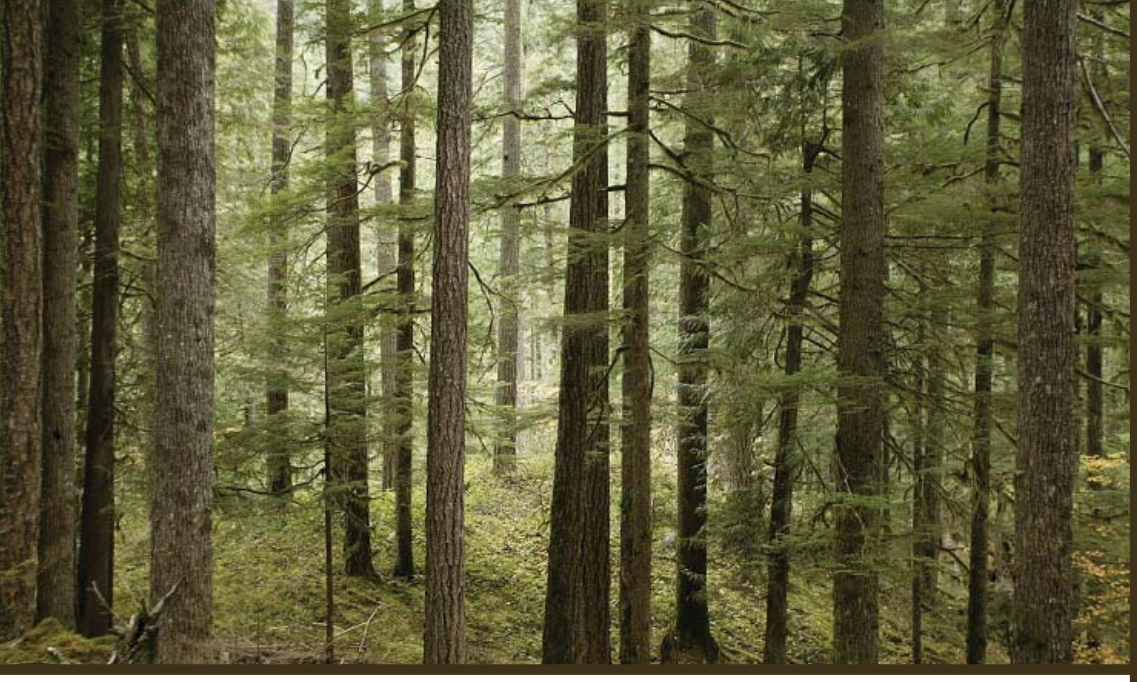

Environmental Assessment

Port Blakely Tree Farms
Morton Block
Safe Harbor Agreement

February 2009

U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office

Environmental Assessment

Port Blakely Tree Farms Morton Block Safe Harbor Agreement

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Acronyms

APE	Area of Potential Effect
BMP	best management practice
BP	Before Present
CFR	Code of Federal Regulations
CHEA	Cooperative Habitat Enhancement Agreement
DAHP	Washington Department of Archaeology and Historic Preservation
dbh	diameter at breast height
EA	Environmental Assessment
Ecology	Washington Department of Ecology
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
Forest Practice Rules	Washington Forest Practices Rules
FR	*Federal Register*
GIS	geographic information system
HCP	Habitat Conservation Plan
LOP	Landowner Option Plan
MBTA	Migratory Bird Treaty Act
murrelet	marbled murrelet
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
Permit	Enhancement of Survival Permit
Port Blakely	Port Blakely Tree Farms, L.P.
RCW	Revised Code of Washington
RD	Relative Density
RMZ	riparian management zone
SEPA	State Environmental Policy Act

SHA	Safe Harbor Agreement
SMA	Special Management Area
SOSEA	Spotted Owl Special Emphasis Area
spotted owl	northern spotted owl
SSA	Special Set-Aside Area
State	State of Washington
tpa	trees per acre
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WMZ	wetland management zone
WRIA	Water Resource Inventory Area

Chapter 1. Introduction

This chapter describes the purpose and need for the Proposed Action and the regulatory environment in which the action would occur.

1.1. Purpose and Need for Action

In November 2008, Port Blakely Tree Farms, L.P. (Port Blakely) submitted an application to the U.S. Fish and Wildlife Service (USFWS) for an Enhancement of Survival Permit (Permit) under Section 10(a)(1)(A) of the Endangered Species Act (16 U.S.C. 1553 *et seq*.)(ESA) (the Proposed Action). In accordance with applicable agency regulations, Port Blakely also submitted a Safe Harbor Agreement (SHA)(Agreement) outlining conservation measures that the company proposes to implement to provide net conservation benefits to the northern spotted owl (*Strix occidentalis caurina*) (spotted owl), Federally listed as threatened on July 23, 1990 (55 *Federal Register* [FR] 26114-26194); and the marbled murrelet (*Brachyramphus marmoratus marmoratus*) (murrelet), Federally listed as threatened in California, Oregon, and Washington State (State) on September 28, 1992 (57 FR 45328-45337). Implementation of the proposed SHA is intended to result in improved habitat quality that would provide a net conservation benefit for the covered species relative to what would otherwise occur under the Washington Forest Practices Rules (Forest Practices Rules). In exchange for committing to the terms of the SHA, Port Blakely would obtain incidental take assurances under the ESA that would apply to the covered lands for a period of 60 years if the Permit is issued. Covered lands are Port Blakely's James G. Eddy Tree Farm, also known as the Morton Block, in Lewis and Skamania Counties, Washington (Figure 1-1).

The USFWS' purpose for this action is to support Port Blakely's efforts to improve habitat for the spotted owl and the murrelet (covered species) and to determine if the

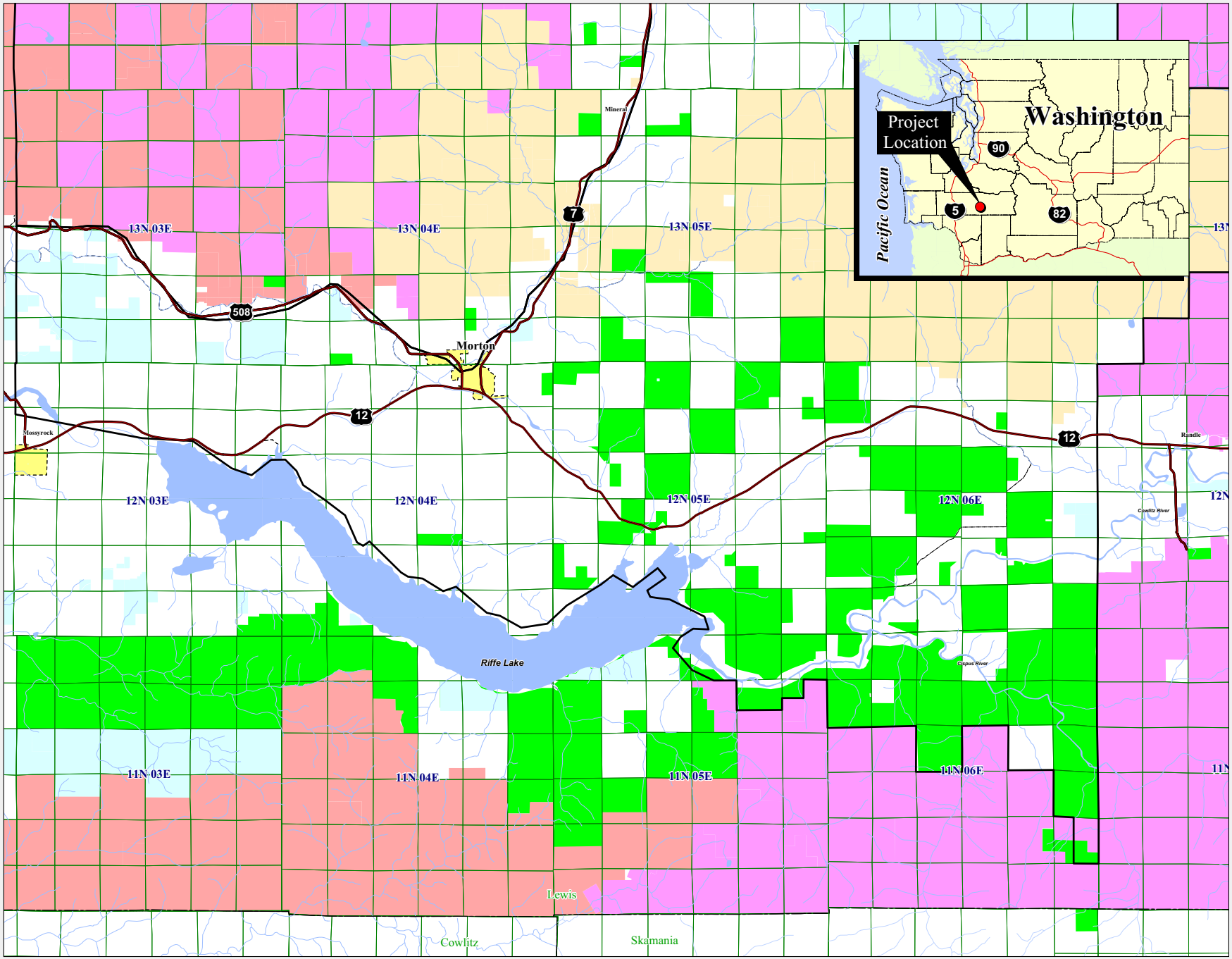
Proposed Action is consistent with the net conservation benefit standard required for issuance of the Permit. The need for the Proposed Action is that USFWS must respond to Port Blakely's application for a Permit. The proposed issuance of a Permit by the USFWS is a Federal action that may affect the human environment and therefore is subject to review under the National Environmental Policy Act (NEPA).

Accordingly, a draft Safe Harbor Agreement (ICF Jones and Stokes 2008) and a draft Environmental Assessment (EA) (USFWS 2008a) were made available on December 17, 2008, for a 30-day public-review period (73 FR 76680). At the same time, a news release was sent to State and Federal elected officials, Native American Tribes, nongovernmental organizations, and the media. The Service received only one comment letter. The letter from the Washington Department of Fish and Wildlife (WDFW) was supportive of the draft Safe Harbor Agreement, but did ask for certain areas of clarification.

USFWS has prepared this Final EA to evaluate the impacts of the proposed Port Blakely SHA and a No Action Alternative on the natural and human environment. The scope of the analysis in this EA covers the direct, indirect, and cumulative environmental impacts of approving the SHA and issuing a Permit, and the anticipated future impacts of implementing the SHA. The following documents will also be included in the record for this proceeding and will supplement the analyses contained in this EA: (1) an ESA Section 7 Biological Opinion concerning Permit issuance; (2) ESA Section 10 Statement of Findings; and (3) a NEPA analysis decision document.

The Washington Department of Natural Resources (WDNR) will separately determine if the SHA meets the requirements and criteria for an acceptable Landowner Option Plan (LOP) and Cooperative Habitat Enhancement Agreement (CHEA) as defined in the Forest Practices Rules. WDNR's decision to approve or disapprove the LOP and CHEA will be made after consulting with WDFW. Such decisions are subject to review under the State Environmental Policy Act (SEPA). It is anticipated that if USFWS arrives at a Finding of No Significant Impact (FONSI), this EA can be adopted by the SEPA lead agency. While SHAs are frequently eligible for categorical exclusion under NEPA (64 FR 32717), to facilitate integration of the SEPA and NEPA process for this planning effort, an EA was the preferred choice. Future eligible SHAs, for instance, may use a categorical exclusion under NEPA.

Port Blakely's goal for the covered lands for the spotted owl is to manage for improved dispersal habitat (primarily for juveniles leaving their natal areas) both within and outside of the Mineral Block Spotted Owl Special Emphasis Area (SOSEA). The recovery plan for the northern spotted owl (USFWS 2008b) identified this area as a Conservation Support Area, WCSA-04. The predominant purpose of



Source: Port Blakely GIS

PORT BLAKELY TREE FARMS LP

Integrity and Innovation since 1864

N

Miles

Figure 1-1

Project Vicinity & Land Ownership

Revision Date: 01/27/2009

Map Legend

- Port Blakely Ownership
- PLSS delineation
- Hydrological features
- SOSEA Boundary
- Federal Government

Parcels by Owner

- State
- West Fork (Murray)
- Weyerhaeuser

this Conservation Support Area, and SOSEA, is to manage for dispersing juvenile spotted owls between Federal lands. The Conservation Support Area is between two Federal Managed Owl Conservation Areas designated in the recovery plan. The SHA is consistent with this concept and would facilitate dispersal of spotted owls by managing forested lands in the plan area on an average timber-harvest rotation of 60 years, protecting Special Management Areas (SMAs) and Special Set-Aside Areas (SSAs), implementing a snag conservation and development program, implementing new nest-site provisions, and providing a monitoring plan.

Port Blakely's goal for the covered lands for the murrelet is to increase the amount of potential nesting habitat. The eventual chance of murrelets nesting in this general area is probably lower than in many other areas of the State. Existing habitat conditions are not favorable, and the area is distant from South Puget Sound, which has low densities of murrelets in comparison to other marine areas. Nevertheless, Port Blakely desires coverage for the species, and will increase the amount of potential murrelet nesting habitat, primarily within SMAs and SSAs.

1.2. Regulatory and Planning Environment

Several Federal and State regulations and/or laws govern the activities proposed under the SHA. A brief summary of relevant regulations is provided below.

1.2.1. Endangered Species Act

The ESA is intended to protect and conserve species listed as endangered or threatened and to conserve the habitats on which they depend. The ESA also mandates that all Federal agencies seek to conserve endangered and threatened species and use their resources and authorities to further such purposes.

Section 9 of the ESA prohibits the "take" of Federally listed endangered and threatened species unless authorized under the provisions of Section 7, 10(a), or 4(d) of the ESA. Section 3 of the ESA defines take as "to harass, harm, pursue, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under the conditions of a permit issued for an approved SHA, if the numbers or ranges of covered listed species are expected to increase because of voluntary conservation measures conducted in accordance with the SHA, the landowner would be authorized to incidentally take those covered species above an established baseline without penalty.

Sections 2, 7, and 10 of the ESA allow USFWS to enter into an agreement embodied in the SHA. Section 2 of the ESA states that encouraging interested parties to develop and maintain conservation programs through Federal financial assistance and a system of incentives is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the ESA requires USFWS to review programs that they

administer and to use such programs to further the purposes of the ESA. By entering into the SHA, USFWS is using the Safe Harbor Program to further the conservation of the Nation's wildlife. Finally, Section 10(a)(1) of the ESA authorizes the issuance of permits to "enhance the survival" of a listed species or to allow for "incidental take" of a listed species while conducting otherwise lawful activities. Specifically, SHAs provide regulatory assurance for non-Federal land owners who voluntarily aid in the recovery of listed species by improving or maintaining wildlife habitat and allow such landowners to return the property to an agreed-upon baseline condition at the end of the Agreement, even if this means incidentally taking the species.

The Section 10 Permit associated with the SHA will authorize incidental take of the covered listed species addressed in the SHA, which include spotted owls and murrelets. The Section 10 Permit does not authorize deliberate take of these species. It is expected that the primary effect on the covered species from the proposed forest management activities will be from disturbance, and less often in the form of degradation or removal of current or future habitat, expected to occur later in the SHA term. Harassment or harm to the covered species that may occur will not be the intent or purpose of the otherwise lawful forest management activities and, therefore, the activities will be covered by the Permit. Thus, Port Blakely, authorized by the Permit to take these species as they undertake such activities, will not be subject to liability for take of the covered species should they occur on the covered lands sometime in the future.

1.2.2. Migratory Bird Treaty Act

The two covered species are also protected by the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-711) (MBTA). It is USFWS policy that an ESA Section 10 permit for listed migratory birds is sufficient to relieve the permittee from liability under the MBTA. For the MBTA, this is accomplished by having the Permit double as a Special Purpose Permit authorized under 50 Code of Federal Regulations (CFR) 21.27.

1.2.3. National Environmental Policy Act

Issuance of an ESA Section 10 permit is a Federal action as defined under NEPA, 42 U.S.C. 4331 *et seq*. and its implementing regulations (40 CFR 1500 *et seq*.). USFWS expects that most SHAs and associated permits will result in minor or negligible effects on other environmental values or resources, including Federally listed species and their habitats. USFWS has determined that most of the conservation plans developed for an SHA will qualify for a categorical exclusion under the NEPA. At times, however, certain SHAs may be significant in extent or complexity or may be controversial and would require additional analysis and public review.

1.2.4. State Environmental Policy Act

SEPA is intended to ensure that environmental values are considered during State and local agency decision making by providing information to agencies, applicants, and the public that encourages the development of environmentally sound proposals. The environmental review process involves the identification and evaluation of probable environmental impacts, and the development of mitigation measures that will reduce adverse environmental impacts. The environmental information, along with other considerations, is used by agency decision makers to decide whether to approve, approve with conditions, or deny a proposal.

Typically, WDNR's review and approval of a LOP and CHEA would require SEPA reviews. However, if an environmental review is conducted under NEPA, it is possible that, under certain conditions, the State SEPA lead agency can adopt the NEPA documentation as meeting SEPA requirements (Washington Administrative Code [WAC] 197-11-630).

1.2.5. Washington Forest Practices Rules

In 1974, the State Legislature passed the Forest Practices Act. The Forest Practices Act was designed to provide protection to forest soils, fisheries, wildlife, water quality and quantity, air quality, recreation, and scenic beauty, while at the same time maintaining a viable forest products industry by regulating forest practices such as timber removal, road construction and maintenance, reforestation, and the use of forest chemicals. The Washington Forest Practices Rules, embodied in WAC Title 222, were first adopted in 1976 and apply to non-Federal and nontribal forest lands in the State. All forest landowners must conduct their forest management activities according to the Forest Practices Rules but only landowners that cut at least 5,000 board feet per year have to file a Forest Practices Application/Notification. However, the Forest Practices Rules provide for exceptions to operating under standard rules, such as conducting forest management operations under a State LOP or CHEA, and/or a Federal conservation plan authorized under Section 10 of the ESA. The Forest Practice Rules are available on the web at http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesRules/Pages/fp_rules.aspx.

1.2.6. Washington Forest Practices Habitat Conservation Plan

The State prepared an HCP covering forest practices on non-Federal and nontribal land in Washington State that addressed the conservation needs of anadromous and native fish, and seven stream-associated amphibians (WDNR 2005). USFWS and the National Marine Fisheries Service (NMFS) approved the Washington Forest Practices HCP and provided take authorizations to the State under Section 10 of the ESA. The take authorizations for aquatic species apply to all landowners that apply

for forest practices permits and conduct their forest management activities according to the Forest Practices Rules (Washington Forest Practices Board 2002). The forest management activities that are covered by the take authorizations are, for the most part, related to those activities conducted in the riparian areas adjacent to fish-bearing and non-fish-bearing streams, and road construction and maintenance activities. Port Blakely's forest management activities as they relate to impacts on aquatic species are covered under the Washington Forest Practices HCP and incidental take permit, were analyzed under the associated environmental impact statement, and will not be analyzed in this EA.

Chapter 2. Alternatives

Two alternatives were developed as part of this EA: the No Action Alternative and the Proposed Action (the preferred alternative). Under both alternatives, forest practices would continue to be conducted in compliance with the current Forest Practices Rules. The Forest Practices Rules (WAC Title 222) and the Forest Practices Habitat Conservation Plan (WDNR 2005) are hereby incorporated by reference and are not described in detail except when a specific action occurring under the Proposed Action would differ from the minimum requirement of the Forest Practices Rules. Activities conducted under the No Action Alternative and the Proposed Action are compared and their differences are summarized in Table 2-1 at the end of this chapter.

All activities associated with Port Blakely's forest harvest operations and silviculture programs would be subject to a formal review by Port Blakely wildlife staff prior to implementation under both alternatives. The primary purposes of the review procedure are to ensure that aquatic and terrestrial wildlife resources are accurately identified within the area affected by the proposed forest management activities; and to ensure that the appropriate conservation measures are incorporated into the harvest unit layout and activities plan. Potentially affected wildlife resources include threatened and endangered species, other sensitive wildlife species of special concern, and ecologically sensitive sites. Unit reviews are conducted by one or more of the wildlife staff and may be carried out over several years prior to the actual timber harvest or silvicultural activity. The review process is described in detail in the SHA.

Forest management activities common to both alternatives include planting after regeneration harvest and monitoring until the stand has reached a stage where it is "free to grow" (trees can outcompete other vegetation); pre-commercial thinning of stands where conditions warrant it; and conducting regeneration harvest when the

stand reaches the appropriate age and conditions. Conditions under which pre-commercial thinning would occur are the same for both alternatives; however, the age at which regeneration harvest would occur is different, and the Proposed Action includes additional management activities. The alternatives are described below.

2.1. No Action Alternative

Under the No Action Alternative, the proposed SHA would not be implemented and the USFWS would not issue a Permit to Port Blakely. Under this alternative, Port Blakely would continue to conduct its forest management activities in accordance with applicable Forest Practices Rules and would not develop a LOP to address the SOSEA goals for spotted owls nor develop a CHEA for murrelets. An approximate 45-year timber-harvest rotation (range of 41 to 50 years) would be implemented. When forest stands, or appropriately sized polygons of forest, reached 45 years of age and stand conditions are suitable for harvesting, the stands would be harvested for regeneration. Port Blakely would conduct pre-commercial thinning but not commercial thinning as part of their forest management plan under the No Action Alternative.

Potential impacts on the human environment from the No Action Alternative were analyzed in the environmental impact statement prepared for the Forest Practices Habitat Conservation Plan (USFWS and NMFS 2006) and are considered to be part of the NEPA environmental baseline for the covered lands and will not be analyzed in this EA.

2.2. Proposed Action

Under the Proposed Action, the SHA would be implemented over approximately 45,306 acres and USFWS would issue a Permit to Port Blakely for a period of 60 years. For USFWS to issue the Permit, the SHA must contain voluntary conservation measures that provide a net conservation benefit to covered species. The SHA must identify the baseline that will be maintained over the term of the agreement. The USFWS's SHA policy is available at http://www.fws.gov/endangered/policy/SAFE_HAR.HTM and http://www.fws.gov/endangered/pdfs/FR/FRnoticeCCAA_SHAreg_revision.pdf. The following section briefly describes conservation measures outlined in the Port Blakely SHA. For a detailed discussion of these elements, please refer to the SHA.

Port Blakely proposes an approximate 60-year rotation (range of 51 to 70 years, with an average age of 60 years). The primary silvicultural management regime would include several options for mid-rotation management that are primarily determined

by factors including steepness of slopes and the feasibility of using ground-based logging equipment, as well as ecological considerations and desired future condition.

The specific options for this management regime are as follows:

- Plant and monitor until "free to grow;" control competing vegetation as needed.
- Consider the most suitable mid-rotation management:
  - no mid-rotation management,
  - pre-commercial thin at 10 to 12 years old,
  - commercial thin at 25 to 40 years old, or
  - both pre-commercial and commercial thinning for some stands.
- Monitor stand health and damage; salvage opportunistically to recover value.
- Conduct regeneration harvest at an average age of 60 years.
- Establish SMAs:
  - leave tree areas,
  - potentially unstable slopes,
  - forested wetlands,
  - cliffs, talus slopes, rock outcrops, and caves, and
  - shrubs and meadows.
- Establish SSAs.
- Enhance wildlife-reserve-tree and green-recruitment-tree retention areas.
- Implement a snag conservation and development strategy.

Components of the Proposed Action that would not be included in the No Action Alternative are commercial thinning; additional protection of SMAs above that required by the Forest Practices Rules; deferment of harvest within SSAs for the term of the Permit; implementation of a snag conservation and development program that would enhance habitat for spotted owl prey species; and provisions for protecting new spotted owl and murrelet nests discovered in the covered area during the term of the Permit that differ from the protections required under the Forest Practices Rules (No Action). These are described in detail in the SHA.

Table 2-1. Comparison of Environmental Impacts between Alternatives

Port Blakely Activity/Element	Option	No Action Alternative Without SHA, LOP, and CHEA	Proposed Action With SHA, LOP, and CHEA	Difference (net conservation benefit)
Plant and monitor	n/a	Plant and monitor until "free to grow."	Same	No difference
Mid-rotation Management	None	Trees grow until harvested.	Same	No difference
	Pre-commercial thin only	Thinned when trees are approximately 10 to 12 years old and 3 to 5 inches dbh. Triggered at densities of 550-650+ trees per acre (tpa) on slopes less than 35% and densities of 450-550+ tpa on slopes greater than 35%. Post-thinning stocking of 300-325 tpa.	Same	No difference
	Both pre-commercial and commercial thinning	Pre-commercial thinning would be as described above; no commercial thinning would occur	Pre-commercial thinning would be as described above; Commercial thinning would be as described below: Thinned when trees are approximately 30 to 40 years old and 10-14 inches dbh Triggered when stand is located on slope of <35%, RD>55, and density is 285-350 tpa Post thinning stocking of 185-225 tpa The following wildlife reserve tree, green recruitment tree, and snag prescriptions will be applied when conducting commercial-thinning activities: ▪ Prescription 1: Two defective trees per acre will be retained. Defective trees are defined, but not limited to, damaged or deformed live trees in the management unit with characteristics such as broken, multiple, bayonet or candelabra tops, or having sinuosity characteristics, i.e., Type 1 wildlife reserve trees described in the Forest Practices Rules (WAC 222-16-010) ▪ Prescription 2: One defective tree per acre will be retained and one snag per acre will be created using mechanical topping at 12 to18 feet, girdling, or chainsaw boring. When selecting trees for snag creation, priority will be given to residual leave trees from the previous regeneration harvest. ▪ Prescription 3: Two snags per acre will be created using mechanical topping at 12 to18 feet, girdling, or chainsaw boring. When selecting trees for snag creation, priority will be given to residual leave trees from the previous regeneration harvest.	Commercial thinning would allow development of suitable owl dispersal habitat at an earlier age under the SHA than if unmanaged On slopes <35%, owl dispersal habitat develops in the 41-50 age class Owl dispersal habitat available to owls for 10-20 years (average) on slopes <35% compared to no dispersal developing without SHA In covered area: owl dispersal habitat will be approx. 4,000 acres more than baseline (8,360 ac) for each decade; for some decades, owl dispersal habitat will be > twice as much as baseline. In SOSEA: owl dispersal habitat will be maintained above 7,500 acres for entire SHA/LOP period, i.e., approx. 3,400 acres more than the baseline amount of 4,100 acres.

Port Blakely Activity/Element	Option	No Action Alternative Without SHA, LOP, and CHEA	Proposed Action With SHA, LOP, and CHEA	Difference (net conservation benefit)
			Yarding corridors and landings will create some variation in stocking throughout the thinned stand; skips and gaps from normal operations may comprise 8 to 15% of a thinned stand.	Contributes to dispersal habitat with variable vegetation patterns and creating space for owl flight.
Regeneration Harvest	n/a	Occurs when conifer-dominated stand is approximately 41 to 50 years old (average age 45 years).	Occurs when conifer-dominated stand is between 51 and 70 years old (average age 60 years).	Trees retained for 5 to 25 years (average 15 years) longer than without SHA, providing suitable owl dispersal habitat. Pre-commercially thinned and commercially thinned stands available as dispersal habitat for 10-20 years (average) on slopes <35%. Pre-commercially thinned stands on slopes >35% (receiving no mid-rotation management) will reach dispersal condition at 51-60 years and will be available for dispersal for up to 10 years; a condition that would not occur without the SHA.
		Forested wetlands would be managed per WAC 222-30-020(5)	Forested wetlands would be managed per WAC 222-30-020(5) with additional protection as follows: ▪ Port Blakely will ensure special efforts are made to avoid soil disturbance when operating within forested wetlands ▪ Seasonal constraints will be applied when operating on tractor-capable ground to further reduce the likelihood of disturbance. ▪ Port Blakely will give forested wetlands priority when selecting areas to retain wildlife reserve trees and green recruitment trees.	Additional protection for forested wetlands with priority placement of wildlife reserve trees and green retention trees.
		Wildlife reserve trees (snags) will be managed per WAC 222-30-020(11). Where safe to do so, wildlife reserve trees will be left to protect habitat for cavity-nesting wildlife, with the following left per acre harvested: ▪ 3 wildlife reserve trees, 2 green recruitment trees, and 2 down logs shall be left. If adequate wildlife reserve trees are not	Port Blakely will follow Forest Practices Rules while conducting commercial-thinning operations; however, to ensure a high chance that wildlife reserve trees will be present during regeneration harvest, Port Blakely will implement one of the following specific conservation measures to retain, recruit, or create snags: ▪ Prescription 1: Two defective trees per acre will be retained. Defective trees are defined, but not limited, damaged or deformed live trees in the management unit with characteristics	A greater number of snags and defective trees distributed across the landscape would be available for wildlife than would occur under standard rules. During commercial-thinning operations, Port Blakely will manage the covered area to

Port Blakely Activity/Element	Option	No Action Alternative Without SHA, LOP, and CHEA	Proposed Action With SHA, LOP, and CHEA	Difference (net conservation benefit)
		available, no additional green recruitment trees will be required as substitutes. ▪ Only wildlife reserve trees greater than or equal to 10 feet in height and greater than or equal to 12 inches dbh shall be counted toward wildlife reserve tree retention requirements. ▪ Green recruitment trees must be greater than or equal to 10 inches dbh and 30 or more feet tall with a t least 1/3 of their live crown. ▪ Large, live defective trees with broken tops, cavities, and other sever defects are preferred as green recruitment trees. ▪ Down logs must have a small end diameter of 12 inches or more and at least 20 feet long or equivalent volume. ▪ In areas where wildlife reserve trees are left, the largest diameter wildlife reserve trees shall be retained to meet the needs of cavity nesters. Where possible, larger trees with numerous cavities should be retained and count as green recruitment trees. ▪ For safety reasons, wildlife reserve trees and green recruitment trees may be left in clumps. ▪ No point within the harvest unit shall me more than 800 feet from a wildlife reserve tree or green recruitment tree area. ▪ For safety reasons, Type 3 and 4 wildlife reserve trees may be removed.	such as broken, multiple, bayonet or candelabra tops, or having sinuosity characteristics, i.e., Type 1 wildlife reserve trees described in the Forest Practices Rules (WAC 222-16-010). ▪ Prescription 2: One defective tree per acre will be retained and one snag per acre will be created using mechanical topping at 12 to 18 feet, girdling, or chainsaw boring. When selecting trees for snag creation, priority will be given to residual leave trees from the previous regeneration harvest. ▪ Prescription 3: Two snags per acre will be created using mechanical topping at 12 to 18 feet, girdling, or chainsaw boring. When selecting trees for snag creation, priority will be given to residual leave trees from the previous regeneration harvest. Port Blakely will follow Forest Practices Rules for green recruitment trees, and for providing wildlife reserve trees when they are available (WAC 222-30-020). Often wildlife trees are not available as a result of past management activities or because they were removed to comply with safety requirements. While conducting regeneration harvest, Port Blakely will ensure that wildlife reserve trees are present by implementing one of the following specific conservation measures to retain, recruit, or create snags: ▪ Prescription 1: Regardless of the number of residual snags present within a regeneration harvest unit, Port Blakely will create additional snags at a rate of 20 per 100 acres and retain six green recruitment trees per acre (diameter class representative of the stand). ▪ Prescription 2: Port Blakely will retain two snags per acre (either residual or created) and supplement current Forest Practices Rules requirements with one additional green recruitment tree for a total of three green recruitment trees per acre. ▪ All wildlife reserve trees designated during the term of the Agreement will be retained for the term of the Agreement and will not be considered available for regeneration harvest as adjacent stands become eligible.	ensure two snags or defective trees, or a combination, remain as snags or develop into snags between the period of commercial thinning and regeneration harvest with the intent of providing prey habitat and improving the quality of dispersal habitat. These snags will be managed according to the prescriptions under regeneration harvest, if still available. Manage for a minimum of two snags and three green recruitment trees per acre; an increase of two snags and one green recruitment tree over standard Forest Practices Rules. Retention of green retention trees for the life of the SHA / LOP / CHEA Agreement.

Port Blakely Activity/Element	Option	No Action Alternative Without SHA, LOP, and CHEA	Proposed Action With SHA, LOP, and CHEA	Difference (net conservation benefit)
Salvage	n/a	Salvage would be conducted per WAC 222-30.	Salvage would be conducted per WAC 222-30, however, during salvage operations, an additional two downed logs per acre will be retained to promote the conservation of biological diversity within managed stands. The downed logs will measure 12 inches or greater on the small end and have a length greater than or equal to 20 feet or equivalent volume. During salvage, special efforts will be made to avoid disturbing shade-tolerant saplings, such as western red cedar and western hemlock. This practice will retain forest understory and promote the development of a more structurally diverse forest canopy. As with thinning entries, existing downed wood is retained and left undisturbed whenever possible.	A greater amount of down wood will be left in the salvage area than is required under standard forest practices rules. Areas in which salvage operations occur would have a more developed understory, than would occur under Forest Practices Rules.
Special Management Areas	n/a	Sensitive sites as defined in WAC 222-16-010 would be protected as required under WAC 222-30-021.	In addition to sensitive sites defined by WAC 222-16-010, Port Blakely recognizes inventory types on the Morton Block as potentially containing unique habitat features or requiring additional permitting under Forest Practices Rules. These Special Management Areas (SMAs) often contain landforms or habitat features that have high conservation value compared to other inventory types. In Port Blakely's land inventory, SMAs are divided into five categories: ▪ Leave tree areas; ▪ Potentially unstable slopes; ▪ Forested wetlands; ▪ Cliffs, talus slopes, rock outcrops, and caves; and ▪ Shrub and meadow.	SMAs provide additional protection to potentially sensitive resources compared to what is required under current Forest Practices Rules. In addition, under Forest Practices Rules, leave tree areas may be harvested in the future; however, trees in the designated SMAs will be retained for the term of the Agreement providing potential owl and murrelet nesting habitat.
Special Set-Aside Areas (SSAs).	n/a	n/a	Port Blakely has identified five areas within the Morton Block that are unique sites and believed to have high conservation value. These areas are well distributed across the covered lands and total 550 acres; 359 acres forested and 191 acres non-forested (rock bluffs, talus slopes, etc.). The forest cover is primarily conifer ranging in age from 76 to 113 years old. Under current Forest Practice Rules, Port Blakely could conduct management activities, i.e., timber harvest, on 216 of the 359 forested acres in these SSAs. However, Port Blakely will defer harvest activities on these five SSAs in an effort to provide enhanced long-term habitat for owls and murrelets. By not operating within these SSAs for the term of the Agreement, stands will mature to an age of 136 to 173 years and will have the potential to provide foraging and nesting areas for owls and nesting areas for murrelets, especially as adjacent stands mature to 60 years of age.	SSAs would provide a greater amount of older forest habitat within the covered area than would occur under current Forest Practices Rules. These areas (359 acres) will be conserved (retained) for the life of the SHA / LOP / CHEA Agreement; providing older trees by the end of the Agreement. These are trees that could provide nesting opportunities to both owls and murrelets; opportunities that would not occur under Forest Practices Rules.

Port Blakely Activity/Element	Option	No Action Alternative Without SHA, LOP, and CHEA	Proposed Action With SHA, LOP, and CHEA	Difference (net conservation benefit)
Potential murrelet nesting habitat protection	n/a	n/a	Port Blakely has identified 498 acres of potential murrelet nesting habitat, defined as stands that are >7acres in size and >81 years old, that would be protected for the term of the Agreement; 275 of these acres are located within SSAs (see above) and 223 acres are outside of SSAs.	Potential murrelet nesting habitat protection would provide a greater amount of older forest habitat within the covered area than would occur under current Forest Practices Rules. These areas (498 acres total, 233 acres not included in SSAs) will be conserved (retained) for the life of the SHA / LOP / CHEA Agreement; providing older trees (approximately 136-173 years) by the end of the Agreement.
Nest site protection	n/a	Currently no nesting habitat would develop outside of riparian zones.	For owls, nesting habitat would likely develop in SMAs and SSAs, and could develop in other areas of the covered lands. For murrelets, nesting habitat could potentially develop in SMAs and SSAs.	Should a nest site be discovered, up to three nest sites would be protected in any given year for each species for a minimum of 3 years.
Alternate Plans	n/a	Only as necessary to meet Forest Practices Rules with comparable results, i.e., at least equal in its overall effectiveness.	Port Blakely may use the Alternate Plan provisions to pursue activities that may enhance owl and murrelet habitat within riparian zones, and other forested leave areas, e.g., SMAs.	With an SHA, Port Blakely has the ability to develop owl and murrelet habitat in areas they otherwise would not consider for special management other than what is required by Forest Practices Rules.

SHA= Safe Harbor Agreement; dbh = diameter at breast height; RD = Relative Density; tpa = trees per acre; SMA=Special Management Area; SSA=Set-Aside Area

Chapter 3. Affected Environment

Elements of the natural and human environment included in this analysis are those with the potential for significant differences between the alternatives, or for which an analysis was required to demonstrate that the difference would not be substantial. Elements of the natural and human environment not specifically addressed are those that would not be affected by the Proposed Action (e.g., recreation) and those for which there would be no significant difference between alternatives (e.g., transportation, energy consumption, air quality, noise, and scenic resources/aesthetics).

The covered area is an industrial tree farm but also provides access to a variety of recreational sites and activities including:

- Cowlitz Wildlife Area, located along the shores of Riffe Lake and the Cowlitz River;
- Taidnapom Park;
- Cispus River take-out area for kayakers;
- Dog Mountain hang-gliding site; and
- Other areas used for hunting, fishing, hiking, mountain biking, and horseback riding.

Driving access is allowed on roads without gates, and access behind locked gates is allowed for non-motorized use only. Access to all sites may be restricted during periods of extreme fire danger to minimize the risk of a fire occurring in the covered area. Recreational access would not change as a result of the Proposed Action, and existing policies and agreements are expected to continue regardless of the alternative selected. Should vandalism or garbage dumping become an issue in the future, access to the covered area may be restricted; however, that would be an independent

action of the landowner and not a result of the Proposed Action. Such restriction could occur under either alternative.

Transportation elements, such as vehicular traffic and energy consumption, would not differ significantly between alternatives over the analysis period. Although the type of forest management activity differs per decade, the difference in the level of activity is not significant.

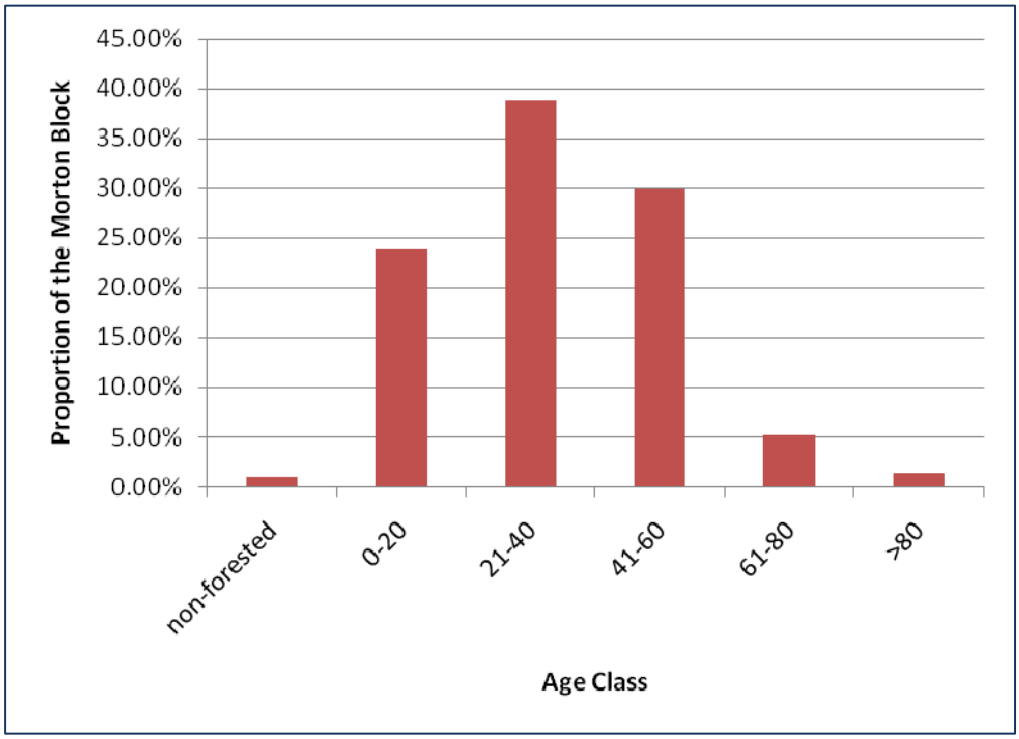
There would be no differences between the alternatives in effects on scenic resources or aesthetics. The covered area has historically been managed as a working tree farm and will continue to be managed as such under either alternative. As a result, it will continue to present a mosaic of forest age classes on the landscape, and viewpoints will come and go with harvest cycles.

3.1. Vegetation

The tree farm currently is a mosaic of primarily coniferous forest stands. An estimated 88 percent of the covered lands are considered available for forest management operations. This amount excludes non-forested areas, SSAs, unstable slopes greater than 100 percent, and riparian management zones along fish-bearing streams. The property is well-stocked and is highly productive timberland (average 50-year site index is 126). At the time the lands were purchased in 2004, the composition of the operable forest was estimated as 64 percent Douglas-fir (*Pseudotsuga menziesii*), 20 percent western hemlock (*Tsuga heterophylla*), and about 16 percent red alder (*Alnus rubra*) and other hardwoods. There are a few very small patches of unmanaged native forest scattered across the landscape, and nearly all the forest stands have been clearcut harvested at least once. The current age structure is diverse with the majority of the stand management units composed of 20- to 60-year-old timber, as shown in Figure 3-1. This age-class distribution is based on forest-inventory data collected by Port Blakely in 2006. Baseline conditions for the covered area were evaluated based on a compilation of existing status and survey data for the covered species, and on an analysis of current forest habitat conditions based on Port Blakely's 2006 forest inventory.

A list of special-status plant species potentially occurring in the covered area was developed through review of the following: (1) listed and proposed endangered and threatened species and critical habitat, candidate species, and species of concern for Lewis County (USFWS 2008c); (2) the Natural Heritage Database (WDNR 2008a); and (3) the Natural Heritage Program list of rare plants for Lewis County (WDNR 2008b). There are two plant species that are Federally listed as threatened with the potential to occur in Lewis County: Kincaid's lupine (*Lupinus sulphureus kincaidii*) and Nelson's checker-mallow (*Sidalcea nelsoniana*). Neither species is expected to occur within the covered area because of a lack of suitable habitat.

Figure 3-1. Estimated Forest Age Composition in 2006



Of the 23 special-status plant species included on the WDNR Natural Heritage Program list of rare plants for Lewis County, five have the potential to occur within the covered area, based on habitat availability, range, and elevation: tall bugbane (*Cimicifuga elata* var. *elata*), western wahoo (*Euonymus occidentalis*), common blue-cap (*Githopsis specularoides*), Nuttall's quillwort (*Isoetes nuttali*), and branching montia (*Montia diffusa*) (Table 3-1) Although Lewis County contains a broad range of habitats, only species with the potential to occur in forested habitats, at elevations similar to those in the covered area (671 feet to 4,331 feet), were included in this analysis.

3.2. Wildlife

Wildlife species that may occur in the covered area include common species typical of low- to mid-elevation managed forests in western Washington, such as black bear (*Ursus americanus*), raccoon (*Procyon lotor*), and American robin (*Turdus migratorius*). Less common species requiring more specialized habitats are also present, including Cope's giant salamander (*Dicamptodon copei*), bald eagle (*Haliaeetus leucocephalus*), and Pacific Townsend's big-eared bat (*Corynorhinus townsendii*).

A review of USFWS's listed species (USFWS 2008c) in Lewis County, and the WDFW Priority Habitats and Species database (WDFW 2008a) identified 23 special-status wildlife species with potential to occur on the covered lands based on

Table 3-1. Special-Status Plant Species Potentially to Occurring in the Covered Area

Species Name	Status*	Habitat Association
Tall bugbane (*Cimicifuga elata* var. *elata*)	FS, SS	Generally associated with edges of mature or old-growth mesic coniferous forest or in mixed coniferous-deciduous forests at elevations ranging from just above sea level to 3,000 feet.
Western wahoo (*Euonymus occidentalis*)	ST	Forested areas on the west side of the Cascade Mountains, often located in shaded, moist draws and ravines.
Common blue-cup (*Githopsis specularoides*)	SS	Open habitats within an otherwise forested landscape, or along the edge of forested habitats at elevations of 200 to 2,500 feet.
Nuttall's quillwort (*Isoetes nuttalli*)	SS	A terrestrial species associated with wet soils or seeps and in mud near vernal pools at low to middle elevations.
Branching montia (*Montia diffusa*)	SS	Moist forests in lowlands and lower montane zones, often found in disturbed sites.

*FS = Federal (USFWS) species of concern; ST = State threatened; SS = State sensitive.
Source: Washington Department of Natural Resources 2008a, 2008b

the known range and habitat requirements of each species. Special-status species with the potential to occur in the covered area are listed in Table 3-2. Current forest-age classes, to which many of the species' habitat associations are closely related, are shown in Figure 3-2.

3.2.1. Threatened and Endangered Wildlife

Northern Spotted Owl

Ecology

The spotted owl lives in structurally complex forests ranging from southwest British Columbia through the Cascade Mountains and coastal ranges in Washington, Oregon, and California, as far south as Marin County (USFWS 2008b). The spotted owl was listed under the ESA in 1990 because of loss of suitable habitat, primarily the mature and old growth forests that it needs for survival. There is a substantial body of information on the ecology of the spotted owl, including A Conservation Strategy for the Northern Spotted Owl: Report of the Interagency Scientific Committee To Address the Conservation of the Northern Spotted Owl (Thomas et al. 1990); Scientific evaluation of the status of the Northern Spotted Owl (Courtney et al. 2004); and the Final Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*) (USFWS 2008b).

The diet of the spotted owl varies by geography and vegetation type, and includes a variety of small mammals, birds, and insects. The primary prey species in the Douglas-fir/western hemlock forests of Washington and Oregon is the northern flying squirrel (*Glaucomys sabrinus*). Other prey species include deer mice (*Peromyscus* spp.), voles (*Microtus* spp.), and snowshoe hares (*Lepus americanus*) (Forsman et al. 1984 in USFWS 2008b). Flying squirrels inhabit forested habitat.

Table 3-2. Special-Status Wildlife Species Potentially Occurring in the Covered Area

Species Name	Status*	Habitat Association
Birds		
Northern spotted owl (*Strix occidentalis caurina*)	FT, SE	Requires mature and old-growth forest, with multiple canopy layers and large amounts of dead and down woody material for nesting, roosting, and foraging (USFWS 2008b).
Marbled murrelet (*Brachyramphus marmoratus*)	FT, ST	Mature and old-growth forest with trees having large-diameter branches or deformities for nest platforms (USFWS 1997).
Bald eagle (*Haliaeetus leucocephalus*)	FS, ST	Uneven-aged forest stands along shorelines; nest trees are usually large and are dominant or co-dominant with the overstory (Watson and Rodrick 2004).
Northern goshawk (*Accipiter gentilis*)	FS, SC	Large stands of multi-layered mature and old-growth forest with greater than 50% canopy closure, two or more canopy layers, canopy gaps, and the presence of shade-tolerant trees (Desimone and Hays 2004).
Peregrine falcon (*Falco peregrinus*)	FS, SS	Cliffs for nesting; Forage on a variety of smaller birds, usually captured on the wing. Hunting territories may extend 19-24 km (12-15 mi) from nest sites (Hays and Milner 2004).
Pileated woodpecker (*Dryocopus pileatus*)	SC	Coniferous forests with abundant snag and down-wood component (Lewis and Azerrad 2004).
Olive-sided flycatcher (*Contopus borealis*)	FS	Coniferous forests; perches on high, dead branches (Stokes and Stokes 1996) or dead tops of trees (Ehrlich et al 1988).
Vaux's swift (*Chaetura vauxi*)	SC	Strongly associated with forests containing large hollow snags (Lewis et al. 2004).
Mammals		
Grizzly bear (*Ursus arctos horribilis*)	FT, SE	Vast areas of wilderness; a variety of habitats including meadows, wet areas, open slopes with huckleberries (USFWS 1993)
Gray wolf (*Canis lupus*)	FE, SE	Wilderness; isolation from human disturbance for denning (Paradiso and Nowak 1982). Requires ungulate prey.
Fisher (*Martes pennanti*)	FS	Believed to have been formerly extirpated in Washington and recently reintroduced on the Olympic Peninsula, fishers use forests with a high percentage of canopy closure, abundant large woody debris, large snags and cavity trees, and understory vegetation (Hayes and Lewis 2006).
Pacific western (Townsend's) big-eared bat (*Corynorhinus townsendii*)	FS, SC	In western Washington, utilizes lowland conifer-hardwood forests, mixed highland conifer forest, and riparian-wetland habitats (Woodruff and Ferguson 2005). A cave-dwelling bat found near conifer forests. Roosts and hibernates in caves, lava tubes, and man-made structures such as mines and old buildings (Christy and West 1993).

Species Name	Status*	Habitat Association
Long-eared myotis (*Myotis evotis*)	FS, SM	Forested habitat below the subalpine/parkland zone; roosts in trees, buildings, and caves (Johnson and Cassidy 1997). Often feed near open water habitat and use snags for maternity colonies (Christy and West 1993).
Long-legged myotis (*Myotis volans*)	FS, SM	A variety of habitats, including montane forests. Summer day roosts are in buildings, rock crevices, fissures in the ground and tree bark. Maternity colonies occur in attics, fissures in the ground, and under tree bark. Caves and mines are used for night roosts and hibernacula (Nagorsen and Brigham 1993). Often feed near open water habitat and use snags for maternity colonies (Christy and West 1993).
Elk (*Cervus elaphus*)	SP	Combination of forest and open habitats. Seclusion from human disturbance important for calving (Thomas and Toweill 1982)
Columbia black-tailed deer (*Odocoileus hemionus columbianus*)	SP	Hardwood and coniferous forest; dense shrubs or other early successional stages containing trees or shrubs. Also meadows and grasslands (Johnson and Cassidy 1997).
Amphibians		
Larch Mountain salamander (*Plethodon larselli)*	FS, SS	Steep, moist, talus slopes, usually moss-covered and under a forest canopy or in mature forest with large woody debris, particularly in sloughed bark at the base of a tree or snag (Nordstrom and Milner 1997a).
Van Dyke's salamander (*Plethodon vandykei*)	FS, SC	Cool, moist habitats in forested areas, usually among large, woody debris or mossy rocks within the wetted edge of streams and seeps (Nordstrom and Milner 1997b).
Cascades frog (*Rana cascadae*)	FS	Highly aquatic; closely associated with edges of seeps and other wetlands (Leonard et al 1993).
Cascade torrent salamander (*Rhyacotriton cascadae*)	SC	Cold, clear springs, seeps, headwater streams, and waterfall splash zones in humid coniferous forests (Nordstrom 1997).
Cope's giant salamander (*Dicamptodon copei*)	SM	Small, steep gradient streams with cold, clear water; a substrate of large gravel to small boulders, some large logs, and no silt (Corkran and Thoms 1996).
Coastal tailed frog (*Ascaphus truei*)	FS, SM	Turbulent mountain streams; has been found as high as 7,000 feet elevation (Leonard et al. 1993).
Western toad (*Bufo boreas*)	FS, SC	Lakes, ponds, and wetlands used for breeding; adults utilize a variety of habitats including forest, brushy areas, and meadows (Corkran and Thoms 1996).

* FT = Federal threatened, FE = Federal endangered, FS = Federal (USFWS) species of concern, ST = State threatened, SE = State endangered, SC = State candidate, SS = State sensitive, SM = State monitor, SP = State protected

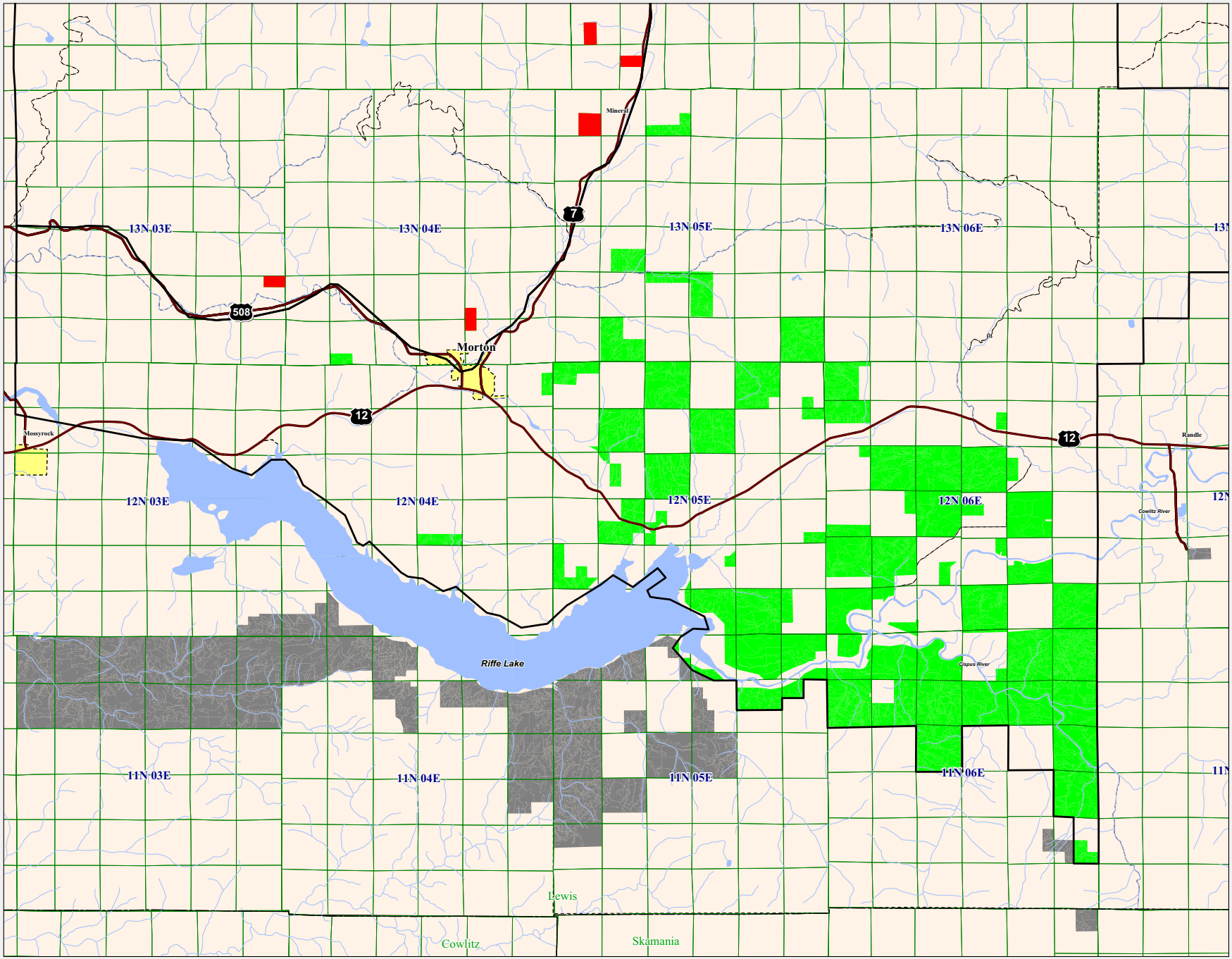


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Figure 3-2

Mineral Block / Link SOSEA

Revision date: 01/27/2009

Map Legend

- Ownership Outside SOSEA
- Dispersal Support
- Dispersal and Demographic Support
- Hydrological features
- Highway
- SOSEA boundary

A study on spotted owl prey species found that flying squirrels were twice as abundant in old forest than in young forest (Carey et. al. 1992). The deer mice occupy almost all forest habitat types throughout the State. Snowshoe hares occur primarily in coniferous forest at all elevations, except for the alpine zone (Johnson and Cassidy 1997). Snowshoe hares use succulent forage vegetation in the understory during the growing season, and feed on buds, twigs, bark, and evergreens during the winter (Fraley 2009, Harlow et al. 1997)

Habitat Status on the Covered Lands

In 2004-2005, Port Blakely hired a third-party contractor (Raedeke Associates, Inc.), to classify spotted owl habitat suitability in the nine spotted owl management circles (owl circles) that overlap the covered area, according to Forest Practices Rules definitions (WAC 222-16-085). A geographic information system (GIS) analysis using aerial photographs and focusing on stand-level attributes, such as age and tree diameter, suggested that sub-mature or young forest marginal habitat potentially occurred on approximately 2,575 acres within the analyzed circles (Herter 2005). However, no old forest habitat suitable for owl nesting was identified in the analyzed circles.

In addition, Port Blakely conducted field surveys of harvest units within owl circles to identify the presence of young forest marginal habitat (Port Blakely 2006). Young forest marginal habitat provides some of the characteristics needed by spotted owls for roosting, foraging, and dispersal (WAC 222-16), but is of lower quality than old-growth or mature forest habitats. For owl circles in this area of the Cascade Mountains, a 1.82-mile radius circle, centered on the owl site center, is assumed to be an annual spotted owl home range, and is used to measure suitable habitat amounts within the owl circle. USFWS has increasing concern for the persistence of owl sites if the amount of suitable habitat within the owl circle falls below 40 percent.

Of the 2,575 acres of potential mature or young forest marginal habitat located in owl circles in the covered area, the total acreage located within planned harvest units, and thus surveyed, was 1,473 acres. Port Blakely confirmed that 115 acres of young forest marginal habitat was present in two of the harvest units. Although the number of snags was determined to be very low, there were adequate amounts of coarse woody debris and shrub cover to qualify the 115 acres as young forest marginal habitat. Of the 115 acres classified as young forest marginal, approximately 49 acres are within an owl circle. The remaining harvest units located within owl circles did not qualify as young forest marginal habitat because the forest lacked an adequate number of qualifying snags, or adequate amounts of understory shrubs and downed logs (Port Blakely 2006). Thus, the GIS analysis and on-the-ground survey data, as well as Port Blakely's forest inventory data, suggest that there are no stands that would provide nesting opportunities for owls in the covered area. In addition, there is very little young forest marginal habitat available, but additional areas of young forest marginal habitat may be discovered during future habitat assessments.

The 49 acres of young forest marginal habitat on Port Blakely's ownership is within two owl circles that have greater than 40 percent suitable habitat. So, of the four suitable owl habitat types (old forest, sub-mature, young forest marginal, and dispersal), only young forest marginal and dispersal habitat are known to occur in the Morton Block (Figure 3-3).

Although the process of dispersal is recognized as a vital life stage of owls, very little research has been conducted to identify key features necessary to facilitate consistent and successful dispersal (Buchanan 2004). Conceptually, dispersal habitat should consist of stand- and landscape-level conditions that promote safe movement of owls across landscapes and provide adequate opportunities for foraging (Miller et al. 1997). Because of the dearth of supporting information, the Forest Practices Rules (WAC 222-16-085(2)(a)) define dispersal habitat in terms of the minimal conditions that are believed to allow for owls to move through a landscape. These conditions include patches at least 5 acres in size that have the following characteristics:

- at least 70 percent canopy cover;
- at least 70 percent of the stand in conifer species greater than 6-inches dbh;
- 130 to 300 tpa with a dbh of at least 10 inches, or a basal area of 100 square feet of 10-inch dbh or larger trees; and
- a minimum of 20 feet between the top of the understory vegetation and the bottom of the live canopy, with the lower boles relatively clear of dead limbs.

In addition to these conditions, the Forest Practices Rules acknowledge the importance of other forest structures or age classes in the landscape (WAC 222-16-010), but these attributes are not included in the definition.

Using the definition of dispersal habitat provided in the Forest Practices Rules, approximately 51 percent (23,105 acres) of the covered area would qualify as dispersal habitat. In contrast to the Forest Practices Rules definition, however, it is likely that the conifer stands on Port Blakely's Morton Block that contain the components sufficient to facilitate dispersal by owls are generally limited to those that are older than 50 years of age. This is because second-growth stands younger than 50 years of age have not been actively managed (pre-commercially or commercially thinned) to create adequate spacing, retain adequate amounts of downed wood and snags, and develop an adequate understory shrub component. By the time conifer stands in the landscape reach 50 years of age they will have – especially assuming implementation of an effective snag conservation and development program – the tree density and structural features that will allow for owl movement and support of their primary prey species.

For the purposes of this analysis, unmanaged conifer stands greater than 50 years of age and managed stands greater than 40 years of age are considered likely to provide dispersal habitat. Thus, suitable habitat for owl dispersal is currently estimated to be approximately 18 percent (8,360 acres) in the Port Blakely Morton Block, 4,083 acres of which is in the Mineral SOSEA (see SHA Section 4.2.2) (Figure 3-3).

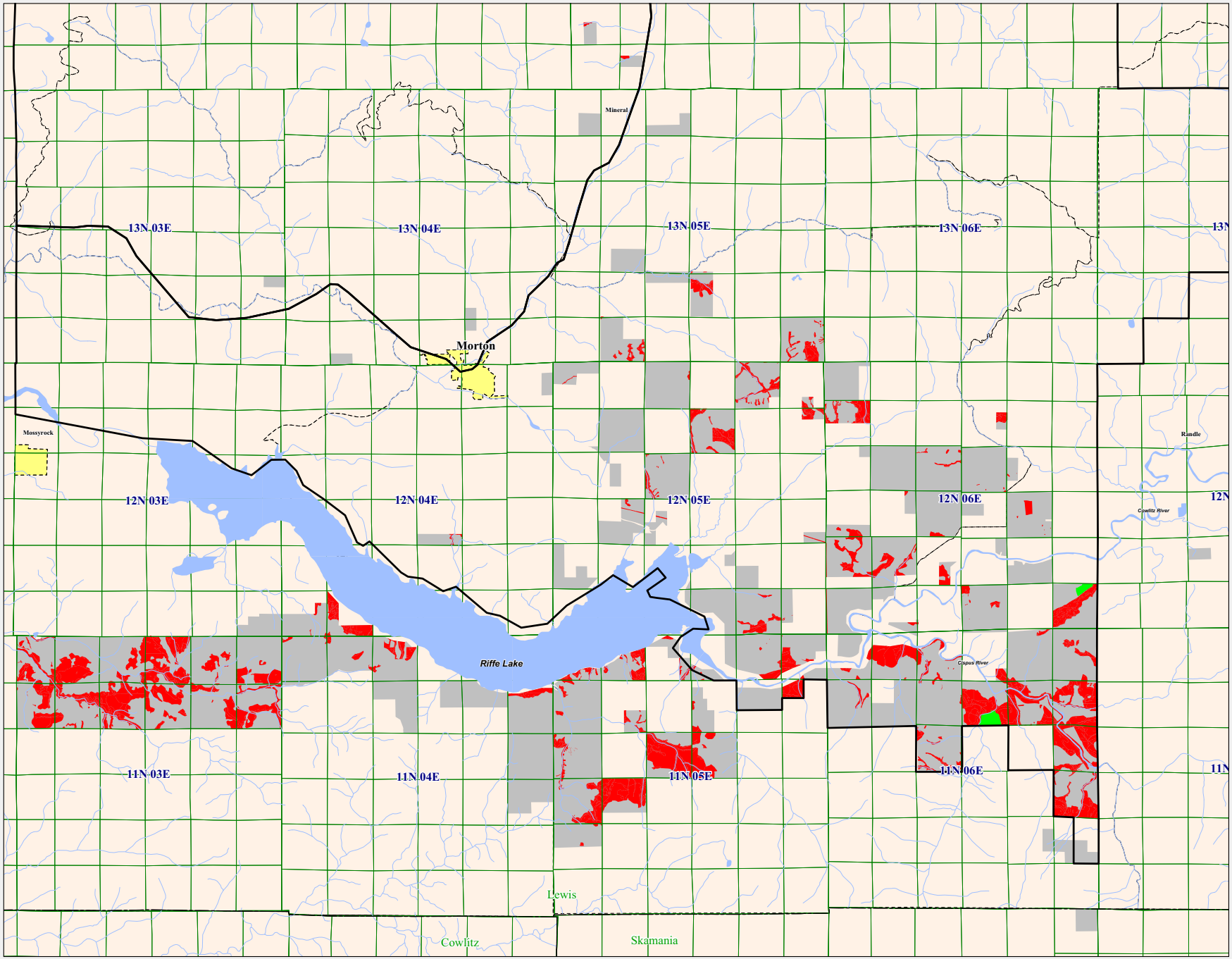

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Figure 3-3

Current Suitable Young Forest Marginal and Dispersal Habitat

Revision date: 01/27/2009

Map Legend

- Port Blakely Ownership
- Hydrological features
- PLSS delineation
- Dispersal Habitat
- Young Forest Marginal Habitat
- SOSEA Boundary

Spotted Owl Occurrence on the Covered Lands

At present, there are no known nesting spotted owls in the covered area. However, nine owl circles associated with site centers on adjacent ownerships (primarily national forest land) overlap portions of the covered area. Of these, six are Status 1 (breeding pair) and three are Status 3 (territorial single). An additional two owl circles affect Port Blakely forest management operations because, although these owl circles are located entirely on adjacent ownerships, they overlap owl circles that extend into Port Blakely ownership such that they influence acreage assessments of owl habitat in the circles on Port Blakely land. Under Forest Practices Rules, suitable habitat needs for each inner (0.7-mile radius) owl circle within a SOSEA are assessed independently and cannot be double-counted; i.e., habitat identified as suitable in one inner circle cannot be identified as suitable habitat for another inner circle. Thus, the amount of habitat that must be protected under Forest Practices Rules is affected by the amount of existing habitat that may occur within two different but overlapping inner circles on and adjacent to Port Blakely's ownership.

Surveys for owls have been conducted in conifer stands throughout the covered area and in adjacent ownerships. Surveys began in 1997 and continued through 2007 and were conducted in association with planned forest management activities. Although the surveys included nearly all requisite elements of the survey protocol (USFWS 1992), they did not include survey visits to areas beyond the immediate vicinity of the proposed management units (i.e., they did not cover the entire area of the owl circle). Because the surveys conducted in the last decade were spatially constrained to the area of proposed management units, we lack information with which to make conclusive statements regarding occupancy of sites on adjacent Federal lands and in portions of the covered lands lacking current survey information.

Records from previous landowners show that there has been only one owl detection in the covered area since surveys were initiated in 1997. This detection occurred in 1997 and was a single male located during a nocturnal survey and the subsequent diurnal follow-up visit. No further responses were obtained in the area during surveys conducted later in that same year or in subsequent years. Surveys conducted in the covered area in 2001, 2002, and 2003 resulted in spotted owl responses but they were determined to be on the adjacent Gifford Pinchot National Forest lands. No spotted owls were detected during surveys conducted in other years through 2007.

Marbled Murrelet

Ecology

The murrelet is a small diving seabird that forges in near-shore marine environments but nests inland in mature conifers (USFWS 1997). It was listed as threatened under the ESA in 1992. One of the primary reasons for the listing was the loss of nesting

habitat, predominantly mature and old-growth forests. The general ecology of the murrelet is well described in the following documents: Recovery Plan for the Marbled Murrelet (USFWS 1997); Evaluation Report for the 5-Year Status Review of the Marbled Murrelets in Washington, Oregon, and California (McShane et al. 2004); and a report to WDNR entitled: Recommendations and Supporting Analysis of Conservation Opportunities for the Marbled Murrelet Long-Term Conservation Strategy (Raphael et al. 2008).

Habitat on the Covered Lands

Murrelets nest in mature and old-growth conifer forests, sometimes as far as 50 miles from the marine environment. These structurally complex forests provide the large limbs with moss, mistletoe, or other deformities, that provide a wide and flat space for nesting.

For the purposes of determining forest stands that would require murrelet surveys prior to forest management activities, the Washington Forest Practices Board (2004) (WAC 222-16-010) identified stands within 50 miles of marine waters that contain all of the following characteristics as having the potential to provide nesting platforms:

- contiguous forested area containing trees capable of providing nesting opportunities;
- at least 40 percent of the dominant and co-dominant trees are Douglas-fir, western hemlock, western red cedar, or Sitka spruce (*Picea sitchensis*);
- at least 7 acres in size;
- large (32-inch or greater dbh) conifer trees present;
- generally multi-storied (2 to 3 layers) canopy; and
- moderate canopy closure.

Port Blakely's forest inventory methods do not measure horizontal limbs and other deformities that can provide nesting platforms that ultimately determine suitable murrelet habitat. Because of this, Port Blakely is conservatively considering stands older than 81 years and at least 7 acres in size to be potential nesting habitat for the species because stands 81 years and older are assumed to provide trees with suitable limbs. USFWS acknowledges that stand age is not an accurate predictor of murrelet nesting habitat, and that stands less than 7 acres may become occupied. Murrelets nest along approximately 6,500 miles of coast line in North America, between the Aleutian Islands and central California. Although populations are distributed throughout this area, there are three apparent gaps in murrelet distribution, one of which is located in southern Puget Sound (Raphael et. al. 2008) that may reduce the likelihood of murrelets nesting in the covered area. In addition, the value of inland habitat declines beyond 40 miles from marine foraging areas, as reported from

studies on Washington Department on Natural Resources lands (Raphael et. al. 2008). However, because of the available forest inventory data, and for the purposes of this EA and the SHA, 81-year-old forest stands greater than 7 acres in size will be used to represent potential murrelet nesting habitat, and will likely result in an overestimate of this habitat in the covered area.

According to the present forest inventory data, stands that are 81 years and older account for 632 acres (Table 3-3). Of these stands, Port Blakely has identified 498 acres that are conifer dominated and greater than 7 acres in size. Of these 498 acres, 372 acres are within 50 miles of marine waters and 126 acres are beyond 50 miles from marine waters (S.B. Murden pers. comm. 2008) (Figure 3-4). Approximately 275 acres of the 498 acres of potential murrelet habitat are in SSAs (Figure 3-4). Although these habitat patches are small, they could function as nesting habitat if they provide suitable nesting platforms. USFWS believes that these acreage estimates of potential habitat are probably on the high end of what may actually be suitable habitat for the species; however, over time they might develop into suitable habitat.

Table 3-3. Acres of Forest Habitat in the 81-Year-Plus Age Class by Decade (No Action Alternative)

Decade	Acres (81-Year-Plus)
2007	632
2017	661
2027	1,369
2037	2,241
2047	3,037
2057	3,790
2067	4,569

Occurrence of Murrelets on the Covered Lands

Approximately 50 percent of the covered land is located within 50 miles of marine waters (Figure 3-4). Areas of potentially suitable habitat in the covered area that are within the 50-mile zone were surveyed to Pacific Seabird Group protocol by the previous landowners as management units were prepared for harvest. Surveys conducted in the covered area by Raedeke Associates from 1998 to 2000, and by ABR from 2001 to 2003, resulted in no murrelet detections. However, one murrelet detection was recorded on lands adjacent to the covered area (T13N, R06E, Section 31). This was a Status 4 detection, meaning that a murrelet was either seen or heard but behavior indicating nesting occupancy was not observed. Status 4 detections indicate presence but not occupancy, therefore further surveys are not required and the site is not considered occupied per WAC 222.16. Given the available survey data

and the current habitat conditions, it is highly unlikely that murrelets nest in the covered area.

Grizzly Bear

Grizzly bears historically occurred in a wide variety of habitat types, suggesting a wide range of habitat tolerances. An abundant and varied food supply and large tracts of land providing relative isolation and freedom from human encroachment are important components of grizzly bear habitat (USFWS 1993). Grizzly bears have not been documented within the covered areas (WDFW 2008a) and are not likely to use the covered area because of the relatively high levels of human activity associated with a managed landscape.

Gray Wolf

Historically, gray wolves occupied a variety of habitat types, suggesting a broad array of habitat tolerances. Key components of suitable habitat for gray wolves include a year-round large ungulate and alternative prey base, space with minimal human encroachment, and suitable denning and rendezvous sites (USFWS 1987). Gray wolves have not been documented within the covered areas (WDFW 2008a). Wolves are not likely to use the covered area in the foreseeable future.

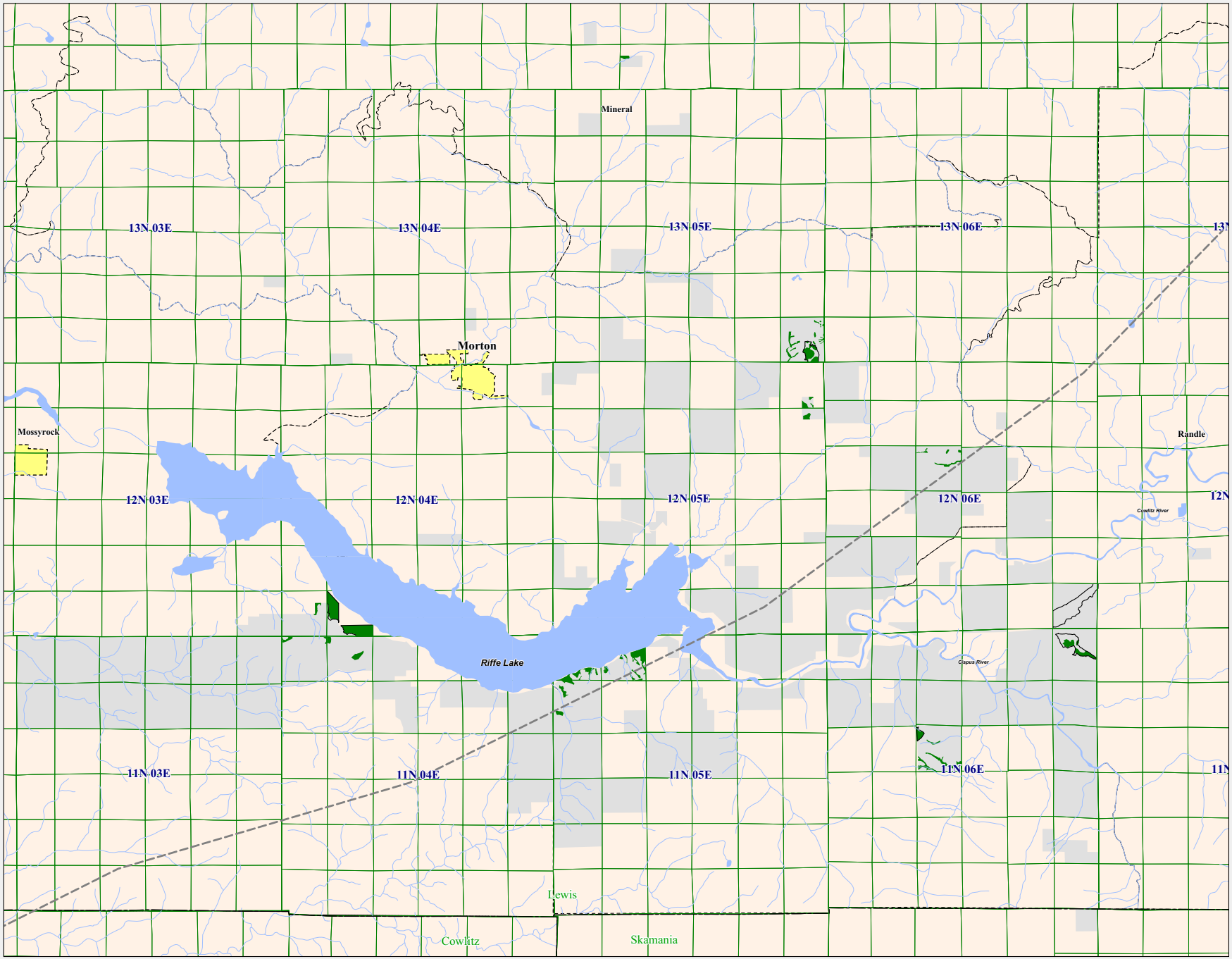
3.2.2. Other Special-Status Wildlife

Bald Eagle

There are four known bald eagle nesting sites on the covered area. Two of these sites are in close proximity to Riffe Lake, one is near Cowlitz Falls, and the fourth is at the upper end of Frost Creek. All four nest sites have been inspected by Port Blakely and WDFW biologists and they are currently protected under short- and long-term site-management plans approved by WDFW. Short-term plans are developed for specific forest management activities that are expected to be of short duration. No winter roosts sites have been documented in the covered area.

Northern Goshawk

Northern goshawks have not been documented in the covered area; however, they have been documented within 1 to 2 miles of the small, isolated blocks of Port Blakely lands in the northwest portion of the covered area. Northern goshawks are generally associated with mature forests and during the breeding season have large home ranges. Goshawks have nested in eastern Lewis County within managed industrial landscapes, utilizing conifer trees with defect as well as deciduous trees for nest sites (Bosakowski et al. 1999). Stands utilized by nesting goshawks are similar to those available on the covered lands, thus, this species may occasionally occur on the covered lands.



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N

Miles

Figure 3-4

Potential Marbled Murrelet Habitat and Set-Aside Areas

Revision date: 08/18/2008

Map Legend

- Port Blakely Ownership
- Hydrological features
- PLSS delineation
- Age Class 81 plus
- Designated Special Set-Aside Areas
- 50 Mile MAMU range

Peregrine Falcon

Peregrine falcons have not been documented in the covered area or in adjacent areas; however, they nest on cliffs in the foothills of the Cascade Mountains and they may occur where suitable habitat is present in the covered area. Cliffs in the covered area may provide suitable nesting habitat for the peregrine falcon.

Pileated Woodpecker

Pileated woodpeckers have not been documented in the covered area or within 1 mile of the covered area (WDFW 2008a). However, this may be because comprehensive surveys for the species have not been conducted. It is possible that they may occur on the covered lands. The current habitat conditions on the covered lands are marginal because of the scarcity of large snags and mature forests.

Olive-Sided Flycatcher

Olive-sided flycatchers have not been documented in the covered area or within 1 mile of the covered area (WDFW 2008a), although no surveys have been conducted, and reported occurrences would be from incidental sightings only. Olive sided flycatchers probably occur on the covered lands because they are relatively common in forested habitat in the western Cascades during summer (June through August) (Seattle Audubon Society 2009). This species is an edge species, preferring the border between forests and openings (Smith et al. 1997).

Vaux's Swift

Vaux's swifts have not been documented in the covered area or within 1 mile of the covered area (WDFW 2008a), although no surveys have been conducted, and reported occurrences would be from incidental sightings only. This species may occur on the covered lands, in areas of older forest (greater than 81 years). Vaux's swift is strongly associated with old-growth forests. Suitable nesting or roosting structures, specifically large, hollow snags or trees with broken tops, is likely to be the limiting factor for occurrence (Lewis et al 2004). The current habitat conditions on the covered lands are probably marginal because of the paucity of suitable snags.

Fisher

Fishers have not been documented in the covered area (WDFW 2008a). Fishers prefer dense, mature forest, although the species inhabits second-growth forests that provide ample cover (Powell and Zielinski 1994, Johnson and Cassidy 1997). Considered to be extirpated in Washington (Lewis and Hayes 2004) fishers have recently been reintroduced to the Olympic peninsula. Although not currently believed to be present in the covered area, the Washington State recovery plan for fishers includes establishing populations in the Cascades both north and south of Interstate 90 (Hayes and Lewis 2006); therefore fisher may inhabit the covered lands in the future.

Pacific Western (Townsend's) Big-Eared Bat

This species has not been documented in the covered area but has been documented adjacent to the northwestern portion of the covered area (WDFW 2008a). The Townsend's big-eared bat may occur in the covered area.

Long-Eared Myotis and Long-Legged Myotis

Two species of special-status bats in the genus myotis may occur in the covered area, although they have not been documented here (WDFW 2008a). Surveys for these species have not been conducted in the covered area. The long-eared myotis and long-legged myotis require habitat that includes suitable roosting habitat. The use of rock crevices, caves, mines, buildings, large hollow trees, snags, or loose bark for day roosts is a characteristic common to these bat species. Myotis species roost in maternity colonies that include their young, and typically use caves or mines for winter hibernacula (Barbour and Davis 1969, Brown and Pierson 1996). Both species are associated with open water habitat, where they often fly to and from roost sites to both drink and forage on insects associated with aquatic and riparian habitat (Christy and West 1993).

Elk

Elk are known to occur in the covered area throughout the year. Portions of the covered area along the southern edge of Riffe Lake and along the Cowlitz and Cispus Rivers are mapped as elk winter range for the Mount St. Helens elk herd. In western Washington, elk winter range is generally located in forested areas that provide thermal and hiding cover interspersed with foraging areas.

Columbia Black-Tailed Deer

Black-tailed deer are known to occur in the covered area throughout the year, and are also likely to migrate seasonally through the covered area. Black-tailed deer are found in coniferous and hardwood forests with dense shrub or early successional stages containing small trees. They will also use meadows, grasslands, and wetland areas.

Van Dyke's Salamander

Van Dyke's salamanders have not been documented in the covered area (WDFW 2008a) but have been documented on lands adjacent to the northwest and southeast portions of the covered area and therefore may occur in the covered area. They are most often associated with moist talus, rock outcrops, logs, seeps, or woody debris along streams (Johnson and O'Neil 2001).

Larch Mountain Salamander

Larch Mountain salamanders have not been documented in the covered area (WDFW 2008a) but have been documented on lands adjacent to the northeast portion of the covered area and therefore may occur in the covered area. The species requires mossy talus, logs, or woody debris (Johnson and O'Neil, 2001).

3.3. Fish and Aquatic Amphibians

Port Blakely's Morton Block is located in the Upper Cowlitz River watershed, Water Resource Inventory Area (WRIA) 26. Within this watershed, Port Blakely properties occur in three major sub-basins: the Tilton River, Riffe Lake, and the Cispus River. Three dams in the Upper Cowlitz River watershed influence fish and aquatic resources by restricting or preventing natural fish passage, controlling downstream hydrology, and impounding the Cowlitz River, forming Mayfield and Riffe Lakes. These dams are the Mayfield, Mossyrock, and Barrier Dams. The Barrier Dam is a complete barrier to fish and was constructed to direct fish to the Cowlitz salmon and trout hatchery complexes located at the dam (NMFS 2004).

3.3.1. Threatened and Endangered Fish Species

The covered area is upstream of the designated Evolutionarily Significant Units of ESA-listed threatened and endangered fish species, including Lower Columbia fall and spring Chinook salmon (*Oncorhynchus tshawytscha)*, Lower Columbia coho salmon (*Oncorhynchus kisutch)*, and Lower Columbia winter steelhead (*Oncorhynchus mykiss*). Hatchery and wild runs of ESA-listed salmon species occur within the covered area. All of these runs are dependent on artificial passage systems (truck-and-haul) to access areas past dams, both downstream and upstream of the study area (Tacoma Power 2005; NMFS 2004; WDFW 2008b). Critical habitat designated for Lower Columbia Chinook salmon includes the Cowlitz River, Riffe Lake, and the Cispus River (70 FR 52630). These areas are also included in the critical habitat designation for Lower Columbia steelhead, as well as Quartz Creek, Woods Creek, and Kiona Creek (70 FR 52630) (Figure 3-5).

Several streams in the covered area contain habitat for salmonids, with Moses Creek and Crystal Creek providing spawning habitat for winter steelhead, and Elk Creek and the Cispus River providing rearing habitat for fall Chinook, coho, and winter steelhead. Spring Chinook salmon are also present in Riffe Lake, the Cispus, and Cowlitz Rivers, and these rivers provide spring Chinook salmon spawning habitat upstream of Riffe Lake. Coho are known to be present in Moses Creek and there is potential coho habitat in Wakeawasis and Rainy Creeks (WDFW 2009).

3.3.2. Other Fish

In addition to anadromous fish species and hatchery stocks, naturally reproducing stocks of resident fish occur throughout the streams and rivers of the watershed and include cutthroat trout (*Oncorhynchus clarki lewisi*) , rainbow trout (*O. mykiss*), three-spine stickleback (*Gasterosteus aculeatus*), and a variety of minnows (Cyprinidae) and sculpins (Cottidae). Fish species in Riffe and Mayfield Lakes include landlocked sockeye (a.k.a. kokanee) (*O. nerka*); coho and Chinook salmon (as mentioned in Section 3.3.1 above); cutthroat, rainbow, and brown trout (*Salmo trutta*); Crappie (*Pomoxis* sp.); largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*); brown bullhead (*Ameiurus nebulosus*); bluegill (*Lepomis macrochirus*); and yellow perch (*Perca flavescens*)) (Tacoma Power 2005, Bait Country Sport Shop 2008). Mayfield Lake also contains northern pikeminnow (*Ptychocheilus oregonensis*), and tiger muskie (hybrid of *Esox masquinongy* and *E. lucius*), which was stocked in an effort to reduce the population of northern pikeminnow (Tacoma Power 2005).

3.3.3. Aquatic Amphibians

Cascades Frog

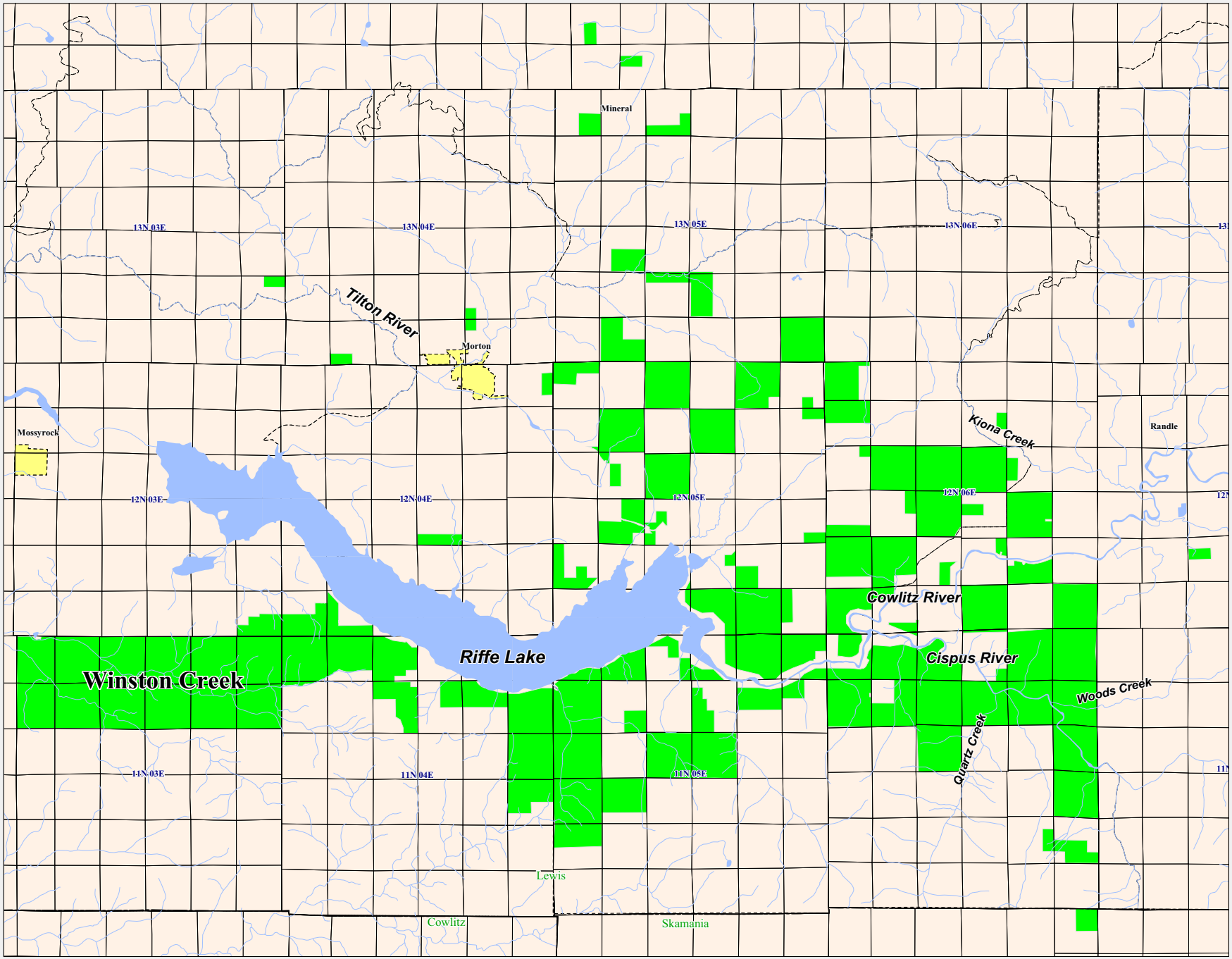
The Cascades frog is found in the Olympic and Cascade Mountains of Washington and Oregon above 2,600 feet in elevation, in montane meadows, slow-moving streams, lakes, and ponds (Leonard et al. 1993). Cascades frogs have not been documented in the covered area (WDFW 2008a), however, no surveys have been conducted for them. Cascades frog is widely distributed in the Washington Cascades (Hallock and McAllister 2005) and, thus, could occur in appropriate habitats in the higher-elevation portions of the covered area.

Cascade Torrent Salamander

Cascade torrent salamanders live in cold, clear springs, seeps, headwater streams, and in waterfall splash zones. They may forage in adjacent moist, forest habitat (Corkran and Thoms 1996). Cascade torrent salamanders have not been documented in the covered area but have been documented on lands adjacent to the southeast portion of the covered area (WDFW 2008a) and so may occur in the covered area.

Cope's Giant Salamander

Cope's giant salamanders live in small streams with steep gradients with permanently flowing clear, cold water. They inhabit streams with substrates consisting of large gravel to small boulders, with some large logs and no silt. Foraging occurs along streambanks and in streamside forests on rainy nights (Corkran and Thoms 1996). Cope's giant salamanders have not been documented in the covered area (WDFW 2008a) but have been documented on lands adjacent to the southeast and northeast portions of the covered area (WDNR 2008a) and so may occur in the covered area.



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N

1 0 1 2

Miles

Scale: 1 : 50,000

Figure 3-5

Streams

Revision date: 08/18/2008

Map Legend

- Port Blakely Ownership
- Hydrological features
- PLSS Delineation

Coastal Tailed Frog

The tailed frog occurs in Washington in fast flowing mountain streams on the west side of the Cascades (Leonard et al. 1993). Although there are no records of tailed frogs in the Priority Habitats and Species database for the covered area (WDFW 2008a), Port Blakely staff have documented the presence of tailed frogs in the covered area during stream surveys (S.B. Murden pers. comm. 2008).

Western Toad

The western toad is widely distributed over all but the most arid regions of the western United States, and can use a wide variety of habitats at elevations ranging from sea level to over 7,000 feet (Blaustein et al. 1995, Leonard et al. 1993). Port Blakely staff members have documented western toads in the covered area (S.B. Murden pers. comm. 2008).

3.4. Wetlands

Specific wetland areas have not been identified within the covered area. Such identification would occur when forest management activities are being planned and field review of sites proposed for management activities are conducted. Forest Practices Rules limit activities within wetlands and their buffers, depending on the wetland type.

Within the various wetland types (Table 3-4) a total of 75 trees per acre of wetland management zone (WMZ) greater than 6-inches dbh must be left. Of the 75 trees, 25 shall be greater than 12 inches dbh including 5 trees greater than 20 inches dbh, where they exist. Leave trees shall be representative of the species found within the WMZ. Retention of wildlife reserve trees is encouraged where possible. Partial cutting or removal of groups of trees is acceptable; however, openings created by harvesting in the WMZ must not exceed 100 feet, measured parallel to the wetland edge. Ground-based harvesting systems must not be used within the minimum WMZ width, unless specifically approved by WDNR. Other than bogs, forested wetlands may be subjected to regeneration harvest.

Table 3-4. Wetland Management Zones

Wetland Type	Acres of Non-forested Wetland*	Maximum WMZ Width	Average WMZ Width	Minimum WMZ Width
A (including bogs)	Greater than 5	200 feet	100 feet	50 feet
A (including bogs)	0.5 to 5	100 feet	50 feet	25 feet
A (bogs only)	0.25 to 0.5	100 feet	50 feet	25 feet
B	Greater than 5	100 feet	50 feet	25 feet
B	0.5 to 5	n/a	n/a	25 feet
B	0.25 to 0.5	No WMZ required	No WMZ required	n/a

*For bogs, both forested and non-forested acres are included.

3.5. Water Quality

The State of Washington has established standards for surface-water quality as required under Chapters 90.48 (Water Pollution Control Act) Revised Code of Washington (RCW). Water-quality standards are specified in WAC 173-201A. As specified in the Forest Practices Rules, riparian management zones (RMZs) of specified widths must be maintained along all WDNR Type S, F, Np, and Ns waters during timber harvest for the protection of water quality (WAC 222-30). There are no active monitoring stations currently in WRIA 26 in the vicinity of the covered area. No streams or stream segments in the covered area are on the Washington Department of Ecology (Ecology) list of impaired waters (per section 303(d) of the Federal Water Pollution Control Act), which identifies failure to attain an applicable water-quality standard for one or more pollutants (e.g., temperature, fecal coliform, and dissolved oxygen) (Ecology 2008a).

RMZs for fish-bearing streams have three zones: the core zone nearest to the water, the inner zone in the middle, and the outer zone furthest from the water. Table 3-5 shows the widths of RMZs required for each site class, and the width of each of the zones. See WAC 222 and/or the WDNR Forest Practices Habitat Conservation Plan (WDNR 2005) for a detailed explanation of the riparian rules for forest practices.

Table 3-5. Riparian Management Zones for Fish-Bearing Streams

Site Class	RMZ width (feet)	Core Zone Width (feet)	Inner Zone width (feet)		Outer Zone Width (feet)	
			Stream width <= 10 feet	Stream width > 10 feet	Stream width <= 10 feet	Stream width > 10 feet
I	200	50	30-84	50-100	66-67	50-66
II	170	50	30-64	50-78	56-57	42-50
III	140	50	30-43	55	46-47	35
IV	110	50	23	33	37	27
V	90	50	10	18	30	22

3.6. Geology and Soils

The Morton Block is located at the western edge of the Cascade Mountain Range. In general, the terrain is mountainous with numerous valleys incised by rivers and creeks. The Morton Block is characterized by shallow, well-drained soils that can be subject to slides in steep terrain. Soils in the upland areas predominantly formed from volcanic ash, pumice, and material weathered from underlying volcanic rock, with areas of colluviums and residuum of native bedrock, supplemented with ash and glacial sediments. Soil profiles vary in depth, but generally consist of sandy and loose-textured material covered with an organic duff layer. Lowland areas contain deep soils consisting of alluvium in addition to ash and pumice. Throughout the covered area, soils are typically well drained, with the exception of wetland areas.

3.7. Cultural Resources

Several laws and regulations require Federal agencies to consider the effects of a proposed project on cultural resources. These laws and regulations set forth a process for compliance, define the responsibilities of the party proposing the action, and prescribe the relationship among other agencies such as the Washington Department of Archaeology and Historic Preservation (DAHP) and the Advisory Council on Historic Preservation. The National Historic Preservation Act (16 U.S.C. 470–470w), is the centerpiece of Federal legislation protecting cultural resources. Washington State laws protect Native American graves and records (RCW 27.44) and archaeological sites and resources on all private and State lands (RCW 27.53).

A file and literature search was conducted at DAHP to determine whether cultural-resources inventories had been conducted for any of the parcels in or adjacent (within 1 mile) of the covered lands, defined as the Area of Potential Effect (APE). The search also assessed whether inventories of cultural properties on adjacent lands could provide evidence that would allow estimating the probability of cultural resources occurring on parcels in the APE. Another purpose of the file and literature search was to determine whether any cultural-resources sites listed in the National Register of Historic Places (NRHP), potentially eligible for listing in the NRHP, or that require additional data prior to a NRHP-eligibility determination within the APE, could be affected by activities associated with the Port Blakely Morton Block.

The search did not identify any cultural resources on the covered lands but did identify several sites within the 1-mile APE. Most of the sites recorded to date are prehistoric lithic scatters that appear to represent the time period locally known as the Castle Creek Interval (500-1,600 Before Present (BP)). Artifacts observed in the sites or in the possession of private collectors indicate use of the area may have occurred as early as the Swift Creek Interval (4,000-9,000 BP). Two sites are early historic Native American cemeteries. Both are considered to be NRHP-eligible under Criterion A as heritage sites, and are also protected by the Washington State Indian Graves and Records Act (RCW 27.44).

The file and literature search revealed that the most extensive investigations of cultural resources conducted in the APE were done for the Cowlitz River Hydroelectric Project, primarily along the edges of Mayfield and Riffe Lakes. During those surveys, at least 93 archaeological sites were reported (Wessen 2004). Other surveys have been conducted for a boat launch, trail, and to record other sites known to private collectors. However, the surveyed areas are a very small portion of the area included in the records search, and most of the areas where archaeological surveys have been conducted are in and around Riffe Lake and along the edge of the Cowlitz River, not on the forested slopes where the Port Blakely parcels are located.

Historic period properties identified in the literature search include the Copper Queen Mine and a cabin, a mining camp and other cabins, the historic Kosmos town site,

and the Kosmos mill. Twenty-two of the sites are in the Kosmos Flat Archaeological District, which was recommended eligible for the NRHP (Cowan 2001), with DAHP concurrence. The Kosmos Flat Archaeological District is not in the APE, but is in the buffer area and most of the sites are in the reservoir draw-down zones. In the Request for Determination of Eligibility for the Kosmos Flat Archaeological District (Cowan 2001), it was noted that most of the sites in the area of Riffe Lake reservoir are in the eastern part, particularly on Kosmos Flat, but the survey around Riffe Lake is incomplete. The historic sites in the APE also include a portion of the Cowlitz-Yakima Trail, a once-important transportation corridor that can yield information about historical road-construction techniques. The Cowlitz-Yakima Trail contributes to the NRHP-eligibility of the Kosmos Flat Archaeological District.

Most of the cultural sites recorded in the APE have not been evaluated in terms of their eligibility for the NRHP. However, of the sites for which recommendations regarding their NRHP eligibility exist, approximately half have been recommended eligible. The sites that have been recorded along the surveyed edge of Riffe Lake provide evidence that there is a high probability that more sites remain to be discovered. The surveys in areas around the Morton Block provide an indication that people have been using the area for at least the late prehistoric, ethnographic, and historic periods and there is some evidence of much earlier use of the area. Because very little surveying has been done above the lake, it is impossible to determine what kinds of activities occurred on the forested slopes or whether sites are preserved on the slopes where the soils can be shallow and subject to slides in steep terrain.

3.8. Land Use

Lewis County covers 2,452 square miles, over 75 percent of which is either owned by the State and Federal governments or is managed for private resource production. Approximately 35 percent of Lewis County is designated as national forest, including the Gifford Pinchot National Forest and the Mount Baker-Snoqualmie National Forest. Lewis County also contains portions of Mount Rainier National Park and the Mount St. Helens National Monument (Lewis County 2002).

Timber production is the dominant land use in central Lewis County. Currently, Port Blakely's Morton Block is devoted exclusively to timber production, as is the majority of the land that surrounds it. The communities of Morton, Glenoma, and Randle, from west to east, are the population centers nearest to the covered area. Morton is located a few miles west of the northern sections of the Morton Block. Six parcels of the Morton Block, totaling 1,280 acres, are located within 3 miles of Morton. The remaining covered lands, 44,028 acres (97 percent), are greater than 3 miles south and east of Morton. Glenoma is located within 1 mile of several Morton Block parcels. Randle is located more than 3 miles from the nearest Morton Block parcel.

3.9. Socioeconomics

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that Federal agencies identify disproportionately high and adverse human health or environmental impacts on minority or low-income individuals. Demographic data for the study area indicates that the minority population is significantly lower than in many other areas of the State (U.S. Census Bureau 2008). Low-income populations, however, are more likely to be present in the vicinity, based on the available data on poverty rates.

The covered area lies in south-central Lewis County, a sparsely populated, rural area of Washington State heavily engaged in timber production. No major population centers exist in the area, though the communities of Mossyrock, Morton, Randle, and Glenoma are nearby. The covered area lies within Lewis County Census Tracts 9717 and 9719, which had a combined population of 7,128 as of the 2000 Census (U.S. Census Bureau 2008). Census data for these two tracts indicate that the population in the area is in excess of 95 percent white (compared to 82 percent of the statewide population). The 2000 Census data also indicate that income in the area is below the State median (Tract 9717 is 80 percent of the State median, and Tract 9719 is 72 percent of the State median). In 2000, approximately 14 percent of the population in these two tracts was earning an income below poverty level, compared to 11 percent statewide.

3.10. Climate Change

The consensus among scientist is that humans are contributing to global warming (Backlund et al. 2008), although the relative contributions of human actions and natural fluctuations is debated. During the 20th century, measurable changes in global average surface temperatures, global sea level, and global precipitation were observed. There have been observable increases in the number and frequency of forest fires and insect outbreaks in the west, southwest, and Alaska; increases in precipitation, stream flow, and stream temperatures throughout the United States; and reduced snowpack and earlier spring runoff in the west (Backlund et al. 2008).

There is no definitive information related to how the forest landscape in eastern Lewis County is affected by the changes described above. However, it is assumed that impacts in Lewis County would be similar to those predicted for other areas and that reduced snowpack and earlier spring runoff may affect aquatic resources and also make forests drier than usual, potentially increasing the risk of fire and, over time, possibly changing the vegetative composition of the landscape (Backlund et al. 2008).

Chapter 4. Environmental Consequences

4.1. Vegetation

4.1.1. No Action Alternative

Of the special-status plant species that may occur in the covered area, only tall bugbane is associated with mature forest. Under the No Action Alternative, habitat for this species would be limited. Western wahoo, which is associated with moist draws and ravines, is most likely to occur in RMZs and would receive some protection, depending on the stream type. Forest edge habitat for common blue-cup would occur along edges of early seral forest. Potential habitat for Nuttall's quillwort may be protected if it is located within an RMZ; however, if it occurs in forested wetlands it may or may not be protected because under Forest Practices Rules forested wetlands are not protected from harvest unless they are bogs. The No Action Alternative may be advantageous for branching montia, which occurs in disturbed areas, as the frequency of ground disturbance within a given area would be greater under the No Action Alternative because of the shorter regeneration-harvest rotation. This increase in frequency and amount of ground disturbance could make it less likely that the four special-status plant species not associated with disturbed sites would persist if they currently inhabit the covered area.

4.1.2. Proposed Action

With longer regeneration-harvest rotations, the frequency and amount of ground-disturbing activity would be less under the Proposed Action than under the No Action Alternative. There would be less potential for disturbance of areas that may contain special-status plant species. Identification and protection of SMAs may

also provide additional protection to special-status plant species. With extended harvest rotations, there is a greater probability that habitat for tall bugbane would develop in the covered area, and it would persist for a longer time. Protection of forested wetlands beyond Forest Practices Rules requirements could benefit western wahoo, Nuttall's quillwort, and branching montia, although the reduction in soil disturbance may not benefit branching montia. With extended harvest rotations, the amount of forested area that is commercially thinned would increase, which could increase habitat availability for common blue-cap in areas where thinning results in creating small openings of early seral forest habitat.

4.2. Wildlife

4.2.1. No Action Alternative

Table 4-1 shows forest-age classes over a 60-year time frame if harvest were to occur on an average 45-year rotation (range 41to 50 years) under the No Action Alternative. This table shows harvest at 40 years of age because stand age data was presented by decade to show the change in forest age classes on the covered lands over time. This is a conservative estimate because some stands would be harvested when in the 41-to 50-year age class.

Table 4-1. Forest Age Classes on the Covered Lands by Decade*, No Action Alternative

Age Class	Acres						
	2007	2017	2027	2037	2047	2057	2067
0-10	8,464	20,322	10,138	2,260	7,054	20,304	10,138
11-20	2,405	7,241	20,322	10,138	2,260	7,054	20,304
21-30	10,918	2,405	7,241	20,322	10,138	2,260	7,054
31-40	6,661	10,920	2,405	7,241	20,322	10,138	2,260
41-50	8,084	750	778	145	187	14	0
51-60	5,425	797	750	778	145	187	14
61-70	1,913	871	797	750	778	145	187
71-80	390	709	871	797	750	778	145
81 Plus	632	877	1,585	2,457	3,253	4,006	4,785
Non-forest	416	415	415	415	415	415	415

*Total acreage varies by up to 2 acres due to rounding.

Threatened and Endangered Wildlife Species

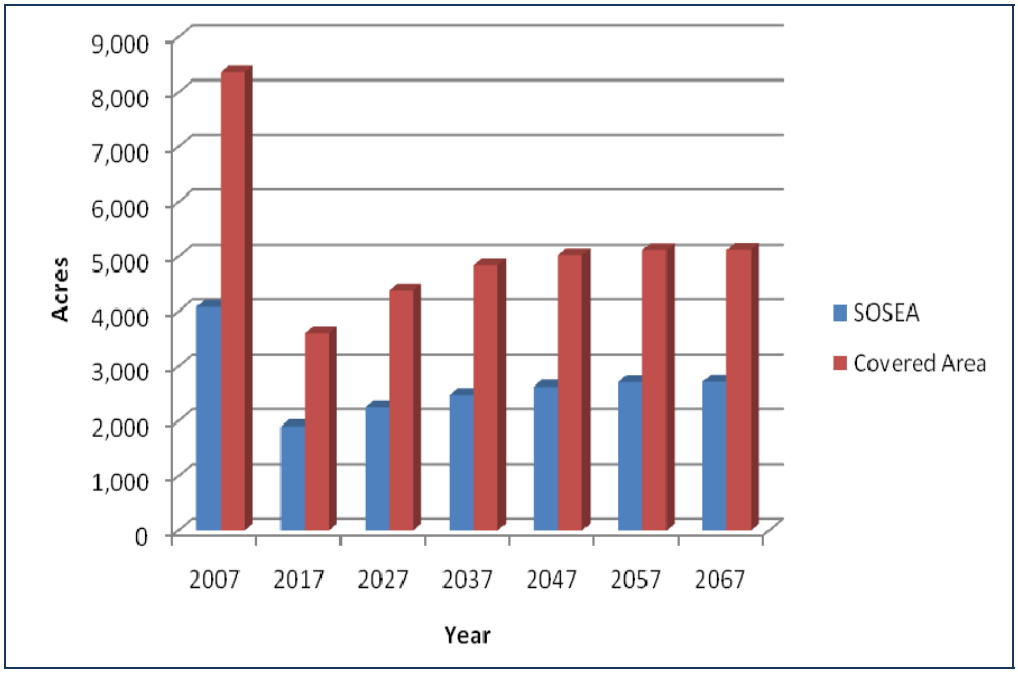
Northern Spotted Owl

Under the No Action Alternative, habitat for spotted owls would be managed for compliance with the ESA and as required under WAC 222-10-041. There are approximately 115 acres of young forest marginal habitat known to occur on Port Blakely lands; 49 acres within two owl circles that overlap the covered area and 66 acres outside of owl circles. Both of these circles contain more than 40 percent suitable spotted owl habitat (young forest marginal or better), on national forest land, with or without the additional 49 acres located in the covered area. It is likely that Port Blakely would harvest the young forest marginal habitat in the covered area, provided that young forest marginal habitat remained above 40 percent in both circles, as allowed under Forest Practices Rules. Future surveys conducted prior to harvest operations could result in discovery of additional young forest marginal habitat but forest inventory data and the GIS analysis indicate that the occurrence of this habitat type elsewhere in the Morton Block is unlikely. All other upland forest stands within owl circles would be placed on a 45-year schedule for regeneration harvest. At this harvest schedule, dispersal habitat (defined as stands that are 50 years of age or older) would not develop outside of RMZs or other ecologically sensitive areas subject to regulatory restrictions (e.g., non-forested wetlands or unstable slopes). There would be more edge and more closed-canopy forests (e.g., stem-exclusion stage) within the owl circles on Port Blakely ownership.

Outside of owl circles, the situation would be the same. No upland forest stands would recruit into dispersal habitat, although stands within RMZs and other ecologically sensitive sites subject to regulatory restrictions would develop into dispersal habitat. This would include areas within and outside of the SOSEA. The amount of dispersal habitat within and outside of the SOSEA that would be available over a 60-year period under the No Action Alternative is shown in Figure 4-1.

Under the No Action Alternative, new nest sites or portions of spotted owl home range circles that are discovered in the future would be managed per the requirements of WAC 222-10-041 and ESA Section 9. WAC 222-10-041 specifies that within SOSEAs, all suitable spotted owl habitat within 0.7 mile of a site center is protected, and 40 percent of the suitable habitat within the owl circle is retained. Outside of SOSEAs, 70 acres of the highest-quality owl habitat around a site center would be retained during the nesting season (March 1 to August 31). In contrast, ESA Section 9 review often considers reductions of suitable habitat below 40 percent within the home range radius as a potential risk of take. Because of the shorter harvest-rotation times that would occur under the No Action Alternative (45-year average rotation), it is unlikely that new site-centers would be established in the covered area, particularly outside of RMZs or other ecologically sensitive areas subject to regulatory restrictions.

Figure 4-1. Dispersal Habitat* in the SOSEA and the Covered Area, No Action Alternative



*Dispersal habitat is defined as stands older than 50 years.

In summary, under the No Action Alternative, the average harvest-rotation age would be less than under the Proposed Action and there would be no voluntary management actions directed to spotted owls. As such, the abundance of small mammals that provide food for dispersing spotted owls is anticipated to be reduced under the No Action Alternative. There would be an increase of younger and more-simply structured forest under the No Action Alternative versus the Proposed Action. The No Action Alternative would potentially provide poorer dispersal capability between Federal lands.

Marbled Murrelet

For the purposes of this EA, as described in Section 3.2.1, forest stands that are older than 81 years and larger than 7 acres are considered potential murrelet nesting habitat. There is currently no documented nesting use of the covered area by murrelets. Under the No Action Alternative, potential nesting habitat would be primarily associated with RMZs and other regulated sensitive areas. Of note, neither the No Action Alternative nor the Proposed Action change management in the RMZs. The amount of potential nesting habitat available would increase over the 60-year period, as trees mature in RMZs and other ecologically sensitive sites protected under Forest Practices Rules. If a new nest site or occupied stand were discovered on or adjacent to the covered area in the future, it would be managed per the requirements of the Forest Practices Rules (WAC 222-10-042)) and ESA Section 9.

Grizzly Bear and Gray Wolf

There is an extremely low likelihood of grizzly bear and gray wolf occurring on the covered lands during the 60-year period. However, if they should occur, they would most likely be traveling through the area, as neither species is expected to regularly use lands within the covered area. Therefore, impacts would be considered insignificant.

Other Special-Status Species

Bald Eagle

Under the No Action Alternative, bald eagles would continue to be managed as they are currently. Existing bald eagle nests would be monitored for activity if forest management activities are planned in the vicinity. Individual site-management plans to minimize or avoid disturbance and/or to protect nest trees from that activity would be developed in coordination with WDFW and implemented. If new nests are found they would be treated similarly. Because site-management plans are developed to minimize or avoid impacts and/or to protect nest trees, the potential for impacts on bald eagles is low.

Peregrine Falcon

Because peregrine falcons nest on cliffs, direct habitat impacts would not occur under the No Action Alternative. Disturbance to nesting peregrine falcons may occur if forest activities occur in the vicinity of a nest; however, the probability of this occurring is low due to the small amount of potentially suitable habitat available.

Other Birds

Under the No Action Alternative, the amount of habitat available for birds associated with mature forest conditions or snags, (northern goshawk, pileated woodpecker, olive-sided flycatcher, and Vaux's swift) would be less than under the Proposed Action. The habitat that would occur would be primarily in RMZs and other ecologically sensitive areas as required under the Forest Practices Rules.

Fisher

Under the No Action Alternative, most forested stands in the covered area would be maintained in age classes less than 45 years old, with the exception of RMZs and other sensitive areas that require protection under the Forest Practices Rules. This would limit potential habitat for the fisher because stands managed under the No Action Alternative would not likely develop the down wood and snag component used by this species. Fisher diet varies by season and food availability and includes a variety of prey species, carrion, and vegetation. In Washington, the only available information on the food habits of fisher comes from reports by trappers in the early 1900's. They reported finding mountain beaver and squirrel remains in the stomachs of fisher, and salal berries and huckleberries in fisher scat. Studies conducted in

British Columbia, Montana, and Idaho found snowshoe hares, red squirrels, and small mammals to be important winter food sources, along with ungulate carrion. A study conducted in the southern Sierra Nevada found sciurids to be the primary prey during spring, summer, and fall, with other small mammals, birds, and reptiles also taken. Fruit was also found to be an important component of the fall diet (Hayes and Lewis 2006). Although not currently believed to be present in the covered area, the Washington State recovery plan for fishers includes establishing populations in the Cascades both north and south of Interstate 90 (Hayes and Lewis 2006); therefore fisher could inhabit the covered lands in the future.

Pacific Western (Townsend's) Big-eared Bat and Myotis Bats

Under the No Action Alternative, potential roosting habitat for tree-roosting bats would be limited to the RMZs and other ecologically sensitive areas that require protection under the Forest Practices Rules. Impacts on roosting habitat and hibernacula in rock outcrops may also be affected by disturbance or removal of canopy cover, which could alter the conditions of the site. Bats may forage over recently harvested areas; however, as these stands develop they are likely to become too heavily stocked for bats to easily move through them. With an average rotation age of 45 years, managed stands would not attain the understory openness or structure for suitable bat habitat.

Elk and Black-Tailed Deer

Under the No Action Alternative, the amount of foraging habitat available following regeneration harvest for both elk and black-tailed deer would increase. However, the amount of forage in older forest stands would be less. Having a greater proportion of the landscape in the youngest age classes would provide potential foraging opportunities for both elk and black-tailed deer; however, if adjacent cover is lacking, this habitat could be underutilized. Because portions of the covered area are within mapped winter range for elk (Lewis County 2008), cover is an important habitat element. Deer and elk can make effective use of young conifer stands for cover.

Van Dyke's Salamander and Larch Mountain Salamander

Under the No Action Alternative, the preferred riparian habitat for Van Dyke's salamander would be largely protected through the RMZ requirements under the Forest Practices Rules. Habitat for Larch Mountain salamander outside of RMZs may be impacted under the No Action Alternative, particularly talus slopes with a conifer canopy. It is likely, however, that this habitat feature would be identified during the Port Blakely Wildlife Program review process and would be given priority for leave tree areas, thus minimizing impacts under the No Action Alternative. Other habitat features used by this species, such as large down logs or sloughed bark at the base of large snags, are not expected to occur outside of the RMZs or forested talus and leave trees as identified by the Wildlife Program.

4.2.2. Proposed Action

Table 4-2 shows forest-age classes over a 60-year time frame if harvest were to occur on an average 60-year rotation (range of 51 to 70 years) under the Proposed Action. This table was derived by predicting harvest of all available stands at 60 years of age. This is a conservative estimate because some stands would be harvested when in the 61- to 70-year age class.

Table 4-2. Forest Age Classes on the Covered Lands by Decade*, Proposed Action

Age class	Acres						
	2007	2017	2027	2037	2047	2057	2067
0-10	8,462	7,126	7,286	5,909	10,139	2,260	7,054
11-20	2,405	7,242	7,126	7,286	5,909	10,139	2,260
21-30	10,918	2,405	7,242	7,126	7,286	5,909	10,139
31-40	6,661	10,918	2,405	7,242	7,126	7,286	5,909
41-50	8,084	6,661	10,918	2,405	7,242	7,126	7,286
51-60	5,425	8,084	6,661	10,918	2,405	7,242	7,126
61-70	1,913	871	798	751	779	145	188
71-80	390	708	871	798	751	779	145
81 Plus	632	876	1,584	2,457	3,255	4,006	4,784
Non-forest	416	416	416	416	416	416	416

*Total acreage by decade varies by up to 2 acres due to rounding.

Threatened and Endangered Wildlife Species

Northern Spotted Owl

Under the Proposed Action, upland forest would be managed with an average harvest-rotation age of 60 years, meaning that dispersal habitat for the juvenile spotted owls would be available in greater amounts and for a longer period of time than would occur under the No Action Alternative (compare Tables 4-1 and 4-2). For this analysis, dispersal habitat is defined as stands greater than 50 years of age on slopes that are equal to or greater than 35 percent (no mid-rotation commercial thinning), the same as the definition used for the No Action Alternative, and stands that are greater than 40 years old on slopes that are less than 35 percent (receive mid-rotation commercial thinning). Under the Proposed Action, commercial thinning would occur on slopes less than 35 percent; therefore, dispersal habitat would develop at a younger age in these stands. Commercial thinning would not occur under the No Action Alternative because the stands would be harvested earlier. On average, 15 years of additional forest growth and maturation would occur under the Proposed Action, providing dispersal habitat that would not exist under the No

Action Alternative. The increase in forested dispersal habitat should improve the chances of successful dispersal of spotted owls between Federal lands.

The implementation of the snag program, as described in detail in the SHA and Section 2 of this EA, is expected to improve the quality of dispersal habitat by providing an increase in prey habitat. Dispersing spotted owls need to find adequate forage resources as they disperse, and the snag program is intended to improve prey habitat for that need. One prey species that is expected to benefit from implementation of the snag program is the northern flying squirrel, which is a primary prey species for the spotted owl.

Mid-rotation management (commercial thinning) would also occur under the Proposed Action, resulting in the earlier development of dispersal habitat that meets the SHA criteria: older than 50 years with no mid-rotation management and older than 40 years with mid-rotation management. Commercial thinning reduces tree density down to approximately 185 to 225 trees per acre, thus improving growth on the remaining trees. Following commercial thinning, canopy cover remains relatively high, and starts to close soon thereafter (within approximately 5 to 10 years). This management option, followed by natural growth, provides cover and within-stand movement opportunities for dispersing spotted owls. The variability in spacing of retained trees will enhance understory shrubs and should provide for additional spotted owl prey.

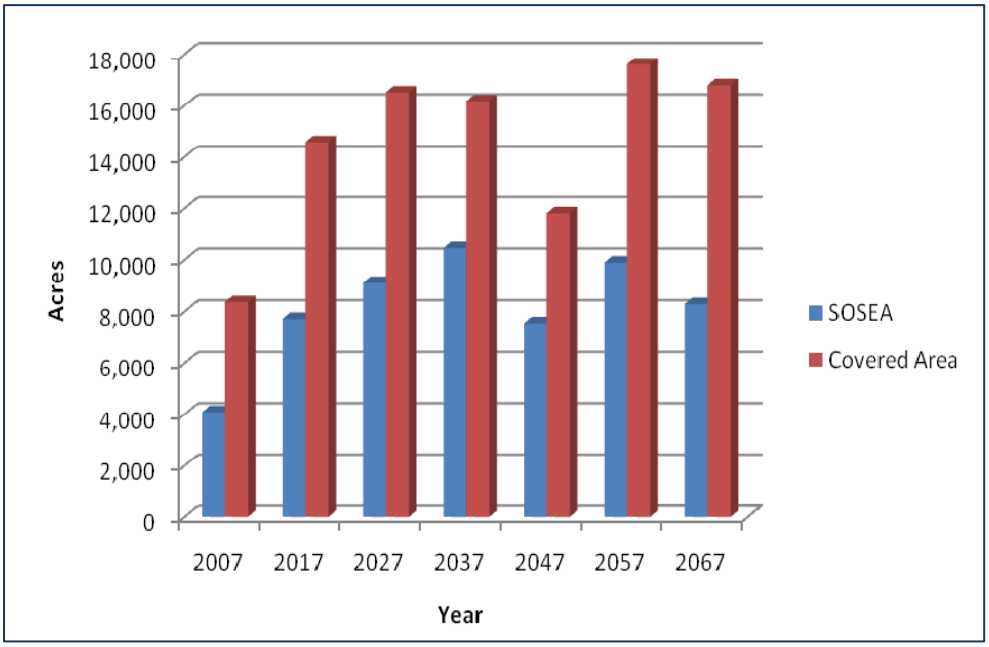
Dispersal habitat in the Mineral Block SOSEA and the covered area under the Proposed Action is shown in Figure 4-2. The amount of dispersal habitat that would be available under the No Action Alternative compared to the Proposed Action is shown in Figure 4-3.

The amount of dispersal habitat would increase in both the Mineral Block SOSEA and the covered area under the Proposed Action (Figure 4-2). Under the Proposed Action, dispersal habitat would exceed current levels for the entire 60-year period and would be well-distributed across the landscape rather than limited primarily to RMZs and other ecological sensitive areas requiring protection under the Forest Practices Rules as under the No Action Alternative.

SMAs, SSAs, a snag conservation and development program, and monitoring of the snag conservation and development program, would also be implemented under the Proposed Action, as would a provision to retain downed wood during salvage operations. Under the Proposed Action, SMAs would receive greater protection than required by Forest Practices Rules under the No Action Alternative. Leave-tree areas designated during the term of the SHA would be retained for the entire term and would not be considered eligible for regeneration harvest when adjacent stands became eligible, unlike the No Action Alternative. Although these leave-tree areas may not necessarily be large in size, over time they are expected to mature and provide potential roosting and foraging opportunities for dispersing spotted owls. Additional protection on potentially unstable slopes and forested wetlands could

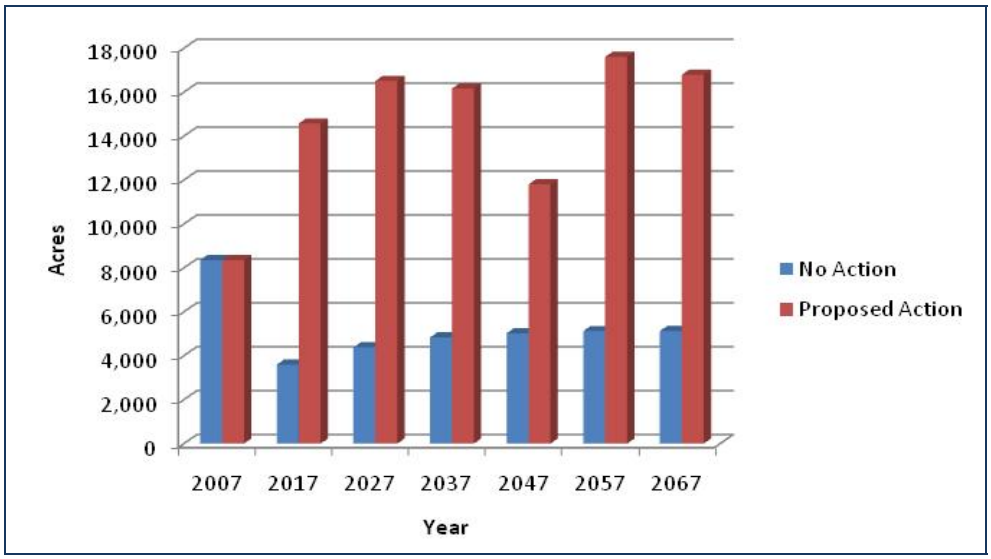
provide similar habitat benefits for spotted owls and their prey, while protecting rocky habitats and areas of shrubs or meadows could provide foraging habitat for prey species.

Figure 4-2. Dispersal Habitat* in the SOSEA and the Covered Area, Proposed Action



*Dispersal habitat is defined as stands older than 40 years of age, if commercially thinned; and older than 50 years if not commercially thinned.

Figure 4-3. Dispersal Habitat* in the Covered Area, No Action Alternative and Proposed Action



*Dispersal habitat is defined as stands older than 40 years of age, if commercially thinned (Proposed Action); and older than 50 years if not commercially thinned (Proposed Action and No Action Alternative).

Under the Proposed Action, an additional 550 acres in 5 parcels distributed across the covered areas would be retained in SSAs where there would be no pre-commercial or commercial thinning, and no regeneration harvest (Figure 3-4). Currently 359 acres of the 550 acres of SSAs are forested, and 191 acres are non-forested. Under the No Action Alternative, 216 acres of the 359 forested acres could be harvested, but would be retained under the Proposed Action. Retaining forested habitat in these areas for the term of the SHA would contribute to the development of larger blocks of older forest habitat distributed across the covered area. These stands would reach ages of 136 to 173 years during the term of the SHA, providing roosting and foraging habitat for spotted owls and potential nesting habitat, even though nesting habitat is not an intended outcome of the Proposed Action.

If, during the course of normal operations, Port Blakely discovers or is informed of the presence of spotted owl nest sites in the covered area, Port Blakely would implement nest-site provisions, as described in the SHA. Because this landscape is intended to facilitate dispersal (primarily of juveniles), as recognized in the terms of the agreement, Port Blakely would not be obligated to provide permanent protections for those owl sites under the Proposed Action. Ultimately, however, the short-term protection of nest sites would benefit dispersal of owls in this landscape and provide a conservation benefit to the species as described in the SHA. While the SHA is not intended to improve nesting habitat, some of the elements of the SHA, i.e., snag and green-tree conservation, may create trees suitable for nesting that would not otherwise develop. These elements may also provide higher-quality foraging habitat needed to support successful nesting.

Under the Proposed Action, allowing trees to grow to an older age, retaining trees in SMAs for the term of the permit, and implementing the snag conservation and development program would improve habitat for northern flying squirrels in the covered area, and would be expected to increase prey availability for the spotted owl. Longer harvest rotations and retention of downed logs would improve habitat for deer mice and other small mammals, and could also increase the availability of prey species for the spotted owl.

Marbled Murrelet

As described previously in the EA, for this SHA and EA, forested stands that are older than 81years and greater than 7 acres in size are considered potential nesting habitat for murrelets. Under the Proposed Action, this habitat would develop primarily in RMZs and in the forested portions of the SSAs. Under the Proposed Action, a total of 550 acres in 5 parcels would be included in the SSAs. Of these, 2 parcels are within 50 miles of marine waters and have a higher potential to provide murrelet nesting habitat than parcels greater than 50 miles from marine waters. One of these parcels is located in the northeastern portion of the covered area and is 72 acres in size, with 53 forested acres supporting trees with an average age of 113 years. The second parcel is located on the south side of Riffe Lake and is

164 acres in size, all of which is forested, supporting trees with an average age of 104 years. Within these two SSAs, a total of 111 acres would be available for regeneration harvest under current Forest Practices Rules but would not be harvested under the Proposed Action. Therefore, the amount of potential murrelet nesting habitat that would develop during the 60-year permit period would be greater under the Proposed Action than under the No Action Alternative.

As described in the SHA, the baseline for marbled murrelets is 498 acres, 275 acres in the SSA's and 223 acres outside of the SSA's. These specific acres have been delineated and will be protected for the duration of the SHA. As described previously in Chapter 3 of this EA, Port Blakely's forest inventory data do not allow for accurately characterizing murrelet habitat. The consequence of this may be that some of the 498 acres may not currently be suitable habitat due to a lack of platforms. However, considering their current age (older than 81 years), and considering the 60 year duration of the SHA, those acres that are presently not suitable might develop into suitable habitat during the course of the SHA.

The Proposed Action would increase the average age of regeneration harvest to 60 years and is thus, unlikely to allow development of suitable murrelet nesting habitat in managed stands. Under the Proposed Action, the majority of benefits to marbled murrelets are expected to occur within the SSAs and in SMAs containing conifers where trees can continue to grow for the duration of the agreement and possibly develop suitable nesting platforms. If, during the course of normal operations, Port Blakely discovers or is informed of the presence of murrelet nest sites in an SSA or other protected area, the nest would be protected for the term of the SHA. However, in the unlikely situation of a nest occurring outside of a protected area, Port Blakely would implement nest-site provisions, as described in the SHA. These provisions would guarantee at least short-term benefits to the species by providing a minimum of 3 years of nest-site protection.

Grizzly Bear and Gray Wolf

Potential impacts on grizzly bears and gray wolves under the Proposed Action would be the same as under the No Action Alternative and likely would be limited to potential disturbance as they are travelling through the area, as neither species is expected to occupy the covered area during the 60-year period.

Other Special-Status Species

Birds

Under the Proposed Action, potential impacts on bald eagles and peregrine falcons would be the same as described for the No Action Alternative. Potential habitat for pileated woodpeckers would increase due to the snag conservation and development program. If large snags are retained, habitat for Vaux's swift could also increase; however, due to past forest management in the covered area, this type of large snag is

expected to be rare. Suitable habitat for Vaux's swift could develop in SSAs and in SMAs. Habitat for other bird species, such as northern goshawk, olive-sided flycatcher, would also likely increase because of the SSAs.

Fisher

Under the Proposed Action, there may be more habitat available for fishers due to the extended harvest rotation, snag conservation and development program, SSAs, and SMAs, in comparison to the No Action Alternative.

Pacific Western Big-Eared Bat and Myotis Bats

Under the Proposed Action, there would be an increase in the amount and quality of roosting habitat available for bats compared to the No Action Alternative. The extended harvest rotation, SSAs, SMAs, and the snag conservation and development program are expected to improve roosting habitat for bats. The proposal will not affect the distribution of wetlands and streams, which are important areas for foraging.

Elk and Columbia Black-Tailed Deer

Under the Proposed Action, the extended harvest rotation would provide older forest cover for both elk and black-tailed deer while even-aged harvests would provide foraging opportunities, especially for the first 5 to 10 years following harvest. Longer harvest rotations would allow for development of thermal cover, particularly as the canopy closes in over a commercially thinned area. Older forest with a developed understory can provide high quality forage when regenerating areas are unavailable, such as during times when snow depth is excessive in open areas. Pre-commercial and commercial thinnings that retain a variety of shrubs and understory plants will benefit deer and elk to a greater extent than forests that have understories comprised of salal (*Gaultheria shallon*), swordfern (*Polystichum munitum*), or Oregon grape (*Mahonia aquifolium)* which offer relatively poor foraging opportunities (Cook 2005, Quail et al. 2003). Thus, the Proposed Action would likely provide a better year-round supply of quality forage. The covered area would continue to provide for elk and black-tailed deer migration under both the Proposed Action and No Action Alternative.

Van Dyke's and Larch Mountain Salamanders

Under the Proposed Action, longer harvest rotations may provide potential habitat benefits for Van Dyke's and Larch Mountain salamanders by providing forest cover for an extended period of time in areas of potential habitat where such habitat may occur outside RMZs. Prescriptions for snag conservation and development, downed-wood retention, and green-tree retention implemented under the Proposed Action may contribute to habitat for these species by providing additional down wood, sloughed bark at the base of snags, and patches of older forest distributed

across the landscape. SMAs and SSAs may also provide habitat protection for these species if they include or are adjacent to suitable habitat features.

The effects of the Proposed Action on special-status species that may be present in the covered area are compared to the No Action and summarized in Table 4-3.

4.3. Fish and Aquatic Amphibians

4.3.1. No Action Alternative

Threatened and Endangered Aquatic Species

Under the No Action Alternative, continued operations are not expected to alter existing fish habitat conditions or otherwise result in take of ESA-listed fish species other than as already described in the Forest Practices Habitat Conservation Plan (HCP) (WDNR 2005), the Forest Practices HCP Environmental Impact Statement (USFWS and NMFS 2006), and the Biological Opinions of USFWS (2006) and NMFS (2006).

Other Aquatic Species

Under the No Action Alternative, fish and aquatic resources would be potentially affected by forest management activities where such activities affect water quality, hydrology, stream shading, and large-woody-debris recruitment. Potential impacts on these species were addressed in the Forest Practices HCP Environmental Impact Statement (USFWS and NMFS 2006), and no additional impacts would occur under the No Action Alternative.

4.3.2. Proposed Action

Under the Proposed Action, effects to fish and fish habitat, including habitat for listed species, is not expected to change in comparison to the No Action Alternative because there would be no changes to RMZs; road construction, maintenance, and abandonment; or other forest management activities that may affect fish resources. The elements that affect fish resources will continue to be managed as per the Forest Practices Rules. Therefore, the Proposed Action is not expected to adversely affect aquatic species.

Table 4-3. Effects of the Proposed Action on Special-Status Wildlife Species Potentially Occurring in the Covered Area

Species Name	Status*	Probability of Occurrence	Effect
Birds			
Northern spotted owl (*Strix occidentalis caurina*)	FT, SE	Not currently present	Beneficial
Marbled murrelet (*Brachyramphus marmoratus*)	FT, ST	Not currently present	Beneficial
Bald eagle (*Haliaeetus leucocephalus*)	FS, ST	Known to occur	Neutral
Northern goshawk (*Accipiter gentilis*)	FS, SC	May occur	Beneficial
Peregrine falcon (*Falco peregrinus*)	FS, SS	May occur	Neutral
Pileated woodpecker (*Dryocopus pileatus*)	SC	Likely occurs	Beneficial
Olive-sided flycatcher (*Contopus borealis*)	FS	Likely occurs	Beneficial
Vaux's swift (*Chaetura vauxi*)	SC	Known to occur	Beneficial
Mammals			
Grizzly bear (*Ursus arctos horribilis*)	FT, SE	Unlikely	Neutral
Gray wolf (*Canis lupus*)	FE, SE	Unlikely	Neutral
Fisher (*Martes pennanti*)	FS	May occur if reintroduced	Beneficial
Pacific western (Townsend's) big-eared bat (*Corynorhinus townsendii townsendii*)	FS, SC	May occur	Beneficial
Long-eared myotis (*Myotis evotis*)	FS, SM	May occur	Beneficial
Long-legged myotis (*Myotis volans*)	FS, SM	May occur	Beneficial
Elk (*Cervus elaphus*)	SP	Known to occur	Beneficial.
Columbia black-tailed deer (*Odocoileus hemionus columbianus*)	SP	Known to occur	Beneficial

Species Name	Status*	Probability of Occurrence	Effect
Amphibians			
Larch Mountain salamander (*Plethodon larselli)*	FS, SS	May occur	Beneficial
Van Dyke's salamander (*Plethodon vandykei*)	FS, SC	May occur	Beneficial
Cascades frog (*Rana cascadae*)	FS	May occur	Neutral
Cascade torrent salamander (*Rhyacotriton cascadae*)	SC	May occur	Neutral
Cope's giant salamander (*Dicamptodon copei*)	SM	May occur	Neutral
Coastal tailed frog (*Ascaphus truei*)	FS, SM	Known to occur	Neutral
Western toad (*Bufo boreas*)	FS, SC	Known to occur	Neutral

4.4. Wetlands

4.4.1. No Action Alternative

Under the No Action Alternative, potential impacts on wetlands would be minimized through implementation of the WMZ as described in WAC 222-30-020(7). Because activity is allowed within WMZs, and the type and amount of activity is dependent upon the type of wetland, some wetland impacts could occur but the amount of impact cannot be quantified at this level of analysis. Individual wetland impacts would be documented at the time of a proposed forest practices activity.

4.4.2. Proposed Action

Under the Proposed Action, potential nonforested wetland impacts would be the same as described for the No Action Alternative and would be assessed individually for each management activity. The potential for impacts on forested wetlands would be less under the Proposed Action than under the No Action Alternative, because under the Proposed Action forested wetlands would be considered for inclusion as SMAs and special efforts would be made to avoid soil disturbance when operating in forested wetlands. Provisions include seasonal timing restrictions on ground-based logging equipment, and identifying forested wetlands as priority areas for wildlife-tree retention.

4.5. Water Quality

4.5.1. No Action Alternative

Harvest activities and road construction, maintenance, and decommissioning all have the potential to affect water quality through contribution of sediment and hazardous materials spills, and by causing temperature changes due to changes in stream shading. Potential impacts would be minimized by implementing existing Forest Practices Rules that address aquatic resources. In addition, Port Blakely would implement best management practices (BMPs) for roads (Port Blakely Tree Farms 2008) and logging (Port Blakely Tree Farms 2007).

4.5.2. Proposed Action

Under the Proposed Action, potential impacts on water quality would be minimized as described under the No Action Alternative. There is no difference between the alternatives with respect to water-quality impacts in general. Impacts on forested wetlands would be somewhat less than under the No Action Alternative because forested wetlands may be treated as SMAs.

4.6. Geology and Soils

4.6.1. No Action Alternative

Under the No Action Alternative, potential impacts on erodible soils would be minimized through compliance with Forest Practices Rules for road construction and maintenance (WAC 222-24) and for timber harvest (WAC 222-30), as well as implementation of BMPs for roads (Port Blakely Tree Farms 2008) and logging (Port Blakely Tree Farms 2007).

4.6.2. Proposed Action

Under the Proposed Action, potential impacts on erodible soils would be minimized as described under the No Action Alternative. Impacts on soils within forested wetlands would be less than under the No Action Alternative because forested wetlands would be treated as SMAs.

4.7. Cultural Resources

4.7.1. No Action Alternative

Applicable Federal regulations located at 36 CFR 800.15(i) define an effect on cultural resources as any "alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility for, the National Register of Historic Places." This applies to archaeology, historic, and ethnographic resources.

Under the No Action Alternative, regeneration harvest and road construction would occur in the covered area, generally in stands that are in the 41- to 50-year age class. Prior to these ground-disturbing activities, Port Blakely would be required to comply with regulatory requirements, including identifying cultural resources, evaluating properties in the APE, and determining effects. Under the No Action Alternative, regeneration harvest would occur on forest slopes and in areas where timber harvest has occurred in the past. These areas have a relatively low probability of containing cultural resources. Road construction, which could cross streams and flat low-elevation areas, would have a higher potential to affect cultural resources; however, the amount of new road construction in the covered area is expected to be low because the area has been managed for timber production for several decades and an extensive road system is already in place.

4.7.2. Proposed Action

Under the Proposed Action, cultural resources would be protected as under the No Action Alternative.

4.8. Land Use

4.8.1. No Action Alternative

Under the No Action Alternative, land uses and land-ownership patterns in the vicinity of the Morton Block would not change relative to current conditions. Port Blakely would continue to manage its forestry activities according to standard Forest Practices Rules. As this would not represent any change to existing conditions, and managed timberland is an encouraged use in rural Lewis County, the No Action Alternative is not anticipated to have any negative impacts on land-use patterns, land ownership, or nearby communities. However, under the No Action Alternative, no provisions for incidental take would be available, and Port Blakely could potentially become subject to land-use restrictions imposed by the ESA with respect to owls and or murrelets. In addition, without the SHA in place, the current forest practices would continue unchanged, and no new wildlife habitat would be created relative to current conditions, thereby lessening the probability of use by owls and murrelets, as well as other wildlife.

4.8.2. Proposed Action

Under the Proposed Action, land uses and land-ownership patterns would remain as under the No Action Alternative and existing conditions. While the Proposed Action would extend the harvest rotation age over the No Action Alternative, no change in land-use patterns or land ownership would occur. The Proposed Action is consistent with the Lewis County Comprehensive Plan (Lewis County 2002) in that no land would be removed from resource production, nor would any rural lands be converted to urban uses.

4.9. Socioeconomics

4.9.1. No Action Alternative

Under the No Action Alternative, Port Blakely would continue to manage its forestry activities according to standard Forest Practices Rules. As this would not represent any change to existing conditions, the No Action Alternative is not anticipated to have any negative impacts on the socioeconomic environment.

4.9.2. Proposed Action

Under the Proposed Action, no change is expected to the socioeconomic environment. The maintenance and improvement of spotted owl dispersal habitat on Port Blakely lands is expected to enhance movement of juvenile spotted owls across the landscape, which may also increase the chance of spotted owls moving across

other ownerships. However, the chance of spotted owls dispersing on other ownerships is probably much lower than Port Blakely lands because adjacent private and industrial owners are expected to continue to manage their forest on rotations less than 45 years, and they are not expected to be creating or protecting snags to the degree that Port Blakely would under the SHA. The anticipated young and simply structured forest stands on adjacent ownerships would not be considered suitable habitat for spotted owls, and would have no ESA restrictions on those lands if owls were in the immediate area. The chance of murrelets nesting on other ownerships with their assumed 45-year rotation is very low outside RMZs and rule-protected areas. Thus, Port Blakely's enhanced management, while beneficial to the covered species on their lands, would be unlikely to increase species occupancy on other private and industrial lands, and therefore unlikely to cause hardships for other landowners. Improved dispersal habitat would benefit juvenile spotted owls moving between occupied areas of national forest lands adjacent to the covered area. While low-income populations are likely to occur in the vicinity of the covered area, none would be directly affected by the issuance of the Permit, as the amount and number of forest management activities on covered lands will remain relatively unchanged because of the increased level of thinning activities under the Proposed Action.

4.10. Climate Change

4.10.1. No Action Alternative

Under the No Action Alternative, impacts of climate change on forested landscapes are likely to vary by region, and more information is needed before detailed estimates can be made for a small area like eastern Lewis County.

Trees sequester carbon as they grow and, to a certain point, older trees sequester more, by volume, than do younger trees on an annual basis (Ryan et al. 2008, Washington Climate Advisory Team 2007). Based on the current age-class distribution of forested stands in the covered area (Table 4-1), and assuming that trees would be harvested at an average age of 45 under the No Action Alternative (data is arranged in 10-year age classes), approximately 50 percent of the covered area would be regeneration harvested in the current decade, and again in the decade beginning in 2047. Based on an assumed 45-year average harvest rotation, stands would continue to be harvested in a cyclical manner and harvest would be greater during some decades than others. This would reduce the amount of carbon sequestered in the covered area as the smaller trees and seedlings planted after regeneration harvest would not sequester as much carbon as would the older trees that were removed.

4.10.2. Proposed Action

The effects of climate change on the covered area are not certain, and are essentially the same as under the No Action Alternative.

Under the Proposed Action, trees not cut during commercial thinings would be harvested at a later age, likely allowing for greater carbon sequestration. Individual trees grown in this extended rotation would store more carbon than trees grown in the shorter rotations of the No Action Alternative, and may help to locally reduce levels of atmospheric carbon.

4.11. Cumulative Impacts

Cumulative impacts are defined under NEPA as "the impact[s] on the environment that results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The cumulative impacts of the various activities within the scope of this EA vary little between the two alternatives. The differences between the two alternatives are related to the amount of voluntary habitat enhancement and protection measures that will occur through Port Blakely's forest management activities conducted according to Washington Forest Practices Rules. This cumulative-impacts analysis focuses on the spotted owl and murrelet conservation provisions and on forest management activities, because these are the focus of the SHA and the basis for the Federal action. The time period for analysis is the requested 60-year Permit duration.

The direct and indirect effects of the Proposed Action on the spotted owl, murrelet, the habitat upon which they rely, and other elements of the affected environment were described previously. To summarize, Port Blakely's forest management activities would be conducted according to Forest Practices Rules complemented with voluntary measures that include 1) harvest rotations that are longer than the industry standard, 2) regular commercial thinning, 3) a snag conservation and development program, and 4) the establishment of SMAs and SSAs. These additional forest management provisions would result in the development, retention, and/or enhancement of forest habitat with the potential for use by spotted owls and murrelets, as well as other fish and wildlife species. The effects of Port Blakely's activities are expected to result in a net conservation benefit to the covered species while no measurable effects on other elements of the affected environment are expected.

The actions occurring in and near Port Blakely's covered lands are expected, for the most part, to be limited to forest management activities. Timber production will likely remain the dominant industry for the area adjacent to the covered lands. The effects of the forest management activities conducted by Federal, State, and private land managers and landowners are expected to be characteristically similar but would differ in degree. For example, sediment delivery to streams from Federal lands would probably be lower than from private lands as a result of the implementation of the Aquatics Conservation Strategy riparian buffers outlined in the Standards and Guidelines for Management of Habitat for Late-Successional and Old-growth Forest Related Species within the Range of the Northern Spotted Owl, i.e. Northwest Forest Plan Standards and Guidelines (USDA and USDI 1994). The aquatic conservation strategy requires wider riparian buffers than the Forest Practices Rules and would, thus, result in greater protection of streams. Forest management activities would differ between landowners with HCPs depending on their location, landscape condition, and species addressed. The difference in the forest management activities being conducted by the land managers and landowners in the analysis area would be in the frequency and level of timber harvest, and the amount of habitat retained, enhanced, and protected. The effects on the covered species and natural resources in and adjacent to the covered lands would be reflective of the different forest management activities implemented by the various land managers and landowners.

Aquatic resources are expected to be least affected because current Forest Practices Rules provide adequate protections of aquatic and riparian habitat functions (WDNR 2005). The Forest Practices Rules apply to all State and private land managers and landowners and include providing adequate stream shading and road construction and maintenance measures that would address temperature and sediment input concerns, respectively.

Forested habitats in early seral stages for terrestrial species would be provided throughout the landscape in adequate amounts by timber harvest activities. Availability of this forested habitat in early seral stages is expected to remain similar to the current condition as private landowners manage their ownership under Forest Practices Rules and on a 40- to 45-year rotation. There is, and will continue to be, limited late successional forest on private lands in the area. Riparian zones may eventually provide late successional forest permeating the landscape. Although stands would grow to an average age of 60 years under the Proposed Action, these stands are not expected to function like an old-growth forest would for the covered species. Maintenance and development of older forest habitat would primarily occur on the adjacent national forest lands as they are managed under the Northwest Forest Plan. Species that rely on this habitat, such as the spotted owl and murrelet, would benefit as these actions continue to improve older-forest-habitat conditions.

The WDNR HCP (WDNR 1997) has provisions to provide spotted owl dispersal habitat in the Elbe, Washington, area (approximately 20 miles north of U.S. Route

12). The West Fork Timber Company (*nee* Murray-Pacific) HCP also contributes to the dispersal-habitat goals for this area with a commitment to provide, on average, 23,000 acres of dispersal habitat across their approximately 53,000-acre ownership by 2043. The definition of spotted owl dispersal habitat for the West Fork Timber Company HCP and the Proposed Action are not the same.

Port Blakely's voluntary measures to recruit older-forest habitat in SMAs and SSAs, extend the rotation age of upland forests, create and conserve snags, and leave more trees than required by Forest Practices Rules would contribute to the conservation of both spotted owls and murrelets. The effect of implementing enhanced forest management activities would be to intentionally create spotted owl dispersal habitat, and allow certain forest patches to grow to become potential nesting opportunities for murrelets. The dispersal habitat would contribute to spotted owl recovery goals for that area, and complement existing spotted owl habitat-development activities on other ownerships. After the first decade, Port Blakely's activities would result in dispersal habitat increasing from 8,360 acres to 14,577 acres. In subsequent decades, the amount of dispersal habitat would range from approximately 11,800 acres to 17,600 acres.

The cumulative impacts of the Proposed Action and anticipated actions by State and private land managers and landowners, as well as the U.S. Forest Service, would result in overall improvements in habitat quality and quantity for covered species. Spotted owl dispersal would be facilitated by development of foraging and dispersal habitat; and older patches of forest that would develop or be retained could serve as nesting habitat for both the spotted owl and the murrelet. Allowing habitat to develop and subsequently protecting nest sites that could result within that habitat for a minimum of 3 years would allow for productivity that may not otherwise occur. Productivity in intervening areas would benefit connectivity between Federal blocks of land.

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7.2. Personal Communications

Murden, S.B., 2008a. Wildlife and Fisheries Manager, Port Blakely Tree Farms, L.P. Tumwater, Washington. June 5, 2008, Telephone conversation. Provided information about potential marbled murrelet habitat on the covered lands.

Murden, S.B., 2008b. Wildlife and Fisheries Manager, Port Blakely Tree Farms, L.P. Tumwater, Washington. June 2008. Multiple telephone conversations. Provided data from stream surveys documenting presence of western toad and tailed frog in covered area.