline trees. During the life of this BO up to **90 potential nest trees** may be used as a tailhold or guyline anchors however, no potential nest trees or tree adjacent to a potential spotted owl or murrelet nest tree would be permitted to be felled. Logging activities within harassment distance of suitable spotted owl nesting habitat and suitable murrelet nesting habitat on federal land will only be allowed outside of the nesting season (between October 1 and February 28).

Spotted Owl

NLAA: All permit related activities on federal land associated with the use of tailholds or guyline trees will occur outside the early breeding season. Any use of mechanized equipment either outside the early breeding season or greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls.

LAA: The use of 90 potential nest trees as tailholds or guyline anchors may result in the death of these trees and therefore would render these trees as unsuitable nesting structure resulting in adverse effects from the loss of these trees.

Spotted Owl Critical Habitat

NLAA: None anticipated.

LAA: The use of 90 potential nest trees as tailholds or guyline anchors may result in the death and loss of those trees as nesting structure and would therefore result in the degradation of suitable habitat.

Marbled Murrelet

NLAA: All permit related activities on federal lands associated with the use of tailholds or

guyline trees will occur outside the early breeding season. Any use of mechanized equipment either outside the early breeding season or greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelets.

LAA: The use of 90 potential nest trees as tailholds or guyline anchors may result in the loss of these trees and therefore result in adverse effects from the loss of these trees.

Marbled Murrelet Critical Habitat

NLAA: None anticipated.

LAA: The use of 90 potential nest trees as tailholds or guyline anchors may result in the loss of those trees and would therefore result in the degradation of suitable habitat.

H.4. Linear Right-of-Way Operations and Maintenance: The ONF expects to issue or renew approximately **20 permits** during the life of this BO for the operation and maintenance of power, phone, cable, water and pipelines. Maintenance activities include brushing below power lines or in ditches to keep vegetation low, hazard tree removal (covered under the **Hazard Tree Removal** program), and noxious weed control (covered under the **Noxious Weed Control** program). Repair or replacement of damaged waterline segments and upgrading of lines to fiber optic cable are common permitted activities. Equipment used may include chainsaws, power and hand tools. These actions may result in the use of motorized equipment in close proximity to suitable habitat during the early breeding seasons. It is expected that operations and maintenance may occur on up to 30 miles per year during the early spotted owl and murrelet breeding season. These actions would not result in the loss or degradation of suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: All activities associated with the operation and maintenance of linear right-of-way permits that will occur outside the early breeding season or that will use mechanized equipment either outside the early breeding season or greater than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15) are not likely to adversely affect spotted owls.

LAA: The Forest estimates a total of 30 miles of operation and maintenance of linear right-of-way permits will use mechanized equipment less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15).

Spotted Owl Critical Habitat

NLAA: 20 permits authorizing up to 30 miles total of operation and maintenance of linear right-of-way permits would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: All activities associated with the operation and maintenance of linear right-of-way permits that will occur outside the early breeding season or that will use mechanized equipment either outside the early breeding season or greater than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) are not likely to adversely affect murrelet.

LAA: The Forest estimates a total of 30 miles of operation and maintenance of linear right-of-way permits will use mechanized equipment less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5).

Marbled Murrelet Critical Habitat

NLAA: 20 permits authorizing up to 30 miles total of operation and maintenance of linear right-of-way permits would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.5. Communication and Weather Sites: The ONF expects to issue or amend permits to maintain and/or upgrade 22 sites per year. Construction of new sites is *not* a covered action in this BO. Extension of tower heights require Level 1 review and are not included if they are anticipated to result in the incidental taking of a spotted owl or murrelet. Maintenance activities could include brushing and clearing of sites to keep vegetation low, structural maintenance and repair and replacement of facilities, road maintenance for access, and fuels management activities, as described in the administrative site plans and could require the use of mechanized equipment during the early breeding seasons at all 22 sites each year. Fuels treatment and road access are covered by those respective Programs described elsewhere in this BO.

Spotted Owl

NLAA: Activities associated with the annual maintenance and/or upgrade of communication and weather sites that will either occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

The extension of existing towers for Communication/Weather sites are not expected to cause the injury or mortality of spotted owls because spotted owls primarily fly under the canopy or if they have to cross an opening they do so at relatively low altitudes above the ground. The familiarity of the existing large structure supporting the antennae would likely be avoided by flying spotted owls. Extension of existing towers would not be likely to be constructed within the potential flight path of spotted owls given their low flying altitude.

LAA: Activities associated with the annual maintenance and/or upgrade of 22 communication and weather sites that will use mechanized equipment less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: Activities associated with the annual maintenance and/or upgrade of 22 communication and weather sites would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with the annual maintenance and/or upgrade of communication and weather sites that will either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect murrelet.

LAA: Activities associated with the annual maintenance and/or upgrade of 22 communication and weather sites that will use mechanized equipment less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5), are likely to adversely affect murrelet.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with the annual maintenance and/or upgrade of 22 communication and weather sites would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.6. Research and Monitoring Permits: The ONF expects to issue 20 permits over the life of this BO. It is anticipated that 10 of these permits (each with an average of 10 sample sites per permit) may affect spotted owls or murrelets due to use of augers, chainsaws, equipment tooters, power tools, and hand tools. However, there would be no loss or degradation of suitable habitat.

If a permit is sought for research and monitoring activities for listed species or their designated critical habitats then separate permitting/consultation (Section 10(a)(1)(A)) with the FWS would be required and are not covered by this BO.

Spotted Owl

NLAA: Activities associated with the operations of research and monitoring permits that will either occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Activities associated with the operations of 10 research and monitoring permits (each with an average of 10 sample sites per permit) may use mechanized equipment on up to 100 sites total (20 per year) less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15).

Spotted Owl Critical Habitat

NLAA: Activities associated with the operations of 20 research and monitoring permits would

not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with the operations of research and monitoring permits that will either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect murrelet.

LAA: Activities associated with the operations of 10 research and monitoring permits (each with an average of 10 sample sites per permit) may use mechanized equipment on up to 100 sites total less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5).

Marbled Murrelet Critical Habitat

NLAA: Activities associated with the operations of 20 research and monitoring permits would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.7. Water Withdrawal Permits: This BO covers the re-issuance of 11 existing water withdrawal permits over the life of the BO. New permits are not addressed by this consultation. Repair and maintenance of existing water transmission lines and systems are authorized by the permit and may include the use of heavy equipment (e.g., backhoe, flatbed truck, boom truck, dump truck) or other mechanized equipment (i.e., chainsaw) during the early breeding season. Actions associated with **Hazard Tree Removal, Road Construction/Reconstruction, and Road Maintenance** are covered under those respective Programs. Maintenance would not include the degradation or loss of suitable spotted owl or murrelet habitat.

Spotted Owl

NLAA: Activities associated with the operations of existing water withdrawal permits that do not occur during the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Activities associated with the operations of 11 existing water withdrawal permits that may use mechanized equipment less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: Activities associated with the operations of 11 existing water withdrawal permits would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with the operations of 11 existing water withdrawal permits that do not occur during the early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect murrelets.

LAA: Activities associated with the operations of 11 existing water withdrawal permits that may use mechanized equipment less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5) and are likely to adversely affect murrelet.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with the operations of 11 existing water withdrawal permits would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.8. Outfitter Guide Permits: The ONF anticipates issuing 36 outfitter-guide permits over the life of the BO. Outfitter-guide permits are granted to outfitters for backcountry trips (such as hunting, fishing, or sightseeing), mountain climbing, and trail-hiking guides, which may include the use of saddle and pack stock as part of the permit. The Forest may clearly state conditions for outfitter operations that will minimize user impacts on species of concern. Conservation measures provided in the BA require Special Use Permits to contain terms and conditions as necessary to avoid adverse impacts to listed species or their habitats. As a result, suitable spotted owl and murrelet habitat would not be degraded.

Spotted Owl

NLAA: 36 permits issued during the life of the BO have a low likelihood of disturbing nesting spotted owls due to low intensity sounds generated by these activities, the activities would occur in areas already receiving human use, and habitat components (large trees, snags, large downed wood) would not be expected to be affected.

LAA: None. There are no actions associated with the operations of 36 outfitter-guide permits over the life of the BO that would cause adverse effects.

Spotted Owl Critical Habitat

NLAA: Activities associated with the operations of 36 outfitter-guide permits over the life of the BO that would not result in the loss or degradation of suitable or dispersal habitat.

Marbled Murrelet

NLAA: 36 permits issued during the life of the BO have a low likelihood of disturbing nesting murrelets due to low intensity sounds generated by these activities, the activities would occur in areas already receiving human use, and habitat components (large trees) would not be affected.

LAA: None. There are no actions associated with the operations of 36 outfitter-guide permits

over the life of the BO that would cause adverse effects.

Marbled Murrelet Critical Habitat

NLAA: There are no activities associated with the operations of 36 outfitter-guide permits over the life of the BO that would result in the loss or degradation of suitable habitat.

LAA: None. There are no actions associated with the operations of 36 outfitter-guide permits over the life of the BO that would cause adverse effects.

H.8. Developed Facilities Permits: The ONF proposes to re-issue 20 permits over the life of this BO. This BO only covers the reissuance of existing permits on existing facilities. New land clearing is not anticipated to exceed 10 acres of non-habitat adjacent to existing facilities during the life of this BO. Facility maintenance activities such as land clearing, installation of new structures, upgrading communication sites, well-drilling, septic system installation and tree removal require prior FS review and approval. **Hazard Tree Removal** is covered by that respective Program. Disturbance to nesting spotted owl or murrelets is not anticipated given the existing structures and on-going human uses of these sites.

Spotted Owl

NLAA: Activities associated with the reissuance of developed facilities permits that will either occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Activities associated with the reissuance of 20 developed facilities permits that will use mechanized equipment on up to 20 sites less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: There are no activities associated with the operations of 20 developed facilities permits over the life of the BO that would result in the loss or degradation of suitable or dispersal habitat.

Marbled Murrelet

NLAA: Activities associated with the reissuance of developed facilities permits that will either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect marbled murrelets.

LAA: Activities associated with the reissuance of 20 developed facilities permits that will use mechanized equipment on up to 20 sites per year less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5), are likely to adversely affect marbled murrelets.

Marbled Murrelet Critical Habitat

NLAA: There are no activities associated with the operations of 20 developed facilities permits over the life of the BO that would result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.9. Recreation Residence Maintenance: The ONF proposes to re-issue 65 permits over the life of this BO. Maintenance activities such as painting, roofing, washing windows, and cleaning gutters do not require FS permission prior to each activity. Prior FS permission is required for ground-disturbing or vegetation-disturbing, activities such as land clearing, installation of new structures, hazard tree falling, and/or sewer hookups. It is likely that fewer than 15 sites per year would involve these types of activities. Recreation maintenance would not exceed 10 acres of non-habitat disturbance adjacent to existing facilities. **Hazard Tree Removal** is accounted for under that Program. Disturbance to nesting spotted owl or murrelets is not anticipated given the existing structures and on-going human uses of these sites.

Spotted Owl

NLAA: Activities associated with the reissuance of recreation residence permits that will either occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Activities associated with the reissuance of 65 recreation residence permits that will use mechanized equipment on up to 15 sites per year less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: Activities associated with the operations of 65 recreation residence maintenance permits over the life of the BO would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with the reissuance of recreation residence permits that will either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect marbled murrelets.

LAA: None. Activities associated with the reissuance of 65 recreation residence permits that will use mechanized equipment on up to 15 sites per year less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5), are likely to adversely affect spotted owls.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with the operations of 65 recreation residence maintenance permits over the life of the BO would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

H.10. Permits for Other Special Uses: The Forest proposes to issue approximately **14 permits** during the life of this BA. Common requests for special uses and group events include such things as club meetings, Native American gatherings, search and rescue, photography, commercial filming, group hikes, and apiaries. For activities falling under the non-commercial group use category, permits are required only when a group exceeds 75 people. On a project-specific basis, requirements are developed to maintain and protect resource values. These requirements are expected to address location, time of year, and sanitation measures.

Spotted Owl

NLAA: Activities associated with “other” special use permits that either occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Activities associated with 14 “other” special use permits that may use mechanized equipment on 3 sites per year that are less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: Activities associated with the issuance of 14 “other” special use permits would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with “other” special use permits that either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect murrelet.

LAA: Activities associated with 14 “other” special use permits that may use mechanized equipment on 3 sites per year less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5), are likely to adversely affect murrelet.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with the issuance of 14 “other” special use permits would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

I. Land Line Survey and Boundary Adjustments: Use of hand tools and chainsaws are required for survey and delineation of land lines. Fifteen miles of surveys will be conducted over the life of this BO, of which 5 miles would be conducted during the early breeding season for the spotted owl and murrelet. This activity would not result in the degradation of suitable habitat, only trees 6 inches dbh or less would be occasionally cut in dense stands.

Spotted Owl

NLAA: Activities associated with 10 miles of landline survey and boundary adjustments are not likely to adversely affect spotted owls due to activities being conducted outside of the early breeding season and no degradation of suitable habitat.

LAA: Activities associated with 5 miles of landline survey and boundary adjustments are likely to adversely affect spotted owls due to use of chainsaws during the early breeding season.

Spotted Owl Critical Habitat

NLAA: Activities associated with landline survey and boundary adjustments would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with 10 miles of landline survey and boundary adjustments are not likely to adversely affect marbled murrelets due to activities being conducted outside of the early breeding season and no degradation of suitable habitat.

LAA: Activities associated with 5 miles of landline survey and boundary adjustments are likely to adversely affect marbled murrelets due to use of chainsaws during the early breeding season.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with landline survey and boundary adjustments would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

J. Administrative Tours and Remote Site Inspections: These tours and inspections require the use of helicopters, generally above 500 feet above ground level, but occasionally below 300 feet above ground level. The Forest expects to conduct an average 3 helicopter tours each year, involving a total of about four stops each or **60 stops** over the life of the BA. It is expected that these flights may occur within harassment distance of suitable habitat during the early breeding season.

Spotted Owl

NLAA: Activities associated with administrative tours and remote site inspections that either

occur outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), the use of helicopters will be greater than harassment distance from suitable habitat are not likely to adversely affect spotted owls.

LAA: Those activities associated with administrative tours and remote site inspections that will require the use of helicopters less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls. This would include 60 stops (12 per year) with helicopter during the life of this BO.

Spotted Owl Critical Habitat

NLAA: Activities associated with administrative tours and remote site inspections would not result in the loss or degradation of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Activities associated with administrative tours and remote site inspections that either occur outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), the use of helicopters will be greater than harassment distance from suitable habitat are not likely to adversely affect marbled murrelets.

LAA: Those activities associated with administrative tours and remote site inspections that will require the use of helicopters less than harassment distance from suitable murrelet habitat during the early breeding season (April 1 to August 5), are likely to adversely affect marbled murrelets. This would include 60 stops (12 per year) with helicopter during the life of this BO.

Marbled Murrelet Critical Habitat

NLAA: Activities associated with administrative tours and remote site inspections would not result in the loss or degradation of suitable habitat.

LAA: None anticipated.

K. Waste Cleanup Activities: The Forest anticipates a total of about **110 sites** of all types will be cleaned during the life of this BO, with about one-third of these involving heavy equipment, of those 15 would occur during the early breeding season for murrelets and spotted owls. It is assumed that clean-up activities on these 15 sites would occur within harassment distance of suitable spotted owl or murrelet habitat. Suitable spotted owl and murrelet habitat would not be affected by clean-up actions.

Spotted Owl

NLAA: Waste cleanup on 95 sites that occurs either outside the spotted owl early breeding season or, if during the early breeding season (March 1 to July 15), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect spotted owls.

LAA: Waste cleanup on 15 sites (3 annually) that require the use of heavy equipment less than harassment distance from suitable spotted owl habitat during the early breeding season (March 1 to July 15), are likely to adversely affect spotted owls.

Spotted Owl Critical Habitat

NLAA: All (110) sites that may occur within critical habitat due to minor understory vegetation effects, but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Waste cleanup on 95 sites that occurs either outside the murrelet early breeding season or, if during the early breeding season (April 1 to August 5), will be greater than harassment distance from suitable habitat if using mechanized equipment are not likely to adversely affect murrelet.

LAA: Waste cleanup on 15 sites (3 annually) that require the use of heavy equipment less than harassment distance from suitable murrelet during the early breeding season (April 1 to August 5), are likely to adversely affect murrelet.

Marbled Murrelet Critical Habitat

NLAA: All (110) sites that occur within critical habitat due to no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

L. Watershed Restoration

L.1. Storm-proofing and Road Drainage Upgrade: The Forest proposes to storm-proof or upgrade drainage on 250 miles of road during the life of this BO. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, approximately 30 miles of storm-proofing or drainage upgrades will be initiated prior to August 6 each year. Activities may include: correcting stream-diversion potentials at stream crossings; removing unstable fill; rerouting road drainage to stable areas; adding, replacing, or installing proper-sized culverts; lowering fills; hardening stream crossings; lowering inlets; out-sloping; ditch-cleaning; placement of surface rock; installing waterbars; mulching and revegetating road surfaces and side slopes; slump repair; and other activities designed to control erosion and sedimentation.

Heavy equipment (grader, excavator, bulldozer, backhoe, dump trucks) is usually involved. Activities range from highly mobile activities such as constructing waterbars to activities that remain in one location for extended periods (three to 120 days) such as large fill removals. Blasting may be needed occasionally. The Forest anticipates blasting with charges of less than or equal to 2 pounds at no more than three sites per year.

Spotted Owl

NLAA: 220 miles of stormproof or upgrade may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting with greater than 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: 30 miles of stormproof or upgrade may occur each year (total of 150 miles during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 3 sites within harassment distance of suitable habitat each year (100 sites during the 5-year term of this consultation).

Spotted Owl Critical Habitat

NLAA: All 250 miles may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: 220 miles of stormproof or upgrade may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting with 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: 30 miles of stormproof or upgrade may occur each year (total of 150 miles during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment. In addition, blasting with less than 2 pound charges may be used during the early nesting season on up to 3 sites each year within harassment distance of suitable habitat (100 sites during the 5-year term of this consultation).

Marbled Murrelet Critical Habitat

NLAA: All 250 miles may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

L.2. Landslide Stabilization: The Forest proposes to stabilize approximately **150 acres (12 miles)** during the life of this BO. This would be primarily be along roads and spread at approximately 100 foot widths (equating to 12 miles of treatment). Techniques such as seeding and fertilizing, installation of erosion-control matting, willow wattling, brush layering, and

planting or transplanting of trees and shrubs typically involve hand labor. Activities such as live cribwall construction, log terracing, and addition of boulders and logs, typically involve the use of heavy equipment. It is assumed that any/all of this work may be in or adjacent to suitable habitat and take place during the early nesting season.

Spotted Owl

NLAA: None anticipated. Activities associated with landslide stabilization may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Landslide stabilization may occur on 2.4 miles annually (a total of 12 miles and approximately 150 acres over the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment.

Spotted Owl Critical Habitat

NLAA: All 12 miles may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

Marbled Murrelet

NLAA: None anticipated. Activities associated with landslide stabilization may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Landslide stabilization may occur on 2.4 miles annually (total of 12 miles and approximately 150 acres over the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment.

Marbled Murrelet Critical Habitat

NLAA: All 12 miles may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

L.3. Road Decommissioning and Bridge Removal: Permanently close and decommission approximately **150 miles** of road during the life of this BA. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, about 10 miles of decommissioning per year (50 miles total during the life of this BO) will be initiated prior to August 6 each year. Activities may include removing culverts, ripping or decompacting road surfaces, out-sloping, removing unstable fills, removing bridges or conversion from a road bridge to a trail bridge, constructing waterbars, seeding/planting, installing erosion control measures, and placing travel barriers. Heavy equipment (grader, excavator, bulldozer, backhoe, dump truck), helicopters (no more than two per year one of which could be during the early nesting season), and mobile cranes may be used.

Over the life of this BA, approximately **25 potential nest trees** may be removed as part of road decommissioning, incidental to removal of culverts and large fills, or necessary shaping of the road prism. Of these 25 trees no more than 5 total (average of one annually) will be removed during the early nesting season for spotted owl and murrelet.

Spotted Owl

NLAA: Up to 100 miles of road decommissioning activities may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 10 miles of road decommissioning may occur each year (total of 50 miles during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat. Additional adverse effects may occur from the removal of up to 5 potential nest trees during the early nesting season during the 5-year term of this consultation. Removal of potential nest trees will be pursuant to the Specific Conservation Measures #5-9 for Road Decommissioning and Bridge Removal.

Spotted Owl Critical Habitat

NLAA: None anticipated.

LAA: Removal of 25 potential nest trees may occur within critical habitat during the life of this BO.

Marbled Murrelet

NLAA: Up to 100 miles of road decommissioning activities may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting of > 2 lb. charges, no blasting with ≤ 2 lb. charge within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 10 miles of road decommissioning may occur each year (total of 50 miles during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment. Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat. Additional adverse effects may occur from the removal of up to 5 potential nest trees during the early nesting season during the 5-year term of this consultation. Removal of potential nest trees will be pursuant to the Specific Conservation Measures #5-9 for Road Decommissioning and Bridge Removal.

Marbled Murrelet Critical Habitat

NLAA: None anticipated.

LAA: Removal of 25 potential nest trees may occur within critical habitat during the life of this BO.

L.4. Instream Aquatic Improvement: The Forest proposes to improve instream aquatic habitat at 30 sites during the life of this BA. Improvements at up to two sites per year are expected to be initiated prior to August 6. Helicopters may be utilized on up to five projects over the life of this BA. Blasting with greater than two pound charges may be required occasionally, but is anticipated to involve no more than three sites during the life of the BO with no blasting prior to August 6. Placement of riprap to stabilize streambanks is not included in this analysis.

Spotted Owl

NLAA: Implementation of up to 20 sites may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat. There would be no blasting with greater than 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 2 sites are expected to be implemented each year (total of 10 sites total during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: All 30 sites may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Implementation of up to 20 sites may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat. There would be no blasting with greater than 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 2 sites are expected to be implemented each year (total of 10 sites total during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment. Helicopter support could be used on 1 site each year during the early

nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Marbled Murrelet Critical Habitat

NLAA: All 30 sites may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

L.5. Fish Passage Improvement: The Forest proposes to improve fish passage at **35 sites** during the life of this BA. Because instream activities must be completed during the summer low-flow period to meet conditions of the HPA, work will be initiated in up to two sites per year (10 sites during the life of this BA) prior to August 6. It is anticipated that only one, if any, of these improvement projects will require the use of helicopters each year and there will be no blasting.

Spotted Owl

NLAA: Implementation of up to 25 sites may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no blasting with greater than 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 2 sites are expected to be implemented each year (total of 10 sites total during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment. Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: All 35 sites may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Implementation of up to 25 sites may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no blasting with greater than 2 lb. charges, no blasting with 2 lb. charge or less within harassment distance of suitable habitat, and no helicopter activities within harassment distance of suitable habitat.

LAA: Up to 2 sites are expected to be implemented each year (total of 10 sites total during the 5-

year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment. Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Marbled Murrelet Critical Habitat

NLAA: All 35 sites may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

M. Wildlife Habitat Management

M.1. Habitat Restoration Activities: The Forest proposes approximately **500 acres** of habitat restoration activities (outside the Silviculture and Watershed Restoration Programs) during the life of this BA. Activities to improve habitat quality include snag creation, installation of nest boxes, or falling of individual trees for downed wood. Blasting may be required, but it is expected that blasting will occur outside the murrelet and spotted owl breeding season.

Spotted Owl

NLAA: None anticipated. Activities associated with habitat restoration may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 100 acres of habitat restoration may be implemented each year (500 acres total during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment.

Spotted Owl Critical Habitat

NLAA: All 500 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: None anticipated. Activities associated with habitat restoration may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 100 acres of habitat restoration may be implemented each year (500 acres total during the 5-year term of this consultation) during the early nesting season (April 1 to August 5) using motorized equipment.

Marbled Murrelet Critical Habitat

NLAA: All 500 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

M.2. Woody Debris Creation: Some silvicultural activities are designed to accelerate development of multi-storied stand character by removing selected trees to promote growth of residual trees. Trees cut are left on the ground or may be used for other restoration activities. Thinning (in plantations) and release (in natural stands) involve work crews with chainsaws. The Forest proposes **160 acres** of this activity during the life of the BA.

Spotted Owl

NLAA: None anticipated. Activities associated with woody debris creation may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 32 acres of woody debris creation may be implemented each year (160 acres total during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment.

Spotted Owl Critical Habitat

NLAA: All 160 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: None anticipated. Activities associated with woody debris creation may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 32 acres of woody debris creation may be implemented each year (160 acres total during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment.

Marbled Murrelet Critical Habitat

NLAA: All 160 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

M.3. Forage Planting: This activity can entail the use of a hydro-mulcher, but normally occurs with the use of hand seeders within areas of disturbance (natural and management caused). This is usually done in the spring or fall seasons when seed survival is higher. Native and desired non-native species are used depending on availability; site conditions and desired future condition of the area. The Forest proposes to plant forage on 100 acres during the life of this BA.

Spotted Owl

NLAA: None anticipated. Activities associated with forage planting may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 20 acres of woody debris creation may be implemented each year (100 acres total during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using motorized equipment.

Spotted Owl Critical Habitat

NLAA: All 100 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

Marbled Murrelet

NLAA: None anticipated. Activities associated with forage planting may occur during the early breeding season and utilize motorized equipment and, therefore, are likely to result in adverse effects.

LAA: Up to 20 acres of woody debris creation may be implemented each year (100 acres total during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using motorized equipment.

Marbled Murrelet Critical Habitat

NLAA: All 100 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

M.4. Inventory and Monitoring of Aquatic and Terrestrial Habitat/Biota: The Forest proposes to conduct numerous surveys during the life of this BA. Activities may include physical stream and riparian surveys, spawning surveys, snorkel surveys, water quality and quantity monitoring, inventory of lakes, mollusk surveys, and bryophyte/fungi surveys. Surveys may be by foot, vehicle, boat or aircraft. Recurring surveys from fixed-wing aircraft are anticipated to occur along approximately 30 miles of the Dungeness and Graywolf Rivers every ten days during late summer and fall as part of the Dungeness Bull Trout telemetry project. Fixed wing surveys will maintain an altitude of 360 feet or more above the forest canopy. Helicopters may be used to provide access to field crews to conduct salmon redd surveys or to collect other data, but

helicopter use is not anticipated to be needed more than one time each year during the early nesting season for spotted owls and murrelets.

Spotted Owl

NLAA: Surveys using fixed wing aircraft or helicopters will be conducted outside the early nesting season (March 1 to July 15) or, if during the early nesting season will maintain an altitude of 360 feet above the forest canopy (120-yard harassment threshold).

LAA: Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Spotted Owl Critical Habitat

NLAA: There would be no disturbance or removal of vegetation.

LAA: None anticipated.

Marbled Murrelet

NLAA: Surveys using fixed wing aircraft or helicopters will be conducted outside the early nesting season (April 1 to August 5) or, if during the early nesting season will maintain an altitude of 360 feet above the forest canopy (120-yard harassment threshold).

LAA: Helicopter support could be used on 1 site each year during the early nesting season (5 sites total during the 5-year term of this consultation) within harassment distance of suitable habitat.

Marbled Murrelet Critical Habitat

NLAA: There would be no disturbance or removal of vegetation.

LAA: None anticipated.

N. Fire Hazard Reduction: The Forest proposes to treat a combined total of approximately **590 acres** per year (**2,950 acres total** during the 5-year term of this consultation) of all fuel types during the life of this BA. Approximately 200 acres would be treated when crews are available in June and July. Chainsaws and hand tools are generally used to remove small ladder fuels or downed and dead material from landings and road corridors. Hand-piling is sometimes performed and may be followed by burning. Burning is generally conducted in the fall or spring.

Methods utilized for reducing fire hazards on the Forest are hand piling, machine piling, landing piling, chipping, lop and scatter, underburning, and slash pullback along roads. About 45 acres of fuels reduction using mechanized equipment (hand piling and chipping) and 40 acres of site prep (using mechanized equipment) for broadcast or underburning are accomplished each year during the early nesting season for murrelets and spotted.

Spotted Owl

NLAA: Up to 2,525 acres of fuels reduction treatment activities may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (March 1 to July 15), no use of motorized equipment within harassment distance of suitable habitat, no helicopter activities within harassment distance of suitable habitat, and no burning within ¼ mile of suitable habitat.

LAA: Up to 85 acres of fuels reduction treatment activities (handpiling and chipping) may occur each year (total of 425 acres during the 5-year term of this consultation) during the early nesting season (between March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

LAA: All 2,950 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Up to 2,525 acres of fuels reduction treatment activities may occur during the 5-year term of this consultation either outside the early nesting season or, if during the early nesting season (April 1 to August 5), no use of motorized equipment within harassment distance of suitable habitat, no helicopter activities within harassment distance of suitable habitat, and no burning within ¼ mile of suitable habitat.

LAA: Up to 85 acres of fuels reduction treatment activities (handpiling and chipping) may occur each year (total of 425 acres during the 5-year term of this consultation) during the early nesting season (between April 1 and August 5) using mechanized equipment

Marbled Murrelet Critical Habitat

NLAA: All 2,950 acres may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable habitat.

LAA: None anticipated.

O. Special Forest Products: This program includes the harvest of salal, bear grass, transplants of small conifers and shrubs, mushroom and berry picking, bough-cutting, Christmas tree cutting, cutting for posts and rails, firewood cutting, pole-cutting, and collection of other forest products. Permits are required for the collection of these products. Harvest of these products is with hand tools or by hand picking with the exception of cutting for posts and rails, firewood cutting, and pole-cutting. The Forest proposes to issue approximately **4,500 permits** per year during the life of this BA.

Approximately 3,500 permits (approximately 700 per year) would be issued for firewood cutting, posts and rails, and pole-cutting during the life of this BA, which may occur year-round when other constraints are not present. Removal of down wood for such things as firewood, shakes, fence posts, rails, or other uses may occur in most land allocations, provided NWFP standards and guidelines are met. Typically, removal is only from road prisms and old log landings. The Forest estimates that one site will be used per permit.

Spotted Owl

NLAA: Harvest activities that occur outside the early nesting season or, if during the early nesting season (March 1 to July 15), do not use motorized equipment within harassment distance of suitable habitat.

LAA: Up to 700 permits (sites) per year (total 3,500 permits during the 5-year term of this consultation) may allow for firewood, post and rail, and pole cutting during the early nesting season (between March 1 and July 15) using mechanized equipment.

Spotted Owl Critical Habitat

NLAA: All 22,500 permits (4,500 per year) may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or dispersal habitat.

LAA: None anticipated.

Marbled Murrelet

NLAA: Harvest activities that occur outside the early nesting season or, if during the early nesting season (April 1 to August 5), do not use motorized equipment within harassment distance of suitable habitat.

LAA: Up to 700 permits (sites) per year (total 3,500 permits during the 5-year term of this consultation) may allow for firewood, post and rail, and pole cutting during the early nesting season (between April 1 and August 5) using mechanized equipment.

Marbled Murrelet Critical Habitat

NLAA: All 22,500 permits (4,500 per year) may occur within critical habitat. Effects would be insignificant or discountable due to minor disturbance or removal of understory vegetation but no loss of suitable or potentially suitable habitat.

LAA: None anticipated.

P. Tribal Requests: Requests are received by Native American Tribes for various forest products that include firewood, yew, western red cedar, and Alaska yellow cedar for ceremonial, artistic, traditional, and other needs. The Forest proposes to allow removal of up to **15 potential nest trees** over the life of this BA. Specific conservation measures do not allow the removal of known spotted owl or murrelet nest trees and restrict the removal of potential nest trees to periods outside the nesting season.

Spotted Owl

NLAA: Harvest of potential nest trees from October 1 to February 28 may affect but are not likely to adversely affect spotted owls through disturbance.

LAA: Removal of potential nest trees will be outside the nesting season and would not result in harassment; however, adverse effects would result from the removal of potential nest trees.

Spotted Owl Critical Habitat

NLAA: None anticipated.

LAA: All 15 potential nest trees may occur within critical habitat and if removed would constitute an adverse effect to critical habitat.

Marbled Murrelet

NLAA: Harvest of non-potential nest trees from September 16 to March 31 may affect but are not likely to adversely affect murrelets.

LAA: Removal of potential nest trees will be outside the nesting season and would not result in harassment, however, adverse effects would result from the removal of potential nest trees.

Marbled Murrelet Critical Habitat

NLAA: None anticipated.

LAA: All 15 potential nest trees may occur within critical habitat and if removed would constitute an adverse effect to critical habitat.

EFFECTS OF THE ACTIONS SUMMARY: SPOTTED OWL

The following provides an aggregated analysis of all Programs and Activities that are likely to adversely affect the spotted owl through the implementation of ONF's 5-year program of work.

Direct Effects

Impacts from Removal of Habitat Components

Loss of Stands of Suitable-Habitat

As per the "Conservation Measures for Murrelets," no Program or Activity may result in the loss of a suitable habitat stand. Therefore, there is no anticipated loss of habitat acreage within any spotted owl nest site or any land allocation, especially LSRs, as a result of the proposed actions. The functionality of LSRs would not be impaired by these actions.

Degradation of Stands of Suitable Habitat

A total of 1,638 trees at least 21" dbh may be removed as part of this 5-year BO. This removal may result in the degradation of some stands.

Loss of Individual Nest-Potential Trees

No known occupied nest trees may be felled. Therefore, the Programs and Activities may only result in the loss of habitat components such as individual large trees or snags. Of concern is the loss of potential nest trees or large trees adjacent to potential nest trees. A potential nest tree does not mean that it is a nest tree; just that it has the structural elements (large limbs, mistletoe brooms, etc.) that provide for nesting. In the BA, a potential nest tree was defined as a tree 21 inches dbh or greater, that is located within suitable habitat. Appendix G identifies the Programs and Activities that are anticipated to remove potential nest trees or trees adjacent to potential nest trees and the number of such trees per Program and Activity.

As a result of the dispersed, localized (individual tree) loss of habitat components that would not result in the loss of suitable habitat, these impacts would not be detectable within the home range of a spotted owl or across the landscape. Therefore, there is no anticipated loss of habitat acreage within any spotted owl home range or any land allocation, especially LSRs, as a result of the proposed actions. The functionality of LSRs would not be impaired by these actions.

Hershey et al. (1998) found spotted owl nest trees occurred in Douglas-fir, western hemlock, and western red cedar on the Olympic Peninsula; the mean diameter of nest trees in their study area which included the Olympic Peninsula was 139.4 cm (54.88 inches); and most nests were in cavities, especially cavities on the sides of trees on the Olympic Peninsula. Given the conservative definition of a potential nest tree as being equal to or greater than 21 inches dbh for purposes of this consultation, the number of potential nest trees to be removed is likely an over estimate. In addition, all but 23 potential nest trees associated with **Trail Bridge Re/Construction** and **Tribal Requests** would be felled along roads and in high human use areas (**Hazard Tree Removal** and **Road Decommissioning**). Trees required for **Trail Bridge Re/Construction** range from 18 to 35 inches dbh. These tree sizes are less than the mean diameter for spotted owl nest sites (54 inches) on the Olympic Peninsula (Hershey et al. 1988) that reduces the likelihood that selected trees would be actual nest trees. For **Tribal Requests**, up to 15 potential nest trees may be removed. However, if the Tribe selects a tree from within suitable habitat, an ONF biologist will survey the area to determine if there are any signs of occupancy. If there are signs of occupancy, tree removal would be prohibited. If there are no signs of occupancy but the tree has suitable nesting structure and meets the criteria of being a potential nest tree, removal will occur outside of the spotted owl and murrelet nesting season (i.e., March 1 to September 30). Based on these conservation measures, we assume **Tribal Requests** would not result in the loss of an actual nest tree.

For the remaining potential nest trees, they would all occur along roads or in developed sites. As a result, there is a low likelihood that few if any of these potential nest trees would actually be an occupied nest tree for several reasons. First, Johnson (1993) found that spotted owl nest sites

were predominately located more than 328 feet from forest edges (such as roads and developed sites). **Hazard Tree** removal would occur within 150 feet of a road or in developed sites (open sites) and the loss of large trees associated with **Road Decommissioning** would occur within close proximity (likely less than 150 feet) of the road being decommissioned. Secondly, the mean diameter for nest trees on the Olympic Peninsula is 54 inches and any tree greater than 36 inches diameter proposed for removal requires an ONF wildlife biologist review. This conservation measure should reduce the likelihood of felling an actual nest tree. In addition, a potential nest tree was defined as being greater than or equal to 21 inches dbh (USDA 2003) that likely overestimates the potential to loss an actual nest tree.

The loss of large tree structure—potential nest trees and trees adjacent to potential nest trees—from within suitable spotted owl habitat would have localized impacts, but would not result in the loss of any suitable habitat stand. These impacts could include the loss of future nest sites, loss of flying squirrel and other prey species habitat, and minor microclimate changes. Given that all but 23 of these trees would come from heavily used areas, their value in terms of future nest sites, flying squirrel habitat, and buffering of edge effects are limited. Hershey et al. (1998) found evidence that selective or single-tree harvesting occurred in 31 percent of the nest sites within their study area; in the majority of the sites less than 10 “large” trees were removed. This suggests minor losses of structural elements in a nest stand do not necessarily reduce its functionality or use.

If a nest tree were cut outside of the nesting season, the spotted owl pair in question would need to relocate to a new nest site. Some spotted owl pairs have several nest sites that they alternately use and most spotted owl homeranges have numerous potential nest trees. Spotted owls have been known to use the same nest stand even after their nest tree had fallen due to wind, fire or decay. Therefore, we assume that the loss of a nest tree could result in the pair selecting another nest tree within the same territory or, worst-case, the adults may abandon the territory or their mate in search of a new territory.

Loss of Individual Spotted Owls Due to Cutting of Active Nest Trees

Felling of potential nest trees or large trees adjacent to potential nest trees, if felled outside of the early breeding season, would not likely kill or injure spotted owls because all spotted owls would be able to fly and escape potential harm. Felling of trees during the early breeding season, however, has the potential to injure or kill spotted owls, particularly spotted owlets or eggs as the adults could fly from danger.

We estimated the expected number of trees with a nesting murrelet to be cut down as part of this 5-year BO through the **Trail Bridge Re/Construction, Tribal Requests, Hazard Tree Removal and Road Decommissioning Programs** (Appendix 2). Our conservative approximation yielded 0.09 of a tree, which means that we anticipate that it is highly unlikely to occur. Therefore, we do not anticipate that any spotted owls would be killed when felling trees as part of this consultation.

Impacts from Disturbance

Spotted owls may be susceptible to disturbance during the early breeding season (Appendix 1). Consequently, FWS considers activities using heavy equipment, chainsaws, aircraft or blasting during the early breeding period of March 1 to July 15 within specified distances (Appendix 1) to have the potential to significantly disrupt breeding, feeding or sheltering—that is, result in harassment. We anticipate that 9,197 total acres, or 1.5 percent of the total acres, in ONF would be subjected to harassment-level activity levels during the early breeding season due to the proposed Program and Activities (Appendix G). The vast majority of these acres would be in areas currently receiving high ambient human activity such as along roads and in recreational areas. Assuming even distribution of occupied, suitable habitat throughout ONF, we expect that 1.5 percent of occupied habitat and 1.5 percent of nesting spotted owls would be harassed annually over the life of this BO. We estimate that there are no more than 88 pairs of spotted owls in ONF (Appendix 2), so we estimate that approximately one pair of spotted owls ($88 \times 1.5\% = 1$) could be harassed annually during the early breeding season by projects covered in this BO. We believe that the actual number of pairs of spotted owls harassed could be lower than that, due to the expected attenuation of effects within the harassment distances.

As presented in Appendix 1, the effects of harassment are defined as adult flushes from the nest and missed feedings of owlets. We anticipate that the effects of harassment in this consultation will be one-time occurrences for individual spotted owls because spotted owls are basically nocturnal; and the activities covered in this BO will be conducted during the day. Further, the activities will not be conducted during the 2-hour dawn and 2-hour dusk periods during the murrelet breeding season as a conservation measure to minimize effects to murrelets. We assume that young spotted owls can miss a feeding without dying or suffering significant nutritional deprivation, and we expect that adult spotted owls can flush from the nest without crushing their eggs or hurting their young. Since we expect that these harassments would be one-time occurrences to individual spotted owls, and that spotted owls can sustain such harassment without permanent injury, we anticipate that all spotted owls that are harassed by these activities would survive without any permanent negative effects.

Indirect Effects

Indirect effects “are caused by or result from the proposed action, are later in time, and are reasonably certain to occur” (USDI and USDC 1998). Indirect effects from the **Recreation Management, Administrative Facilities Maintenance, Transportation System Construction/Reconstruction, and Lands and Special Uses** Programs may result in a negligible increase in forest users. However, given that these proposed Programs/Activities have limited new development associated with **New Site Creation, Trail Construction, and Road Construction/Reconstruction** any increase in forest users is more likely in response to increased demands (increasing populations) and not so much in response to enhanced or maintained recreational conditions on ONF.

Indirect effects associated with the **Silviculture** Program, excluding **Salvage Sales**, and **Structural Diversity Improvement Activity** would be the enhancement of forest stand

conditions over time and a likely improvement in the quality of late-successional habitat for the spotted owl and other species.

Indirect effects associated with **Hazard Tree Removal** and **Salvage Sales** would be the likely removal of downed wood for fuelwood collection that may have localized impacts to small mammal populations that may be prey species for the spotted owl. These Activities are not likely to increase forest fragmentation which can result in increased predation rates given the locality of these trees adjacent to heavily used and already disturbed areas and the localized impact of 1 or 2 trees being felled in an area.

There are no other anticipated indirect effects associated with other Programs or Activities.

Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation. The effects of ONF authorizing activities under the **Lands and Special Uses** and **Special Forest Products** Programs have been analyzed under the Effects of the Action. For **Tailhold Permits and Road Easements**, however, only the effects on federal lands were analyzed. The potential effects of logging adjoining nonfederal lands on federally listed species was not analyzed in this BO and would, therefore, require separate ESA coverage, as appropriate. Therefore, there are no anticipated interrelated or interdependent actions affecting the spotted owl.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this BO. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Within the Action Area there are 125,867 acres of nonfederal lands that are not subject to provisions of an existing HCP (WDNR and Simpson Timber Company). Although there are 16,246 acres of Tribal lands within the Action Area, the Tribes have historically consulted on their forest management plans and are expected to in the future. Therefore, cumulative effects may occur across 109,621 acres of nonfederal lands within the Action Area. However, not all of these lands provide suitable spotted owl or dispersal habitat. The Programmatic BA (USDA 2003) identified, based on past forest practice applications, up to 500 acres of dispersal habitat may be removed annually from nonfederal lands “adjacent to” ONF. We assume for purposes of this analysis that “adjacent to” is the same as the Action Area. Therefore, we assume there would be the removal of up to 2,500 acres of dispersal habitat on nonfederal lands over the life of the BO.

The loss of dispersal habitat on these nonfederal lands would reduce, but not significantly impair the spotted owl’s ability to disperse across the landscape (Olympic Peninsula). In a 1995 analysis

(Holthausen et al. 1995), it was concluded that it was likely, but not assured, that a stable population of spotted owls would be maintained within portions of ONF and the core area of the ONP in the absence of any nonfederal contribution of habitat. Given the establishment of HCPs on the Olympic Peninsula on nonfederal lands, the 1995 analysis of risk is further strengthened by the demographic and dispersal support on these HCPs lands.

Activities on nonfederal lands (primarily timber harvest) may cumulatively add some level of disturbance to spotted owls on ONF if the spotted owls were in close proximity to the nonfederal operations and the operations occurred during the early breeding season. Assuming: 1) private operations would occur on 40-acre parcels; 2) 12.5 parcels (40-acre areas) would be operated on each year (for a total of 500 acres per year); 3) these operations occurred during the early breeding season; and 4) that the operations would occur adjacent to an active spotted owl nest on federal lands, the cumulative effects would equate to 74 acres of disturbance per year. This figure was derived by determining the area around a 40-acre square given a 65-yard harassment distance (195 feet) and multiplying that area by 12.5 “parcels” per year. Despite this worst-case scenario, when these harassment “acres” are added to those anticipated from the proposed ONF actions, there would essentially be no change in the likelihood of disturbing spotted owls across ONF annually.

EFFECTS OF THE ACTIONS SUMMARY: SPOTTED OWL CRITICAL HABITAT

The following provides an aggregated analysis of all Programs and Activities that are likely to adversely affect spotted owl critical habitat through the implementation of ONF’s 5-year program of work.

Direct Effects

The primary constituent elements for spotted owl critical habitat are nesting, roosting, foraging, and dispersal habitat. The proposed Programs and Activities would result in the loss of 1,638 potential nest trees and trees adjacent to potential nest trees. Although structural elements (large trees) may be removed from within suitable habitat stands, the stand would retain its suitability and function. As identified in Hershey et al. (1998), minor removal of habitat elements does not necessarily preclude use of the area by spotted owls. In addition, the loss of these structural elements (more than 95%) would occur within 150 feet of roads or developed sites reducing their habitat suitability especially for nesting. The loss of large tree structure could, however, reduce future nest site availability and prey species habitat, and result in minor microclimate changes. Given that all but 23 of these trees would come from heavily used areas, their value in terms of future nest sites, flying squirrel habitat, and buffering of edge effects are limited. Although some suitable spotted owl habitat may be degraded through the loss of structural elements (individual large trees), there would be no reduction in suitable spotted owl habitat within CHUs on ONF.

The loss of 193 acres of dispersal habitat for road construction would adversely affect spotted owl critical habitat. This analysis assumes a worst-case scenario that all proposed road construction would occur in spotted owl critical habitat. However, only 47 percent of all dispersal habitat on ONF is contained within CHUs. If we assume all affected dispersal habitat was removed from

CHUs this would equate to approximately 0.3 percent of all available dispersal habitat (excluding suitable habitat). If we evaluate this loss from available dispersal plus suitable habitat (which by definition provides dispersal habitat) the impact of the loss of 193 acres of dispersal habitat from CHUs would represent approximately a 0.1 percent loss. If the 193 acres of dispersal habitat was removed from the CHU with the least amount of suitable and dispersal habitat (CHU WA-44) it would represent a loss of approximately 6 percent of available dispersal plus suitable habitat in that CHU. At a landscape level, the loss of 193 acres of dispersal habitat would result in greater than 69 percent of the CHUs on ONF providing suitable and dispersal habitat. Based on the 50-11-40 Rule (Thomas et al. 1990), this suggests that dispersal capabilities among and between CHUs would not be impaired by the proposed action in that at least 50 percent of the landscape provides for dispersal. In fact 66 percent of the ONF would provide dispersal functions after the implementation of all proposed activities. In addition, the loss of dispersal habitat through the construction of roads would likely occur in short segments and would be linear in nature. Spotted owls do not necessarily avoid crossing small openings such as road corridors when dispersing. Given the relatively small impact of these road segments, road construction is not expected to appreciably influence spotted owl dispersal patterns across the ONF.

Indirect Effects

Indirect effects “are caused by or result from the proposed action, are later in time, and are reasonably certain to occur” (USDI and USDC 1998). Indirect effects associated with the **Silviculture Program**, excluding **Salvage Sales**, and **Structural Diversity Improvement Activity** would be the enhancement of forest stand conditions over time and a likely improvement in the quality of late-successional habitat for the spotted owl and other species.

Indirect effects associated with **Hazard Tree Removal** and **Salvage Sales** would be the likely removal of downed wood for fuelwood collection which may have localized impacts to small mammal populations that may be prey species for the spotted owl.

There are no other anticipated indirect effects to spotted owl critical habitat associated with other Programs or Activities.

Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation. The effects of ONF authorizing activities under the **Lands and Special Uses, Special Forest Products, Tailhold Permits, and Road Easements** as they relate to effects on federal lands have been analyzed under the Effects of the Action. Since spotted owl critical habitat was not designated on nonfederal lands, there are no Interrelated and Interdependent Actions that would occur on nonfederal lands.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this BO. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Nonfederal lands were not designated as spotted owl critical habitat, therefore cumulative effects to spotted owl critical habitat would not occur.

CONCLUSION: SPOTTED OWL AND SPOTTED OWL CRITICAL HABITAT

After reviewing the current status of the spotted owl, the environmental baseline for the Action Area, the effects of the proposed actions, and the cumulative effects, it is the biological opinion of FWS that the action, as proposed, is not likely to jeopardize the continued existence of the spotted owl and is not likely to destroy or adversely modify designated critical habitat.

Spotted Owl

The ONF's proposed Programs and Activities are not likely to jeopardize the continued existence of the spotted owl for the following reasons. 1) The proposed action would not result in the loss of suitable spotted owl habitat. 2) No known occupied nest sites would be removed. 3) The proposed action would only result in the degradation of suitable stand conditions through the removal of individual, large (larger than 21 inch dbh) trees, but not to the degree that the functionality of the stand would be reduced. 4) The removal of trees is not likely to remove any tree actively being used as a nest tree. 5) The conservation strategy in the NWFP (i.e., LSRs and dispersal capability between and among LSRs) would continue to function at baseline conditions given no loss of suitable habitat and only minor losses of dispersal habitat. 6) Proposed stand-management actions would be designed to enhance the function of LSRs and dispersal habitat in a shorter period of time than would occur under a non-managed scenario. 7) Approximately one pair of spotted owls may be subjected to harassment annually over the life of the BO. We anticipate that all spotted owls that are harassed by these activities would survive without any permanent negative effects. 8) We do not anticipate that any active spotted owl nest would be cut as part of these activities. 9) The cumulative loss of dispersal habitat on nonfederal lands within the Action Area would not significantly impair the spotted owl's ability to disperse across the Olympic Peninsula.

Given the above analysis and conclusions, the distribution and numbers of breeding spotted owls in the ONF would not be affected. The FEMAT assessed the likelihood of survival with implementation of the NWFP as being 83 percent over 100 years. In addition, in a 1995 analysis (Holthausen et al. 1995), it was concluded that it was likely, but not assured, that a stable population of spotted owls would be maintained within portions of ONF and the core area of the ONP in the absence of any nonfederal contribution of habitat. Given existing HCPs on nonfederal lands, this assurance is further strengthened by demographic and dispersal support from HCPs lands on the Olympic Peninsula. Therefore, we conclude that the proposed action is not likely to preclude the survival and recovery of the spotted owl.

Spotted Owl Critical Habitat

The proposed action would result in the degradation of suitable stand conditions through the removal of large (larger than 21 inch dbh) trees, but not to the degree that the functionality of the stands would be reduced. Although some suitable spotted owl habitat may be degraded through the loss of structural elements, there would be no reduction in the quantity of spotted owl habitat within critical habitat on ONF. Although 193 acres of dispersal habitat may be removed from critical habitat due to road construction activities this would occur in small isolated patches that would not appreciably affect dispersal habitat functions within individual CHUs. There would remain greater than 69 percent of all available dispersal plus suitable spotted owl habitat in the CHUs within the ONF, which would be sufficient to maintain dispersal function between CHUs across the Peninsula. In addition, there would remain greater than 66 percent of all available dispersal plus suitable spotted owl habitat within the ONF, which would be sufficient to maintain dispersal function across the Peninsula. Therefore, the proposed actions would not destroy or adversely modify spotted owl critical habitat.

EFFECTS OF THE ACTIONS SUMMARY: MARBLED MURRELET

The following provides an aggregated analysis of all Programs and Activities that are likely to adversely affect the murrelet through the implementation of ONF's 5-year program of work.

Direct Effects

Impacts from Collision

The extension of existing towers for **Communication/Weather Sites** may result in murrelet injuries or death as a result of collisions with the tower; no new towers would be constructed. Murrelets have died as a result of flying into powerlines (USDI 1997). Communication sites are usually placed at the highest point possible, usually on ridge tops, and are quite prominent. Collisions of birds with towers, transmission lines, and associated structures are more likely when structures are tall (greater than 200 feet), guy wires are used, structures are lit, and structures are located in areas where birds are likely to congregate or pass (Manville 2000). The FWS "Interim Guidance (September 14, 2000) For Recommendations On Communications Tower Siting, Construction, Operation and Decommissioning" (FWS 2000 Interim Guidance) (USDI 2000c) recommends as the most effective way to reduce bird collisions is to collocate communication equipment on existing towers.

The proposed extension of communication towers would be collocated with existing structures and requires Level 1 review. All existing structures are less than 200 feet in height, are not lit, and three structures have guy wires but these structures are less than 80 feet tall. Level 1 site-specific review of proposed tower extensions would use the FWS 2000 Interim Guidance to identify means to minimize potential impacts to murrelets.

Based on radar tracking of murrelets on the Olympic Peninsula, murrelets follow valley bottoms and go around prominent ridges when approaching or departing their nest sites (B. Cooper, ABR, Inc., pers. comm. 7 Jul 2003.). Given the murrelet's characteristic flight patterns and the type of communication structures to be approved under this Program, it is not likely that murrelets will be killed or injured as a result of extending communication towers. New construction of towers or extension of towers that do not meet the FWS's 2000 Interim Guidance and pose a threat to murrelets are not analyzed in this BO and would require separate consultation.

Impacts from Removal of Habitat Components

Loss of Stands of Suitable-Habitat

As per the "Conservation Measures for Murrelets," no Program or Activity may result in the loss of a suitable habitat stand. Therefore, there is no anticipated loss of habitat acreage within any murrelet nest site or any land allocation, especially LSRs, as a result of the proposed actions. The functionality of LSRs would not be impaired by these actions.

Degradation of Stands of Suitable Habitat

A total of 1,638 trees at least 21" dbh may be removed as part of this 5-year BO. This removal may result in the degradation of some stands.

Loss of Individual Nest-Potential Trees

No known occupied nest trees may be felled. Therefore, the Programs and Activities may only result in the loss of habitat components such as individual large trees or snags. Of concern is the loss of potential nest trees or large trees adjacent to potential nest trees. A potential nest tree does not mean that it is a nest tree; just that it has the structural elements (large limbs, mistletoe brooms, etc.) that provide for nesting. In the BA, a potential nest tree was defined as a tree 21 inches dbh or greater, that is located within suitable habitat. Appendix G identifies the Programs and Activities that are anticipated to remove potential nest trees or trees adjacent to potential nest trees and the number of such trees per Program and Activity.

Murrelet nest tree characteristics were described in USDI (1997) as being located in old-growth or mature trees that are greater than 30 inches dbh. The average nest tree diameter in the Pacific Northwest and British Columbia was 63 inches, with the smallest nest tree being 24 inches dbh in British Columbia. Trees must have large branches or deformities for nest platforms, including debris platforms created by mistletoe infestations. Murrelet nest trees occur in stands dominated by Douglas-fir, western hemlock, and Sitka spruce in Washington and Oregon. Eighty-one

percent of all nests in the Pacific Northwest and British Columbia had greater than or equal to 75 percent overhead cover. The murrelet Recovery Plan (USDI 1997) defines a potential nest tree as a large tree, generally more than 32 inches dbh with potential platforms or deformities.

Given the conservative definition in the BA that a potential nest tree is any tree greater than or equal to 21 inches dbh for purposes of this consultation, the number of potential nest trees to be removed is likely an overestimate. In addition, all but 23 potential nest trees associated with **Trail Bridge Re/Construction** and **Tribal Requests** would be felled along roads and in high human-use areas (**Hazard Tree Removal** and **Road Decommissioning**). Trees required for **Trail Bridge Re/Construction** range from 18-35 inches dbh. These tree sizes are less than the average diameter for a murrelet nest tree (63 inches), reducing the likelihood that selected trees would be actual nest trees. For **Tribal Requests**, up to 15 potential nest trees may be removed. However, if the Tribe selects a tree from within suitable habitat, an ONF biologist will survey the area to determine if there are any signs of occupancy. If there are signs of occupancy, tree removal would be prohibited. Based on this conservation measure, we assume **Tribal Requests** would not result in the loss of an actual nest tree.

For the remaining potential nest trees associated with **Road Decommissioning** and **Hazard Tree Removal**, they all would occur along roads or in developed sites with high human use. Nelson and Hamer (1995b, as cited in USDI 1997) found that successful murrelet nests were significantly farther from edges (such as roads and forest openings) than unsuccessful nests, and cover directly around the nest was significantly greater at successful nests than unsuccessful nests. Murrelets experience high predation rates. Possible explanations for this include the fact that populations of murrelet predators, such as corvids (jays, ravens, and crows), are increasing in response to habitat changes and food sources provided by humans (USDI 1997). In addition, the creation of forest edge habitat (such as from the construction of roads and timber harvest operations) may increase the vulnerability of murrelet nests to predation (USDI 1997). However, a small number of murrelets have been recorded successfully nesting in high human-use areas.

The loss of an actual nest tree would be considered a significant disruption in the breeding activity of murrelets. However, murrelets appear to select new nest sites from year to year as a possible adaptation to reduce predation (USDI 1997). Therefore, it is assumed that the murrelet pair would find an alternate nest site the following breeding season.

Loss of Individual Murrelets Due to Cutting of Active Nest Trees

We estimated the expected number of trees with a nesting murrelet to be cut down as part of this 5-year BO through the **Trail Bridge Re/Construction, Tribal Requests, Hazard Tree Removal** and **Road Decommissioning Programs** (Appendix 2). Our conservative approximation yielded 0.4 of a tree, which means that we anticipate that it is unlikely to occur. Therefore, we do not anticipate that any murrelets would be killed when felling trees as part of this consultation.

Impacts from Disturbance

Murrelets may be susceptible to disturbance during the breeding season (Appendix 1). Consequently, the FWS considers activities using heavy equipment, chainsaws, aircraft or blasting during the early breeding period of April 1 to August 5 within specified distances (Appendix 1) to have the potential to significantly disrupt breeding, feeding or sheltering—that is, result in harassment.

We anticipate that 7,885 total acres, or 1.2 percent of the total acres, in ONF would be subjected to harassment-level activity levels during the early breeding season due to the proposed Program and Activities (Appendix G). The vast majority of these acres would be in areas currently receiving high ambient human activity such as along roads and in recreational areas. Assuming even distribution of occupied, suitable habitat throughout ONF, we expect that 1.2 percent of occupied habitat and 1.2 percent of nesting murrelets would be harassed annually over the life of this BO. We estimate that there are 1,051 pairs of murrelets in ONF (Appendix 2), so we estimate that approximately 13 pairs of murrelets ($1051 \times 1.2\% = 13$) could be harassed annually during the early breeding season by projects covered in this BO. We believe that the actual number of pairs of murrelets that would be harassed could be lower than that, due to the expected attenuation of effects within the harassment distances.

As presented in Appendix 1, the effects of harassment are defined as adult flushes from the nest and missed feedings of chicks. We anticipate that the effects of harassment in this consultation will be one-time occurrences for individual murrelets because murrelets are most active during dawn and dusk, and the activities will not be conducted during the 2-hour dawn and 2-hour dusk periods during the murrelet breeding season. We assume that young murrelets can miss a feeding without dying or suffering significant nutritional deprivation, and we expect that adult murrelets can flush from the nest without crushing their eggs or hurting their young. Since we expect that these harassments would be one-time occurrences to individual murrelets, and that murrelets can sustain such harassment without permanent injury, we anticipate that all murrelets that are harassed by these activities would survive without any permanent negative effects

Indirect Effects

Indirect effects “are caused by or result from the proposed action, are later in time, and are reasonably certain to occur” (USDI and USDC 1998). Indirect effects from the **Recreation Management, Administrative Facilities Maintenance, Transportation System Construction/ Reconstruction and Lands and Special Uses** Programs may result in a negligible increase in forest users. However, given these proposed Program Activities have limited new development associated with **New Site Creation, Trail Construction, and Road Construction/ Reconstruction** any increases in forest users is more likely in response to increased demands (increasing populations) and not so much in response to enhanced or maintained recreational conditions on the ONF.

Indirect effects associated with the **Silviculture** Program, excluding **Salvage Sales**, and **Structural Diversity Improvement Activity** would be the enhancement of forest stand

conditions over time and a likely improvement in the quality of late-successional habitat for the murrelet and other species.

Although predation by corvids is a significant threat to murrelets, the majority of activities covered in this BO are not anticipated to influence corvid populations or distribution. The majority of Programs and Activities would not generate concentrated human activity or associated garbage in an area that would attract corvids to the site. In addition, the Programs and Activities which may influence forest stands, such as **Hazard Tree Removal**, are not anticipated to increase forest fragmentation given their locality within already heavily used and fragmented areas. These Programs and Activities are not expected to appreciably influence forest stands to the point that corvid predation would increase over baseline conditions. Although it is anticipated there may be a negligible increase in forest users due to the **Recreation Management, Administrative Facilities Maintenance, Transportation System Construction/ Reconstruction and Lands and Special Uses** Programs and the limited new development associated with **New Site Creation, Trail Construction, and Road Construction/ Reconstruction**, these anticipated increases in forest users is more likely to be in response to increased demands (increasing populations) and not so much in response to enhanced or maintained recreational conditions on the ONF. With the exception of **New Site Creations** (parking lots, toilets, picnic tables), these recreation Programs and Activities are not expected to contribute to an increased corvid population over existing levels given no increased capacity for forest users and an active refuse program. **New Site Creations** could attract corvids to an area not currently receiving high corvid use. As a result, **New Site Creations** require Level 1 review to ensure site location minimizes the potential risk of corvid predation on nearby murrelet nests and proper maintenance of the sites will occur to minimize attracting corvids to the sites. There are no other anticipated indirect effects associated with other Programs or Activities.

Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation. The effects of the ONF authorizing activities under the **Lands and Special Uses** and **Special Forest Products** Programs have been analyzed under the Effects of the Action. For **Tailhold Permits and Road Easements**, however, only the effects on federal lands were analyzed. The potential effects of logging adjoining nonfederal lands on federally listed species was not analyzed in this BO and would therefore require separate ESA consultation, as appropriate. Therefore, there are no anticipated interrelated or interdependent actions that may affect murrelets.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this BO. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Within the Action Area there are 125,867 acres of nonfederal lands that are not subject to provisions of an existing HCP. Although there are 16,246 acres of Tribal lands within the Action Area, the Tribes have historically consulted on their forest management plans and are expected to in the future. Therefore, cumulative effects may occur across 109,621 acres of nonfederal lands within the Action Area. However, not all of these lands provide suitable murrelet habitat. The BA identified, based on past forest practice applications, that up to 500 acres of spotted owl dispersal habitat may be removed annually from nonfederal lands “adjacent to” the ONF. We assume for purposes of analysis that “adjacent to” is the same as the Action Area. Since spotted owl dispersal habitat is not considered to provide suitable murrelet habitat, we assume there would be no cumulative effects to murrelets through the loss or degradation of habitat.

Activities on nonfederal lands (primarily timber harvest) may cumulatively add some level of harassment to murrelets on the ONF if the operation occurred during the early breeding season and it occurred within the appropriate harassment distance to a nesting pair of murrelets. Assuming: 1) private operations would occur on 40-acre parcels; 2) 12.5 parcels (40 acre areas) would be operated on each year (for a total of 500 acres per year); 3) these operations occurred during the early breeding season; and 4) that the operations would occur adjacent to an active murrelet nest on federal lands, the cumulative effects would equate to 51 acres of disturbance per year. This figure was derived by determining the area around a 40-acre square given a 45 yard disturbance distance (135 feet) and multiplying that area by 12.5 “parcels” per year. Despite this worst-case scenario, when these disturbance “acres” are added to those anticipated from the proposed action, there would essentially be no detectable change in the likelihood of disturbing nesting murrelets across the ONF annually.

EFFECTS OF THE ACTIONS SUMMARY: MARBLED MURRELET CRITICAL HABITAT

The following provides an aggregated analysis of all Programs and Activities that are likely to adversely affect murrelet critical habitat through the implementation of the ONF’s 5-year program of work.

Direct Effects

The primary constituent elements for murrelet critical habitat are: 1) trees with platforms suitable for murrelet nesting; 2) stands within one-half mile of individual trees with suitable platforms, and with a canopy height of at least one-half the site potential tree height (USDI 1995). The proposed Program and Activities would result in the loss of at least 1,638 individual large (\geq 21 inches dbh) trees (including potential nest trees). Although structural elements (large trees) may be removed from within suitable habitat stands, the stand would retain its suitability and function. In addition, the loss of these structural elements (more than 95%) would occur within 150 feet of roads or developed sites reducing their habitat suitability due to greater susceptibility of nest predation. Murrelet critical habitat would be adversely affected through the loss of trees with platforms suitable for murrelet nesting. It is anticipated, however, that no more than one actual nest tree would be lost. And, although suitable murrelet habitat would be degraded through the loss of structural elements (large trees), these impacts would not result in any reduction in

available stands within one-half mile of individual trees with suitable platforms, and with a canopy height of at least one-half the site potential tree height within murrelet CHUs on the ONF.

Indirect Effects

Indirect effects “are caused by or result from the proposed action, are later in time, and are reasonably certain to occur” (USDI and USDC 1998). Indirect effects associated with the **Silviculture** Program, excluding **Salvage Sales**, and **Structural Diversity Improvement Activity** would be the enhancement of forest stand conditions over time and a likely improvement in the quality of late-successional habitat for the murrelet and other species.

There are no other anticipated indirect effects associated with other Programs or Activities.

Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation. The effects of the ONF authorizing activities under the **Lands and Special Uses, Special Forest Products, Tailhold Permits, and Road Easements** as they relate to federal lands have been analyzed under the Effects of the Action. The potential effects of logging adjoining nonfederal lands which are designated as murrelet critical habitat were not analyzed in this BO and would therefore require separate ESA consultation, as appropriate. Therefore, there are no anticipated interrelated or interdependent actions that may affect murrelet critical habitat.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this Biological Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Within the Action Area there are 2,467 acres of murrelet critical habitat on nonfederal lands that are not subject to provisions of an existing HCP. There have been no recent Timber Harvest Plans filed with the WDNR to harvest within murrelet critical habitat on nonfederal lands in the action area (J. Springer, WDNR, pers. comm., July 2003). We assume previous Timber Harvest Plans submitted in 2000 and 2001 for harvest in murrelet critical habitat have been logged and were therefore considered in the environmental baseline. As a result, we do not anticipate any cumulative effects to murrelet critical habitat.

CONCLUSION: MARBLED MURRELET AND MARBLED MURRELET CRITICAL HABITAT

After reviewing the current status of the murrelet, the environmental baseline for the Action Area, the effects of the proposed actions, and the cumulative effects, it is the biological opinion of FWS that the action, as proposed, is not likely to jeopardize the continued existence of the murrelet and is not likely to destroy or adversely modify designated critical habitat.

Marbled Murrelet

The ONF's proposed Programs and Activities are not likely to jeopardize the continued existence of the murrelet for the following reasons. 1) The proposed action would not result in the loss of suitable murrelet habitat. 2) No known occupied nest sites would be removed. 3) The proposed action would only result in the degradation of suitable stand conditions through the removal of individual, large (larger than 21 inch dbh) trees, but not to the degree that the functionality of the stand would be reduced. 4) The removal of trees is not likely to remove any tree actively being used as a nest tree. 5) The conservation strategy in the NWFP (i.e., LSRs and dispersal capability between and among LSRs) would continue to function at baseline conditions given no loss of suitable habitat and only minor losses of dispersal habitat. 6) Proposed stand-management actions would be designed to enhance the function of LSRs and dispersal habitat in a shorter period of time than would occur under a non-managed scenario. 7) Approximately 13 pairs of murrelets may be subjected to harassment annually over the life of the BO. We anticipate that all murrelets that are harassed by these activities would survive without any permanent negative effects. 8) We do not anticipate that any active murrelet nest would be cut as part of these activities.

Within Recovery Zones 1 and 2, the Final Recovery Plan considered the following lands as being essential for the recovery of the murrelet: 1) any suitable habitat in an LSR; 2) all suitable habitat in the Olympic AMA, 3) suitable habitat on State lands within 40 miles of the Coast, and 4) habitat within occupied murrelet sites on private lands. The proposed action would not affect state or private lands within these Recovery Zones. However, the proposed actions may affect suitable habitat within LSRs and the Olympic AMA. The proposed actions would degrade, through the loss of hazard trees, suitable habitat, but not to the degree that the affected stand would no longer provide suitable habitat. As per the Final Recovery Plan for the Marbled Murrelet (USDI 1997), "land uses strategies that retain mature/old-growth forest characteristics and minimize fragmentation of forest stands may avoid taking marbled murrelets in some cases. Modification of suitable but unsurveyed habitat also may pose a significant risk of take, but the risk will vary depending on habitat quality and location. Retention of habitat characteristics such as stand size, canopy closure, and horizontal structure may avoid or minimize impacts to nesting marbled murrelets." The proposed action would not affect stand size, and would only minimally affect canopy closure and horizontal structure through the removal of hazard trees. Based on the location and quality of habitat to be affected, i.e. along roads and in developed areas, the risk to the species and the function of the LSRs and AMA is minimal and does not rise to the level of jeopardizing the species.

Given the above analysis and conclusions, the distribution and numbers of breeding murrelets in the ONF would not be affected. Therefore, we conclude that the proposed action is not likely to preclude the survival and recovery of the murrelet.

Marbled Murrelet Critical Habitat

The proposed action would result in the degradation of suitable stand conditions through the removal of large (≥ 21 inch dbh) trees, but not to the degree that the functionality of the stands would be reduced. It is anticipated that no more than one nest tree may be removed as a result of these actions. Therefore, although some suitable murrelet habitat may be degraded through the loss of structural elements, there would be no reduction in the quantity of murrelet habitat within critical habitat on ONF. There are no anticipated cumulative effects to murrelet critical habitat in the Action Area. Therefore, the proposed actions would not destroy or adversely modify murrelet critical habitat.

INCIDENTAL TAKE STATEMENT: SPOTTED OWLS AND MURRELETS

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by FWS as an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Harass is defined by FWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by ONF so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. ONF has a continuing duty to regulate the activity covered by this incidental take statement. If ONF (1) fails to assume and implement the terms and conditions or (2) fails to require a contractor, applicant, agent, lessee, permittee, licensee, purchaser, or right-of-way grantee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the contract, permit, or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, ONF must report the progress of the action and its impact on the species to FWS as specified in the incidental take statement (50 CFR §402.14(i)(3)).

To the extent that this statement concludes that take of any threatened or endangered species of migratory bird listed in 50 CFR 10.13 will result from the agency action for which consultation is being made, FWS will not consider such take to be a violation under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-711), if such take is in compliance with the terms and conditions (including amount and/or numbers) specified herein.

AMOUNT OR EXTENT OF TAKE: SPOTTED OWL

FWS anticipates that no spotted owls will be taken in the form of harm, either directly or indirectly, as a result of this proposed action. FWS anticipates that one pair of spotted owls could be subjected to incidental take due to harassment annually during this 5-year BO.

Effect of the Take

In the accompanying BO, FWS determined that this level of anticipated take is not likely to result in jeopardy to the spotted owl or destruction or adverse modification of spotted owl critical habitat.

AMOUNT OR EXTENT OF TAKE: MARBLED MURRELET

FWS anticipates that no murrelets will be taken in the form of harm, either directly or indirectly, as a result of this proposed action. FWS anticipates that 13 pairs of murrelets could be subjected to incidental take due to harassment annually during this 5-year BO.

Effect of the Take

In the accompanying BO, FWS determined that this level of anticipated take is not likely to result in jeopardy to the murrelet or destruction or adverse modification of murrelet critical habitat.

REASONABLE AND PRUDENT MEASURES: SPOTTED OWLS AND MURRELETS

FWS believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of spotted owls and murrelets:

1. Minimize risk of adverse effects to spotted owls and murrelets.
2. Monitor Project implementation and compliance with the Conservation Measures.
3. Incorporate results of monitoring into management practices.

TERMS AND CONDITIONS: SPOTTED OWLS AND MURRELETS

In order to be exempt from the prohibitions of section 9 of the ESA, ONF must comply with the following terms and conditions, in addition to the conservation measures listed above, all of which implement the reasonable and prudent measures described above. Terms and conditions are non-discretionary.

1. Do not implement noise-generating Programs and Activities within injury-threshold distances (Appendix 1; Table G) during the early breeding season of any *known* spotted owl or murrelet nest site.
2. Review available information from monitoring and applicable investigations regarding spotted owls and murrelets. Apply this information in an adaptive-management approach to conservation measures, effect determinations, and other considerations regarding spotted owls and murrelets.
3. Notify FWS within 3 working days upon locating a dead, injured or sick endangered or threatened species specimen. Initial notification must be made to the nearest FWS Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Contact FWS Law Enforcement Office at (425) 883-8122, or the Western Washington Fish and Wildlife Office at (360) 753-9440.

CONSERVATION RECOMMENDATIONS: SPOTTED OWLS AND MURRELETS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purpose of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. FWS provides the following recommendations:

1. Participate in and support FWS investigation/field studies regarding noise attenuation.
 - a. Identify and rank the most-common project types for which noise disturbance is a consideration.
 - b. Assist in identifying individual projects for which noise attenuation can be measured.
 - c. Assign a contact person to work with FWS personnel in transferring information.
2. Develop and maintain a spatially explicit database which can track activities conducted and distribution of adverse effects through space and time. This database can be used to maintain a running tally of implemented projects and ensure anticipated levels of incidental take are not unknowingly exceeded.
3. Participate in and support murrelet and spotted owl research occurring on ONF and in adjacent Olympic Experimental State Forest and Olympic National Park.

4. Be especially vigilant in ensuring that food and food trash are secured and removed from the forest so that corvids are not fed by or attracted to people.
5. Reduce the potential for collisions by following best management practices for communication towers. Avoid tall structures, especially those over 200 feet tall. Eliminate, reduce, or visually mark guy wires. Avoid known concentration areas of murrelets or locations that are either near habitat or have a high likelihood to be in the flight-path of murrelets. Avoid areas with a high incidence of low clouds and fog. Down-shield area lights. Remove unused towers.

In order for FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, FWS requests notification of the implementation of the conservation recommendation.

REINITIATION NOTICE

This concludes formal and informal consultation on the action outlined in the Programmatic BA (USDA 2003). As provided in 50 CFR §402.16, reinitiation of consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this BO; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not considered in this BO; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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Abbreviations used:

CDF is California Department of Forestry and Fire Protection

ODF is Oregon Department of Forestry

USDA is U.S. Department of Agriculture

USDC is U.S. Department of Commerce

USDI is U.S. Department of the Interior

US DOT is U.S. Department of Transportation

WDFW is Washington Department of Fish and Wildlife

WDW is Washington Department of Wildlife

WFPB is Washington Forestry Practices Board

WOFM is Washington Office of Financial Management

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APPENDICES (lettered appendices are as ordered in USDA 2003)

Appendix A. Project Consistency Evaluation Form (begins on next page)

APPENDIX A: PROJECT CONSISTENCY EVALUATION FORM - Part I
Olympic National Forest Programmatic Biological Assessment

*****MUST INCLUDE A MAP OR PROJECT WILL NOT BE COVERED*****

Project Name: _____ District _____ Project Size (Acres or _____)
Watershed(s) and Hydrologic Unit Code(s) **See Table A** _____
Legal Description (T/R/S): _____ Project _____
Program Area (from programmatic BA): _____
Project Type (from program descriptions in BA): _____

Vegetation type: Forested _____ Road prism _____ Riparian _____ Wetland _____
(acres or % of project area) ****You can have 100% in more than one vegetation type (ERFO may be Road Prism and**

Current canopy closure estimate (if trees present): _____
Will trees be felled/removed/modified? _____ If yes, number, size, and species: _____
How many trees greater than or equal to 21" dbh will be felled? _____
Number of hazard trees \geq 21" dbh to be felled? _____

Will other vegetation be modified? _____ Estimate how much and which species? _____

Will the project be ground disturbing _____ If yes, size of area disturbed (acres): _____
Does project have the potential to affect a waterbody (Y/N)? _____ If yes, name: _____
If yes, have you incorporated the terms of the HPA (Y/N)? _____

Land Allocations (acres or % of project) LSR: _____ AMA: _____ Riparian
Matrix: _____ Administratively Withdrawn: _____ Congressionally Withdrawn: _____

Is project consistent with: NWFP (Y/N)? _____ Olympic LRMP (Y/N)? _____
Watershed Analysis (Y/N)? _____
LSR Assessment (Y/N)? _____

NEPA Type? _____ Expected NEPA Decision Date: _____
Scheduled implementation dates (months for operation in each year): Start _____ End _____
Expected project duration (# days/months): _____ Fiscal years in which project will occur: _____

Equipment Use: Equipment Type (from Table A) _____ Start and End Dates _____ Frequency of Use _____
See Table B below

Brief Project Description: Please describe the purpose, scope, and extent of the project; type of work involved; project prescriptions; and specific design features incorporated to minimize adverse impacts to species or habitats. Include associated work (ie road building for a timber sale or bucking and hauling logs for a fish structure) and other pertinent information not covered above.

TABLE A - Olympic National Forest 5th-Field Watersheds and HUC Codes

WATERSHED	HUC	WATERSHED	HUC
Hood Canal RD		Pacific RD	
Big Quilcene River	1711001803	Bogachiel River Lower	1710010113
Discovery Bay	1711002001	Bogachiel River Upper	1710010112
Dosewallips River	1711001804	Calawah River	1710010111
Duckabush River	1711001805	Calawah River North Fork	1710010109
Dungeness River Lower	1711002005	Calawah River South Fork	1710010110
Dungeness River Upper	1711002004	Clallam River	1711002105
Grey Wolf River	1711002003	Clearwater River Upper	1710010203
Hamma Hamma River	1711001807	East Twin/West Twin/Deep Creeks	1711002103
Hood Canal West Shore Lower	1711001806	Elwha River Lower	1711002011
Hood Canal West Shore Upper	1711001801	Hoh River Middle	1710010118
Little Quilcene River	1711001802	Hoko River	1711002106
McDonald/Siebert Creek	1711002006	Humptulips River East Fork	1710010502
Satsop River East Fork	1710010404	Humptulips River West Fork	1710010501
Satsop River Middle Fork	1710010406	Humptulips River/Stevens Creek	1710010503
Satsop River West Fork	1710010407	Lyre River	1711002102
Sequim Bay	1711002002	Pysht River	1711002104
Skokomish River North Fork Lower	1711001702	Queets River Lower	1710010207
Skokomish River North Fork Upper	1711001701	Queets River Middle	1710010202
Skokomish River South Fork	1711001703	Queets River/Matheny Creek	1710010205
Wynoochee River Middle	1710010409	Queets River/Salmon River	1710010206
Wynoochee River Upper	1710010408	Quinalt Lake Frontal	1710010211
		Quinalt River Lower	1710010213
		Quinalt River Upper	1710010209
		Quinalt River/Cook Creek	1710010212
		Sol Duc River Lower	1710010114
		Sol Duc River Middle	1710010108
		Sol Duc River Upper	1710010106
		Wishkah River Upper	1710010412

TABLE B - Equipment Types

- Non-motorized Handtools
- Motorized Handtools (includes chainsaws)
- Trail Machinery (includes motorized wheelbarrows, etc.)
- Heavy Equipment
- Aircraft
- Explosives
- Other (specify)

Project Consistency Evaluation Form – Part II
Olympic National Forest Programmatic Biological Assessment

Species Specific Information - Puget Sound Chinook Salmon

1. Is the project in a fifth-field watershed that contains or has the potential to contain P. S. Chinook salmon (Y/N)? _____

If No → What is your basis for this determination? _____

Project will have No Effect on Puget Sound Chinook salmon or designated critical habitat

If Yes → go to question 2.

2. Do the stream(s) in which impacts may occur contain suitable habitat for Puget Sound Chinook? _____

3. How far (approx., in river miles) is project from nearest suitable habitat for Puget Sound Chinook salmon? _____

4. Does the proposed action have the potential to alter or affect the following indicators: temperature, sediment, chemical contamination/nutrients, physical barriers, substrate embeddedness, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, wetted width/depth ratio, streambank condition, floodplain connectivity, peak/base flows, drainage network, road density and location, disturbance history, function of riparian reserves

(use Enclosure A to answer this)? _____

If No → Project will have No Effect on Puget Sound Chinook Salmon or designated critical habitat

If Yes → Use Decision Pathway for Aquatic Effects Determinations to make effects determination, document rationale

Effects Determination: _____

Rationale (based on project info, Enclosure A, and required conservation measures):

Project Conservation Measures (see project descriptions, generate additional measures if necessary):

Submitted by: _____
Fisheries Biologist

Date: _____

Level 1 Approval: _____
NMFS Representative

Forest Service Representative

Project Consistency Evaluation Form – Part II
Olympic National Forest Programmatic Biological Assessment

Species Specific Information - Hood Canal Summer Chum Salmon

1. Is the project in a fifth-field watershed that contains or has the potential to contain H.C. summer chum (Y/N)? _____

If No → What is your basis for this determination? _____

Project will have No Effect on Hood Canal summer chum salmon or designated critical habitat

If Yes → go to question 2.

2. Do the stream(s) in which impacts may occur contain suitable habitat for H.C. summer chum salmon? _____

3. How far (approx., in river miles) is project from nearest suitable habitat for H.C. summer chum salmon? _____

4. Does the proposed action have the potential to alter or affect the following indicators: temperature, sediment, chemical contamination/nutrients, physical barriers, substrate embeddedness, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, wetted width/depth ratio, streambank condition, floodplain connectivity, peak/base flows, drainage network, road density and location, disturbance history, function of riparian reserves
(use Enclosure A to answer this)? _____

If No → Project will have No Effect on Hood Canal summer chum salmon or designated critical habitat

If Yes → Use Decision Pathway for Aquatic Effects Determinations to make effects determination, document rationale

Effects Determination: _____

Rationale (based on project info, Enclosure A, and required conservation measures):

Project Conservation Measures (see project descriptions, generate additional measures if necessary):

Submitted by: _____ Date: _____

Fisheries Biologist

Level 1 Approval: _____

NMFS Representative and Date

Forest Service Representative and Date

ESSENTIAL FISH HABITAT

Project Consistency Evaluation Form – Part II
Olympic National Forest Programmatic Biological Assessment

Species Specific Information - bull trout

1. Is the project in a fifth-field watershed that contains or has the potential to contain bull trout (Y/N)? _____
If No → What is your basis for this determination? _____
Project will have No Effect on bull trout
If Yes → go to question 2.
2. Do the stream(s) in which impacts may occur contain suitable habitat for bull trout? _____
3. How far (approx., in river miles) is project from nearest suitable habitat for bull trout? _____
4. Does the proposed action have the potential to alter or affect the following indicators: subpopulation size, growth and survival, life history diversity and isolation, persistence and genetic integrity, temperature, sediment, chemical contamination/nutrients, physical barriers, substrate embeddedness, large woody debris, pool frequency, pool quality, off-channel habitat, refugia, wetted width/depth ratio, streambank condition, floodplain connectivity, peak/base flows, drainage network, road density and location, disturbance history, function of riparian reserves, disturbance regime, or integration of species and habitat conditions (**use Enclosure A to answer this**)? _____
If No → Project will have No Effect on bull trout
If Yes → Use Decision Pathway for Aquatic Effects Determinations to make effects determination, document rationale

Effects Determination: _____

Rationale (based on project info, Enclosure A, and required conservation measures):

Project Conservation Measures (see project descriptions, generate additional measures if necessary):

Submitted by: _____ Date: _____
Fisheries Biologist

Level 1 Approval: _____
USFWS Representative Forest Service Representative

ENCLOSURE A - Environmental Baseline and Effects of the Proposed Action on Aquatic Indicators at the 5th Field Watershed and Project Action Area Scales.

In the appropriate column(s), mark **S** for short-term impacts (within first year), **L** for long-term impacts (>1 year).

Indicator	BASELINE 5 th Field Watershed Scale			BASELINE Project Action Area Scale			EFFECTS OF ACTION 5 th Field Watershed Scale			EFFECTS OF ACTION Project Action Area Scale		
	Proper Function	At Risk	Unacceptable	Proper Function	At Risk	Unacceptable	Restore	Maintain	Degrade	Restore	Maintain	Degrade
Temperature												
Sediment												
Chemical Contaminants												
Passage Barriers												
Substrate Embeddedness												
Large Woody Debris												
Pool Frequency and Quality												
Large Pools												
Off-channel Habitat												
Refugia												
Width/ Depth Ratio												
Streambank Condition												
Floodplain Connectivity												
Change in Peak/Base Flows												
Drainage Network Increase												
Road Density & Location												
Disturbance History												
Riparian Reserves												
Disturbance Regime (BT)												
Subpopulation Size (BT)												
Growth and Survival (BT)												
Life History Diversity and Isolation (BT)												
Persistence and Genetic Integrity (BT)												
Integration of Species and Habitat Conditions (BT)												

Restore = project is likely to have a beneficial impact on habitat indicator

N/A = project does not have the potential to impact the habitat indicator

Maintain = project may affect indicator, but impact in neutral

(BT) = indicator only to be evaluated for bull trout

Degrade = project is likely to have a negative impact on the habitat indicator

PROJECT CONSISTENCY EVALUATION FORM – Part II
Olympic National Forest Programmatic Biological Assessment

Terrestrial Species Specific Information

Will project produce above ambient noise for setting?: If yes, when?

Northern Spotted Owl:

Nearest known activity center (<0.25 mi./0.25-1.0 mi./>1.0 mi.) _____

Nearest suitable habitat (adjacent/<0.25 mi./0.25-1.0 mi./>1.0 mi.) _____

Habitat surveyed? To protocol? If surveyed, year of surveys and results:

Will project occur during early breeding season? _____ during late _____

How much suitable habitat will be modified? _____ dispersal habitat? _____

Will this suitable habitat be degraded or _____ dispersal habitat? _____

Will this suitable habitat be adversely impacted _____ dispersal habitat? _____

How much suitable habitat will be adversely disturbed by noise within the distance _____

Northern Spotted Owl Critical Habitat:

Percent of project area within _____ Acres of CHU to be modified? _____

Will it impact primary elements _____ If yes, will impacts to CHU be adverse? _____

Marbled Murrelet:

Nearest known site (<0.25 mi./0.25-1.0 mi./>1.0 mi.) _____

Nearest suitable habitat (adjacent/<0.25 mi./0.25-1.0 mi./>1.0 _____

Habitat surveyed? To protocol? If surveyed, year of surveys and results:

Will project occur during early breeding _____ during late season? _____

How much habitat will be modified? _____ Will it be _____

How much suitable habitat will be adversely disturbed by noise within the _____

Marbled Murrelet Critical Habitat:

Percentage of project area in CHU _____ Acres of CHU to be modified _____

Will project impact primary elements? _____ If yes, will impacts to CHU be adverse? _____

Bald Eagle:

Nearest known site (400m/800m/1.0mi/>1.0 _____ Is the project in suitable habitat? _____

Is project within a bald eagle use area? _____ Last survey(s) _____

Will project occur during breeding _____ during wintering season? _____

Is there potential for visual impacts? _____ Is ambient noise level a problem? _____

How much habitat will be modified? _____ Will it be removed/degraded? _____

Additional Information/Explanations (include here what type of bald eagle use area(s) is within 400/800/1 mile of project area; if habitat for any species will be modified and determination is that this modification will not remove or degrade habitat, explain reason for this determination. If suitable and/or dispersal habitat for the spotted owl will be removed or degraded, but the determination is that this removal/degradation will not have an adverse affect on spotted owl habitat in the long-term, explain the reason for this determination):

EFFECTS DETERMINATIONS: (to be filled out and signed by appropriate biologists based on above information)

Is the proposed project consistent with the Programmatic BA? _____
Is Level 1 Team approval required for project to be consistent? _____

If consistent, enter effects determination from BA for species or critical habitat below:

Northern Spotted Owl _____
Marbled Murrelet _____
Bald Eagle _____
Spotted Owl Critical Habitat _____
Marbled Murrelet Critical Habitat _____

Project Conservation Measures:

Submitted by: _____ Date: _____
Wildlife Biologist

Level 1 Approval: _____
USFWS Representative and Date USFS Representative and Date

(Distribution: one copy to project file, copies to Level 1 team)

Appendix C. Threatened and endangered species critical periods

Terrestrial Threatened and Endangered Species Critical Periods

Species	Early Breeding Season	Late Breeding Season	Wintering Season
Spotted Owl	March 1 – July 15	July 16 – September 30	None
Marbled Murrelet	April 1 – August 5	August 6 – September 15	None
Bald Eagle	January 1 – August 15		October 31 – March 15

Timing for Listed Fish Species

STOCK	MIGRATION	SPAWNING	INCUBATION	REARING
Hood Canal RD				
SF Skok. su/fall Chinook	mid-August to October	September to November	September to mid-February	January to July
Hamma Hamma/ Duckabush fall Chinook	August to mid-September	early September to November	Early September to late February	January to July
SF Skok,Hamma, Duckabush summer chum	September to mid October	mid-September to late October	mid-September to mid-February	January to June
SF Skok,Hamma, Duckabush, Bull Trout	mid-June to November	mid-September to mid-December	mid-September to July	year round
Satsop River bull trout	mid-June to November	mid-September to mid-December	mid-September to July	year round
Quilcene RD				
Dungeness/Greywolf sp/su Chinook	mid-May to August	August to mid-October	August to mid-January	mid-December to July
Sequim Bay (JCL /Dungen. R) summer chum	September to mid-October	September to mid-October	September to February	January to June
Discovery Bay (Snow/Salmon) summer chum	September to mid-October	September to mid-October	September to February	January to June
Big Quil, Little Quil fall Chinook	September to mid-October	September to November	September to February	January to July
Dosewallips fall Chinook	August to mid-September	early September to November	early September to mid-February	January to July
Dosewallips, Big Quil, Little Quil summer chum	September to mid-October	mid-September to late October	mid-September to mid-February	January to June
Dosewallips, Big Quil, Little Quil	mid-June to November	mid-September to mid-December	mid-September to June	year round

STOCK	MIGRATION	SPAWNING	INCUBATION	REARING
bull trout				
Dungeness/Greywolf bull trout	mid-June to November	mid-September to mid-December	mid-September to June	year round
Quinault RD				
Queets, Quinault Humptulips Rivers, bull trout	mid-June to November	mid-September to mid-December	mid-September to June	year round
Moclips/Copalis Rivers bull trout	mid-June to November	mid-September to mid-December	mid-September to June	year round
Wynochee River bull trout	mid-June to November	mid-September to mid-December	mid-September to June	year round
Soleduck RD				
Hoh River bull trout	mid-June to November	mid-September to mid-December	mid-September to June	year round

Sources:

NOAA Technical Memorandum, NMFS-NWFSC-32, 1997
NOAA Technical Memorandum, NMFS-NWFSC-35, 1997
Salmon and Steelhead Stock Inventory, Appendix I, 1994
Salmonid Stock Inventory, 1998
Brenkman, Sam, Olympic National Park, pers. comm. 1999.

Appendix F. Summary of effects by project and by species covered by this BO.

Note: LAA determinations may also be NLAA. ^aHarassment through noise-generating activities ≥ 92 dB.

^bHarm through removal of potential nest tree or removal of spotted owl dispersal habitat in CHU.

PROGRAM	NS Owl	NS Owl CHU	Marbled Murrelet	MM CHU	Bald Eagle	Bull Trout
RECREATION MANAGEMENT						
Developed Site Operation & Maintenance	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Dispersed Site Maintenance	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Trail Maintenance	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Trail Relocation, Construction, and Reconstruction	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Trail Bridge/Footlog Maintenance	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Trail Bridge/Footlog Construction and Reconstruction	LAA ^{ab}	LAA	LAA ^{ab}	LAA	NLAA	NLAA
New Recreation Site Creation	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
ADMINISTRATIVE FACILITIES MAINTENANCE	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
HAZARD TREE REMOVAL	LAA ^{ab}	LAA	LAA ^{ab}	LAA	NLAA	NLAA
SILVICULTURAL PROGRAM						
Commercial Thinning & Uneven-aged Mgmt	LAA ^a	LAA	LAA ^a	NLAA	NLAA	NLAA
Salvage Sales	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Pre-Commercial Thinning (PCT)	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Timber Stand Improvement (Non PCT)	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Aerial Fertilization	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Planting	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Cone Collection	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Seed Orchard Operation/Maintenance	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
NOXIOUS WEED CONTROL PROGRAM	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
TRANSPORTATION SYSTEM						

PROGRAM	NS Owl	NS Owl CHU	Marbled Murrelet	MM CHU	Bald Eagle	Bull Trout
Road Reconstruction	LAA ^a	LAA	LAA ^a	NLAA	NLAA	NLAA
Permanent Road Construction	LAA ^a	LAA	LAA ^a	NLAA	NLAA	NLAA
Temporary Road Construction	LAA ^a	LAA	LAA ^a	NLAA	NLAA	NLAA
Bridge Construction/Reconstruction	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Transportation System Repair	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Operation of Rock Sources	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
ROAD MAINTENANCE PROGRAM	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
LANDS & SPECIAL USES						
Road Use & Access Permits	LAA ^a	LAA	LAA ^a	NLAA	NLAA	NLAA
Road/Trail Easements	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Tailhold and Guyline Anchor Permits	LAA ^b	LAA	LAA ^b	LAA	NLAA	NLAA
Linear ROW Operations/Maintenance	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Communication and Weather Sites	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Outfitter Guide Permits	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Developed Facilities Permits	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Recreation Residence Administration	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Research and Monitoring Permits	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Water Withdrawal Permits	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Permits for Other Special Uses	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
LAND LINE SURVEY & BOUNDARY ADJUSTMENTS	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
ADMINISTRATIVE TOURS AND REMOTE SITE INSPECTIONS	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
WASTE CLEANUP ACTIVITIES	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
WATERSHED RESTORATION						
Storm-proofing & Road Drainage Upgrading	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Landslide Stabilization	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA

PROGRAM	NS Owl	NS Owl CHU	Marbled Murrelet	MM CHU	Bald Eagle	Bull Trout
Road Decommissioning and Bridge Removal	LAA ^{ab}	LAA	LAA ^{ab}	LAA	NLAA	NLAA
Instream Aquatic Improvement	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Fish Passage Improvements	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
WILDLIFE & FISH HABITAT MANAGMENT						
Habitat Restoration Activities	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Woody Debris Creation	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Forage Planting	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Inventory & Monitoring of Aquatic & Terrestrial Habitat/Biota	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
FIRE HAZARD REDUCTION	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
OTHER FOREST PRODUCTS						
Bear Grass and Salal Harvest	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Christmas Tree Cutting	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Bough Cutting	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Cutting for Posts and Rails	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Mushroom Picking	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Firewood Collection	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Disposition of Confiscated Materials	LAA ^a	NLAA	LAA ^a	NLAA	NLAA	NLAA
Other Forest Products Requests	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Tribal Request for Ceremonial/Traditional Needs	LAA ^b	LAA	LAA ^b	LAA	NLAA	NLAA

Appendix G. Effects due to annual removal of habitat and disturbance by project type, and amount of adverse effects due to harm and harassment for murrelets and spotted owls (the following 6 pages). Available in separate PDF

Appendices G1-G3. Effect determinations and species-specific conservation measures for the spotted owl, marbled murrelet, and bald eagle

The following tables outline the determination effects for the northern spotted owl, marbled murrelet, and bald eagle by the type of disturbance during the nesting and/or wintering seasons and the associated effects determinations. A list of conservation measures specific to each species will follow the respective table designed to avoid or minimize terrestrial impacts. These conservation measures are to be incorporated into each project to avoid or minimize impacts to species. Application of these conservation measures to specific projects assists in the final determination of effect to each species or its habitat.

Northern Spotted Owl

Appendix G-1. Effects Determinations by Type of Disturbance and Operating Period for Northern Spotted Owl when Occupied Sites and/or Unsurveyed Suitable Habitat Occurs in the Vicinity of the Proposed Work

Type of Disturbance	Operating Period for Project Activities and Associated Effects Determinations for Northern Spotted Owl					
	NE		NLAA		LAA	
	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat
Blasts larger than 2 pounds	10/1-2/28	any	3/1-7/15 ^a	> 1 mile	3/1-7/15	< 1 mile
	7/16-9/30 ^b	> 1 mile	7/16-9/30	< 1 mile		
Blasts less than or equal to 2 pounds	10/1-2/28	any	3/1-7/15	> 120 yards	3/1-7/15	< 120 yards
	7/16-9/30	> 120 yards	7/16-9/30	< 120 yards		
Impact pile drivers, jackhammers, or rock drills	10/1-2/28	any	3/1-7/15	> 60 yards	3/1-7/15	< 60 yards
	7/16-9/30	> 60 yards	7/16-9/30	< 60 yards		
Large-size helicopter (Sikorsky type) or large airplane	10/1-2/28	any	3/1-7/15	> 1 mile	3/1-7/15	< 1 mile
	7/16-9/30	> 1 mile	7/16-9/30	< 1 mile		
Helicopter (Bell Jet Ranger type or single-engine plane)	10/1-2/28	any	3/1-7/15 ^a	> 120 yards	3/1-7/15	< 120 yards
	7/16-9/30	> 120 yards	7/16-9/30 ^b	< 120 yards		

Appendix G-1. Continued.

Type of Disturbance	Operating Period for Project Activities and Associated Effects Determinations for Northern Spotted Owl					
	NE		NLAA		LAA	
	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat
Heavy equipment, motorized tools	10/1-2/28	any	3/1-7/15	> 35 yards	3/1-7/15	< 35 yards
	7/16-9/30	> 35 yards	7/16-9/30	< 35 yards		
Chainsaws falling trees and cutting downed wood	10/1-2/28	any	3/1-7/15	> 65 yards	3/1-7/15	< 65 yards
	7/16-9/30	> 65 yards	7/16-9/30	< 65 yards		
Prescribed burning	10/1-2/28	> 0.25-mile	3/1-7/15	> 0.25-mile	3/1-7/15	< 0.25-mile
			7/16-2/28	< 0.25-mile		

^a March 1 to July 15 (early breeding season)

^b July 16 to September 30 (late breeding season)

Conservation Measures for Spotted Owl

Habitat Removal

- Activities in occupied habitats or unsurveyed habitats for the northern spotted owl will not result in: (a) changing suitable habitat to unsuitable; (b) changing spotted owl dispersal habitat to non-dispersal (*exception includes road use and access permits, realigning small road segments for transportation system repair, and temporary and permanent road construction for commercial thinning activities*); and (c) the significant degradation of habitat for the spotted owl (activities may modify some components of owl habitat such as potential nest trees, logs, snags, mistletoe structure, etc.), but not to a degree that would change the habitat classification, or function of the stand.
- Activities that remove dispersal habitat within designated critical habitat require Level 1 review.

Individual Trees

- Known occupied spotted owl nest trees shall not be removed.
- If hazard tree removal or 'potential nest tree' removal is to be done within suitable owl habitat during the spotted owl early breeding season (March 1 to July 15), review by an ONF wildlife biologist and consultation by Level 1 will be required.
- ONF will require a visual survey in the area immediately after felling the tree to determine if young owls were on the tree. An ONF and FWS wildlife biologist will be notified if occupancy was found.
- When feasible, minimize the number of large conifers (21" dbh or larger) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from suitable habitat if it is possible and safe to do so. If the site does not meet the coarse woody debris requirements for the site, felled trees should be left on site.
- Any removal of dispersal habitat within spotted owl designated critical habitat will require Level 1 review.
- Any proposed removal of any tree larger than 36" dbh within suitable spotted owl habitat will require ONF wildlife biologist review.

Active Nest

- If an active spotted owl nest is found an ONF wildlife biologist will be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances (as outlined in Table G-1) will be prohibited during the early nesting season (March 1 to July 15).

Ground-Level Disturbance

- When feasible, design projects to occur at times of the year and locations that reduce the potential for disturbance to spotted owls.
- When feasible, begin activities in the area farthest from spotted owl suitable habitat when conducting activities that must occur within the adverse-effect threshold distance of suitable habitat during the breeding season.
- When feasible, adjust the location of activities to utilize topographic and vegetative buffers when feasible, where it is necessary to conduct activities that would increase noise levels within the adverse-effect threshold distance of suitable habitat during the

nesting season. Location of activity upslope of suitable habitat is likely to be less severe than locating the activity downslope of suitable habitat.

Aircraft

- During the **early breeding season of the spotted owl (March 1 to July 15)**, aircraft altitude must be 360 feet above the forest canopy (exception for helicopters on direct approach or departure from landing zones, and emergency).
- When feasible, minimize the number of overflights over suitable habitat, minimize the use of the same flight paths or the amount of time hovering over the same suitable habitat during the breeding season.
- When feasible, use the smallest, quietest helicopters that can accomplish the task efficiently and safely.

Blasting: see Appendix M for blasting guidelines

Prescribed Burning

- Burning during the early nesting season for spotted owls (March 1 to July 15) will be conducted 0.25-mile away from suitable nesting habitat.

Conservation Measures for Designated Critical Habitat for Spotted Owl

- Avoid or minimize the removal or modification of nesting, roosting, foraging (suitable habitat), and dispersal habitat.
- Except for issuance of road use and access permits that may authorize road construction through ONF lands to access nonfederal land (dispersal habitat removal), small road systems for transportation system repair, and permanent and temporary road construction to access commercial thinning areas (dispersal habitat removal), activities within critical habitat for the northern spotted owl will not significantly alter, remove, or reduce the constituent elements of critical habitat (either nesting/roosting/foraging or dispersal habitat). In other words, activities will not degrade the structure of the stand so as to change the habitat classifications of those stands or the function of the CHU (i.e., stand will not be reclassified to a lower status; suitable habitat would not be degraded to unsuitable habitat; dispersal habitat would not be degraded to non-dispersal habitat).
- Activities that remove dispersal habitat within designated critical habitat require Level 1 review.

Marbled Murrelet

Appendix G-2. Effects Determinations by Type of Disturbance and Operating Period for Marbled Murrelet when Occupied Sites and/or Unsurveyed Suitable Habitat Occurs in the Vicinity of the Proposed Work

Type of Disturbance	Operating Period for Project Activities and Associated Effects Determinations for Marbled Murrelet					
	NE		NLAA		LAA	
	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat
Blasts larger than 2 pounds	9/16-3/30	any	4/1-8/5 ^a	> 1 mile	4/1-8/5	< 1 mile
	8/6-9/15	> 1 mile	8/6-9/15 ^b	< 1 mile		
Blasts less than or equal to 2 pounds	9/16-3/30	any	4/1-8/5	> 120 yards	4/1-8/5	< 120 yards
	8/6-9/15	> 120 yards	8/6-9/15	< 120 yards		
Impact pile drivers, jackhammers, or rock drills	9/16-3/30	any	4/1-8/5	> 60 yards	4/1-8/5	< 60 yards
	8/6-9/15	> 60 yards	8/6-9/15	< 60 yards		
Large-size helicopter (Sikorsky type) or large airplane	9/16-3/30	any	4/1-8/25	> 1 mile	4/1-8/5	< 1 mile
	8/6-9/15	> 1 mile	8/6-9/15	< 1 mile		
Helicopters (Bell Jet Ranger type) or single-engine airplane	9/16-3/30	any	4/1-8/5	> 120 yards	4/1-8/5	< 120 yards
	8/6-9/15	> 120 yards	8/6-9/15	< 120 yards		

Appendix G-2. Continued.

Type of Disturbance	Operating Period for Project Activities and Associated Effects Determinations for Marbled Murrelet					
	NE		NLAA		LAA	
	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat	Date	Distance from Suitable Habitat
Heavy equipment, motorized tools	9/16-3/30	any	4/1-8/5 ^a	> 35 yards	4/1-8/5	< 35 yards
	8/6-9/15	> 35 yards	8/6-9/15 ^b	< 35 yards		
Chainsaws falling trees and cutting downed wood	9/16-3/30	any	4/1-8/5	> 45 yards	4/1-8/5	< 45 yards
	8/6-9/15	> 45 yards	8/6-9/15	< 45 yards		
Prescribed burning	9/16-3/30	> 0.25-mile	4/1-8/5	> 0.25-mile	4/1-8/5	< 0.25-mile
			8/6- 3/30	< 0.25-mile		

^a April 1 to August 5 (early breeding season)

^b August 6 to September 15 (late breeding season)

Conservation Measures for the Marbled Murrelet

General

- During the marbled murrelet nesting season (April 1 to September 15), **all activities that generate noise above 92 dB** must be scheduled between 2 hours after sunrise and 2 hours before sunset. After August 5, the effect determination will change from LAA to NLAA determination within the harassment distances, but work should still take place outside the two-hour windows.
- Projects located within or adjacent to suitable nesting habitat for marbled murrelets will remove garbage or trash regularly from the project area.

Habitat Removal

- When feasible, avoid or minimize harvest of trees from within 300 feet of suitable murrelet habitat that contributes to the buffering properties of the stand.
- Activities in occupied habitats or unsurveyed habitats for the marbled murrelet will not result in: (a) changing suitable habitat to unsuitable and (b) the significant degradation of habitat for the marbled murrelet (activities may modify some components of murrelet habitat such as potential nest trees, or those trees that provide protection of a potential nest tree) but not to a degree that would change the habitat classification, or function of the stand.

Individual Trees

- Known occupied murrelet nest trees shall not be removed.
- If hazard tree removal or ‘potential nest tree’ removal is to be done within suitable murrelet habitat during the murrelet early breeding season (April 1 to August 5), review by an ONF wildlife biologist and consultation by Level 1 will be required.
- ONF will require a visual survey in the area immediately after felling the tree to determine if young murrelets were on the tree. An ONF and FWS wildlife biologist will be notified if occupancy was found.
- When feasible, minimize the number of large conifers ($\geq 21''$ dbh) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from suitable habitat if it is possible and safe to do so.
- When feasible, avoid or minimize the removal of platforms, trees with platforms, and trees providing cover to platforms even if the stand is currently unoccupied by murrelets.
- Any proposed removal of any tree larger than 36'' dbh within marbled murrelet nesting habitat will require review by an ONF wildlife biologist.

Active Nest

- If an active marbled murrelet nest is found an ONF wildlife biologist will be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances (as outlined in Table G-2) will be prohibited during the early nesting season (April 1 to August 5).

Ground-Level Disturbance

- When feasible, design projects to occur at times of the year and locations that reduce the potential for disturbance to marbled murrelets.

- When feasible, begin activities in the area farthest from marbled murrelet habitat when conducting activities that must occur within the adverse-effect threshold distance of suitable habitat during the breeding season.
- When feasible, adjust the location of activities to utilize topographic and vegetative buffers when feasible, where it is necessary to conduct activities that would increase noise levels within the adverse-effect threshold distance of suitable habitat during the nesting season. Location of activity upslope of suitable habitat is likely to be less severe than locating the activity downslope of suitable habitat.

Aircraft

- During the **early breeding season of the murrelet (April 1 to August 5)**, maintain a minimum flight altitude of 360 feet above the forest canopy (except for helicopters on direct approach and departure from landing zone, and emergency).
- When feasible, minimize the number of overflights over suitable habitat and amount of time hovering over the same amounts of habitat.
- When feasible, utilize the smallest, quietest helicopters that can accomplish the task efficiently and safely.

Blasting: see Appendix M for blasting guidelines

Prescribed Burning

- Burning during the early nesting season for murrelets (April 1 to August 5) will be conducted 0.25-mile away from suitable nesting habitat.

Conservation Measures for Designated Critical Habitat for Marbled Murrelet

- Avoid or minimize impeding the development of murrelet recruitment and buffering habitat, suitable murrelet habitat, primary constituent elements within habitat, and avoid removal of primary constituent element 3 (i.e., stands containing trees that are at least half the site-potential tree height) within 0.5 mile of critical habitat or suitable habitat.
- Avoid or minimize activities that would degrade or impede development of, primary constituent elements in stands adjacent to habitat.

Bald Eagle

Appendix G-3. Effects Determinations by Type of Disturbance and Operating Period for Bald Eagle Use Areas^a

	Operating Period for Project Activities and Associated Effects Determinations for Bald Eagle					
	NE		NLAA		LAA ^b	
Type of Disturbance	Date	Distance from Bald Eagle Use Area	Date	Distance from Bald Eagle Use Area	Date	Distance from Bald Eagle Use Area
Blasts larger than 2 pounds	8/16-10/30	> 1 mile	1/1-8/15 ^c or 10/31-3/15	> 1 mile	1/1-8/15 or 10/31-3/15	< 1 mile
Blasts less than or equal to 2 pounds	8/16-10/30	> 1 mile	1/1-8/15 or 10/31-3/15	> 1 mile	1/1-8/15 or 10/31-3/15	< 1 mile
Impact pile drivers, jackhammers, or rock drills	8/16-10/30	> 0.25 mile	1/1-8/15 or 10/31-3/15	> 0.25-mile	1/1-8/15 or 10/31-3/15	< 0.25-mile

Appendix G-3. Continued.

	Operating Period for Project Activities and Associated Effects Determinations for Bald Eagle					
	NE		NLAA		LAA^b	
Type of Disturbance	Date	Distance from Bald Eagle Use Area	Date	Distance from Bald Eagle Use Area	Date	Distance from Bald Eagle Use Area
Large-size helicopter (Sikorsky type) or large airplane	8/16-10/30	> 1 mile	1/1-8/15 or 10/31-3/15	> 1 mile	1/1-8/15 or 10/31-3/15	< 1 mile
Helicopters (Bell Jet Ranger type) or single-engine airplane	8/16-10/30	> 1 mile	1/1-8/15 or 10/31-3/15	> 1 mile	1/1-8/15 or 10/31-3/15	< 1 mile
Heavy equipment and motorized tools	8/16-10/30	>0.25-mile no line-of-sight or >0.50-mile line-of-sight				
			1/1-8/15 or 10/31-3/15	>0.25-mile no line-of-sight or >0.50-mile line-of-sight	1/1-8/15 or 10/31-3/15	<0.25-mile no line-of-sight or <0.50-mile line-of-sight
Prescribed burning	8/16-10/30	> 1 mile	1/1-8/15 or 10/31-3/15	> 1 mile	1/1-8/15 or 10/31-3/15	< 1 mile

^a Bald Eagle Use Area = BEMA, known nest territory, known winter roost sites, and concentrated winter foraging areas, trees that provide protection to either a nest or roost tree, and trees that are likely to be nest or roost sites, which are 1 mile or less from a water body that can support bald eagles.

^b LAA = May Affect, Likely to Adversely Affect determination will require separate biological assessment and consultation.

^c 1/1 to 8/15 (bald eagle breeding season) or 10/31 to 3/15 (bald eagle wintering season)

Conservation Measures for the Bald Eagle

Habitat Removal

- Activities within a bald eagle use area (Bald Eagle Management Area as described in the Olympic NF LRMP, known nest territory, known winter roost sites, and concentrated winter foraging areas) will not alter, remove, reduce or degrade eagle habitat, nor will adversely impact the eagles' primary food sources or foraging areas.

Individual Trees

- Known (occupied or historic) bald eagle nest trees or trees adjacent to known (occupied or historic) nest trees will not be felled.
- When feasible, minimize the number of large conifers ($\geq 21''$ dbh) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from roosting or nesting habitat if it is possible and safe to do so.
- Any proposed removal of any tree larger than 36'' dbh within a bald eagle use area will require ONF wildlife biologist review.

Active Nest

- If an active bald eagle nest is found, an ONF wildlife biologist will be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances (as outlined in Table G-3) will be prohibited during the nesting season (January 1 to August 15).

Ground-Level Disturbance

- When feasible, design projects to occur outside the appropriate season (breeding and/or wintering) and outside Bald Eagle Management Areas.
- When feasible, adjust the location of activities to utilize topographic and vegetative buffers when feasible.

Aircraft

- During the bald eagle breeding season (January 1 to August 15), overflights will be restricted to a minimum altitude of 1000 feet within 1-mile of an active nest or nest of unknown status.
- From November 1 thru March 15, overflights will be restricted to a minimum altitude of 1000 feet within 1-mile of a bald eagle wintering area.

Blasting: see Appendix M for blasting guidelines

Prescribed Burning

- Burning during the nesting season for bald eagles (January 1 to August 15) will be conducted 1-mile away from a bald eagle use area.
- Burning during the wintering period (October 31 through March 15) will be conducted 1-mile away from a bald eagle use area.

Appendix H. Adjustments made to the numbers given in the project descriptions to calculate the acres of adverse effects due to harassment presented in Appendix G. If no entries are given here, then no adjustments were made.

Project Type	Effects as Described in Program Descriptions	Adjustments	Effects as Presented in Appendix G
Developed site operation maintenance	116 sites	Immobile use of heavy equipment will be required in only 20 sites	20 sites annually
Dispersed site maintenance	1,405 sites	Maintenance of approximately ten of these sites is expected to use heavy equipment during the early nesting season in areas of low ambient sound and visual levels	10 sites annually
Trail maintenance	270 miles	Unlike trail restoration, in which all miles are subjected to noise from chainsaws, trail maintenance is subjected to chainsaw work only about once per mile; consequently, each mile here is considered as one site. 88 miles of maintenance will take place in wilderness areas, in which chain saws cannot be used, leaving 182 miles (sites).	182 sites annually
Trail bridge and footlog construction or reconstruction	25 sites; 8 potential nest trees	Ten bridges and footlogs will require replacement, with either native or fabricated material. Assume of those, eight trees of with possible nest structure may be used; include only those areas expected to remove potential nest trees in the early season. Replacement and construction occurs from spring through late fall.	5 sites total

New recreation site creation	10 sites	Assume that most of construction would be in already disturbed areas.	2 sites total
Hazard tree removal	1,500 potential nest trees	Road maintenance with 200 hazard trees/year that may be potential nest trees. Other programs with 100 hazard trees/year that may be potential nest trees. Of these 300 trees, we assume that 60 potential nest trees may need to be felled in the early season to open campgrounds, roads, etc.	60 sites annually
Commercial thinning and uneven-aged management	6,400 acres	Including only those areas expected to be affected during the early nesting season	3,200 acres total
Pre-commercial thinning	15,000 acres	Some of the work will be conducted during the early nesting season	500 acres total
Timber stand improvement (non-pct)	500 acres	Some of the work will be conducted during the early nesting season	100 acres total
Noxious weed control (mechanical removal)	500 acres	Include only those sites expected to use mechanized equipment during the early nesting season (85% of weed removal during this period)	425 acres total
Road reconstruction (non-commercial thinning)	50 miles	Approximately one-half of the work will be conducted during the early nesting season	25 miles total
Road reconstruction (commercial thinning)	5 miles	About one-half of the work will be conducted during the early nesting season	3 miles total
Road reconstruction (blasting)	25 sites	About one-half of the work will be conducted during the early nesting season	13 sites total

New road construction (road building for commercial thinning)	5 miles	About one-half of the work will be conducted during the early nesting season	3 miles total
New road construction (blasting)	25 sites	About one-half of the work will be conducted during the early nesting season	13 sites total
Temporary road construction (for commercial thinning)	40 miles	About one-half of the work will be conducted during the early nesting season	20 miles total
Temporary road construction (blasting)	25 site	About one-half of the work will be conducted during the early nesting season	13 sites total
Transportation system repair (regular repair)	400 sites	About 20% of the sites are expected to be affected during the early nesting season – 80 sites total	16 sites annually
Transportation system repair (blasting)	8 sites	Including only those areas expected to be affected during the early nesting season	2 sites annually
Rock sources (blasting)	40 sites	Including only those areas expected to be affected during the early nesting season	3 sites annually
Road maintenance	2,200 miles	Maintenance on 70%, or 1,200 miles, is expected to occur in the early nesting season. Mobile work (with motorized equipment) is expected at 450 miles in ML 1-2 (with possible adverse effects), and 700 miles in ML 3-5. Immobile work is expected at 80 sites in ML 3-5.	450 miles for ML 1-2; 80 sites for immobile ML 3-5 annually
Road use and access permits	5 miles	Including only those miles expected to be affected during the early nesting season	1 mile annually

Road and trail easements	20 easements	3 miles/easement average (60 miles). Assume 85% of easements will be for roads (51 miles) and 15% for trails (9 miles).	51 mi for roads, 9 mi for trails
Linear right-of-way operations and maintenance	20 permits	Range of right-of-ways between 200 feet and 1,000 feet (water pipeline), and power/telephone range between 0.10 to 20.0 miles. Some of areas have existing ambient disturbance.	30 miles total
Research and monitoring permits	20 permits	10 permits with possible adverse effects; each of these with 10 samples per permit	100 sites total
Recreation residence maintenance	65 sites	Including only those expected to include heavy machinery or chain saws during the early nesting season.	15 sites annually
Land line surveys	15 miles	Including only those areas expected to be affected during the early nesting season	5 miles total
Waste cleanup	110 sites	Assume one-third of sites (35 sites) would require use of heavy equipment, of those only 15 sites expected to be affected during the early nesting season.	15 sites total
Stormproofing and road drainage upgrade	250 miles	Include only those areas expected to be affected during the early nesting season	150 miles
Landslide stabilization	150 acres	150 acres spread along roads at approx. 100-foot widths equals 12 miles	12 miles total
Road decommissioning/bridge removal (heavy equipment)	150 miles	Including only those areas expected to be affected during the early nesting season	50 miles total

Road decommissioning/bridge removal (helicopter)	10 sites	Including only those areas expected to be affected during the early nesting season	1 site annually
Road decommissioning/bridge removal	25 potential nest trees	Include only those areas expected to remove potential nest trees during the early breeding period.	5 sites total
Instream improvement (regular work)	30 sites	Including only those areas expected to be affected during the early nesting season	10 sites total
Instream improvement (helicopter work)	30 sites	Including only those areas expected to be affected during the early nesting season	5 sites total
Fish passage improvement (heavy equipment)	35 sites	Including only those areas expected to be affected during the early nesting season	10 sites total
Fish passage improvement (helicopter work)	35 sites	Including only those areas expected to be affected during the early nesting season	5 sites total
Fire hazard reduction	2,950 acres	Include only those acres that would have mechanized equipment during early breeding season (hand-piling, chipping, and underburn site-prep)	85 acres annually
Firewood collection	3,500 permits	Assuming that some sites would be used by many permit holders, and some would use more than one site, so average one site per permit	3,500 sites total

Appendix I. Total number of vehicles passing through ONF road segments during the 7-month recreation season Road sections were differentiated by maintenance level and estimated number of vehicles.

Maintenance level	Estimated daily vehicle count	Mean estimated daily vehicle count	Miles per maintenance level/vehicle count road section	Days in the 7-month recreation season	Total yearly vehicle count per road section
2	1-4	2.5	547.79	210	525
2	5-10	7.5	305.05	210	1,575
2	11-20	15.5	196.65	210	3,255
2	21-50	29.5	21.05	210	6,195
2	51-100	75.5	3.27	210	15,855
3	1-4	2.5	14.23	210	525
3	5-10	7.5	31.96	210	1,575
3	11-20	15.5	79.83	210	3,255
3	21-50	29.5	199.99	210	6,195
3	51-100	75.5	17.80	210	15,855
3	101+	150.0	15.60	210	31,500
4	5-10	7.5	1.88	210	1,575
4	11-20	15.5	1.73	210	3,255
4	21-50	29.5	45.26	210	6,195
4	51-100	75.5	11.02	210	15,855
4	101+	150.0	31.34	210	31,500

Appendix M. Guidelines for blasting on National Forest land relative to disturbance to wildlife

Introduction

These guidelines are intended to minimize potential adverse effects to threatened /endangered species from the use of explosives. The following discussion and guidelines for determining affects on wildlife are based on 1) a literature review; 2) noise monitoring conducted in the Pacific Northwest; 3) a blasting demonstration (MBS Bios 1994) conducted in May of 1994 and in 1996 to measure decibel levels and record wildlife reactions; and 4) mitigation developed by an ONF blaster to muffle the noise created by blasting that could be incorporated into most of our activities. These guidelines will be implemented for use on the Olympic NF, with minor modifications as suggested by Chuck McDonnell, ONF blaster, which have been incorporated.

These guidelines are designed to be general in nature and are for use by biologists and project managers in assisting in the layout of a project and determination of effects on wildlife. Site-specific conditions should be taken into account by biologists when determining the best method for reducing noise created by blasting and determining the final effects on wildlife.

Many factors are part of that determination. Topography, vegetation and ambient noise levels play crucial roles in how sound carries throughout the area surrounding a particular site. See "Considerations for certain types of projects" for a complete description of the analysis factors. As additional information is gathered, these guidelines may be revised.

Wildlife Impacts

Extensive research has documented potential detrimental impacts of noise pollution on wildlife (Boyles and Samson 1983, Dufour 1980, Fletcher 1980, Knight and Cole 1991, Knight and Skagen 1988, Mancini et al 1988). Impacts reported varied according to the type and duration of noise, ambient noise levels, wildlife species, populations and individuals, history of disturbance, and habituation.

Some of the adverse effects observed included mortality and loss of breeding success (Knight and Cole 1991), nest abandonment (Shaw 1970), abandonment of favorite feeding or resting areas (Knight and Skagen 1988), behavior changes (Andersen et al 1990, Holthuijzen et al 1990), health risks from elevated heart rate (Ward and Cupal 1979), energy expended to escape noise (Geist 1971, 1978), loss of audio contact with family, flock or herd members, and interference with courtship (Barrass 1983).

Even short-term disturbance showed long term impacts, especially if other sources of stress were present (Andersen et al 1990, Dufour 1980). Noise apparently has less impact if wildlife is visually buffered from its source (Signer 1978, 1986). Low frequency sounds

generally had less impact than high frequency sounds, although there were some exceptions (Dufour 1980). Several researchers stressed the importance of seasonal timing.

A research project was conducted in southeastern Idaho using controlled blasting to determine the impact on 12 nesting pairs of prairie falcons (Hulthuijzen 1990). All other possible sources of disturbance were removed from the vicinity, so that effects of blasting alone could be determined. These birds were monitored to determine their immediate response to the blasts, behavior modifications, productivity and occupation of traditional nest sites in future years. All aeries were occupied at the time the experiment began, with the pairs in various stages of incubation. Experimental aeries were exposed to an average of 90 blasts over 61 days with peak noise levels of 124 to 146 dB. All aeries were located well away from other human disturbance.

In this study, researchers found that in their immediate reaction to blasting, perched falcons usually left their perch, flew around, then perched again (67 percent). Thirty percent remained perched. Two percent left the area and had not returned 30 minutes later. Incubating falcons either stayed put (59 percent), sat up briefly then resumed incubation (16 percent), or left the nest, flew up the canyon, perched and returned (24 percent). One percent flew from the aerie and disappeared for about 30 minutes. Brooding falcons usually continued brooding (81 percent). No pairs deserted their nests. There was no evidence of habituation.

With respect to behavior changes compared to the control pairs not exposed to blasting, males particularly spent less time perching, preening and flying in the canyon. They patrolled the nesting territory less frequently and had fewer aggressive interactions. In their long-term observations, researchers found all 4 experimental territories occupied the year following the blasting; only one was occupied a year later. Productivity dropped correspondingly; 14 young were produced the test year, 7 the year after, only 5 the third year.

This apparent mild response of prairie falcons has been related to their habituation to natural loud occurrences such as landslides and thunderclaps. Responses can be dramatically different with other species. Mountain goats react to sudden sharp noises by fleeing up the cliffs, apparently an innate reaction to the hazards of rockfalls and avalanches (Geist 1978). Even between different populations of the same species, responses vary. Hunted populations of elk are more responsive to sharp sounds than unhunted populations (Ward and Cupal 1979).

On the Mt. Baker-Snoqualmie National Forest, several informal investigations were conducted to determine responses of various species to blasting and to determine how far blasting carries over different landscapes. In May of 1994, decibel readings were taken at 580 feet obstructed, 500 feet unobstructed, 1000 feet obstructed and within ambient noise levels of a river, and 0.25 mile obstructed by vegetation. At 1/4 mile away, no blasts had decibel readings recorded above ambient forest environment levels within a valley floor

terrain. At all these locations, after the initial louder (more than 85 db) blasts, birds (blue grouse, passerines) using the surrounding vegetation began to habituate to the blasting and continued to call at regular intervals. Louder blasts (more than 85 db) tended to have more concussion effects resulting in cessation of bird calling until 10 to 15 seconds after the blasts, when calling resumed. When concussion was minimal, birds continued calling at uninterrupted rates.

Guidelines to mitigate sounds of blast

These guidelines will apply in most circumstances for most projects under most conditions and can be used as a rule of thumb. They will be followed where noise effects on wildlife are an issue. If these guidelines are followed in an effort to reduce noise impacts on wildlife, it is likely that 85 db or less at the habitat of concern will be achieved.

Implementing these guidelines requires that the person doing the blasting apply the correct procedure with the primary objective of removing the obstacle while trying to keep the blast as quiet as possible. Monitoring to determine if contractors, miners, or permittees are actually doing what we ask is the only way to ensure that these mitigations will work.

Implementing these mitigations would insure that the blast is reasonably quiet and will not carry very far into the vegetation.

1. Don't use explosives during the period of two hours before sunset until two hours after sunrise.
2. Don't use surface shots.
3. Cover detonator cord on the surface, when used, with a minimum of 6" of fill.
4. All shots should be fired in pre-drilled or dug holes that are small in diameter, shallow, and properly stemmed or back-filled.
5. Place sandbags or other fill over loaded holes, over each shot to increase stemming.
6. All holes will be individually primed with electric blasting cap or NONEL blasting cap (noiseless and preferred, but slightly more expensive).
7. In multiple hole shots:
 - a. No two-holes side by side will be fired simultaneously.
 - b. Blasting caps with milisecond delay will be used.
 - c. At least 50 miliseconds of delay will be used between holes.
 - d. To limit the total amount of charge going off at any point in time, calculate the weight of explosive per delay per distance using the following formula derived from the U.S. Office of Surface Mining surface coal mining protective regulations: $W(\text{weight}) = \frac{D(\text{distance})^2}{4000}$
8. Don't exceed a powder factor of one-half pound of explosives per cubic yard of solid rock. Do not exceed 1/4 pound per cubic yard of explosive when air gapping boulders. For tree cutting, use $W(\text{weight of explosive}) = 0.004 D^2$. For stump use one pound per foot diameter at ground level.
9. Don't overload holes, and don't use detonating cord.

Considerations for certain types of projects

1. For trail maintenance or construction, to remove a very large boulder, a technique called "air gapping" can be used that is relatively quiet. A hole should be dug under the boulder and then filled with soil after the charge is placed, so that a surface shot is avoided.
2. Tree Topping contracts: These will be very loud by the nature of the type of explosion, so a limited operating period may be the only effective way to mitigate the noise.
3. Potholes: Dig a hole for each charge. Depth should be four times the diameter. Top prime and backfill the hole after loading. If possible, avoid the use of detonating cord. Consider the use of delays between rows.
4. Mitigating blasting to assist in firefighting activities during wildfires is not reasonable or effective.
5. Ditchline cleaning: Don't use detonation cord to tie shot together. Use an iron bull bar to make a hole for each charge.
6. Road Construction or decommissioning (removing bridges and culverts): Don't overload holes or use detonating cord. Bridges: Place charges on the sills between the stringers. Culverts: Cut off exposed ends, place the charge inside the pipe and stem each end by twice the diameter.
7. Weather Considerations. Wind, rain, snow or fog can dissipate sound, while clouds or inversions will tend to hold it near the ground. Use weather conditions to your advantage.
8. Topography/Vegetation: Consider the topography of the blast site; it will affect the way sound carries. Is it at the top of a ridge where sound can dissipate freely, adjacent to a deflecting hillside, or at the head of a canyon which will carry sound like a conduit? Similarly, consider the character of surrounding vegetation. Dense old growth can block sound more affectively than open stands. Also, in areas of high avalanche hazard, wildlife may be more habituated to large noises, which may or may not cause them to flush easier.

In conclusion, in most cases blasting can be effectively mitigated to minimize disturbance to sensitive wildlife species without requiring limited operating periods if: we follow the basic rules, use common sense, seek the common goal to reduce noise, and do follow-ups to insure that mitigation is properly conducted. This applies to mining claims, trail construction and maintenance, road construction, road decommissioning, construction of building or landing sites, tree topping, potholes, and most other uses for blasting on National Forest Land.

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Appendix N. Decision pathway to determine whether removing specific trees results in incidental take due to harm (from USDA 2003 appendix of same letter).

Before starting this analysis, determine the dbh of the target tree or trees.

If the tree:

_____ is **less than 21” dbh**, regardless of whether it is in suitable habitat for murrelet and/or spotted owl, or within a bald eagle use area, (i.e., Bald Eagle Management Area [BEMA], a known nest territory, known winter roost site, or a concentrated winter foraging areas), the Review is complete---no count toward the hazard tree allotment under the Programmatic BA is necessary.

If the project area:

_____ **is** within a bald eagle use area (see definition above), OR
_____ has a tree proposed for removal that is **≥ 36” dbh** that is within suitable nesting habitat for murrelet and/or spotted owl, OR
_____ has a tree proposed for removal that is **≥ 36” dbh** within suitable nesting habitat for murrelet and/or spotted owl and **more than 1 tree** is needed to be removed **every ½ mile of road or trail** or **more than 2 trees per acre** are proposed for removal within one location, Contact the ONF wildlife biologist to determine if a separate BA needs to be completed.

If the project **does not fall within these parameters** and the tree is **≥ 21” dbh**, GO TO STEP 1.

STEP 1: Checking Maps at Project Level

Overlay project area with GIS layer(s) and work with an ONF wildlife biologist to determine if the project area is within proximity to spotted owl and marbled murrelet suitable habitat and bald eagle use areas.

_____ If the project is **definitely** within a bald eagle use area, discuss with the ONF wildlife biologist to determine if a separate BA will be required.

_____ If the project is **definitely** within murrelet and/or spotted owl suitable habitat or if there **some question**, the project lead has the option to either continue with this checklist (GO TO STEP 2) and include a site visit, *or* not include a site visit and count tree(s) as “potential nest trees” towards yearly allotment as outlined in the Programmatic BA. This decision must be discussed with the ONF wildlife biologist.

_____ If the project is **definitely not** within murrelet and/or spotted owl suitable habitat, and/or within a bald eagle use area- No review is required before cutting. Review is complete—if the tree (s) to be removed is a hazard tree-count tree(s) as “non-potential nest tree(s)” towards yearly allotment as outlined in the Programmatic BA. Ensure all NEPA and ESA requirements are completed.

STEP 2: Checking Stand Description---On location. Read the stand description below:

- The tree resides in a multi-species mature coniferous stand with a canopy cover of 60 percent to 80 percent, with a mature understory that extends into the canopy, OR
- young stand with a canopy cover of 60 percent to 80 percent with interspersed large trees with a mature understory that extends into the canopy

AND has any of the following characteristics:

- single-layer stand with dominant overstory trees, OR
- multi-layer stand

THEN the project lead has the option to either GO TO STEP 3 which may include a site visit **or** choose not to do field verification and count as “potential nest tree” towards yearly allotment as outlined in the Programmatic BA. This decision must be discussed with the ONF wildlife biologist.

If the tree is within a stand that **does not fit** this description, then the tree is not within suitable nesting habitat for spotted owl and murrelet, and no further review is required before cutting. Review is complete---if the tree(s) to be removed is a hazard tree-count tree(s) as “non-potential nest tree(s)” towards yearly allotment as outlined in the Programmatic BA. Ensure all NEPA and ESA requirements are completed.

STEP 3: Nest Tree Description for Murrelet and Spotted Owl

If the tree **is** within suitable habitat **and** meets the potential nest tree description criteria below, then the tree must be inspected by a FS wildlife biologist to determine if it is a potential nest tree for spotted owls or murrelets. If the FS wildlife biologist cannot make the inspection, then the tree must be counted as a “take tree,” and it is counted toward the total allotted in the Programmatic BA. If two or more adjacent trees are to be removed from suitable habitat--even if the trees are not potential nest trees--then a FS wildlife biologist must be contacted to determine if the tree removal would result in take due to removal of suitable habitat.

Nesting Tree Criteria (spotted owl or murrelet):

- the tree is ≥ 21 inch dbh and is dead, partially alive, or alive

AND has any of the following features:

- broken top
- large raptor nest
- mistletoe clump ≥ 5 inches across
- lateral limb ≥ 5 ” diameter and more than 50 feet from the ground
- platform with ≥ 5 ” diameter and more than 50 feet from the ground
- cavity
- moss on branches
- witches’ broom

Appendix 1. Estimates of distances at which incidental take of murrelets and spotted owls due to harassment are anticipated from sound-generating, forest-management activities in Olympic National Forest (the following 22 pages). Available in separate PDF

Appendix 2. Estimate of the expected number of trees with a nesting murrelet or nesting spotted owl to be cut down as part of this 5-year BO for ONF.

Here we estimate the expected number of trees, or fraction of a tree, with a nesting murrelet or spotted owl that would be cut down as part of this 5-year BO for the Olympic National Forest (ONF). Here we are not concerned with the habitat loss associated with cutting down suitable-habitat trees; we are concerned with the harm (injury, death) involved with cutting down a tree with nesting birds in it.

Overall, this estimate is the following:

$$\frac{\text{total no. of nesting pairs}}{(\text{no. nest-potential trees per suitable-habitat acre}) \times (\text{no. suitable-habitat acres})} \times \begin{matrix} \text{no. nest-} \\ \text{potential} \\ \text{trees to be} \\ \text{cut} \end{matrix} = \begin{matrix} \text{expected no. of trees} \\ \text{cut with a nesting} \\ \text{murrelet or spotted} \\ \text{owl} \end{matrix}$$

If we calculated just one probability, or we multiplied two or more probabilities, then the final answer would be a probability. But since we are multiplying a probability by the number of trees to be cut (the number of trials), the final answer is the expected numbers of cut trees. These calculations are similar to the ones we make when we calculate the number of expected values in a chi-square table; such values are not percentages, but they are numbers of things like acres, fruit flies, or salamanders. We consider the likelihood of falling tree and hitting another tree with a nesting murrelet or spotted owl in it to be so low that we are not considering it in this analysis.

(1) Number of nesting pairs of murrelets and spotted owls in ONF.

(1a) Murrelets. Raphael et al. (2002:340) “estimated, on average, >150 ha of habitat per murrelet available in the 10 drainages.” They also stated that “we expect that 150 ha could support more than a single pair of marbled murrelets” (p. 340). They noted that they may have overestimated the amount of nesting habitat in their study area, and that these density figures may be too low. Here we conservatively estimate the density of murrelets in the ONF as one pair per 100 ha (247 acres). Assuming even distribution, dividing 247 acres into the 259,731 acres of suitable murrelet habitat in ONF yields an expected total of approximately 1,051 pairs of murrelets for ONF.

(1b) Spotted owls. The final draft recovery plan for the spotted owl (USDI 1992) stated: “There are an estimated 200 to 225 owl pairs in the [Olympic Peninsula] province (157 pairs are known at this time).” For the period from 1989 to 1994, Holthausen et al. (1995) reported a total of 155 pair sites and 79 sites occupied by single owls or multiple owls of undetermined status for the Peninsula, and 97 or 117 pairs of spotted owls for ONF. The long-term demography data (Franklin et al. 1999:33) for the Olympic study area suggested a 6% annual decline in the spotted owl population for the years of study (1987-1998). The 2002 annual report (Forsman and Biswell 2003:3) stated: “The information collected since 1998 does not suggest any improvement in this picture” and “the percent of territories with pairs was still only about 50% of the levels detected in 1987-1992” (p. 2). Assuming a conservative 75% retention of spotted owls (vs. 50%) using the high end of the 1989-94 estimate produces 88 pairs (75% of 117 pairs) for ONF. In the calculation below, we assume that

these 88 pairs of spotted owls nest every year, which is conservative, because spotted owls nest approximately every other year (Franklin et al. 1999, Forsman and Biswell 2003).

(2) **Number of nest-potential trees per suitable-habitat acre.** We very conservatively estimate that there is, on average, at least one nest-potential tree for murrelets or spotted owls per suitable-habitat acre throughout ONF (Susan Piper, ONF Wildlife Biologist, and Dick Carlson, ONF Forest Silviculturalist, June 13, 2003, pers. comm.). Moreover, if there were any fewer nest-potential trees per acre, the area would not be considered to be suitable habitat for either species.

(3) **Number of suitable-habitat acres.** Personnel of the ONF estimate that there are 259,731 acres of suitable murrelet and spotted owl habitats in the Forest (see Table 20 in this BO, taken from USDA 2001).

(4) **Number of nest-potential trees to be cut.** We estimate the number of nest-potential trees to be cut during this 5-year BO in Tables 1 and 2. Values for (b) in Table 1 and (b) and (d) in Table 2 were estimated by Susan Piper, ONF Wildlife Biologist, Dick Carlson, ONF Forest Silviculturalist (June 13, 2003, pers. comm.), Cindy Levy, WWFOW, and Kent Livezey, WWFOW. The majority of hazard trees to be cut will be dead snags or mostly dead snags (Dick Carlson, ONF Forest Silviculturalist, June 13, 2003, pers. comm.), which are unsuitable for murrelets but can be suitable for spotted owls.

(4a) Murrelets.

Table 1. Estimate of the number of murrelet nest-potential trees to be cut during this 5-year BO.

Activity in which trees $\geq 21''$ dbh are to be cut	Total trees $\geq 21''$ dbh to be felled during the nesting season (a)	Percent trees that have ≥ 1 potentially suitable nesting platform (b)	Total nest-potential trees (a*b = c)
Hazard trees	300	30	90
Bridge stringers	5	100	5
Road decom., bridge removal	5	100	5
		Total	100

(4b) Spotted owls.

Table 2. Estimate of the number of spotted owl nest-potential trees to be cut during this 5-year BO.

Activity in which trees $\geq 21''$ dbh are to be cut	Total trees $\geq 21''$ dbh to be felled during the nesting season (a)	Percent trees with an owl-size cavity (b)	Total trees with an owl-size cavity (a*b = c)	Percent trees with large enough branches to support an owl nest (d)	Total trees with large enough branches to support an owl nest (a*d = e)	Total trees that either have a owl-size cavity or branches large enough to support an owl nest (c+e) (must be \leq (a))
Hazard trees	300	10	30	75	225	255
Bridge stringers	5	0	0	100	5	5
Road decom., bridge removal	5	10	1	100	3	4
					Total	264

(5) Expected number of trees cut with nesting murrelets or spotted owls in them.

(5a) Murrelets.

$$\frac{1,051}{1 \times 259,731} \times 100 = 0.405 \text{ tree}$$

So it is unlikely that a tree with a nesting murrelet in it would be cut as part of this 5-year BO. To see how much we would have to change these figures to anticipate that they would cut such a tree, we could, for example, increase the number of nesting pairs on ONF from 1,051 to 1,300 and increase the number of nest-potential trees to be cut from 100 to 150. These changes would yield 0.751 of a tree with a nesting murrelet in it.

(5b) Spotted owls.

$$\frac{88}{1 \times 259,731} \times 264 = 0.089 \text{ tree}$$

So it is very highly unlikely that a tree with a nesting spotted owl in it would be cut as part of this 5-year BO. To see how much we would have to change these figures to anticipate that they would cut such a tree, we could, for example, increase the number of nesting pairs on ONF from 88 to 200 and increase the number of nest-potential trees to be cut from 264 to 1,000. These changes would yield 0.770 of a tree with a nesting spotted owl in it.

We view these estimates as conservative for two reasons. (1) We estimated that there is only one nest-potential tree per acre throughout the ONF. If the true average is, for example, five nest-potential trees per acre, then the above estimates should be divided by 5. (2) We assumed that spotted owls would nest every year, whereas they typically nest every other year.

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Appendix Figures 1-5 (the following 5 pages). Available in separate PDF